medico-legal update

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Website: www.medicolegalupdate.org

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editor

Dr. R.K. Sharma
Institute of Medico-legal Publications
Logix Office Tower, Unit No. 1704, Logix City Centre Mall, Sector-32, Noida - 201 301 (Uttar Pradesh)

Printed, published and owned by

Dr. R.K. Sharma
Institute of Medico-legal Publications
Logix Office Tower, Unit No. 1704, Logix City Centre Mall, Sector-32, Noida - 201 301 (Uttar Pradesh)

Published at
Institute of Medico-legal Publications
Logix Office Tower, Unit No. 1704, Logix City Centre Mall, Sector-32, Noida - 201 301 (Uttar Pradesh)
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241. Efficacy of Philippine Ageratina Adenophora as Home Remedy to Stop Bleeding among Natives of Western Mountain Province

June II A. Kiblasan, Rosemarie T. Bangsail, Annie Lourie Y. Paredes
The Effect of Health Education Based on the Health Belief Model about Pap Smear Test on Women in Rural District Indonesia

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Abstract

Background: The aim of this study was to evaluate the effectiveness of educational interventions based on Health Belief Models (HBM) on the adoption of cervical cancer screening and prevention behaviours in Indonesian women in a rural district.

Method: This is a quasi-experimental study with pre-test and post-test design. The convenience sampling was used and a total of 100 women participated in this study. One hour educational intervention based on a health belief model including lectures, question and answer, group discussions and booklets on cervical cancer and cervical cancer screening provided to participants. The content of the session included basic information regarding cervical cancer facts, important early detection, recommended screening method, guidelines for Pap smear screening and the role of pap smears in early diagnosis of cervical cancer. As well as, pamphlets distributed to participants. Post-test test hold within six months after the end of the intervention.

Results: The findings showed that the mean difference of the scores before and after health educational intervention about Pap smear and cervical cancer for all constructs (except; perceived susceptibility and severity were no changes) has increased significantly with P-value <0.001.

Conclusion: Providing rigorous information to women about the risk of cervical cancer the benefits of early detection of cervical cancer and having regular Pap smear tests are crucial to increase the intention to undergo cervical cancer screening among women in a rural area.

Keywords: Health education, health beliefs model, Pap smear.

Introduction

Cervical cancer is the main cancer in women, and the leading cause of death in women around the world including in Indonesia¹,². According to WHO data in 2012, in Indonesia cervical cancer is the second leading cause of death on women with cancer, with an incidence of 20,928 cases and 9,498 deaths, cases per 100,000 women. In addition, the burden of cervical cancer is very high (> 80%) in developing countries³.

Early detection of cervical cancer can prevent or delay the progression of cervical abnormalities to become invasive⁴. Pap smear screening is effective in reducing the incidence and mortality of cervical cancer cases⁵-⁷. In fact, when cervical cancer is found early, it is possible to treat it. Starting June 2014, the Indonesian government has offered free Pap smear screening to married women over the age of 30 to reduce the incidence of cervical cancer. In Indonesia, women with low socioeconomic status generally seek healthcare only when they experience the symptoms, and it is strenuous to treat the advanced stage of cervical cancer⁸.

DOI Number: 10.37506/mlu.v21i2.2636
According to the health belief model (HBM), women are quicker to seek health services if their perceptions of vulnerability and seriousness related to certain health conditions are high, barriers to carrying out such behavior are low, and the benefits of engaging in health behaviors are very important. Similarly, health beliefs about cervical cancer screening have been shown to be important in determining behaviors associated with cancer prevention. Knowledge has an important role in influencing women’s decisions to undergo cervical cancer screening. Research shows that having sufficient knowledge of cervical cancer and a screening program increases the acceptance and use of available screening services. Designing efficient educational programs by selecting suitable and influential theories or models for behavior change. Health education is the main basis for all cancer prevention interventions in women. The aim of this study was to evaluate the effectiveness of educational interventions based on health belief models on screening behavior and prevention of cervical cancer in women in Indonesia.

Method

A quasi-experimental study with pre-test and post-test designs was used to evaluate the effectiveness of educational interventions based on a health belief model in preventing cervical cancer among Indonesian women in Takalar district. Post-test hold within six months after the end of the intervention. Convenience sampling was applied to recruit a sufficiently representative sample of the target population in Takalar District, a rural area with an estimate of around 66,000 women (Central Bureau of Statistics, Takalar District, 2012).

The inclusion criteria for study participants were married women, aged ≥18 years, able to communicate using Indonesian (national language), regardless of whether they could read or not. The exclusion criteria were women with a history of cervical cancer or hysterectomy. G*Power version 3.1.9.2 was used to perform sample size assuming α = 0.05, power level = 0.8, and an effect size of 0.36. The minimum sample size is estimated to be 59. Given the 10% reduction rate, a total of 70 participants will be recruited into this study.

Measurements: All variables were measured using a questionnaire. Health Beliefs Model Scale for Cervical Cancer and Pap The Smear test (HBMSCCPS) was used to assess the health confidence of cervical cancer screening. The scale was modified from the Champion Health Beliefs Model (CHBM) scale and the HBMSCCPS consisted of 35 items (5 subscales) with a five-point Likert scale from strongly disagree (score 1) to strongly agree (score 5). HBMSCCPS retest tests ranged from 0.79 to 0.87 and Cronbach’s alpha ranged from 0.62 to 0.86. The questionnaire consisted with five subscales; “benefits of pap smear test” consisted 8 questions, “barriers to pap smear test” for 14 questions, “perceived seriousness of cervical cancer” for 7 questions, and “health motivation” consisted of 3 questions. The mean of the item-Content Validity Index (I-CVI) was 0.99 and the mean -CVI score was 0.97 for Indonesian questionnaire. As well as, the internal consistency of HBMSCCPS with Cronbach’s alpha = 0.69 for the total score.

Data Collection Procedure: The principal investigator (PI) and one research assistant collected and analyzed the data. After obtaining IRB approval from Muhammadiyah Jogyakarta University, PI will seek permission from the head of the community health center, and also visit community health cadres in each district to identify potential subjects that meet all the inclusion criteria. Women who met the inclusion criteria and agreed to participate were provided with informed consent to be read and signed, and then asked to complete a pre-test questionnaire, including demographic data, intention to take cervical cancer screening, Health Belief Model Scale for Cervical Cancer and Pap Smear Test.

One-hour educational intervention based on a health belief model including basic information regarding cervical cancer facts (e.g. epidemiology, signs/symptoms and risk factors for cervical cancer development), important early detection, recommended screening method, guidelines for Pap smear screening and the role of Pap smears in early diagnosis of cervical cancer. Pamphlets were also be distributed to all participants. The post-test will measure after the end of the intervention.

Statistical Analysis: The analysis was carried out using SPSS version 26.0. Descriptive statistics of proportion used to analyze the demographics data and for Health Model Belief data used a paired sample t-test to provide further description and evaluation of the intervention with a statistical significance of 0.05.
## Result

### Table 1. The Demographic characteristics of the respondents in Takalar District

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group Intervention n = 100 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>92</td>
</tr>
<tr>
<td>Divorced/widow</td>
<td>8</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
</tr>
<tr>
<td>&lt; 20</td>
<td>7</td>
</tr>
<tr>
<td>21-30</td>
<td>15</td>
</tr>
<tr>
<td>31-40</td>
<td>36</td>
</tr>
<tr>
<td>&gt; 41</td>
<td>42</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>7</td>
</tr>
<tr>
<td>Elementary</td>
<td>25</td>
</tr>
<tr>
<td>Junior high school</td>
<td>27</td>
</tr>
<tr>
<td>Senior high school</td>
<td>30</td>
</tr>
<tr>
<td>Bachelor</td>
<td>11</td>
</tr>
<tr>
<td><strong>Tribes</strong></td>
<td></td>
</tr>
<tr>
<td>Makassar</td>
<td>97</td>
</tr>
<tr>
<td>Buginese</td>
<td>3</td>
</tr>
<tr>
<td>Others</td>
<td>0</td>
</tr>
<tr>
<td><strong>Occupational</strong></td>
<td></td>
</tr>
<tr>
<td>Not working/housewife</td>
<td>76</td>
</tr>
<tr>
<td>Civil servant</td>
<td>1</td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>4</td>
</tr>
<tr>
<td>Officer</td>
<td>1</td>
</tr>
<tr>
<td>Others</td>
<td>18</td>
</tr>
<tr>
<td><strong>Salary</strong></td>
<td></td>
</tr>
<tr>
<td>&lt; 1.5 million</td>
<td>74</td>
</tr>
<tr>
<td>1.5-2.5 million</td>
<td>10</td>
</tr>
<tr>
<td>&gt; 2.5 -3.5 million</td>
<td>5</td>
</tr>
<tr>
<td>&gt; 3.5 million</td>
<td>11</td>
</tr>
<tr>
<td><strong>History of Partum</strong></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>14</td>
</tr>
<tr>
<td>Yes</td>
<td>86</td>
</tr>
<tr>
<td><strong>Religion</strong></td>
<td></td>
</tr>
<tr>
<td>Islam</td>
<td>99</td>
</tr>
<tr>
<td>Kristen</td>
<td>1</td>
</tr>
<tr>
<td>Hindu</td>
<td>1</td>
</tr>
<tr>
<td><strong>Received Cervical Cancer Information</strong></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>45</td>
</tr>
<tr>
<td>Yes</td>
<td>55</td>
</tr>
<tr>
<td><strong>Received Pap smear Information</strong></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>60</td>
</tr>
<tr>
<td>Yes</td>
<td>40</td>
</tr>
<tr>
<td><strong>Did Pap Smear</strong></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>91</td>
</tr>
<tr>
<td>Frequently</td>
<td>8</td>
</tr>
<tr>
<td>Every 1-3 years</td>
<td>1</td>
</tr>
<tr>
<td>Rarely</td>
<td>0</td>
</tr>
<tr>
<td><strong>Family History of Cervical Cancer</strong></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>97</td>
</tr>
<tr>
<td>Yes</td>
<td>3</td>
</tr>
<tr>
<td><strong>Friends History of Cervical Cancer</strong></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>98</td>
</tr>
<tr>
<td>Yes</td>
<td>2</td>
</tr>
</tbody>
</table>

**Source:** Primary Data, 2020

The table showed that the characteristic of the total 100 respondents participated in this study. The results showed that the average age of the participants was 39.66±1.25. The majority of the participants were Muslims (99%), Makassarnese (97%), married (92%), worked as housewife (76%), history of partum (86%) and income <1.5 million per month (74%). In addition, 60% of total participants had received cervical cancer and Pap smear information. Most of participants reported never did Pap smear (91%), as well as most of them did not have family and friends with the history of cervical cancer respectively 97-98%.
Table 2. The mean±SD of scores of construct of Health belief model in women before and after Intervention

<table>
<thead>
<tr>
<th>Variables</th>
<th>Intervention</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td></td>
<td>Mean±SD</td>
<td>Mean±SD</td>
</tr>
<tr>
<td>Benefits of Papsmear test</td>
<td>3.8±0.78</td>
<td>4.2±0.79</td>
</tr>
<tr>
<td>Barriers to Papsmear</td>
<td>3.1±0.63</td>
<td>3.4±0.81</td>
</tr>
<tr>
<td>Perceived Seriousness of Cervical Cancer</td>
<td>2.9±0.76</td>
<td>2.9±0.72</td>
</tr>
<tr>
<td>Susceptibility to Cervical Cancer</td>
<td>2.0±0.81</td>
<td>2.0±0.83</td>
</tr>
<tr>
<td>Health Motivation</td>
<td>3.9±0.93</td>
<td>4.2±0.90</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2020

Table 2 reported that the mean scores of the construct of the benefits of Pap smear test in pre-test were 3.8±0.78 and after the intervention increase to 4.2±0.79 with the statistically significant (P<0.001). Related on the construct of barriers to Pap smear showed the mean scores before intervention were 3.1±0.63 and 3.4±0.81 after interventions with the p value 0.001. In addition, the construct of perceived seriousness of cervical cancer and susceptibility to cervical cancer revealed no change in the mean scores before and after intervention. While, related the construct of health motivation showed the mean scores increased from 3.9±0.93 to 4.2±0.90 respectively before and after intervention with p value<0.001.

Table 3. The Mean Difference Before and After Intervention

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits of Papsmear test</td>
<td>0.4</td>
</tr>
<tr>
<td>Barriers to Papsmear</td>
<td>0.3</td>
</tr>
<tr>
<td>Health Motivation</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2020

Table 3 showed the mean difference before and after intervention for the construct of benefits of Papsmear test were increased 0.4, while the construct of barriers to Papsmear and health motivation were increased 0.3.

Discussion

The major focus of this study is to investigate the effect of health educational intervention based on health belief model scale in improving the health confidence of cervical cancer screening among adult women in Takalar, a rural district in South Sulawesi Indonesia. Of total 100 respondents received 40-60 minutes health educational intervention.

This study revealed that there was a significant increase of the confidence on participants based on the perceived benefits of Pap smear test subscales. This findings is similar with the result of another study among 70 women in Iran, this study found that women were more sensible of the advantages from doing pap smear after the education. Further, this finding were also proved by other studies. The highlight on perceived benefits has been emphasized in some studies about the persuasion of adults’ women to undertake the Pap smear test. Considering to the impact of knowledge on practice, lack of knowledge about the advantages and the functions of the pap smear might be as the caused for poor practice of pap smear. Consistent with our results, another study also knew the lack of knowledge as one of the primary reasons of low participation on the cervical cancer screening test. After the intervention of health education, the level of knowledge was improved notably that was emphasized on the effect of the health education on participants’ knowledge. This study findings validated by other similar studies. Another study has also confirmed the impact of educational intervention on increasing women’s knowledge and participation in cervical cancer screening program. However, there was appositive relationships for designing educational interventions for changing the knowledge levels and women beliefs.

Furthermore, this study also found that there was a significant decreased of the perceived barriers to undergo Pap smear test among the women after the intervention. Designing and implementing educational program based on health belief model can promote women’s
awareness and reduce their perceived barriers and as well as enhance their practice regarding Pap smear test\textsuperscript{15,18}. This findings may refers to the effectiveness of educational intervention based on the Health Belief Model that has caused the women in the intervention group able to overcome the barriers\textsuperscript{15}. This findings is contrast with other studies which reported that educational intervention increased the perceived barriers in intervention group\textsuperscript{13,14}. Psychological barriers for instance fear and embarrassment have been the most crucial barriers among women.

With regards to perceived susceptibility and severity in intervention group showed no effect on the confidence of taking cervical cancer screening program. It might be due to insufficient intervention time for influencing the attitudes of the adult’s women\textsuperscript{13}. In contrast with other study that reported the increasing in the mean scores after receiving education about cervical cancer\textsuperscript{14,16}. Moreover, regarding the health motivation subscales showed that there was a significant increased on women motivation to do Pap smear test. This result also supports by the study among 106 women in Iran that showed the mean difference of the scores before and immediately after educational intervention was significant higher than score before intervention\textsuperscript{19}.

This study has some limitations; the sample limited to women who referred to the healthcare centers and only include small sample group. Further, it is suggested that future research should recruit participants from variety groups of women, increasing the total number of participants would also allow for a more robust results and analysis. As well as, this research had pre- and post-intervention measurements at two times, which showed only the short-term effects of the health educational intervention.

**Conclusion**

Generally, the results of this research suggested that health education based on Health Belief Model guide to encourage women to do Pap smear test. By considering the advantages of taking Pap smear as a helpful screening tools, health educational intervention based on Health Belief Model is highly advocated in healthcare centers.

**Acknowledgements:** The authors would like to thank to all participants and the Ministry of Education of Republic Indonesia (DIKTI) for the funding (Contract number: 231/SP2H/LT/DRPM/2019).

**Conflict of Interest:** None declared.

**Ethical Clearance:** This research was approved by the ethical committee of Muhammadiyah Jogjakarta University. Before participation on the research process, all participants signed an informed consent and all the interests of all participants are secured.

**References**


Social Determinants, Working Status, Knowledge and Attitude Regarding Hospital Waste Management Practices in Hospitals of Bengkulu Province

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Abstract

Introduction: Healthcare waste are considered infectious and hazardous. It requires specific handling prior to its disposal and poses a stern dangers to ecological, occupational and public health if not managed with caution. Hazardous waste management is a concern for every health care organization and for every healthcare professional.

Objective: The objective of the study was to know association demographic social determinants, working status, knowledge and attitude with practice of disposal infectious waste among health personal in hospital Province of Bengkulu

Methodology: A quantitative descriptive cross-sectional Study design was used. The research was carried for the period of five months from February 2019 to August 2019 and the sample size is estimate base on the multiple logistic regressions.

Result: In this study, most of the respondents (42.06%) not good practice of disposal infectious waste. The multivariate analysis reported age (Adjusted OR: 1.44, 95% CI: 1.04 to 2.01) with p-value: <0.030, education (Adjusted OR: 1.40, 95% CI: 1.04 to 1.90) with p-value: <0.028, management system (Adjusted OR: 5.24, 95% CI: 3.04 to 9.03) with p-value: <0.001, knowledge (Adjusted OR: 1.85, 95% CI: 1.30 to 2.63 with p-value: <0.001, attitude (Adjusted OR: 5.21, 95% CI: 3.06 to 8.86) with p-value: <0.001.

Conclusion: Almost half of hospital health personal had poor practice of disposal handling infectious waste in Bengkulu Province, Indonesia. Infectious waste management system was strongly influence on practice disposal waste.

Keywords: Infectious Waste, Social Determinants, Working Status, Knowledge, Attitude, Hospital Bengkulu.

Introduction

The hospital is not only a place of patient care but also can be a place of disease spread. Hospital waste may be dangerous to risk to patients but also to other health workers. Medical waste is very dangerous and then they need special care and management before the final disposal. Every countries have regulatory systems on medical waste depending on their own country’s finances, regulations and political capacity as well. Generally, Indonesia have universal waste transfers and transport vehicles that it used to transfer health waste from the point of activities to the care and disposal facilities. Indonesia is the country with the most results from health-care waste across the country.[1,2,3]

A research in 2004 indicated that around half of the hospitals surveyed carried out waste separation.
However, most of Health-Centers activities used to mix their waste at landfills along with domestic waste or burned them in their backyard. Generally overcoming hospital waste has been using incinerators as the most common medical waste handling technology. However, the specifications of their standard operating tools and procedures have not been good yet. The level of knowledge about hospital waste hazards is also very low at all levels of health facility personnel.\(^{[4,5]}\)

The absolute number of clinical waste made in Indonesia is around 225 tons every day and the normal/quiet/bed/day of creation squander - 0.68 kg/bed/day.\(^{[6]}\)

The Management of emergency clinics must oblige data about the threats of irresistible waste and report pretty much the entirety of the means, not simply the isolation cycle. \(^{[7]}\)

The population of Bengkulu province in 2015 is 1,874,944 million people, consists of 10 residences have 22 hospitals that do not perform hospital standard medical waste management. Thus, about health care waste information in Bengkulu province still lack off details information. This study will focus on quantity of infectious waste in hospital, the implementation to integrate it according to regulation and the knowledge and attitude of hospital workers about health care waste at public and private hospitals in Bengkulu Province.\(^{[8]}\)

The right actions and less of knowledge on the management of handling waste infection will be result to happen of nosocomial infection. Furthermore, several studies have concluded that the advent of pathogenic bacteria in various types of general waste, clinically sharp waste and another waste. The results of research show that clinical solid waste contains various types of nosocomial and practical bacterial pathogens like *Staphylococcus aureus* and *Pseudomonas aeruginosa*.\(^{[9]}\)

Clinical waste ought to be taken care of appropriately, including irresistible, obsessive, sharps, drug, genotoxic, synthetic squanders, hardcore hefty squanders pressurized compartments and radioactive waste. Good system of waste management can reduce incidence of healthcare workers. The system can reduce the incidence of injection of syringes and nosocomial infections also. It is crucial to create a condition of safe working good atmosphere for health workers.\(^{[10]}\)

This paper is an attempt to provide with a review of hospital waste management practices of among workers, who are considered as the integral part of health care and are the focal members of health care team dealing with health care waste.

### Methodology

This studied design with cross sectional study, collect general data for descriptive and after that researcher will conduct with quantitative method and calculated, to know about Practice Infectious Waste Management System (segregation to transportation process) of Socio Demographic factors (age and education attainment), Working Status (occupation, position, work experience, working day/week, working hour/day, average personal income), Management system infectious waste, Knowledge of disposal infectious waste and Attitude infectious waste of health personal at small hospital of Bengkulu Province, Indonesia. The method included questionnaire adopted by government policy in Indonesia.

The sample in this study was taken as many as 825 respondents from 7 hospitals (type B and C) hospitals province of Bengkulu. The research sample consisted of 590 nurses, 129 midwives, 16 sanitation workers and 20 doctors.

The type of dependent variable is a dichotomous outcome and the statistics that use to answer the research question is multiple logistic regressions and the sample size is estimate base on the multiple logistic regressions formula (Hsieh, Bloch, & Larsen, 1998) and is calculate by software STATA version 14.

**Ethical Consideration:** Written Consent from participants was taken before including them in study. The data collected from the correspondents has been kept purely confidential and only used for statistical analysis about study.

### Results and Discussion

The finding of a 40% not good practice of disposal waste, therefore the future studies might with largest of hospitals. The socio economic characteristics of respondents were showed mean age was 35.79±6.48 SD years old consist of male (26.42%) and female (73.58%). They were married (79.03%) and (20.97%) single. Almost all of the respondents were Diploma degree (51.03%) followed by bachelor degree (43.88%), high school (4.48%) and Master degree (0.61%).
The working status characteristics of respondents were showed in Table 4. Half of them have working in inpatient unit (64.61%) have outpatient unit (19.39) and other (16%). They occupation have nurse (71.52%) have midwife (15.64%) and other (12.84%). Type position respondent were permanent staff (61.45%) and temporary staff (38.55%) and almost of the respondent have work experience less than 10 years. Most of respondents working more than 6 days per week (82.42%) and working more than 8 hours per days (62.30%). Monthly per capita income of respondents ranged from 850,000.- to 5,000,000 Indonesia Rupiah with the mean 2,399,000 and SD 893,092.

Table 1. Associated with demographic factors in Bengkulu Sumatra is used simple logistic regression.

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Number</th>
<th>% Poor Practice</th>
<th>OR</th>
<th>95% CI</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ 35</td>
<td>255</td>
<td>44.12</td>
<td>1</td>
<td>0.55 to 1.02</td>
<td>0.0661</td>
</tr>
<tr>
<td>&lt; 35</td>
<td>92</td>
<td>37.25</td>
<td>0.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ Bachelor Degree</td>
<td>138</td>
<td>37.60</td>
<td>1</td>
<td>1.05 to 1.84</td>
<td>0.0200</td>
</tr>
<tr>
<td>&lt; Bachelor Degree</td>
<td>209</td>
<td>45.63</td>
<td>1.39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Midwife &amp; Other</td>
<td>98</td>
<td>41.70</td>
<td>1</td>
<td>0.75 to 1.39</td>
<td>0.8952</td>
</tr>
<tr>
<td>Nurse</td>
<td>249</td>
<td>42.20</td>
<td>1.02</td>
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<tr>
<td>Position</td>
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<td></td>
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<tr>
<td>Permanent staff</td>
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<td>41.22</td>
<td>1</td>
<td>0.82 to 1.45</td>
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<tr>
<td>Temporary staff &amp; Other</td>
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<td>43.40</td>
<td>1.09</td>
<td></td>
<td></td>
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<td>Work Experience (Years)</td>
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<td></td>
<td></td>
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<tr>
<td>≥ 10 years</td>
<td>228</td>
<td>39.46</td>
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<td>1.06 to 1.93</td>
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<tr>
<td>&lt; 10 years</td>
<td>119</td>
<td>48.18</td>
<td>1.43</td>
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</tr>
<tr>
<td>Working day/week</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>6</td>
<td>281</td>
<td>41.32</td>
<td>1</td>
<td>0.83 to 1.70</td>
<td>0.3543</td>
</tr>
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<td>66</td>
<td>45.52</td>
<td>1.19</td>
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<tr>
<td>Working hour/day</td>
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<tr>
<td>8</td>
<td>89</td>
<td>33.84</td>
<td>1</td>
<td>1.22 to 2.25</td>
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<td>&gt; 8</td>
<td>258</td>
<td>45.91</td>
<td>1.66</td>
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<td>Income</td>
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<td>≥ 2,000,000 rupiah</td>
<td>238</td>
<td>41.83</td>
<td>1</td>
<td>0.77 to 1.39</td>
<td>0.8400</td>
</tr>
<tr>
<td>&lt; 2,000,000 rupiah</td>
<td>109</td>
<td>42.58</td>
<td>1.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management system</td>
<td></td>
<td></td>
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<tr>
<td>Good (≥16 scores)</td>
<td>216</td>
<td>34.73</td>
<td>1</td>
<td>2.45 to 4.76</td>
<td>0.0001</td>
</tr>
<tr>
<td>Poor (&lt;16 scores)</td>
<td>131</td>
<td>64.53</td>
<td>3.42</td>
<td></td>
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<tr>
<td>Knowledge</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>High (12 - 20 scores)</td>
<td>71</td>
<td>31.98</td>
<td>1</td>
<td>1.30 to 2.48</td>
<td>0.0003</td>
</tr>
<tr>
<td>Low (0 - 11 scores)</td>
<td>276</td>
<td>45.77</td>
<td>1.80</td>
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<tr>
<td>Attitude</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive (≥72 scores)</td>
<td>283</td>
<td>38.24</td>
<td>1</td>
<td>2.94 to 8.23</td>
<td>0.0001</td>
</tr>
<tr>
<td>Negative (&lt;72 scores)</td>
<td>64</td>
<td>75.29</td>
<td>4.92</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The results showed that nurses who had low knowledge about treatment process 41.02% of the total nurses were 686 respondents, midwife had low knowledge about treatment of 37.98% of the total midwife of 135 respondent, sanitarian officer had low knowledge about treatment and transportation 50% of the total sanitarian account of 23 respondent and doctors had low knowledge of transportation 30% of the total doctors of 15 respondent.
Multiple logistic regression was performed for multivariate analysis which including variable that reported statistical effect on practice in bivariate analysis. The multivariate analysis reported age (Adjusted OR: 1.44, 95% CI: 1.04 to 2.01) with p-value: <0.030, education (Adjusted OR: 1.40, 95% CI: 1.04 to 1.90) with p-value: <0.028, management system (Adjusted OR: 5.24, 95% CI: 3.04 to 9.03) with p-value: <0.001, knowledge (Adjusted OR: 1.85, 95% CI: 1.30 to 2.63 with p-value: <0.001, attitude (Adjusted OR: 5.21, 95% CI: 3.06 to 8.86) with p-value: <0.001 and level of finding information literacy (Adjusted OR: 2.31, 95% CI: 1.48 to 3.59) with p-value: <0.001.

In this study, most of the respondents (42.06%) not good practice of disposal infectious waste, it means that personal health have good practice (57.94%), age > 35 years old (44.12%), high school and diploma (45.63%). Based on the results of research study conducted in the metropolitan city of Pakistan found that out of 275 including doctors, nurses, paramedics and sanitary workers were interviewed that only 28% had good practice following the proper guidelines and WHO rules, > 35 years old 36% and high school and diploma (51.6%) \[11\]. Furthermore, the practice of officers in the management of medical waste carried out in hospital of Kebumen Indonesia, it was find that (22.2%) had poor practice while respondents who had good practices obtained results (77.8%). \[12\]

In line with the findings with present study the research by Hence, Sahiledengle, B.\[13\] that reported of four hundred and nine healthcare workers cooperated in the study, for a response rate of 97.4% were factors that associated with self-reported healthcare waste segregation practice. The differences in the results of this study are due to differences in the number of study samples, locations and research questions. This research is an action that is observe is an active process of activities from segregation to infectious waste disposal of infectious waste.

In light of the outcome, got ordinary and powerful preparing of clinical understudies is significant. Regular mindfulness missions and classes ought to improve the information about safe dealing with and removal of biomedical waste among clinical understudies for future pragmatic application. \[14\]

**Conclusion**

Almost half of hospital health personal had poor practice of disposal handling infectious waste in Bengkulu Province, Indonesia. Infectious waste management system was strongly influence on practice disposal waste. Therefore, hospital should be doing promotion about impact of practice infectious waste. The target of promotion should be all of personal health and the promotion could be using mass media and community in hospital.

Management of Hospital should be provided some poster or brochure which explained about danger of infectious waste and how to prevent. Health care professional should improve their knowledge about infectious waste. Besides, they should discover if poor waste management practices have a bearing on the health of hospital staff.

Future study might be conducted with qualitative studies it can be providing better understanding and knowledge in practice disposal infectious waste.

**Conflicts of Interest:** All authors declare that they have no competing interest

**Source Funding:** The Faculty of Public Health, Khon Kaen University of Thailand and University Muhammadiyah Bengkulu of Indonesia for technical support and financial support.

**Ethical Consideration:** This study was approved by the Human Research and Ethics Committee of Khon Kaen University, Thailand (reference number Ref.KKK 0201.2.3/2450)

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The Role of Cell-Free Fetal DNA as a Preventative Attempt to Decrease the Severity of Genetic Disorders: A Review

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Abstract

The development of prenatal diagnosis has developed very rapidly over decades. Prenatal screening is applied to a mother with high-risk pregnancy (threatening the life of the fetus), such as a too-old mother or a too-young mother and having a certain disease in her medical history. Up until now, the curative method to treat genetic disorder is still developed and perfected. Therefore, a preventative action during pregnancy is important to do, such as Noninvasive Prenatal Testing (NIPT). NIPT method that is widely developed is the circulating cell-free fetal DNA (cffDNA) testing that can be useful for determining the fetal gender, the identification of specific single-gene disorders, blood type, paternity determination, and the potency of regular use for testing chromosomal abnormalities. The detection of cell-free fetal DNA in the maternal blood circulation provides a new expectation for NIPT, especially preventing the severity of genetic disorders.

Keywords: Cell-free fetal DNA, Prenatal diagnosis, Genetic disorder.

Introduction

The development of prenatal diagnosis has developed very rapidly over decades. Firstly, amniocentesis was developed at the beginning of 1970 and chorionic villus sampling (CVS) was developed at the beginning of 1980. Invasive prenatal diagnosis (CVS and amniocentesis) is not a low-risk option for all mothers, because there are many limitations that need to be improved. The invention of cell-free DNA (cf DNA) began from a study conducted by Mandel and Metals in 1948 showing the availability of nucleic acid (DNA) circulating in the peripheral blood. Furthermore, a further study was conducted by Bianchi et al., in 1997 to identify fetal cells in maternal blood report the method to isolating the cells. Dennis Lo, in his research findings, also reported the existence of cell-free fetal DNA (cffDNA) circulation in the plasma of pregnant women. These findings paved the way for developing Noninvasive Prenatal Testing (NIPT). The discovery of cell-free fetal DNA in maternal plasma in 1997 triggered the scientists to develop a reliable method, namely noninvasive prenatal diagnosis.

Cell-Free Fetal (cff) during Pregnancy: In 1953, Peter Brian Medawar, in his publication, explained the immunological tolerance during pregnancy. Peter suggested that there was anatomy that became a barrier between a mother and the fetus. For his finding, he was awarded a Nobel prize in 1960. However, as time went by, his finding was proven wrong. During pregnancy,
fetal cells flow across the placenta to the maternal circulation and vice versa, and the fetal cells can be identified as stem cells. Cell free fetal (cff) DNA is from trophoblast cells. Hence, the fragment of fetal DNA is released to the maternal circulation after the degradation of trophoblasts, the apoptotic fetal cells circulating in maternal blood can be the minor source of cffDNA. In the maternal blood circulation during early and late pregnancy, there are around 3 to 6% of the total cffDNA.

In the current development by using microfluidic digital polymerase chain reaction (PCR), it shows a higher concentration of fetal DNA than expected of around 10 to 12% from the total DNA in the maternal plasma. The size of circulating cffDNA mostly in the form of a short fragment of DNA; its length is around 193 bp (base pair) and it can be detected since week 4 of pregnancy, even though it can be definitely known since week 7 of pregnancy, and the concentration is significantly increased during the last 8 weeks of pregnancy. The half-life of cffDNA is around 16 minutes and is undetectable 2 hours after giving birth.

The Potency of Genetic Materials in Maternal Plasma as Biomarkers for Fetal Abnormalities: A study on genetic materials in maternal plasma during pregnancy as biomarkers had a special challenge. It is due to a high number of fetal components that can pass through the placenta or are directly released from the placenta, and it is important to note that the fetal components can be isolated and distinguished according to maternal biofluids.

(1) **Protein:** Human plasma proteome is an invaluable resource to assess health status and since it reflects the physiological status of an individual. Protein as biomarkers in prenatal diagnosis for congenital malformation has not been widely investigated and understood. Clinically, the application of maternal plasma proteins is an analysis of alpha-fetoprotein (AFP) analysis for neural tube defects (NTD).

(2) **Micro RNA:** MicroRNA (miR) is a series of short RNAs with a length of around 22 nucleotides and it is functional for gene expression. A unique microRNA profile can also be used as biomarkers for congenital malformation. Congenital diseases like congenital diaphragmatic hernia (CDH) and congenital heart disease (CHD) can be associated with the failure of miR gene expression.

In the development, the miR profile, besides being a new diagnostic instrument in certain diseases, potentially can be biomarkers for fetal health.

(3) **Long Non-Coding RNAs:** Long RNA non-coding (lncRNA) is a DNA transcription with a length of more than ~200 nucleotides and has no protein code. Gu et al., identified five lncRNAs (ENST00000436681, ENST00000422826, AA584040, AA709223, dan BX478947) from maternal plasma to detect fetal congenital heart disease. LncRNA has a big potency as prenatal biomarkers yet it still needs further investigation.

(4) **Circular RNAs:** Circular RNAs (CircRNA) are circular RNA particles resulted from the ligation of pre-mRNA (‘back-splicing’). CircRNA has a circular structure and remarkably high stability in biological matrices, such as plasma and saliva. A study by Peng et al., showed that circ-ZNF609 was detected in the tissue of a patient with Hirschsprung (HD) disease. Since the stability of circRNA is high and it plays a role in cell differentiation, it fulfills the requirements as biomarkers for fetal abnormalities.

(5) **Circulating Fetal DNA:** Circulating Fetal DNA (cfDNA) is produced from the placenta to maternal circulation during pregnancy; cfDNA is from cytotrophoblast and apoptosis in the syncytiotrophoblast or syncytiotrophoblast fusion in the physiological condition. cfDNA as biomarkers can provide information to patients for medical decision-making without increasing the risk of pregnancy loss and providing additional diagnostic information, treatment planning, the strategy, and the management of counseling.
using the target sequence; this method uses a different fraction of coding sequence and is detected in all chromosomes, however, the target sequence amplifies either non-polymorphic or polymorphic regions.1,2,7 The NIPT method refers to circulating cfDNA testing and it can be used for fetal gender, the identification of specific single-gene disorders, blood type, paternity determination, and the potency of routine use for testing Down Syndrome (DS) in all pregnancies.8 Several latest studies showed that the screening method is the most effective way for trisomy 21, with a detection level of more than 99% and a false positive rate of around 0.1%, coming from cfDNA testing.2

Conclusion

Non-Invasive Prenatal can be used as an initial health screening test and enhanced by fetal examination to see abnormalities either through diagnostic tools or maternal serum biomarkers. One such serum biomarker is using cfDNA for fetal and genetic diagnosis the chromosomal conditions of this examination have a major influence on the development of fetal medicine practice around the world.

Ethical Clearance: This study was approved by the ethical committee of the Faculty of Dentistry, Universitas Airlangga, 156/HRECC.FODM/III/2020.

Conflict of Interest: There was no conflict of interests regarding the publication of this study.

Source of Funding: The funding source of this study was supported by Directorate of Research and Community Services, Deputy of Research and Development Reinforcement, Ministry of Research and Technology/National Agency for Research and Innovation.

References


Measurement the Levels of Catalase Activity, Malondialdehyde and Ferritin in Beta-thalassemia Major Patient

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¹Research, ²Assit. Prof., University of Al-Qadisiyah, College of Science, Department of Biology, Iraq

Abstract

The present study has been carried out at the Women’s and Educational Children’s Hospital in the city of Samawa to determine the level of oxidative stress indicators and level ferritin. 66 samples of a patient with beta-thalassemia major were collected and observation of some clinical signs was followed, the group of a patient was divided into two subgroups according to the splenectomy, Group One (G1)) Included 52 samples from beta-thalassemia major patients, type non-splenectomy, (G2) included 14 samples from thalassemia patients splenectomy and 34 samples were collected from healthy males as control samples (C) to measure the level the activity of Catalase enzyme (CAT) and concentration levels of malondialdehyde MDA as oxidative stress indicators by using the Spectrophotometer and level ferritin using vidas. The results showed a significant decrease (p<0.05) in the efficacy of catalase and a significant increase (p<0.05) in the level of the MDA and level ferritin in beta-thalassemia major patients compared to control group.

Keywords: Beta-thalassemia, splenectomy, MDA, CAT.

Introduction

Thalassemia: It is a genetic disorder in the synthesis of haemoglobin widespread in the world. The distinguishing feature of thalassemia is the synthesis of unbalanced globin chains, as the synthesis of the α-chain takes place at a normal rate, in contrast, a decrease in the production of the β-chain, which leads to deposits A large intracellular basis leads to ineffective erythrocyte production and a set of subsequent pathophysiological mechanisms(1). Oxidative stress is a disturbance in the balance between oxidants and antioxidant enzymes present in the body. Oxidative stress occurs in patients with beta-thalassemia major as a result of increased levels of lipid peroxides and intermediate free radicals, as well as a decrease in the total capacity of antioxidants caused by repeated blood transfusions due to severe anemia. The use of iron chelation agents with antioxidants material can be useful in regulating antioxidant status in patients with beta-thalassemia major(2) Perform frequent blood transfusions in patients with beta-thalassemia major, iron levels are increased, making the red blood cells vulnerable to oxidative stress(3) Due to increased generation of free radicals and lipid peroxidation, and a decrease in total antioxidant capacity, lead to an imbalance between oxidants and antioxidants that results in oxidative stress(4) Patients with beta-thalassemia major receive regular blood transfusions monthly to prevent severe anemia and allow the normal growth and development of the body(5). Each unit of donor blood contains 420ml of blood and about 200mg of iron(6) While blood transfusions prevent many complications of severe anemia, the body is unable to get rid of the iron overload that accompanies every blood transfusion, so it is deposited in the tissues and organs, leading to damage and failure of the body’s systems(7). By stimulating the formation of reactive oxygen species (ROS) causing chronic oxidative stress the excess quantities of iron convert oxidants into high-energy radicals represented by hydroxyl radicals from ROS through the Fenton/Haber-Weiss reaction(8). Which leads to oxidative stress, as ROS acts on lipid peroxidation of free cell membranes to form lipid hydroperoxides, which upon their dissolution form cell-toxic secondary compounds such as alkanes and aldehydes (such as MDA), which is a by product of the lipid peroxidation process, which reflects cases of increased generation of free radicals and Oxidative stress(9). MDA is a biomarker of oxidative damage(10). Also, it is considered one of the indicators of iron concentration in the liver, and chronic blood transfusion in thalassemia patients is associated with the cumulative damage of iron in the tissues(11). The level of MDA in the blood plasma of beta-type thalassemia major patients
increases (1-8) times compared to healthy subjects\(^{(12)}\). Also, the levels of cellular antioxidant vitamins such as vitamins A, C and E, and enzymatic antioxidants such as catalase, glutathione peroxide and glutathione in patients with beta-thalassemia major, compared to the normal level for healthy people, indicates the effect of disease on antioxidant systems\(^{(13)}\). The presence of the catalase enzyme as an antioxidant system in all cells and at high concentrations in red blood cells works to remove hydrogen peroxide by analyzing it into molecular oxygen and water\(^{(14)}\). It is one of the most abundant antioxidants that work to reduce the types of reactive oxygen (ROS) that accompany many diseases such as thalassemia, aging, cataract, atherosclerosis, diabetes and nutritional deficiencies\(^{(15)}\).

**Materials and Method**

This study was conducted at the College of Science/Al-Qadisiyah University for the period from 1/10/2019 to 1/10/2020, as 66 samples of males with Thalassemia were collected in the Thalassemia Center in Samawah, and they were previously diagnosed, and they were divided into two groups: Group One (G1)) Included 52 samples from beta-thalassemia major patients, type non-splenectomy, and the second group (G2) included 14 samples from Thalassemia patients splenectomy, and 34 samples were collected from non-infected males as control samples (C), with ages ranging from 18 to 40 years for all samples.

**Sample collection:** About 4 ml of venous blood was drawn by syringe from the current study samples, then transferred to gel tubes without anticoagulant and then left for 20 minutes at room temperature for blood to coagulate, and then transferred to a centrifuge for ten minutes at 3000 rpm. Then, collecting and transfer into 3 test tubes to use in measuring the level of ferritin,MDA and CAT.

**Measuring the level of ferritin:** The serum concentration of ferritin was measured by automated equipment (Vidas). The assay principle combines an enzyme immunoassay competition method with a final fluorescent detection (ELFA). The solid phase receptacle (SRP) serves as the solid phase as well as the pipetting device for the assay. Dispensed in the sealed reagent strips. All assay steps are performed automatically by the instrument. The reaction medium is cycled in and out of the SRP several times. The sample is taken and transferred into the well containing the antigen labelled with alkaline phosphate (conjugate). Competition occurs between the antigen present in the sample and the labelled antigen for specific anti-ferritin antibody coated on the interior of the SRP. During the final detection step, the substrate (4-Methyl-umbelliferyl phosphate) is cycled in and out of the SRP. The conjugated enzyme catalyzes the hydrolysis of this substrate into a fluorescent product (4-Methyl-umbelliferyl) the fluorescence of which is measured at 450nm.

**Measurement of catalase activity:** The method (Aebi, 1974) was followed to investigate the level of activity of the enzyme catalase in the blood serum, which depends on the activity of the enzyme in breaking down hydrogen peroxide, and its effectiveness is measured by the lack of absorption of consumed hydrogen peroxide, and the absorbance reading of samples is recorded at a wavelength of 240 nm.

**Measurement of the Malondialdehyde level:** The level of MDA in the serum was measured using the method used by researchers (Guidet and Shah, 1989). The level of MDA was measured in the serum, and it represents one of the main products of lipid peroxide. The method depends on the interaction between lipid peroxides, mainly the Malondialdehyde, and thiobarbituric acid (TBA) This reaction takes place in an acidic medium and forms a coloured product, as the absorption intensity was measured at 532 nm.

**Statistical Analysis:** To analyze the results, Graph Prism 7 was used to know the significant differences in the studied criteria included in the current study using one-way analysis of variance (ANOVA). Tukey’s multiple comparisons test was used with a probability level of 0.05 to compare the significant differences between the averages of the current study groups.

**Results and Discussion**

The catalase activity recorded a significant decrease of \( p < 0.05 \) in the G1 patient group compared to the G2 patient group and the control group, while the last two groups did not record a significant difference between them, \( p > 0.05 \) (Table 1 and Fig. 1A).

The results recorded a significant increase, \( p < 0.05 \), in the MDA concentration level in the two groups of patients, G1 and G2, compared to the control group, but when the two groups of patients were compared with each other, they did not show a significant difference \( p > 0.05 \) Table (1) and Figure (1B).
Table (1) and Figure (1C) show the level of ferritin in the two groups of beta-thalassemia patients without splenectomy (G1) and patients with splenectomy (G2) compared to the control group. The results recorded a significant difference of p <0.05 in the level of Ferritin at probability level p <0.05 in the G1 and G2 patient groups compared to the control group.

Table (1) The level of efficacy of CAT (u/ml) and the concentration of MDA (μmole/L) and level Ferritin (ng/μl) in beta-thalassemia major

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Group G1</th>
<th>Group G2</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catalase (U/ml)</td>
<td>2.426±0.91 b</td>
<td>4.261±0.61ab</td>
<td>5.898±1.1 a</td>
</tr>
<tr>
<td>Malondialdehyde (nmol/l)</td>
<td>0.278±0.037 b</td>
<td>0.235±0.026 b</td>
<td>0.122±0.026 a</td>
</tr>
<tr>
<td>Ferritin (ng/μl)</td>
<td>3546±530 b</td>
<td>4918±581 b</td>
<td>221.7±31 a</td>
</tr>
</tbody>
</table>

Values represent the means±standard error. The different letters indicate a significant difference in the probability level P <0.05 among groups, while The similar letters indicate no significant difference in the probability level P >0.05 among groups.

Figure (1) Shows the level of efficacy CAT enzyme (A), MDA concentration (B) and level Ferritin in beta-thalassemia major.

The decrease in the level of catalase may reflect the extent of oxidative damage that may arise in thalassemia patients, which may be one of the reasons that lead to complications of the disease, as patients suffer from impaired function of the liver, heart, endocrine glands and other clinical complications, as catalase is one of the enzymes of the system Defensive antioxidant in the cells of the body and at a high level in red blood cells. Therefore, the oxidative damage increases when the antioxidant activity decreases against the high
The decrease in catalase enzyme activity was associated with an increase in the patients’ MDA levels. The oxidation of lipids resulting from MDA leads to the generation of collateral bonds that act on some antioxidants and weaken their link with cell membranes, leading to their lack of activity and imbalance of the oxidation-antioxidant system. Also, thalassemia patients have a low level of expression of the FOXO3 gene, which encodes for antioxidant enzymes, including catalase, and this gene is found spread on red cell membranes, and that the defect and degradation occurring in the patients’ blood cells and early stages leads to a decrease in the level of the FOXO3 gene, which is negatively reflected on the antioxidant system and thus inhibition of reactive oxygen species and increase oxidative damage to red blood cells and their membranes and this was confirmed by the Al-Athari (2019) study, as it was observed that low levels of catalase activity were associated with decreased expression of the FOXO3 gene.

The amounts of iron released as a result of the decomposition of hemoglobin in thalassemia patients stimulate the production of reactive oxygen species, in addition to the negative effect resulting from the accumulated iron as a result of periodic blood transfusions to compensate for the decrease in the hemoglobin level, as repeated blood transfusions contribute to increasing iron absorption and thus generating high levels from the reactive oxygen species ROS and superoxide resulting from the increase of free radicals in red blood cells leading to oxidative damage. These products increase the lipid peroxidation, which results in high levels of MDA, in addition to that the state of oxidative stress can affect all cells and tissues of the body, and consequently, high levels of MDA in the tissues leak into the blood causing this noticeable increase in thalassemia patients. This was confirmed by Walter et al. (2006) in his study, as they observed an increase in the level of MDA in beta-thalassemia major patients about (1-8) times compared to healthy subjects. As noted by Vichinsky et al. 2005. To the fact that the increase in the level of MDA is one of the indicators of iron concentration in the liver, and the process of chronic blood transfusion in thalassemia patients is associated with the cumulative damage to iron in the tissues, and accordingly, the increased levels of MDA were associated with increased levels of ferritin in patients and these results were consistent with the findings of the current study.

Ferritin binds to iron, transports and stores it in a non-toxic, soluble form. The reason for the increase in ferritin levels may be due to the increase in iron levels caused by thalassemia, or due to frequent blood transfusions in thalassemia patients that lead to rapid iron loading. Because each unit of blood contains 200-250 mg of iron (1 ml of red blood cells contains 1 mg of iron) that cannot be excreted. Excess iron stimulates lipid oxidation and the generation of oxidants that affect the red blood cells and thus reduce antioxidants, especially catalase, according to what Aziz and others (2017), as he mentioned in his study that iron overload comes from continuous blood transfusions for patients as free iron ions accumulate That leads to an increase in oxidative stress that depletes antioxidants in the cells and thus increased oxidants that cause damage to the membranes and organelles of the cells of the body. Iron also increases in the body as a result of iron absorption in food through the intestine or from continuous blood transfusions, which leads to an accumulation of iron that may exceed the ability to detoxify ferritin. One of the secondary causes of iron overload is the inefficiency of the treatments used to iron chelation, accumulated which is one of the main reasons for the increase in oxidants that break down the red blood cells’ membranes in their formation stages.

Ethical Clearance: Nil

Source of Funding: Self

Conflict of Interest: Nil

Reference


The Proteomic Expression of Nuclear Apoptosis-Inducing Factor1 (NAIF1) in Colorectal Tissues

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Abstract

The neogenic recombinases are potentially a source of genetic variability possibly implicated in the mechanisms of genetic instability involved in the processes of carcinogenesis. One of these neogenic recombinases is the nuclear apoptosis-inducing factor 1 (NAIF1), which codes the protein NAIF1 that induces apoptosis in various human cancers.

The aim of this work is to study the expression of NAIF1 neogene in cancerous and non-cancerous colorectal tissues.

The protein expression of NAIF1 gene has been studied by western blot method in the samples of protein extracted from 29 patients with colorectal cancer.

The result of this study showed that the protein expression of NAIF1 was found in both cancerous and non-cancerous colorectal tissues, but it is highly expressed in non-cancerous tissues adjacent to cancerous one. Its expression is higher in non-metastatic cancerous tissues compared with metastatic one. Also this expression is higher in microsatellite instable (MSI) group of cancer compared with microsatellite stable (MSS) group.

It can be concluded that NAIF1 protein expression inversely related with more advanced stage or grade of colorectal cancer and it may have a role in inhibition of proliferation, migration and invasion of colorectal cancer by inducing apoptosis.

Keywords: DNA transposons, Domestication, Neogene, NAIF1, microsatellite instable, microsatellite stable, colorectal cancer.

Introduction

Colorectal cancers are solid tumors whose somatic genetic and epigenetic alterations are best documented[1]. They are relatively homogeneous tumors in terms of their anatomopathological characteristics as they are in more than 90% of cases of adenocarcinomas[1]. Two main groups of colorectal cancers characterized by different somatic genetic alterations were presents[1-3]. The most frequent group is characterized by a chromosomal instability resulting in the recurrent loss of chromosomal segments[4,5], called LOH for Loss of heterozygoty and represents 85% of colorectal adenocarcinomas[2]. The other colorectal cancer group is characterized by microsatellite instability (MSI) due to a mismatch repair of DNA (MMR repair system)[2].

However, a phenomenon called molecular domestication has been reported for some DNA transposons resulting in the formation of neogenes[6]. Most of these neogenes domesticated from DNA transpon encode proteins for the most part still poorly characterized and whose biological functions are poorly
known. These proteins are involved in various biological processes that contribute directly or indirectly to genome stability (cell proliferation, cell cycle progression, chromatin modification, transcription...) [6,7]. Analysis of the human genome made it possible to identify 47 genes derived from transposable elements among which 43 genes are derived from domesticated DNA transposons [8]. One of these neogenes, which is selected in this study, is the neogenic recombinase nuclear apoptosis-inducing factor 1 (NAIF1) code the protein NAIF1 that derived from the DNA transposon by molecular domestication. NAIF1 is a nuclear protein that contains a Myb-like domain at its N-terminal region [9].

The human gene encoding nuclear apoptosis inducing factor 1 (NAIF1) is located on chromosome 9q34.11, and reported to repress the progression of several human cancers [9,10-14].

In gastric cancer [10,12], prostate carcinoma [11], in osteosarcoma cells [13], in non-small-cell lung cancer [14]. NAIF1 inhibit the progression of cancer by inducing apoptosis and it plays an important role in control of the expression of some pivotal anti-cancer or apoptosis-related genes in physiological level [10,12]. These findings may indicate that it is very likely that NAIF1 may predominantly act as a tumor-suppressive gene, possibly through the activation of apoptotic pathways, in various types of cancers [10-14]. In the present study the model retained for the study of the expression of NAIF1 neogenic protein by the western blot method was an in vitro model of human colorectal cancerous and non-cancerous tissues, using the protein extracted from these tissues and by the antibodies synthesized by Arnaoty et al [15], that allow the study of the expression and the analysis of neogenic recombinase corresponding to NAIF1 protein.

The aim of this study is to show the protein expression of NAIF1 in these colorectal tissues.

Materials and Method

The tumor samples and their Characteristics: Frozen samples of colorectal tumors (tumor tissue and adjacent non-tumoral colonic tissue) from 29 patients operated with colorectal cancer in 2007 or 2008 and stored in a tumor bank were selected for this study. The main characteristics of the included colorectal tumors are summarized in Table 1.

<table>
<thead>
<tr>
<th>Pt No</th>
<th>Sex</th>
<th>Tumor cells %</th>
<th>Tumor localization</th>
<th>Stage</th>
<th>Differentiation</th>
<th>Status MSI, MSS</th>
<th>BRAF</th>
<th>KRAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F</td>
<td>80%</td>
<td>Rt colon</td>
<td>2</td>
<td>Intermediate</td>
<td>MSI-H</td>
<td>Non mutated</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>M</td>
<td>90%</td>
<td>Rt colon</td>
<td>2</td>
<td>Poor</td>
<td>MSS</td>
<td>Non mutated</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>M</td>
<td>90%</td>
<td>Lt colon</td>
<td>4</td>
<td>Poor</td>
<td>MSS</td>
<td>Non mutated</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>F</td>
<td>90%</td>
<td>Lt colon</td>
<td>2</td>
<td>Intermediate</td>
<td>MSS</td>
<td>G13D</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>M</td>
<td>90%</td>
<td>Sigmoid</td>
<td>2</td>
<td>Intermediate</td>
<td>MSS</td>
<td>G12D</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>M</td>
<td>90%</td>
<td>Rt colon</td>
<td>4</td>
<td>Good</td>
<td>MSS</td>
<td>G12A</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>M</td>
<td>90%</td>
<td>Rt colon</td>
<td>3</td>
<td>Poor</td>
<td>MSI-H</td>
<td>Non mutated</td>
<td>Non mutated</td>
</tr>
<tr>
<td>8</td>
<td>M</td>
<td>75%</td>
<td>Rt colon</td>
<td>3</td>
<td>Intermediate</td>
<td>MSS</td>
<td>Non mutated</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>F</td>
<td>80%</td>
<td>Rt colon</td>
<td>3</td>
<td>Poor</td>
<td>MSI-H</td>
<td>V600E</td>
<td>Non mutated</td>
</tr>
<tr>
<td>10</td>
<td>M</td>
<td>75%</td>
<td>Rt colon</td>
<td>3</td>
<td>Poor</td>
<td>MSS</td>
<td>G12C</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>M</td>
<td>90%</td>
<td>Rt colon</td>
<td>1</td>
<td>Intermediate</td>
<td>MSS</td>
<td>G12D</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>M</td>
<td>90%</td>
<td>Rectum</td>
<td>3</td>
<td>Intermediate</td>
<td>MSS</td>
<td>G13D</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>F</td>
<td>50%</td>
<td>Rt colon</td>
<td>3</td>
<td>Intermediate</td>
<td>MSI</td>
<td>Non mutated</td>
<td>Non mutated</td>
</tr>
<tr>
<td>14</td>
<td>F</td>
<td>80%</td>
<td>Rt colon</td>
<td>3</td>
<td>Poor</td>
<td>MSI-H</td>
<td>Mutated</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>M</td>
<td>70%</td>
<td>Rt colon</td>
<td>2</td>
<td>Intermediate</td>
<td>MSI-H</td>
<td>V600E</td>
<td>G12S</td>
</tr>
<tr>
<td>16</td>
<td>F</td>
<td>50%</td>
<td>Rt colon</td>
<td>2</td>
<td>Intermediate</td>
<td>MSS</td>
<td>Non mutated</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>M</td>
<td>50%</td>
<td>Sigmoid</td>
<td>2</td>
<td>Intermediate</td>
<td>MSS</td>
<td>Non mutated</td>
<td></td>
</tr>
</tbody>
</table>
### Protein extractions from tumoral and non-tumoral samples:

Sections with a thickness of 10 μm of the samples of tumor and non-tumor tissues preserved at -80°C, were made by using a cryostat in the department of histopathology/Trousseau hospital/Tours/France. From these tissue sections, protein lysates were prepared using an ice-cold RIPA buffer (20 mM Tris-HCl (pH 7.2), 150 mM NaCl, 1 mM EDTA, 10% glycerol, 1% Triton X-100, 0.5% deoxycholate, 0.1% SDS, 1 mM DTT, 16 complete protease cocktail (Roche)). The protein extracts were assayed by the Bradford method and preserved at -20°C.

### Analysis of proteins by acrylamide gel electrophoresis:

The electrophoresis technique under denaturing conditions SDS-PAGE was used. The total protein extracts were mixed with lysis buffer (20% SDS, 100 mM NaCl, 10 mM beta-mercaptoethanol, cocktail of protease inhibitors (Roche Diagnostics GmbH, Mannheim, Germany)), and then denatured for 5 min at 95°C.

Fifty micrograms of protein extracts from cancerous and non-cancerous tissues were deposited in each well of a polyacrylamide gel.

### Western Blot:

After electrophoresis, the proteins were transferred to a polyvinylidene difluoride (PVDF) membrane (Bio-Rad, Richmond, USA) using “Trans-Blot® SD Semi-DryTransfer Cell” (BIO-RAD) in transfer buffer (40 mM Tris-base, 0.1M Glycine, 20% ethanol).

The membranes were then incubated with the anti-NAIF1 primary antibody (In Cell Art, Nantes/France) at a dilution of 1: 250 for two hours at room temperature. After three successive 10-minute washes then incubated with a secondary antibody coupled to Goat anti-Mouse IgG-HRP (Amersham, GE Healthcare) for 1 hour at room temperature. After three successive 10-minute washes the membranes were analyzed by means of a chemiluminescence reaction (Amersham ECL Advance Western Blotting Detection Kit, GE Healthcare) the images were collected using the FUGI LAS4000 imager.

The membranes were then dehybridized and then re-hybridized with a polyclonal anti-chicken actin antibody (Abcam, USA).

### Analysis of the data obtained by western blot:

For each patient, expression of the NAIF1 protein in cancerous colorectal tissue was compared to that observed in adjacent non-cancerous tissue. The expression results were then analysed according to different clinical and molecular parameters. The results were calculated by taking into account on the migration gels the band corresponding to the 35-kDa isoform of NAIF1 expression. The Western blot signals were analysed with the Multi Gauge software (which determines the optical density of the bands obtained in Western Blot and corresponding to the protein expression and their contents of housekeeping protein, actin).

### Statistical Analysis:

We have performed statistical analyses to compare the two types of samples (cancerous...
(T) and non-cancerous (N)), this is an adjustment of protein expression parameters as a function of stromal cell percentage over sample T or N for each selected patient. The Kolmogorov-Smirnov and Shapiro-Wilk test were used to test a difference in NAIF1 expression in these two types of samples [non-cancerous (N) versus cancerous (T)], and for cancerous samples (T) differentiate between non-metastatic/metastatic; MSI/MSS; mutated KRAS, BRAF/non-mutated, A result is considered significant if p≤0.05.

**Results**

**Expression of the NAIF1 protein in colorectal tissues (cancerous & non-cancerous):** Results highlighted a unique product of expression of NAIF1 in all samples of colorectal tissues cancerous (T) and non-cancerous (N) by western blot, corresponding to 35 kDa molecular weight equal to that of the NAIF1 transposase (figure 1,2) using the anti-NAIF1 antibody (In Cell Art, Nantes/France).

![Figure 1](image1.png)

**Figure 1:** NAIF1 expression by western blot for 8 patients with antisera anti NAIF1. Lanes 1 to 16 correspond to protein extracts colorectal tissues (N,T) in 8 patients respectively. Hybridizing the membranes with a specific monoclonal antibody actin, in each lane. Molecular weights are indicated in the left margins. Molecular weight of NAIF1 is indicated in the right margin.

![Figure 2](image2.png)

**Figure 2:** NAIF1 expression by western blot represented by Histogram for protein extracts of 8 samples with anti NAIF1.

The protein expression of the NAIF1 gene was analysed according to different parameters figures 3:

We compared the expression of NAIF1 between the two types of samples non-cancerous tissues (N) versus cancerous tissues (T) by adjusting them according to the percentage of stromal cell on the N and T sample. This comparison showed that the level of expression of NAIF1 in N is significantly higher than that observed in T (p-value = 0.0001).

![Figure 3](image3.png)

**Figure 3:** NAIF1 expression by western blot represented by Histogram for protein extracts of 8 samples with anti NAIF1.

Also we compared the expression of NAIF1 for the cancerous samples (T) according to the status of phenotype microsatellite instable (MSI) or microsatellite stable (MSS).

We observed that NAIF1 expression of T in MSI tumors was significantly greater than that observed in MSS tumors (p-value = 0.0001).

Then we compared the expression of NAIF1 for cancerous samples (T) according to the metastatic or non-metastatic stage of cancer. There is a significant difference observed in NAIF1 expression in the metastatic (low expression) versus non-metastatic (high expression) stage of cancer, high expression in non-
metastatic compared with metastatic one (p-value = 0.0001).

Finally, we compared the expression of NAIF1 for cancerous samples (T) according to KRAS and BRAF mutated versus non-mutated cancers. There is no significant association was observed between the level of NAIF1 expression for cancerous samples (T) according to KRAS and BRAF mutated versus non-mutated cancers.

Figure 3: NAIF1 expression according to comparison between 3 parameters where P=0.0001. A: comparison between (N, T). B: comparison between (non-metastatic, metastatic). C: comparison between (MSI, MSS).

Discussion

Several studies have described the proteomic expression of NAIF1 gene [10-14]. Our results are consistent with the previous studies were done on NAIF1 gene expression showed that, NAIF1 is expressed in both cancer tissue or cancer cell lines and in non-cancerous or normal tissue[10,12], this expression was strong or high in non-cancerous or normal tissue compared with weak or little seen in cancerous one. This finding may be interpreted by a possible relationship between gene expression and stage or grade of tumor (inversely related) and inturn possible role for this gene in the regression or inhibition in this type of cancer. Our results here in colorectal tissue cancerous and non-cancerous are in coherence with Luo’s finding in tissues, they demonstrated NAIF1 protein is highly expressed in human normal gastric tissue and down-regulated or lost in gastric cancer tissue [10]. These findings may indicate that it is very likely that NAIF1 may predominantly act as a tumor-suppressive gene, possibly through the activation of apoptotic pathways, in various types of cancers [10-14]. On the other hand, the high level of expression of NAIF1 in normal areas might suggest a role of NAIF1 in the control of genes with anti-tumor activity.

NAIF1 is significantly highly expressed in the tumor tissues of the colon with molecular phenotype of microsatellite instable (MSI) than in those of microsatellite stable (MSS) molecular phenotype. These results tend to suggest that NAIF1 could be associated with the mechanism of carcinogenesis of colorectal cancers of MSI molecular phenotype. Unfortunately, no information available in the bibliography tried to reveal this possible link between the genetic phenotype of cancer wether microsatellite instable (MSI) or microsatellite stable (MSS) status at the level of nucleotide and NAIF1 gene expression. To confirm the correlation, further research is required.

NAIF1 expression in the metastatic (low expression) versus non-metastatic (high expression) stage of colorectal cancer, is in coherence Luo’s finding in tissues [10]. This may be assumed by either the gene has a role in inhibition the progression of cancer by inducing apoptosis or the highly progressed cancer express this gene little. Further investigation will be required to clarify this relationship.

Conclusion

The higher expression of NAIF1 protein in non-cancerous colorectal tissues and lower expression in cancerous one, with higher expression in non-metastatic than metastatic one may indicates a relationship between cancer inhibition and regression with gene expression. There is a role of NAIF1 in colorectal carcinogenesis especially for cancers of microsatellite instable (MSI) phenotype. Therefore, NAIF1 may provide new clues for developing anti-cancer drugs.

Acknowledgments: We thank E. Goudeau (INSERM UMR 1087, Nantes) for her technical expertise in molecular biology, B. Pitard (Nantes university) for providing antibodies.

Source of Funding: This work was funded by the C.N.R.S, the I.N.R.A., the Groupement de Recherche CNRS 2157, and the Ministère de l’Education Nationale, de la Recherche et de la Technologie. It also received funding from a research program grant from the Cancéropôle Grand-Ouestand grants from Amgen and the French National Society of Gastroenterology.

Ethical Clearance: Samples were taken from the department of histopathology/Trousseau hospital/ Tours/France. Patients had been informed of using their samples for research purposes and their consents to participation in this type of research had been collected.

Conflict of Interest: There is no conflict.

References
2. Chung DC. “The Genetic Basis of Colorectal


Studying and Evaluating the Effect of Laser on Bacterial Species, (A Vetro Study)

Aedah Z. Alkaisy¹, Hydar Saadi Hassan Al-Wasti²

¹Asst Prof., ²Lecturer, College of Medicine, University of Baghdad, Iraq

Abstract

Background: Candida species are part of the normal oral microbiota being Candida albicans.

Objective: This study was designed and carried out to find the effect of laser on Candida albicans bacterial cell line.

Materials and Method: 16 mice 2 months ages which divided into 4 groups each one consist of 4 mice, while additional 4 mice (group E) were not exposed to the laser beam and considered as a control while the other groups were irradiated with laser beam after anaesthetized and swapped by the species on the tongue of target animal with range of 250 clinical isolates of Candida species, the groups were exposed for different time 10, 15, 20, and 25 seconds (groups A, B, C, and D respectively) with a duration of 2 hours.

Results: The no. of colony/2cm² were calculated for four times and there mean was calculated, the means were 10⁹, 10⁷, 10⁴, and 10² for groups A, B, C, and D respectively, while it was 10¹⁵ in control group.

Conclusions: Laser beam reached the tissue of the cervical lymph nodules that treated with laser, the electromagnetic oscillations gradually “swing and excite “single cells, this thought to eventually intensify the bionomical process that ultimately regulate the performance of various vital organs.

Keywords: Candida albicans, laser, bacterial species, vetro study.

Introduction

Candida species are part of the normal oral microbiota being Candida albicans the most common species associated with clinical manifestations, which range from superficial mucocutaneous lesions, such as oropharyngeal candidiasis (OPC), to disseminated forms of the infection (¹-³). OPC is the result of adhesion and penetration of fungal species into the oral tissues⁴ and it has a high incidence in patients that use immunosuppressive drugs, broad-spectrum antibiotics, anti-diabetic mediations, anticancer therapies, and in patients with the acquired immunodeficiency syndrome (AIDS)⁵.

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This study evaluated the effectiveness of antimicrobial Low Level Laser Therapy (LLT) in the treatment of oral candidiasis by using diode laser to reduce the activity of fungi(Candida) in the tongue. This model of oral candidiasis was developed to allow the monitoring of the infection and the establishment of the laser treatment. Three-weeks-old female and male mice were immunosuppressed and inoculated with C. albicans to induce oral candidiasis. After the appearance of white coated tongue the subject were ready for study.

Materials and Method

Twenty white mice were randomly ascending taken 2 months of age; 100gm of weight were prepared for this study. The animals were grouped for six groups, each of 4 mice, treated and not treated mice. One group were taken as a control, the other were treated by laser, all the animals tangs were swapped by the Candida that cultured in the agar, after preparing the culture. A range of 250 clinical isolates of Candida species were streaked
onto chocolate agar and incubated for 48 hours at 37°C in the presence of an atmosphere of 6% CO₂. All cultures were grown in 90 mm diameter plastic petri dishes with 25 ml of chocolate agar.

Group A, B, C, D were treated with laser by irradiated the cervical lymph nodules of the target animal by different duration times 10, 15, 20, and 25 min respectively and repeated the same for four days, while group E was considered as control and were not treated with laser beam. The animal anaesthetized and swapped by the species on the tongue of target animal, after the success appearing of the white coated spots on the tongue we take a swapped from each tongue of irradiated animal as follows:

- **Group A:** Continuous irradiated by laser for 10 sec twice daily with duration time of two hours
- **Group B:** Continuous irradiated by laser for 15 sec twice daily with duration time of two hours.
- Same procedure was applied on the groups C, and D with time of irradiation of 20, and 25 min respectively. After three days we swapped the tongue of the animals of each groups and cultured them in chocolate agar incubated for 24 hours. Each petridish were examined under microscope and bay using mesh lens we count the colony of each petri.

- **Group E:** remain as a control after swapped all the animals of his group with candida, and exam the swap of each animal (not treated) at the day four after the appearance of the white spot appearance.

### Results and Discussions

The results that were collected are shown in table 1, and 2.

#### Table 1: The irradiated group

<table>
<thead>
<tr>
<th>Radiated group</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal number</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

#### Table 2: The effects of laser irradiation with respect to the numbers of colony

<table>
<thead>
<tr>
<th>Groups</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of colony/2cm²</td>
<td>$10^9$, $10^{10}$, $10^8$</td>
<td>$10^9$, $10^{10}$, $10^7$, $10^6$, $10^5$</td>
<td>$10^4$, $10^5$, $10^4$, $10^3$, $10^1$</td>
<td>$10^2$, $10^2$, $10^2$</td>
<td>$10^{14}$, $10^{12}$, $10^{18}$, $10^{16}$</td>
</tr>
<tr>
<td>Mean</td>
<td>$10^9$</td>
<td>$10^7$</td>
<td>$10^4$</td>
<td>$10^2$</td>
<td>$10^{15}$</td>
</tr>
</tbody>
</table>

Many theories have been postulated about the mechanism of action for low level laser especially about the exact mechanism of action and the physiological changes occurring at the cellular level(5,6).

The increasing in the diameter of diseased mice that swapped with *Candida* is a result of laser that laser beam carries electromagnetic oscillations of definite frequency. When it reaches the tissue of the cervical lymph nodules that treated with laser, the electromagnetic oscillations gradually “swing and excite “single cells, this thought to eventually intensify the bionomical process that ultimately regulate the performance of various vital organs, and then the cell itself begins to emit light similar to the rays of the laser and that let to stimulate the salivary gland secretion(3).

The salivary glands connective tissue contains many plasma cells and lymphocytes that plasma cells secrete $\text{IgA}$, which form a complex with secretory component synthesized by the serous acinar, the $\text{IgA}$-rich secretory complex released into the saliva is resistant to enzymatic digestion and constitutes an immunologic defense mechanism against pathogens in the oral cavity(3), so the laser beam main job was to cause activation in the cell which in turn leads to an intensification of the bionomical processes shown in table 2.

The biological law states that weak stimuli excite physiological activity and moderately strong ones favor it, strong ones retard it and very strong ones arrest it from all laser irradiation of tissue show that units of light energy (photons) are absorbed by enzymes which react to light within the cell(6,7).

Infrared light that used in this study absorbed at the cell membrane, this results in a change in membrane permeability, increased ATP levels and increased DNA production(8). The photons picked up by the cell membrane result in improved membrane stability and increased activity of the ATP-dependent Na/K pump, because cell metabolism is influenced by Na/K movement.
across the membrane, increasing the gradient will affect the flow of ions and hence the overall metabolism of the cell\(^9\).

**Ethic Statement:** The researchers already have ethical clearance from all required institution and laboratories.

**Conflicts of Interest:** The author declares that there are no conflicts of interest.

**Funding:** There is no source of any funding

**References**


Knowledge and Practices of Nurses Regarding Corona Virus (COVID-19): An Educational Intervention

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Abstract

Background: COVID-19 it is the new coronavirus and most cases appeared in the Chinese city, Wuhan at the end of December 2019 in the form of acute pneumonia. It was identified through genetic sequences. It is believed that the COVID-19 originated in animals and most cases appeared in the seafood and animal market in Wuhan. The virus can spread from the infected person to another person through close contact without protection. Aim was to evaluate the effect of an educational intervention nurses’ knowledge and practices regarding Corona virus (COVID-19). Quasi-experimental design (pre and post intervention) was utilized. A total sample of (70) staff nurses were recruited in the study. The study was conducted at General Farasan Hospital. Data were collected through two main tools: A structured self-administered questionnaire, and nurses’ practices toward COVID-19.

Results: Revealed that 55.7% of nurses had poor knowledge before intervention. However, 88.6% of them had good knowledge after intervention. As well as, only 7.1% of the studied nurses had competent practices toward covid 19 before training. Meanwhile, after training the competent practices changed to 94.3%.

Conclusion: The implementation of an educational intervention was effective and significantly improved nurses’ knowledge and practices towards covid 19.

Keywords: Corona virus (COVID-19), Nurses practices, Educational Intervention.

Introduction

COVID-19 It is the new coronavirus and most cases appeared in the Chinese city, Wuhan at the end of December 2019 in the form of acute pneumonia. The virus was identified through genetic sequences. It is believed that the COVID-19 originated in animals and most cases appeared in the seafood and animal market in Wuhan. The virus can spread from the infected person to another person through close contact without protection. The common symptoms of COVID-19 include: fever, cough, shortness of breath and sometimes develops into pneumonia. It may cause severe complications in persons with immunodeficiency, the elderly and persons with chronic diseases such as cancer, diabetes and lung diseases.[1]

The novel coronavirus infection (COVID-19), also termed SARS-CoV-2, which emerged in December 2019 has become a global public health emergency and was declared a pandemic by the World Health Organisation on the 11th March 2020. Symptoms of COVID-19 are nonspecific although most typically involve cough, shortness of breath and fever, and the disease presentation can range from no symptoms (asymptomatic) to severe pneumonia and death. Most people infected with COVID-19 virus have mild disease and recover. Approximately 80% of those infected have mild to moderate disease, 13-14% has severe disease and around 6% develop critical disease. Individuals at highest risk for severe disease and death include people aged over 60 years and those with underlying conditions such as hypertension diabetes and cardiovascular disease; mortality rates increase with age and disease in children seems to be both rare and mild .[2]
A comprehensive understanding of infection prevention and control is mandatory for nurses while seeking to protect themselves, patients, colleagues and community. So taking it after the hand hygiene, understanding the key component of the proper use of PPE is when and how to put it on (don) and how to take it off (doff) again comes under lead responsibilities. The nurses should select the appropriate personal protective equipment like before undertaking any clinical intervention according to the provision of ministry of health.\[26\] Preventing the spread of infection to and from nurses and patients depends totally on your prompt actions by the effective and proper use of personal protective equipment’s such as cover all gowns or plastic aprons, Triple layer medical mask or N-95 Respirator mask, goggles, face shields and gloves, head and shoe cover.\[3\]

Nurses play a vital role in health care system and health team. All health care providers especially nurses are on the frontline battling against this pandemic and providing services to patients which is helpful to prevent and control COVID-19 pandemic. Nurses should properly arrange critically ill patients with COVID-19; complete the evaluation in the shortest time possible. In the meanwhile, urgent care, such as wheelchair/flatbed transfer, oxygen inhalation, electrocardiogram monitoring, sputum suction, and establishment of venous access, should be completed. The evaluation should include three components: general condition assessment should include age, present history illness, past medical history, allergic history, vital signs, oxygen saturation, breath, consciousness state, and systemic symptoms, such as fever, cough, expectoration, chest congestion, hypodynamia, muscle soreness, and diarrhoea., self-care ability assessment, and specialized assessment. The evaluation’s specific content should be reasonably selected according to the nursing human resources available and the critical degree of the patient’s condition.\[4\]

Specialized assessment should include cognitive functional assessment, nutritional status assessment, and venous thromboembolism (VTE) risk assessment. The Mini-Cog Test (Milian M et al 2012) is recommended for the evaluation of cognitive function as it is brief, minimally influenced by language and education level, and easily accepted by patients. The Nutrition Risk in Critically Ill (NUTRIC) Scale may be used to evaluate the nutritional status of critically ill elderly patients. However, considering elderly patients are prone to suffering from malnutrition, nutritional support should be provided immediately after admission in the case of insufficient medical staff. VTE risk assessment varies depending on different clinical situations: For medical patients, the Padua Scale is recommended, while for surgical patients, the Cabrini Risk Assessment Model is recommended.\[5\]

Critically ill patients with COVID-19 are more likely to have psychological panic and anxiety due to insufficient knowledge of the disease and lack of access to information. The following measures should be considered in these cases. First, evaluate the patient’s cognitive changes, emotional responses, and behavior changes, and provide appropriate emotional support. For patients with anxious and depressed tendencies, self-rating scales, such as an anxiety self-rating scale and a depression self-rating scale, can be used for assessment, and professional psychological personnel can be asked to help patients according to the situation. Second, various means, such as cognitive behavioral therapy, positive psychology, explaining COVID-19 in simple and understandable language, and providing continuous information support, may help elderly patients to a timely transition to the psychological stage of treatment, and to build up the confidence to overcome the disease. Third, relaxation training, such as meditation, hypnosis, music therapy, and other ways to relieve patients’ anxiety and depression, should be provided if possible.\[6\]

Discharge instructions should consist of the following: Select appropriate breathing rehabilitation exercises and teach them to patients, such as airway clearance training, breathing exercises, pursed-lip breathing, and abdominal breathing, advise patients to strengthen nutritional support, eat more high-protein, high-vitamin, high-calorie food, and more fresh vegetables, fruits, milk, and so on. Likewise, instruct patients to work and rest regularly and to get adequate sleep, it is recommended that patients continue to be monitored for 14 days after discharge and continue to wear masks. If possible, it is recommended to live in a single room with good ventilation, reduce close contact with others, eat separately, carry out hand hygiene thoroughly, and avoid outdoor activities. And it is recommended that patients return to the hospital for re-examination 2 and 4 weeks after discharge. During the period after discharge, if the patient has fever, dyspnoea, or the reappearance of other uncomfortable symptoms, or if a family member with close contact has a new novel
coronavirus infection or suspected infection symptoms, they should go to the hospital immediately. [7]

Significance of the Study: The novel coronavirus detected in China in 2019 is closely related genetically to the SARS-CoV-1 virus. SARS emerged at the end of 2002 in China, and it caused more than 8 000 cases in 33 countries over a period of eight months. Around one in ten of the people who developed SARS died. As of 30 March 2020, the COVID-19 outbreak had caused over 700 000 cases worldwide since the first case was reported in China in January 2020. Of these, more than 30 000 are known to have died. Elderly people above 70 years of age and those with underlying health conditions (e.g. hypertension, diabetes, cardiovascular disease, chronic respiratory disease and cancer) are considered to be more at risk of developing severe symptoms. Men in these groups also appear to be at a slightly higher risk than females. [8]

In addition, from the researchers’ clinical experiences, they found Nurses are lacking knowledge and skills required for caring of those patients. Best practices intervention protocols are not available for nurses working in the hospital. So, the current educational intervention was developed for nurses to update and upgrade their knowledge, skills and to be reference guide whenever needed, also, it should be utilized and integrated through educational modalities, in order to assist nurses to be competent in nursing care, therefore this study conducted to improve maternity nurses’ knowledge and skills regarding corona virus by applying an educational intervention.

Aim of the Research: To evaluate the effect of an educational intervention on nurses ’knowledge and practices regarding covid 19. This aim was achieved through:

1. Assessing nurses’ knowledge and practices regarding covid 19
2. Designing and implementing nursing educational intervention regarding coping with covid 19 & international standards infection control.
3. Evaluating nursing educational intervention after application it

Research Hypotheses: Nurses who received an educational intervention would have improved knowledge and practices toward covid 19 & international standards infection control than before intervention.

Materials and Method

Research Design: Quasi-experimental design (pre and post intervention) was utilized to fulfil the aim of this study.

Setting:

This study was conducted at General Farasan Hospital.

Sampling:

Sample type: A convenient sample.

Sample size and technique: All nurses working in the above mentioned setting at the time of the data collection were included in the study. The sample size was completed three days per week during four months. Total number was 70 staff nurses.

Tools of data collection:

Two main tools were used for data collection:

I- A structured self-administered questionnaire: It was designed by the researcher after reviewing related literature. It was written in an Arabic language in the form of close and open-ended questions. It encompassed two major parts:

First part included personal and socio demographic data such as (age, educational qualifications, occupation, residence and years of experience in the hospital).

Second part included nurses’ knowledge about corona virus (covid 19). It consisted of;

(Definition, aetiology, incubation period, signs symptoms, mode of transmission, most dangerous groups vulnerable for covid 19,self-assessment tool, signs of recovery from covid 19 complications, methods of personal protective for preventing spreading the virus, precautions of infection control, priorities of nursing care for this infection and healthy life style following during covid 19).

Knowledge Scoring: Each item was assigned a score of (2) given when the answer was correct and a score (0) was given when the answer was incorrect or do not know. Nurses total knowledge score was 24 and classified as the following; poor when total score was < 60%, average when total score was 60% < 75% and good when total score was ≥ 75%.
II- Nurses practices towards corona virus (covid 19): This tool was developed by the researcher after reviewing related literatures to assess nurses skills pertaining corona virus (covid 19) and consisted of (20) items such as (Placing patients with potential or confirmed infection with the emerging coronaviruses (Covid 19) in well-ventilated individual rooms or in rooms equipped with airborne infection reserves, reducing the number of health care workers, family members and visitors who come into contact with a patient with a potential or confirmed infection with coronavirus, Applying the “Five Times” approach in which the hands should be cleaned: Before touching the patient; Before any cleaning or disinfection procedure; And after exposure to the risks of body fluids; After touching the patient; After touching the patient’s surroundings, including contaminated objects or surfaces, wash hands with soap and water, or use an alcoholic solution to scrub hands, using of personal protective equipment for hand hygiene is not necessary. Hand hygiene is essential when placing these equipment, especially when taking it off etc………;).

**Scoring:** The items were judged according to a three point. Not done took (1) score, incompetent done took (2) score and competent done took (3) score. The total practice were divided into competent if the total score above 75 and incompetent if less than 75.

**Tools validity and reliability:** Tools were reviewed by a panel of three experts in the field of nursing to test its content validity. Modifications were done accordingly based on their judgment. Reliability was done by Cronbach’s Alpha coefficient test which revealed that each of the two tools consisted of relatively homogenous items as indicated by the moderate to high reliability (internal consistency) of each tool (knowledge = 0.92 and practices = 0.87).

**Ethical Considerations:** An official permission was granted from the directors of the pre mentioned setting with reference number (REC41/5/105). Each nurse was informed about the purpose of the study then an oral consent was obtained before starting the data collection. Confidentiality was ensured throughout the research study process, and the nurses were assured that all data was used only for research purpose. Each nurse was informed that participation is voluntary and free to withdraw from the study at any time.

**Pilot Study:** The pilot study was carried out on 8 nurses (about 10% percent of the total sample) to test the clarity and applicability of the study tools as well as estimation of the time needed to fill the questionnaire. Required modifications were done in the form of added of some questions. Nurses involved in the pilot were excluded from the study.

**Procedure:** The following phases were adopted to fulfil the aim of the current study; assessment, planning, implementation, and evaluation phases. These phases were carried out from the beginning of June 2020 to the end of September 2020 covering 4 months. Official approvals and letters to conduct this research were obtained from Dean of researcher Faculty to Directors of the previous mentioned sitting.

**Assessment Phase:** This phase encompassed interviewing the nurses to collect baseline data, at the beginning of interview the researcher greeted each nurse, explained the purpose, duration, and activities of the study and taken oral consent. Pre-test was done to assess nurses’ knowledge and practices regarding corona virus (covid 19). The data obtained during this phase constituted the base line for further comparison to evaluate the effect of an educational intervention. Average time for the completion of each nurse interview was around (25-30 minutes).

**Planning Phase:** Based on baseline data obtained from pre-test assessment and relevant review of literature, the educational intervention was developed by the researcher in a form of printed Arabic booklet to satisfy the studied nurses’ deficit knowledge, and practices regarding corona virus (covid 19).

**General objective of the educational intervention** was to improve nurses’ knowledge and practices about corona virus (covid 19).

**Implementation Phase:** Implementation of an educational intervention took (16) weeks period. The researcher visited the previous mentioned setting, three days/week. The educational intervention involved (4) scheduled sessions and were implemented according to working circumstances. These sessions were repeated to each subgroup of (3-5) nurses. The duration of each session lasted from half an hour to one hour including periods of discussion according to their achievement, progress and feedback. The researcher followed all
precautionary measures during the training of the nurses, as well as the nurses, they were committed to wearing masks, social distancing, safety and sterilization. At the beginning of the first session an orientation to the educational intervention and its aims took place, Arabic and English language was used to suit the nurses’ level of understanding. Feedback was given in the beginning of each session about the previous one. Different methods of teaching were used such as modified lecture, group discussion, power point and brainstorming. Suitable teaching media were included an educational booklet that distributed to all nurses in the first day of the educational intervention as well as audio-visual aids and videos were used.

**Evaluation Phase:** After the implementation of the educational intervention, the follow up test for nurses’ knowledge and practices were done by the same format of the pre test to evaluate the effect of the implemented educational intervention.

**Statistical Design:** Data were verified prior to computerized entry. The Statistical Package for Social Sciences (SPSS version 20.0) was used. Descriptive statistics were applied (e.g., mean, standard deviation, frequency and percentages). Test of significance (chi square and paired t test) was applied to test the study hypothesis. Correlation coefficient was calculated between knowledge, and attitude scores. A statistically significant difference was considered at p-value p<0.05, and a highly statistically significant difference was considered at p-value p ≤ 0.001.

**Results**

**Table (1)** shows personnel characteristics of the studied nurses. It was found that more half of nurses (74.3%) were aged from 20-30 years, with a mean of age 27, 34 ± 5.44 years. As far as nurses’ qualification, more than half of them (60.0 %) had bachelor of nursing as well as half of them (50.0 %) was nursing specialist. Regarding experience years at the hospital, about half of nurses (51.4%), their experience ranged from 5-10 years, with a mean of 6.36 ± 2.75 years. And (64.3%) of nurses were lived in rural area.

**Table (2)** represents that total mean scores of studied nurses’ knowledge regarding covid 19, indicated that more than half (55.7%) of them had poor level of knowledge before implementation. The mean of the total score of nurses’ knowledge was 14.1 ± 3.25 to evaluate the knowledge retention among nurses after implementation the same table proved that 88.6% of the nurses had good knowledge and the mean of total score was 22.52 ± 1.09.. The same table illustrated that the total nurses’ practice, indicated that 7.1% have competent practices before implantation. While after implementation 94.3% have competent practices.

**Figure 1** shows that, there was statistically significant difference between pre and after implementation regarding knowledge about covid 19 (p=<0.001)

**Figure 2** represent that, there was statistically significant difference between pre and after implementation regarding practices about covid 19 (p=<0.001)

**Table (3)** reflects that, distribution of the studied nurses total knowledge score in relation to their personnel characteristics, there was a general improvement in all items of knowledge about covid 19 after educational intervention as compared to before educational intervention with highly statistically significant difference between studied nurses total knowledge score, and their personnel characteristics pre and post intervention.

**Table (4)** demonstrates distribution of the studied nurses total practices score in relation to their personnel characteristics, there was a highly statistically significant difference between studied nurses total performance score, and their personnel characteristics pre and post training, with highly statistically significant difference before, and after implementing educational intervention.

**Table (5)** clears that correlation between studied nurse’s total knowledge and practices score pre and post intervention, there was there was highly statistically significant correlation between knowledge after teaching and practice after training.
Table (1): Distribution of the studied nurses according to their general characteristics (n=70)

<table>
<thead>
<tr>
<th>Items</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (Years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20</td>
<td>6</td>
<td>8.6</td>
</tr>
<tr>
<td>20:30</td>
<td>52</td>
<td>74.3</td>
</tr>
<tr>
<td>&gt;31</td>
<td>12</td>
<td>17.1</td>
</tr>
<tr>
<td><strong>Mean +SD</strong></td>
<td></td>
<td>27 ±5.44</td>
</tr>
<tr>
<td><strong>Educational qualification</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor of Nursing</td>
<td>42</td>
<td>60.0</td>
</tr>
<tr>
<td>Nursing Technician Institute</td>
<td>28</td>
<td>40.0</td>
</tr>
<tr>
<td><strong>Occupation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nursing specialist</td>
<td>35</td>
<td>50.0</td>
</tr>
<tr>
<td>Nurse</td>
<td>28</td>
<td>40.0</td>
</tr>
<tr>
<td>Head of the department</td>
<td>7</td>
<td>10.0</td>
</tr>
<tr>
<td><strong>Residence</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>25</td>
<td>35.7</td>
</tr>
<tr>
<td>Rural</td>
<td>45</td>
<td>64.3</td>
</tr>
<tr>
<td><strong>Years of experience</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 5 years</td>
<td>3</td>
<td>4.3</td>
</tr>
<tr>
<td>5 to 10 years</td>
<td>36</td>
<td>51.4</td>
</tr>
<tr>
<td>More than 10 years</td>
<td>31</td>
<td>44.3</td>
</tr>
<tr>
<td><strong>Mean +SD</strong></td>
<td></td>
<td>6.36 ± 2.75</td>
</tr>
</tbody>
</table>

Table (2) Total Mean Score of studied sample knowledge & Practices pre and post implementation of the intervention program (n=70)

<table>
<thead>
<tr>
<th>Items</th>
<th>Pre intervention</th>
<th>Post intervention</th>
<th>t test</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td><strong>Total Knowledge about covid 19:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>16</td>
<td>22.9</td>
<td>62</td>
<td>88.6</td>
</tr>
<tr>
<td>Average</td>
<td>15</td>
<td>21.4</td>
<td>5</td>
<td>7.1</td>
</tr>
<tr>
<td>Poor</td>
<td>39</td>
<td>55.7</td>
<td>3</td>
<td>4.3</td>
</tr>
<tr>
<td><strong>Mean ±SD</strong></td>
<td>14.1 ± 3.25</td>
<td>22.52 ± 1.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total practices:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competent</td>
<td>5</td>
<td>7.1</td>
<td>66</td>
<td>94.3</td>
</tr>
<tr>
<td>Incompetent</td>
<td>65</td>
<td>92.9</td>
<td>4</td>
<td>5.7</td>
</tr>
<tr>
<td><strong>Mean ±SD</strong></td>
<td>10.15 ± 2.26</td>
<td>19.91 ± 1.53</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 1 Shows total knowledge about covid 19 pre and post implementation of the intervention

Figure 2: Displays total practices about covid 19 pre and post implementation of the intervention

Table (3). Distribution of the studied sample total knowledge score pre and post implementation of the intervention program in relation to their personnel characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total knowledge score</th>
<th>Pre-intervention</th>
<th>Post –intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ±SD</td>
<td>Statistical test</td>
<td>P value</td>
</tr>
<tr>
<td>Age in years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20</td>
<td>3.75±1.48</td>
<td>0.773 (F)</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>20:30</td>
<td>4.26±1.28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;31</td>
<td>3.66±1.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>Total knowledge score</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------</td>
<td>-----------------------</td>
<td>--------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td></td>
<td>Pre-intervention</td>
<td>Post –intervention</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean ±SD</td>
<td>Statistical test</td>
<td>P value</td>
</tr>
<tr>
<td>Educational qualification</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor of Nursing</td>
<td>4.15±1.174</td>
<td>0.100 (F)</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Nursing Technician Institute</td>
<td>4.20±2.29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years of experience</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 5 years</td>
<td>4.29±1.34</td>
<td>0.953 (F)</td>
<td>13.09±1.60</td>
</tr>
<tr>
<td>5 to 10 years</td>
<td>3.73±1.48</td>
<td></td>
<td>14.05±.91</td>
</tr>
<tr>
<td>More than 10 year</td>
<td>4.10±1.79</td>
<td>0.666 (t test)</td>
<td>16.00±.000</td>
</tr>
<tr>
<td>Residence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>3.60±1.81</td>
<td></td>
<td>16.00±.000</td>
</tr>
<tr>
<td>Rural</td>
<td>4.15±1.42</td>
<td></td>
<td>13.60±1.58</td>
</tr>
</tbody>
</table>

Table (4). Distribution of the studied sample total practice score pre and post implementation of the intervention program in relation to their personnel characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total practice score</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-intervention</td>
<td>Post –intervention</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean ±SD</td>
<td>Statistical test</td>
<td>P value</td>
</tr>
<tr>
<td>Age in years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20</td>
<td>12.91±4.46</td>
<td>0.516 (F)</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>20:30</td>
<td>13.86±5.036</td>
<td></td>
<td>31.89±1.22</td>
</tr>
<tr>
<td>&gt;31</td>
<td>13.22±2.33</td>
<td></td>
<td>32.55±1.74</td>
</tr>
<tr>
<td>Educational qualification</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor of Nursing</td>
<td>14.44±4.13</td>
<td>2.64 (F)</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Nursing Technician Institute</td>
<td>11.90±4.48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years of experience</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 5 years</td>
<td>13.73±4.79</td>
<td>0.800 (F)</td>
<td>30.73±1.93</td>
</tr>
<tr>
<td>5 to 10 years</td>
<td>13.31±4.069</td>
<td></td>
<td>32.36±1.11</td>
</tr>
<tr>
<td>More than 10 year</td>
<td>11.70±4.39</td>
<td></td>
<td>34.70±.674</td>
</tr>
<tr>
<td>Residence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>12.80±1.92</td>
<td>0.548 (t test)</td>
<td>34.80±.447</td>
</tr>
<tr>
<td>Rural</td>
<td>13.36±4.68</td>
<td></td>
<td>31.50±2.024</td>
</tr>
</tbody>
</table>
Table (5). Correlation between studied nurses’ total knowledge and practice score pre and post implementation of the intervention program

<table>
<thead>
<tr>
<th>Variable</th>
<th>Knowledge before teaching</th>
<th>P</th>
<th>Knowledge after teaching</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practice before training</td>
<td>.171</td>
<td>&gt;0.05</td>
<td>.971**</td>
<td>&lt;0.001**</td>
</tr>
<tr>
<td>Practice After training</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Discussion**

Nowadays, COVID-19 is a life-threatening agent with the worldwide spread and it has become an international concern. This disease was first reported on 12 December 2019 from Wuhan (1). Health workers, especially nurses, have close contact with infected patients and have a decisive role in infection control. The health care providers are at the front line of the outbreak response of current pandemic of COVID19 and exposed to hazards that put them at risk of infection. Rapid spread of the COVID-19 pandemic has become a major cause of concern for the healthcare profession in all over the world. All health care professional must stay aware of the latest information on the COVID-19 outbreak.[10]

This study was carried out to evaluate the effect of educational intervention on nurses’ knowledge and practices regarding corona virus (covid 19). As regard characteristic of the studied sample, it was found that more half of nurses (74.3%) were aged from 20-30years, with a mean of age 27, 34 ± 5.44years. As far as nurses’ qualification, more than half of them (60.0 %) had bachelor of nursing as well as half of them (50.0 %) was nursing specialist. Regarding experience years at the hospital, about half of nurses (51.4%), their experience ranged from 5-10 years, with a mean of 6.36 ± 2.75 years. And (64.3%) of nurses were lived in rural area. In this respect Nemati , et al (2020) [11] who studied “Assessment of Iranian Nurses’ Knowledge and Anxiety Toward COVID-19 During the Current Outbreak in Iran” and found that the demographic characteristics of the participants. More than 75% of the respondents were in the group of less than 40-years-old. Concerning the education level, (56.3%) participants had a high school diploma or less, more than half of them (67%) had associate’s or bachelor’s degrees, provides data regarding work experience:, 30.6% between 5 and 15 years.

On investigating knowledge of the studied sample regarding corona virus (covid 19), the findings of the current study revealed that before the educational intervention, nurses had poor knowledge about covid 19, their low scores of knowledge may be attributed to the fact that covid 19 are new advanced emerging virus and the nurses, are still deficient in this issue. As well as after graduation, nurse’s neglect reading updating their professional knowledge, it was expected to find such low level of knowledge. The present study findings are in congruence with Joshi, et al (2020) [12] who studied “Knowledge and awareness among nursing students regarding the COVID-19: a cross sectional study”, who concluded that, the study participants showed adequate basic knowledge and awareness of COVID-19. There is a strong need to implement periodic educational interventions and training programs on infection control practices and other updates of COVID-19 across all healthcare professions including nursing students. Additional online education interventions and campaigns are also required. This would definitely improve the knowledge and confidence of nursing students to provide the right care to their patients and protect them self from COVID-19.

Furthermore, after implementing the educational intervention, there was a statistically significant improvement for knowledge scores in relation to covid 19. Such improvement might be accounted on nurses’ interest to learn and acquire knowledge about the study topic as well as the written booklet distributed to nurses used as an ongoing reference, which was helpful in nurses’ acquisition of knowledge, in addition to encouragement of questions, participation, and interactions along the intervention as well as the use of multimedia. These results are consistent with CHEN etal.,(2020) [13] who studied that Nursing Perspectives on the Impacts of COVID-19, and concluded that- Nurses are key members of healthcare teams charged to control and prevent the spread of infectious diseases. Moreover, nurses work on the front line, providing direct care to individuals infected with COVID-19. Further effort is
necessary to develop strategic recommendations and to integrate new knowledge into education. The immediate efforts to control and prevent COVID-19 and to care for those who are infected remain ongoing.

Concerning nurses’ practices towards covid 19, the findings of the current study revealed that about two thirds of the studied nurses had incompetent practices toward covid 19 before intervention. Meanwhile, after intervention the percentage changed to majority of the studied nurses had competent practices toward covid 19. This could be due to the fact that, receiving training from educational intervention and high adherence with training sessions with their active participation improving their knowledge and lead to competent practices.

These findings are in the same line with Fernandez et al., (2020)\(^\text{[14]}\) who studied “Implications for COVID-19: a systematic review of nurses’ experiences of working in acute care hospital settings during a respiratory pandemic” who concluded that nurses should receive clear, concise and current information about best practice nursing care and infection control, as well as sufficient access to appropriate PPE to optimise their safety. Adequate staffing is essential to ensure that nurses are able to take breaks during shifts, take leave when they are ill and provide appropriate skill mix. Support for nurses to manage competing family responsibilities and maintain safe contact and communication with family members can reduce personal stress and anxiety.

In general, the nurses in the present study demonstrated poor knowledge, with incompetent practices. Implementing educational intervention that met their needs proved successful in fostering their knowledge and improving their skills, thus leading to acceptance of the research hypothesis. The effectiveness of the educational intervention and its independent positive influence on nurses’ knowledge and practices towards covid 19 was apparent from the results. The findings are in congruence with the results of Chen and Lou, (2013)\(^\text{[15]}\) systematic review that revealed that such programs are beneficial as they involve multi-dimensional teaching strategies. Furthermore, Varghese (2013)\(^\text{[16]}\) added that nurses have an important role in imparting knowledge, therefore, the nursing policy protocol should include the current technologies to update the knowledge regarding recent advances to cope with infection control of covid 19 in addition to structured teaching programme is one of the effective methods to acquire & impart knowledge and practices.

Regarding integrating knowledge into practices, the present study demonstrated a positive statistically significant correlation between knowledge and practices, with improved knowledge being associated with competent practices. This finding is quite expected and is consistent with McEachan et al., (2016)\(^\text{[17]}\) who studied “Meta-analysis of the reasoned action approach (RAA) to understanding health behaviours” who reported that some health care workers have inadequate awareness of infection prevention practices. Knowledge of a disease may influence health care workers practices, and incorrect practices directly increase the risk of infection. Understanding health care workers knowledge, & practices and possible risk factors helps to predict the outcomes of planned behaviour.

Additionally, the findings of the current study illustrated that there was a highly statistically significant correlation between total knowledge, total practices scores and general characteristics. These findings are supported by Zhang et al., (2020)\(^\text{[18]}\) who studied “Knowledge, attitude, and practice regarding COVID-19 among healthcare workers in Henan, China” that emphasized that training regarding protection should be organized according to different factors (work experience, educational attainment, and so on), and medical systems should ensure that frontline workers have enough time to rest between shifts, to avoid overwork and non-conscious errors during epidemic relief efforts. Moreover, to reduce the risk of infection among healthcare professionals who are not in direct contact with patients, policy and education should be implemented to convey the importance of disclosing possible exposure to the virus.

**Conclusion**

In the light of the study findings, it can be concluded that, there was a statistically significant improvement in nurses ‘knowledge mean scores, after intervention, as well as there was a statistically significant difference in nurses’ practices scores before, and after intervention. The implementation of an educational intervention was effective and significantly improved nurses’ knowledge and practices towards covid 19. Furthermore, the above mentioned findings proved and supported the research hypothesis.

**Recommendations:**

- Adequately planned in-service training programs related to covid 19 must be established to develop
nurses' knowledge and practices in order to fit newly developed concepts in care.

- Simple guidelines regarding COVID-19 should be available and easily access in all departments of the hospital
- This study can be replicated on a larger sample in other hospitals for generalizing the findings.

Acknowledgements: The researcher expresses their gratitude and thanks Jazan University, Farasan University college, General Farasan Hospital, all nurses and all who have directly or indirectly helped them to complete this study and their support in each major step of the study.

Funding: Jazan University

Conflict of Interest: The researcher declares that there is no conflict of interest statement

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Protecting Public Rights on Land Management: A Disjunction between Ideality and Reality

Agus Suprihanto¹, Farida Patittingi², Anwar Borahima³, Sri Susyanti Nur⁴

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Abstract

Land-use systems are characterized by complex interactions between human decision-makers and their rights environment. Mismatches between the scale of human drivers and the impacts of human decisions potentially threaten the public rights as a whole. The research is a normative legal research using a statute, case, and conceptual approaches. The results show that land for management rights can be used for the purposes of conducting their duties or business, and its use can be transferred to third parties with the approval of the holder of management right. In fact, transfer of rights and imposition of mortgage rights can occur even without the permit of the holder of management right. However, when there is default, the creditor experiences obstacles because the National Land Agency rejects to issue a Land Registration Certificate without the holder’s permit of management rights, so that collateral cannot be executed. This condition results in the failure to fulfill the principles of justice and legal certainty for creditors and debtors. This provision should be abolished because it contradicts the principle of justice and legal certainty for the parties having an interest in utilizing the management rights land.

Keywords: Civil Law; Public Rights; Land Rights; Management.

Introduction

Land is a fundamental human need (constitutional rights). More important of land for human life, everyone will always try to own and control it.¹ The population continues to grow causes the need for land to increase, it can be seen from the development of residential, industrial and tourism areas or other needs. Meanwhile, the existing land does not increase or permanent, so requires the State to regulate it so that the State’s objectives in promoting the welfare of the Indonesian people can be fulfilled for national development. Land is one of the main assets as a medium for implementing development to create a just and prosperous society. The preamble of the 1945 Constitution affirms one of the objectives of the Indonesian namely to establishes an Indonesian state government that protects the entire Indonesian nation and all Indonesian blood and to promote public welfare. It can be seen that one of the objectives of the Indonesian State is to promote the general welfare and for all Indonesian people.²

In order to ensure legal certainty for individuals and legal entities to fulfill business needs and to build anything, it is given the right of the land.³ According to Van Vollenhoven, the source of State power over natural resources (including land) is the State is given the authority to regulate everything and it is based on its position has the authority to make legal regulations.⁴ This land registration will produce registration maps, measuring documents for legal certainty including the location, boundaries and width, information and the subject concerned, right status, as well as anything concerns the land and finally issuing a certificate as a powerful evidence.⁵ Land right is a right that give the authority to use land that is given to a person or legal entity. In principle, the purpose of land utilization is to fulfill 2 (two) types of needs i.e cultivation and to build anything.

In practice, the implementation of management rights has experienced significant developments both in terms of its regulation and implementation in the field.⁶
Various regulations that regulate the management rights are all at the level of implementing regulations, the rules governing and their explanations are still separate and have not been formed in one law. Management rights which include designation, use, period and compensation provided that the granting of land rights to third parties is conducted by an authorized official based on statutory regulations. In juridical context, the position of the third party is only the “hitchhiking” party such as the holder of temporary land rights due to limited.7

Lending made by a Bank as a financing institution should receive legal protection for creditors and recipients, as well as for related parties to receive protection through a legal guarantee institution for all interested parties. In giving credit facilities, requires a sufficient credit guarantee economically and good in juridical, because the condition of debtor may unexpectedly be in a situation of being unable to pay his/her loan installments (bad credit). If this happens, then the guarantee is expected to guarantee the repayment of debtor’s credit.

As the legal phenomena as described above, it can be seen that stakeholders, including notary and the National Land Agency have not implemented procedures according to the applicable regulations in granting, transferring and binding mortgage rights to building use rights on management rights land, due to existing regulations is still unclear and not-codified, so it does not provide legal protection and legal certainty for parties, especially creditors.

Method

The research is a normative legal research using a statute, case, and conceptual approaches.8 Data were analyzed with descriptive qualitative analysis with content analysis. In this study, the authors used the qualitative research method, which (in general) generates words rather than numbers as data for analysis. The approach used is observation and interpretation, which makes these phenomena observable. This paper provides information on the latest trend in research.9

Selling and Buying a Plot of Land on Management Right Land: Insights from Indonesia: The procedure for legal actions in transferring (selling, grants, exchanging, pledging or collateralizing and others) of land located on management rights land is almost same as the procedure for buying and selling a plot of land on State land. In selling and buying transaction of land and/or buildings on State land, the parties, namely the seller and the buyer do not need to request approval or permit from any party unless otherwise stipulated by the legislation. It is different if the land are transferred or traded over the land area of management rights, stipulated by Article 34 paragraph (7) jowith Article 54 paragraph (9) Government Regulation No. 40 of 1996 concerning Business Use Rights, Building Use Rights and Land Use Rights before the selling and buying of land use rights for building on management rights land, the parties especially the seller are required to apply for a permit from the holder of the management rights concerned.

As a follow-up to the request, the holder of the management right has the right to issue or reject a permit or recommendation as a form of approval or rejection of the transfer of land and/or buildings to other parties. Permits or recommendations are addressed to the person concerned, the land-owner. However, sometimes when a management right holder gives a permit or recommendation to the Head of the National Land Agency to continue to registration of names change in the documents or certificates of land as traded.

The permits or recommendations by holder of management rights are a real reflection of the implementation of part of the authority of the State’ Controlling Rights. In the process of issuing permits or recommendations, the holders of the management rights refer to the terms and conditions set by the holder of the management rights and refer to the contents of the agreed land use surrender agreements as a basis for consideration in the framework of granting permits or recommendations.1

Each holder of management rights has its own policies, terms and conditions. They have different administrative management procedures for the land that is controlled with a management right, including the procedure for transferring land rights or assigning them. If the transfer of land will result in inconsistent with the function of land designation and use other than the stipulated provisions or policies, the holder of the management right may reject the application for a permit or recommendation for transfer of the land.

Permits or recommendations for the transfer (selling and buying) of land and/or buildings on management rights are used as tools or instruments to do supervisory (control) function which is the duty and authority of the
holder of the management rights concerned over land use by third parties. Through a permit or recommendation agency, the holder of the management right can monitor and prevent parts of management rights land that violate government provisions and policies.

One of the requirements for the transfer (selling and buying) of land and/or buildings on management rights land is to pay the management money concerned. The holders of management rights are authorized to charge administrative fees from holders of land rights on management rights land. The amount of administrative fee is determined based on the full policy by the holder of the management right concerned and notified to the applicant in the permit or recommendation or notified separately.

The Fulfillment of Prudential Banking Principles as an Ideal Model for Protecting Public Rights to Land: Based on banking principles, credit or financing as provided by banks contains an element of risk, so that in its implementation the bank must consider the principles of credible credit. These principles are to prevent or reduce the occurrence of risk, therefore the banking sector is required to implement prudent banking principles. The term prudent relates to the supervision and bank management. The principle of prudent requires banks to always be careful in conduct their business activities, meaning that they must always be consistent in implementing laws and regulations in the banking sector based on professionalism and good faith.

The principle of prudence or also known as the prudential banking principle is an important principle in the practice of banking in Indonesia so that it must be applied or implemented by banks in conduct their business activities. Also, banks are required to be able to design a good legal relationship with prospective debtors, so as to create good working synergy between creditors and debtors. If the debtor is declared in default, the bank can easily execute the collateral given by the debtor based on the design of the legal relationship that has been previously made. Thus, collateral in their credit is a powerful means of securing credit.

The process of granting credit decisions includes credit initiatives and applications, followed by credit analysis and evaluation, credit negotiations, recommendations for granting credit decisions, credit agreements, binding credit collateral, documentation and credit administration, credit disbursement approval and credit monitoring also against risks that may arise, so as to anticipate by taking measures as protection, legal aspects that strengthen the position of the bank, as well as looking for various alternatives to save credit repayments. Especially in this research regarding Building Use Rights, it is necessary to analyze the collateral that will be used as credit guarantees.

Generally, legal theory states that the act of transferring rights can only be done by legal subjects against legal objects that are privately owned as well. Because the legal relationship between the subject and the object in the management rights is more public in nature, the legal act of transferring rights (transferring rights directly to another legal subject) is legally prohibited. If there is an intention to terminate the legal relationship between management rights from the legal subject to another legal subject, that intention is only possible through waiving the right. Especially for investment needs, local governments may apply for management rights to cooperate with investors or third parties. Such management rights can be issued after a certificate is issued which states that the land or land concerned is a management right for the agency concerned.

Such management rights can be utilized by management rights holders including the private sector for or for commercial purposes. One of the forms is by granting Building Use Rights on land under management rights which according to regulations regulates the period of time and other related matters. Management rights are assets of state assets, for the guarantee of Building Use Rights on the land of the management rights that the guarantee is done by the holder of the Building Use Rights on land. The management rights are the Building Use Rights not on the land concerned, so that the provisions related to the prohibition of guaranteeing state assets can be avoided.

Get legal protection is the hope of every legal subject in an agreement. Legal protection is a protection of the rights and obligations of a person where a protection is provided to legal subjects in the form of legal instruments, both preventive and repressive in nature. As a preventive measure, creditors must also conduct credit supervision where the bank must monitor the use of credit, whether the use is in accordance with the provisions. In addition, periodic visits are also held, as well as warnings if the credit being extended has problems. Supervision must also be done over the period of guarantee for Building
Use Rights so that it does not expire before the credit period. At this stage of supervision, it can be seen that credit quality or what is commonly referred to as earning asset quality.

Conclusion

Land for management rights can be used for the purposes of conducting their duties or business, and its use can be transferred to third parties with the approval of the holder of management right. In fact, transfer of rights and imposition of mortgage rights can occur even without the permit of the holder of management right. However, when there is default, the creditor experiences obstacles because the National Land Agency rejects to issue a Land Registration Certificate without the holder’s permit of management rights, so that collateral cannot be executed. This condition results in the failure to fulfill the principles of justice and legal certainty for creditors and debtors. A judicial review is required of Government Regulation No. 40 of 1996 which stipulates that the transfer of Building Use Rights on management rights land requires prior permit. This provision should be abolished because it contradicts the principle of justice and legal certainty for the parties having an interest in utilizing the management rights land.

Ethical Clearance: No ethical approval is needed.

Source of Funding: Self

Conflict of Interest: Nil

References

Effect of Lifestyle Modification Module on Patients’ Compliance Postoperative Bariatric Surgery

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Abstract

Background: Obesity is a grave public health threat, more serious even than the opioid epidemic. It is associated with increased risk of several chronic diseases. Bariatric surgery is an effective and safe technique for the treatment of morbid obesity and co-morbidities related to obesity.

Objective: This study aimed to evaluate the effect of lifestyle modification module on patients’ compliance postoperative bariatric surgery.

Method: A quasi experimental design was utilized for the study. A purposive sample of 104 patients with postoperative bariatric surgery who are selected according to certain inclusion criteria.

Results: There was significant improvement in patients’ compliance post implementation of lifestyle modification module where the pre compliance mean score was 21.04±8.07 and the post mean score was 33.59±8.34.

Conclusions: Lifestyle modification module has positive effect on improving patients’ compliance postoperative bariatric surgery. This demonstrates that the module is an effective intervention for postoperative counseling to improve bariatric surgery outcomes.

Keywords: Postoperative bariatric surgery, lifestyle modification, patient’s compliance.

Introduction

Obesity has been recognized as a universal global health problem, described as an epidemic by the World Health Organization (WHO). It is a chronic, life-limiting disease, which is associated with a number of serious health conditions such as type 2 diabetes mellitus, cardiovascular disease, high blood pressure, obstructive sleep apnea, asthma, osteoarthritis, and some types of cancer¹². Bariatric surgery is increasingly recognized as the most effective treatment for individuals who are severely obese. Bariatric surgery not only helps in weight reduction, but also improves obesity-related medical conditions and consequently increases the quality of life³.

Worldwide, the total number of bariatric surgery performed in 2014 consisted of 579,517 surgical operations. Compared with 2017, the total number of metabolic and bariatric procedures performed in the united states in 2018 increased from approximately 228,000 to 252,000⁴⁵.

Patients undergoing bariatric surgery are required to adhere to the postsurgical behavioral recommendations that includes; following specific eating and drinking behaviors; exercise regularly; take medication/supplements daily; and attend follow-up medical appointments for regular monitor and evaluation of health status⁶⁷.
It is recommended that patients receive lifestyle modification instructions in the form of a discussion or seminar, booklet or through support groups, educational sessions and one-to-one discussions that provides information of recovery and lifestyle behaviors change[^8,^9].

**Method**

In the present study, quantitative and evaluative approach was used. Research design was quasi experimental: one group pre test - post test. Study was conducted in bariatric surgery outpatient clinic and bariatric surgery department at El-Demerdash Hospital which affiliated to Ain Shams University, Cairo, Egypt.

The sample of 104 postoperative patients with bariatric surgery. Type I error with significant level alpha (α) = 0.05 (confidence level 95%). The inclusion criteria were: patients’ one month postoperative bariatric surgery, age over 18 years, from both sexes, obesity related co-morbidity.

The structured questionnaire was administered.

1. Demographic characteristics and patients’ clinical data.

2. (A) Postoperative compliance assessment tool, developed by the researcher using the related literatures (American Society for Metabolic and Bariatric Surgery Surgery[^10^]; still et al[^11^] and Kumar and Gomes[^12^]). (B) Medication Adherence Rating Scale (MARS): adopted from (Thompson et al, 2000[^13^]). (C) Perceived Stress Scale (PSS): adopted from (Cohen et al., 1983[^14^]). (D) Bariatric Analysis and Reporting Outcome System (BARO) and quality of life questionnaire: adopted from (Moorehead et al., 2003[^15^]).

Data collection started by selecting patients who are met the inclusion criteria, informed consent was taken followed by the pretest and distribution of lifestyle modification module. Patients’ tools were filled in by the researchers or by the patients according to patients’ educational level.

Patients followed and evaluated after six months post sessions. Data collection process starting at December 2018 until the end of September 2019.

Statistical analysis was performed with SPSS for window, version 20.0 Armonk, NY: IBM Crop. Data analysis was done using A chi-square test $x^2$ and the values were considered statistically significant when p-value $< 0.05$.

**Results**

**Patients’ Characteristics:** Table (1) shows the mean age of all patients was 32.57±6.18 years. The study participants include 78 female (75%), 75 urban (72.1%), 51 diploma education (49%), 81 not working (77.9%) and 67 married (64.4%).

**Regarding clinical data:** Table (2) illustrates that 96 suffered from chronic disease (92.3%), 85 were obese (81.7%), 56 were between 40 kg$^2$<50 kg$^2$(53.8%) of body mass index, 100 patients followed program before to lose weight (96.2%), 52 diet regimen only (50%) and 101 gain weight (97.1%).

Table (3) demonstrates significant difference in total compliance post implementation of lifestyle modification module where mean score pre module implementation was (9.51±3.32, 3.53±3.27, 3.95±1.27, 3.50±1.51, 21.04±8.07) and post implementation of lifestyle modification module was (13.82±3.28, 9.06±3.19, 5.58±1.24, 4.48±0.85, 33.59±8.34) respectively.

Table (4) illustrates significant differences in total mean scores of patients’ compliance with medication, perceiving stress and Bariatric Analysis and Reporting Outcome System (BARO): quality of life post implementation of lifestyle modification module with 95% confidence interval 1.542-2.164, 2.063-2.349, 2.133-2.867 respectively.

Table (1): Percentage distribution of the studied patients according to their demographic characteristics (n=104).
### Table (2): Percentage distribution of the studied patients regarding clinical data (n=104).

#### Present history

<table>
<thead>
<tr>
<th>Suffers from chronic diseases</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>96</td>
<td>92.3</td>
</tr>
<tr>
<td>No</td>
<td>8</td>
<td>7.7</td>
</tr>
</tbody>
</table>

#### Chronic diseases (*)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obesity</td>
<td>85</td>
<td>81.7</td>
</tr>
<tr>
<td>Hypertension</td>
<td>27</td>
<td>26.0</td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td>34</td>
<td>32.7</td>
</tr>
<tr>
<td>Others (ex. thyroid problems)</td>
<td>14</td>
<td>13.5</td>
</tr>
</tbody>
</table>

#### Body Mass Index (BMI)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 kg² &lt; 35 kg²</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>35 kg² &lt; 40 kg²</td>
<td>14</td>
<td>13.5</td>
</tr>
<tr>
<td>≥ 40 kg²</td>
<td>56</td>
<td>53.8</td>
</tr>
<tr>
<td>≥ 50 kg²</td>
<td>34</td>
<td>32.7</td>
</tr>
</tbody>
</table>

#### Follow program before to lose weight

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>100</td>
<td>96.2</td>
</tr>
<tr>
<td>No</td>
<td>4</td>
<td>3.8</td>
</tr>
</tbody>
</table>

#### The program followed before consist of:

- Diet only.
- Diet and physical exercise.
- Body slimming medicines and herbals.

#### Outcomes of the previous programs:

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight loss</td>
<td>3</td>
<td>2.9</td>
</tr>
<tr>
<td>Weight gain</td>
<td>101</td>
<td>97.1</td>
</tr>
</tbody>
</table>

* Patients may have more than one disease or take more than one medications.

### Table (3): Differences in total compliance among studied patients pre and post implementation of lifestyle modification module (n=104)

#### Items of compliance

<table>
<thead>
<tr>
<th>Compliance to diet after bariatric surgery</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
<th>Mean ±SD</th>
<th>Chi-square</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre</td>
<td>11</td>
<td>28</td>
<td>65</td>
<td>62.5</td>
<td>9.51±3.32</td>
<td>69.076</td>
</tr>
<tr>
<td>Post</td>
<td>58</td>
<td>34</td>
<td>12</td>
<td>11.5</td>
<td>13.82±3.28</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compliance to physical exercise</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre</td>
<td>0</td>
<td>7</td>
<td>97</td>
<td>93.3</td>
<td>3.53±3.27</td>
<td>80.004</td>
<td>0.001</td>
<td>2.383-2.735</td>
</tr>
<tr>
<td>Post</td>
<td>8</td>
<td>61</td>
<td>35</td>
<td>33.7</td>
<td>9.06±3.19</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compliance to sleep and rest instructions</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre</td>
<td>40</td>
<td>30</td>
<td>34</td>
<td>32.7</td>
<td>3.95±1.27</td>
<td>40.735</td>
<td>0.001</td>
<td>1.195-1.687</td>
</tr>
<tr>
<td>Post</td>
<td>85</td>
<td>10</td>
<td>9</td>
<td>8.7</td>
<td>5.58±1.24</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compliance to stop smoking activities</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre</td>
<td>0</td>
<td>4</td>
<td>13</td>
<td>76.5</td>
<td>3.53±1.70</td>
<td>0.151</td>
<td>0.697</td>
<td>2.579-2.892</td>
</tr>
<tr>
<td>Post</td>
<td>0</td>
<td>5</td>
<td>12</td>
<td>70.6</td>
<td>5.06±1.82</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table (4): Differences in mean score regarding medication compliance, perceiving stress and Bariatric analysis and reporting outcome system (BARO) and Quality of life questionnaire among studied patients pre and post implementation of lifestyle modification module (n=104).

<table>
<thead>
<tr>
<th>Items of compliance</th>
<th>Good (N=104)</th>
<th>Fair (N=104)</th>
<th>Poor (N=104)</th>
<th>Mean ±SD</th>
<th>Chi-square</th>
<th>95% CI</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliance to follow-up</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>51</td>
<td>49.0</td>
<td>34</td>
<td>32.7</td>
<td>19</td>
<td>18.3</td>
<td>3.50±1.51</td>
</tr>
<tr>
<td>Post</td>
<td>84</td>
<td>80.8</td>
<td>18</td>
<td>17.3</td>
<td>2</td>
<td>1.9</td>
<td>4.48±0.85</td>
</tr>
<tr>
<td>Total compliance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>1</td>
<td>1.0</td>
<td>19</td>
<td>18.3</td>
<td>84</td>
<td>80.8</td>
<td>21.04±8.07</td>
</tr>
<tr>
<td>Post</td>
<td>16</td>
<td>15.4</td>
<td>60</td>
<td>57.7</td>
<td>28</td>
<td>26.9</td>
<td>33.59±8.34</td>
</tr>
</tbody>
</table>

Discussion

This study evaluates the effect of lifestyle modification module on patients’ compliance postoperative bariatric surgery and found that it produced a significant improvement in patients’ compliance. The hypothesis of the study demonstrated that the module is an effective tool to help this group of bariatric surgery patients to modify their lifestyle.

The study findings illustrates that, more than half of patients achieved good level of compliance with diet instructions post implementation of lifestyle modification module. This result may be due to the motivation and support provided by researchers and the desire of patients to achieve good outcomes of operation and appropriate weight loss. In addition to improved patients’ skills in preparing foods, selecting types and eliminating prohibited diet.

This result agree with Kalarchian et al. who found that there was statistically significance difference in weight change of the studied patients at 4 months and 6 months after surgery post eating guidelines interventions[16]. While Toussi, Fujioka and Coleman stated that the non compliance was higher after the surgery regarding diet recommendations[17].

There was statistically significance difference in patients’ compliance post implementation of lifestyle modification module. This may be due to that the researchers ensured that the successful outcomes of bariatric surgery didn’t depend only on compliance with diet or medication but it also includes physical exercises that help to achieve the desirable weight loss. This result is agreed with Coen et al. who reported that two thirds of the studied patients successfully completed the recommended physical exercise interventions at the first six months after bariatric surgery[18].

The majorities of the studied patients have good level of compliance with sleep and rest instructions after bariatric surgery. This is because patients stated that the recommended instructions about sleep and rest after bariatric surgery in the module was easy and simple to applied and followed. This enhances quality, duration of sleep and improves obstructive sleep apnea, and body posture. This result is consistent with Mello et al. who stated that bariatric surgery have demonstrated improvement in sleep disorders in people after surgery due to the impact of weight reduction[19].

The majority of the studied patients have good level of compliance with follow up after bariatric surgery. This due to that patient recognized the importance of follow up visits during the educational session of lifestyle modification where it promote health and reduce the
risk of weight regain. This finding agree with Dagan et al. who reported that most of studied people attend to follow-up visit at the first 3 months and 6 months and more than three quarters of them attend to follow-up after 12 month of bariatric surgery[20].

There was statistically significant improvement post implementation of lifestyle modification module where, more than half of the studied people achieve fair level of total compliance. This study is agree with Dagan et al. who revealed that all of the studied patients have medium to high adherence to the major lifestyle recommendations during the first year following bariatric surgery[20].

There was statistically significant improvement in patients’ compliance with medication post implementation of lifestyle modification module. This could be attributed to patients’ believes about the importance of prescribed medications and increased their awareness regarding benefits of compliance with vitamins and minerals supplements long life after surgery as a mean to compensate the essential element that have been lost due to small dietary meals intake as a result of surgery mechanism.

This result is consistent with Hood et al. who reported that medication adherence tends to be good in the early post-surgery period, 90% of patients taking supplements daily or every other day 5 months post-surgery[21].

The perceiving of stress was improved among individuals with bariatric surgery because they convinced about the bad effect of stress on health and surgery outcomes, so that they practice and adhere to the stress relieving measures that explained by the researchers. This result go in the same line with Boniecka et al. who reported that, near half of the studied individuals had a moderate level of stress[22].

Regarding Bariatric Analysis and Reporting Outcome System (BARO) and quality of life, there was a statistically significant improvement post implementation of lifestyle modification module among studied people where (pre mean score= 1.57±0.89 and post mean score= 5.00±1.47). This finding is supported by Alkassis et al. who found that there was a statistically significant improvement in people quality of life domains after surgery and no one had a very poor or poor quality of life score, where (pre mean= −0.33±0.93 and post mean= 1.68±0.62)[23].

Conclusion

Implementation of lifestyle modification module has positive effect on improving patients’ compliance post-operative bariatric surgery regarding diet, physical exercise, sleep and rest instructions, follow up visits, medication adherence, stress perceiving, and quality of life.

Acknowledgements: Thanks to all patients who are agreed to participate in the study.

Ethical Clearance: Institutional ethical committee obtained for the study.

Source of Funding: Self

Conflict of Interest: Nil

References


The Association of Serum Irisin with Vitamin D and Body Mass Index in Healthy Adults

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Abstract

Objectives: This study was designed to explore the relationship between serum irisin hormone with Vitamin D levels and investigate the association of serum Vitamin D3 concentrations and serum irisin levels with BMI of male healthy individuals in Anbar province.

Method: This study included 84 Iraqi men with the age range (20-40) year, divided into three groups depending on body mass index (BMI). The weight and height of all participants were taken to extract BMI. The ELISA method has been used to estimate levels of vitamin D and the irisin hormone in the serum. Pearson correlation coefficient was used to find the association between the studied variables.

Results: The mean and standard deviation of serum vitamin D concentrations was significantly lower in all groups. This study showed there was non-significant difference in the mean of irisin among the three groups. A negative linear correlation was found between vitamin D and BMI, while a positive correlation with irisin. A positive correlation was found between irisin with BMI.

Conclusion: People with a high BMI are deficient in Vitamin D. There was a positively relation between serum irisin levels and BMI.

Keywords: Serum, Irisin, hormone, Vitamin D, BMI.

Introduction

Vitamin D is a set of sterol hormones which have a function as a hormone and are required for the growing and conservation of bone tissue, also for the calcium and phosphorous homeostasis (1). Its levels are evaluated through the plasma 25-hydroxyvitamin D levels [25(OH)2D] (2). It is regarded as a hormone which acts through nuclear receptors called vitamin D receptor (VDR) which present in various organs such as bone, kidneys, intestine, brain, immune system, and most different body parts (3). The main source of 25(OH) D is daily sunlight exposure, numerous functions of over two hundred genes regulated by vitamin D and is vital for maturity and growth. There are two forms of vitamin D: Ergocalciferol (Vitamin D2) and Cholecalciferol (vitamin D3) (4). Vitamin D3 can be performed in two ways: firstly, by intestinal absorption, secondly, endogenously by a precursor of 17-hydroxyl cholesterol on the skin with adequate exposure to UV day time (5). Many studies have revealed that obesity, described as a BMI ≥ 30 kg/m², and low serum 25(OH)D levels are linked with many diseases (6, 7).

Irisin/FNDC5 a newly detected hormone that became a promising target for the connection between health and physical exercise in recent years (8). Irisin is a hormone similarly as polypeptide consisting of 112 amino acid and is split from the carboxyl end of a membrane-spanning protein with 196 amino acid so-called FNDC5 (9). Fibronectin type three domain-containing protein five(FNDC5) forms of an extracellular area containing the fibronectin type three (FnIII) domain, which is disunited from a slight cytoplasmic area by the helical trans membrane part and is split to irisin(10). Irisin is a myokine that expressed and secreted principally by muscle tissue, and its secretion is especially stimulated by exercise performing on white adipose tissue by
Peroxisome proliferator-activated receptor gamma (PPAR-γ) coactivator-1α (is a part of a family of transcription co-activators that acts a fundamental role in the regulation of cellular energy metabolism) (9). Irisin hormone is considered a transporter that enhances the transformation of the lipid-storing white adipose to the brown adipose tissue that catabolize the energy leading to raise thermogenesis (11). Additionally, Irisin improves oxidation of fatty acid and glucose metabolism, retard atherosclerosis (12). Pardo et al., They indicated that an increase in fat body mass about (1) kilogram could cause a double rise in irisin levels (13), Whereas two previous studies have shown that losing weight in people described as obese leads to low levels of irisin in the blood (14).

Materials and Method

The current study was done at the college of science, University of Anbar, and the General Educational Hospital in Ramadi city from August 2019 to January 2020. This study includes three groups of healthy individual men in the range of age (20-40) years. These groups have no chronic disease or infectious disease when they are tested, were chosen by depending on body mass index (Normal group (A): BMI=18.5 to 24.9 kg/m², Obese group (B): BMI≥30 kg/m², and Underweight group (C): BMI≤18.5 kg/m²). From each individual, (5 mL) of blood were obtained in the early morning after fasting (10-12) hours. This amount of blood, after serum isolation, stored in Eppendorf tubes in a freezer at -20ºC for hormonal analysis. Serum vitamin D levels and irisin hormone levels were estimated by the enzyme-linked immunosorbent assay (ELISA). Calculation of body mass index was done by “dividing the body weight in (Kilogram) by the square of the height (in meter)”(16).

Statistical Analysis: The statistical analysis was carried by using the computer program SPSS version 16 (Statistical Package for Social Sciences). All studied parameters were expressed as mean±standard deviation (SD). The significance of differences among the groups was determined by a one-way ANOVA test. The correlations between variables were confirmed by Pearson correlation analysis.

Results

The mean of BMI in group A was (24.4 ±1.48 kg/m²), which showed a significant difference with group B (36.7 ±4.52 kg/m²) and group C (18.4±0.45 kg/m²) at p ≤ 0.05, Table 1. The mean of Vitamin D in A, B and C groups (18.27±10.23 ng/mL), (17.26±8.17 ng/mL), (20.25±10.77 ng/mL) respectively showed there was non-significant difference (Table 1). In this study, there was non-significant difference in serum irisin among A, B, and C groups (Table 1). As appeared in Table 2, Pearson analysis showed a negative correlation between vitamin D and BMI (r=- 0.252) at P ≤ 0.05. While a weakly positive association was shown between vitamin D and irisin (r=0.21) at p≤ 0.05. A moderate positive correlation was showed between irisin with BMI at p<0.05 (r= 0.477).

Discussion

This result showed that the majority of the individuals who participated in this study were suffering from hypovitaminosis D. Most of those with vitamin D deficiency were in the obesity and normal groups compared with underweight group. In 2016, Wakayo T et al., (17) indicated that vitamin D deficiency was associated with metabolic syndrome. Vitamin D levels insufficient could have numerous causes, like irregular intestinal function or malabsorption, decreased intake or raised degradation of vitamin D(18). Some researches proposed that obesity improved the chance of vitamin D deficiency(19). In a study to observe the predominance of vitamin D deficiency in adult Iraqi personages including postmenopausal women, they showed that
deficiency of vitamin D happened in more than (85%) of postmenopausal women, more than (60%) of young men in age (25-49) years (20). The significant decrease in the level of vitamin D in this study is due to numerous causes, such as: eating poor meals with vitamin D, lack of exposure to sunlight, the geographic location or the lack of animal sources (milk, cheese, and egg yolks) as a similar result with the previous study (21). Underweight is considered as an abnormal condition like obesity due to its association with several cases such as mental health defect, a decline of muscle strength, osteoporosis and cardiovascular disease(22). In the current period, FNDC5/irisin became a hopeful aim for the link between physical activity and body health(23). There are some studies investigated that serum irisin is unclear in obese individuals. One previous study includes (300) obese cooperators discovered that serum irisin levels were not significant higher than those in the group of controls (24). Other investigations reported to lowering the serum irisin concentrations in obese subjects than in normal weight, but the variation was correlated with presence or absence of DM (25,26). The mechanisms that control synthesis and secretion of irisin are not perfectly known (27). In the common people, irisin levels increase with daily activities and serum irisin is correlated with the lipid profile (28).

For the correlation relationships, These results agreed with Taheri et al., (29) who have found that serum levels of 25(OH)D has a negative correlation with body mass index in adults with and without type 2 diabetes mellitus in Iran. A new meta-analysis revealed a positive linking between obesity and vitamin D deficiency in whole age groups (30). A study by Vimaleswaran et al., (31) showed high BMI cause lowering in vitamin D levels between both men and women in various age groups, presenting strong argument about role of obesity as a crucial risk agent in hypovitaminosis D. This finding corresponding with Al-Daghri et al., (32) who found a significant increase in circulating irisin level at 12 months post-vitamin D intervention. Also this result agreed with previous study in Iraqi rheumatoid arthritis males patients with diabetes mellitus type II (30). In a previous study, Irisin levels were associated with “body mass index (BMI)” and fat accumulation, and researchers revealed that the main source of irisin levels is adipose tissue in the serum of patients (13). Most studies additionally revealed a positively association between the levels of irisin hormone and body mass, mass of fats, and, infrequently, waist-hip ratio. In a health people, the greatest of the irisin concentrations in the blood comes from the muscle cells, but, in case of obesity, the rate of irisin that secreted from adipose tissue is apparently more elevate than in lean status because of the rise in fat mass totally(31). There is second clarification about the relationship between irisin levels with fat mass and BMI, might be in the resistance progression of irisin. In obesity, the secretion of Irisin increased from muscle cells, perhaps to increase using of energy and glucose homeostasis to reach a metabolic balance (32).

Conclusion
The current study showed a decrease in vitamin D levels in the study sample subjects for the three groups who are healthy. The hormone irisin has a critical correlation with BMI. People with a higher body mass index are more likely to have a vitamin D deficiency.

Conflict of Interest: None

Funding: Self

Ethical Clearance: Not required

References
5. He, C., Lin, Z., Robb, S. W., & Ezeamama, A. E. Serum vitamin D levels and polycystic ovary syndrome: a systematic review and meta-analysis. Nutrients, 2015. 7(6), 4555-4577.


Efficacy of Health Belief Model-Based Intervention in Enhancing Breast Cancer Screening Behaviors among Women at Al-Najaf Al-Ashraf City

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Abstract

Background: Breast cancer is disease in which cells in breast tissue change and divide uncontrolled, resulting in a lump or mass. This study aims to determine the efficacy of health belief model-based intervention in enhancing women’s breast cancer screening behaviors.

Method: A randomized controlled trial was conducted using the Health Belief Model. The study included a systematic random sample of 110 women. Women who age 22-68-years were selected from Banks in Al-Najaf Al-Ashraf City.

Data were collected through a self-report instrument that includes women’s sociodemographic characteristics of age, marital status, and economic status, the Perceived Susceptibility Scale, the Perceived Benefits Scale, the Self-Efficacy Scale, the Health Motivation, the Perceived Severity Scale, and the Perceived Barriers Scale. Data were analyzed using the statistical package for social sciences, version 26.

The study results revealed that HBM-based intervention was efficacious in enhancing the Perceived Susceptibility, the Perceived Benefits, the Self-Efficacy, the Health Motivation, the Perceived Severity, and the Perceived Barriers for women in the study group. The researcher concluded that the HBM-based intervention was efficacious in enhancing women’s screening behaviors for breast cancer.

Conclusion: The researcher concluded that the HBM-based intervention was effective in enhancing women’s breast cancer screening behaviors.

Keywords: Health Belief Model-Based Intervention, Breast Cancer, Screening Behaviors.

Introduction

Cancer is a present of abnormal cells that spread and characterized by the uncontrolled growth and result in death. If the spread is not controlled (1). Globally, more than half new cases deaths from cancer among worldwide of men and women combined in 2018 are estimated to occur in Asia, because the region has nearly 60% of the global population (9).

Breast cancer is disease in which cells in breast tissue change and divide uncontrolled, resulting in a lump or mass. Most breast cancers begin in the lobules (milk glands) or in the ducts that connect the lobules to the nipple (1) during 2013 year 4,529 women with breast cancer were forming loss of life, and 909 ladies died from that disorder due to late analysis and insufficient administration (10). According of American Cancer Society (ACS) there are three screening method are BSE, clinical breast examination, mammography. Mammography is more effective way for early detection of breast cancer (3). Breast self-examination make women aware of their breasts so as to detect changes early (4).

In health education, the Champion Health Belief Model (CHBM) is theoretical models used to study the health behavior that can be introduced by Champion in the 1980s. This model has been widely used by researchers (5). When people find themselves at risk for the disease (Perceived Susceptibility), realize that the disease has serious potential consequences (Perceived Seriousness), believe that prevention would have positive results...
(Perceived Benefits), barriers of that behavior is fewer than obtained benefits (Perceived Barriers), and believe that they have the ability to perform health behavior activities (Self-Efficacy), it would be more probable for them to accomplish this behavior.(6)

A randomized controlled trial design was used to guide this study in Banks of Al–Raafidayn/branch Al-Amir, Al-Ghuri, Seven, and Muslim Bin Aqeel at Al-Najaf Al-Ashraf for the period from February 1th, 2020 to thirty of April, 2020 on probability randomized sampling method (systematic random samplings method) to recruit study subjects. Data were collected through a self-report instrument that includes First part: The demographic characteristics of the nursing staff (age, marital status, economic status).


The validity of the questionnaire and the educational program were verified by presenting it to (9) experts. The sample has received a pre-test, intervention based health belief model, and post-test I, Post- test II. Descriptive and inferential statistics were used to analyze the results of the study using the Statistical Package of Social Sciences (SPSS) version 26.

Results

Table 1. Participants’ Socio-demographic Characteristics

<table>
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<th>Control (N = 55)</th>
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<td>Percent</td>
<td>Frequency</td>
<td>Percent</td>
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<tr>
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<td>1.8</td>
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Table (1) The age mean for participants in the study group is 41.21±10.32; more than two-fifth age 44-55-years (n = 25; 45.4%), followed by those who age 33-43-years (n = 14; 25.5%), those who age 22-32-years (n = 11; 20.0%), and those who age 55-68-years (n = 5; 9.1%).

For the control group, the age mean is 41.76±10.17; two-fifth age 44-54-years (n = 22; 39.5%), followed by those who age 33-43-years (n = 15; 27.3%), those who age 22-32-years (n = 12; 21.8%), and those who age 55-68-years (n = 6; 10.9%).
There are significant differences in the values of the HM for BSE over time for participants both in the study and control groups (F = 186.222, df = 2, p < .05 vs. F = 9.352, df = 2, p < .05).

There are significant differences in the values of the Perceived Susceptibility for contracting breast cancer over time for participants both in the study and control groups (F = 339.015, df = 2, p < .05 vs. F = 3.723, df = 2, p < .05).

There are significant differences in the values of the Perceived Severity of breast cancer over time for participants both in the study and control groups (F = 133.393, df = 2, p < .05 vs. F = 3.879, df = 2, p < .05).

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**Table 2. Within-subjects for the Health Motivation**

<table>
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<tr>
<th>Effect</th>
<th>Value</th>
<th>F</th>
<th>Hypothesis df</th>
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<th>Sig.</th>
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<td>53.000</td>
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<td>.875</td>
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<td>Wilks’ Lambda</td>
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<td>.875</td>
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<td>Roy’s Largest Root</td>
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<td>2.000</td>
<td>53.000</td>
<td>.000</td>
<td>.875</td>
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<td>HM (Control)</td>
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a. Design: Intercept Within Subjects Design: SE for BSE, b. Exact statistic

**Table 3. Within-subjects for the Perceived Susceptibility for contracting breast cancer**

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<th>Value</th>
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<th>Hypothesis df</th>
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<th>Partial Eta Squared</th>
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<td>Pillai’s Trace</td>
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<td>339.015b</td>
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<td>.927</td>
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<tr>
<td>Wilks’ Lambda</td>
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a. Design: Intercept Within Subjects Design: SE for BSE, b. Exact statistic

**Table 4. Within-subjects for the Perceived Severity of breast cancer**

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<th>Sig.</th>
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<td>.011</td>
<td>.155</td>
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a. Design: Intercept Within Subjects Design: Perceived Severity of breast cancer, b. Exact statistic
There are significant differences in the values of the Perceived Severity of breast cancer over time for participants both in the study and control groups ($F = 133.393$, df = 2, $p < .05$ vs. $F = 4.879$, df = 2, $p < .05$).

**Table 5. Within-subjects for the Perceived Benefits of BSE**

<table>
<thead>
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<th>Effect</th>
<th>Value</th>
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<tr>
<td>Wilks’ Lambda</td>
<td>.105</td>
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<td>Roy’s Largest Root</td>
<td>8.540</td>
<td>226.298$^b$</td>
<td>2.000</td>
<td>53.000</td>
<td>.000</td>
<td>.895</td>
</tr>
<tr>
<td><strong>Benefits (Control)</strong></td>
<td></td>
<td></td>
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<tr>
<td>Pillai’s Trace</td>
<td>.206</td>
<td>6.868$^b$</td>
<td>2.000</td>
<td>53.000</td>
<td>.002</td>
<td>.206</td>
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<td>Wilks’ Lambda</td>
<td>.794</td>
<td>6.868$^b$</td>
<td>2.000</td>
<td>53.000</td>
<td>.002</td>
<td>.206</td>
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<tr>
<td>Hotelling’s Trace</td>
<td>.259</td>
<td>6.868$^b$</td>
<td>2.000</td>
<td>53.000</td>
<td>.002</td>
<td>.206</td>
</tr>
<tr>
<td>Roy’s Largest Root</td>
<td>.259</td>
<td>6.868$^b$</td>
<td>2.000</td>
<td>53.000</td>
<td>.002</td>
<td>.206</td>
</tr>
</tbody>
</table>

a. Design: Intercept Within Subjects Design: Perceived Benefits of BSE, b. Exact statistic

There are significant differences in the values of the Perceived Benefits of BSE over time for participants both in the study and control groups ($F = 226.598$, df = 2, $p < .05$ vs. $F = 6.868$, df = 2, $p < .05$).

**Discussion**

Concerning the values of the Health Motivation (HM) for BSE for the study group, there was a noticeably increase by time compared to the control group. Also, there was a priori significant difference in the HM for BSE over time for participants in the study group. The omnibus effect (measure of association) for this analysis is .567, which indicates that approximately 56% of the total variance in the HME for BSE values is accounted for by the variance in the administered intervention. For the control group, there was no significant difference in the HM for BSE over time. Furthermore, there was a constant difference in participants’ HM for BSE in the study group over time. These findings reflect the positive, constant effect of the administered intervention in enhancing participants’ HM for BSE. These findings are consistent with (8) with who concluded that The results of the data analysis showed a statistically significant difference between the intervention and control groups regarding the mean scores of knowledge and motivation before the intervention (P>0.05) and after intervention the mean score and standard deviation for intervention group 40.84±6.21 while control group 38±6.47.

Regarding the values of the Perceived Susceptibility for developing breast cancer for the study group, there was a noticeably increase by time compared to the control group. Also, there was a significant difference in the Perceived Susceptibility for developing breast cancer over time for participants in the study group. The omnibus effect (measure of association) for this analysis is .521, which indicates that approximately 56% of the total variance in the Perceived Susceptibility for developing breast cancer values is accounted.

For by the variance in the administered intervention. For the control group, there was no significant difference in the Perceived Susceptibility for developing breast cancer over time. Furthermore, there was a constant difference in participants’ Perceived Susceptibility for developing breast cancer in the study group over time. These findings reflect the positive, constant effect of the administered intervention in enhancing participants’ Perceived Susceptibility for developing breast cancer. These findings are consistent with (7) who concluded that mean score and standard deviation for experimental 4.33±28.14 and p-value 0.007 while in control group 4.32±14.79 and 0.23 The results of the present study indicate a significant increase in the post-test mean scores on perceived susceptibility and severity in the experimental group compared to the control.

Regarding the values of the Perceived Severity of
breast cancer for the study group, there was a noticeably increase by time compared to the control group. Also, there was a significant difference in the Perceived Severity of breast cancer over time for participants in the study group. The omnibus effect (measure of association) for this analysis is .371, which indicates that approximately 37% of the total variance in the Perceived Severity of breast cancer values is accounted for by the variance in the administered intervention. For the control group, there was no significant difference in the Perceived Severity of breast cancer over time. Furthermore, there was a constant difference in participants’ Perceived Severity of breast cancer in the study group over time. These findings reflect the positive, but not constant effect of the administered intervention in enhancing participants’ Perceived Severity of breast cancer. These findings are consistent with(7) who concluded that the mean score and standard deviation for experimental group. 4.01±26.75 and p<0.001 and control group 1.67±84.10 and p-value 0.36 after intervention with respect to the values of the Perceived Benefits of BSE for the study group, there was a noticeably increase by time compared to the control group. Also, there was a significant difference in the Perceived Benefits of BSE over time for participants in the study group. The omnibus effect (measure of association) for this analysis is .550, which indicates that approximately 55% of the total variance in the Perceived Benefits of BSE values is accounted for by the variance in the administered intervention. For the control group, there was no significant difference in the Perceived Benefits of BSE over time. Furthermore, there was a constant difference in participants’ Perceived Benefits of BSE in the study group over time. These findings reflect the positive, constant effect of the administered intervention in enhancing participants’ Perceived Benefits of BSE. These findings are consistent with (7) who concluded that the study results demonstrated a significant increase in the post-test mean score of perceived benefits in the experimental group compared to the control group. Mean±SD 1.23±22.20 for the experimental group and the control group 1.67±84.10.

Conclusion

1. The Customer Satisfaction Scale is very important to assess the quality of health services and can predict compliance and use with international standards for quality of services.

2. The study found that most primary health care centers are located in densely populated areas. Therefore, primary health care services are adequately provided.

Recommendations: The researchers recommend it is necessary to incorporate health belief model-based interventions into the curricula of graduate programs in Iraq.

Encourage graduate students to adopt intervention-based studies in their future proposed research.

Conflict of Interest: The researchers confirm that there is no any conflict of interest.

Source of Funding: This study is self-funded.

Ethical Clearance: The researchers obtained the ethical approval from the University of Baghdad, College of Nursing.

References


Effect of Physalis Angulata L. Leaf Water Extract on Malondialdehyde (MDA) Testis, Calcium Intracellular Sperm and Total Motile Sperm of Male Wistar Rats (Rattus Novergicus) Model of Hypertension

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Abstract

Background: Determining the sperm quality can be measured by calculating sperm motility and sperm motility is governed by intracellular calcium (Ca²⁺) concentration. However, the intracellular calcium increase found in essential hypertension cases may decrease acrosome reaction and increase ROS production, and may trigger sperm cell apoptosis. Ground cherry (Physalis angulata L) is an herbal plant containing bioflavonoid as antioxidant which is crucial to defend against free radicals and prevent toxic effects.

Objective: This study aims to test the capacity of Physalis angulata L. extract, in preventing disruption of sperm motility in male Wistar strain rats model of hypertension through oxidative stress reduction and cytosolic calcium regulation.

Method: Experimental animal male white rat (Rattus novergicus) model of hypertension were intraperitoneally inducted with L-NAME. The animals were divided into 5 treatment groups and given Physalis angulata L. leaf water extract with various doses for 14 consecutive days. At the end of the study, animals were sacrificed, and testes were taken for measuring the MDA levels, intracellular calcium, and sperm motility.

Results: Physalis angulata L. leaf water extract is proven to prevent increasing number of testicular MDA level, prevent increasing number of sperm intracellular calcium, and prevent decreasing number of motile sperm in male white Wistar strain rat model of hypertension.

Conclusion: The results show that the Physalis angulata L. leaf water extract is proven to prevent the increase of MDA testis level and the increase of intracellular calcium testis amount, and prevent the number of motile sperm on male Wistar strain white mice model of hypertension.

Keywords: Physalis angulata L., malondialdehyde (MDA), Sperm Intracellular Calcium, motile sperm, Hypertension.

Introduction

Infertility is defined as a failure to pregnant after one year of attempting pregnancy by having regular sexual intercourse without contraception(1). Among men with an average age of 38 years, 44% has infertility due to hypertension that results in testicular organ damage, but the mechanism remains unclear. In hypertension, ROS increases. It is strongly suspected that oxidative stress due to hypertension plays an important role in infertility pathomechanism(2-5). At the cellular level, Reactive Oxygen Species (ROS) has a toxic effect that can damage sperm(6, 6).

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The sperm quality can be measured by calculating sperm motility because it reflects the normal development and maturation of spermatozoa in epididymis. Sperm motility is governed by intracellular calcium (Ca\(^{2+}\)) concentrations\(^7\). In the homeostatic state, calcium (Ca\(^{2+}\)) is the second messenger that regulates cell function, including sperm cells \(^8\). However, an increase in intracellular calcium found in cases of essential hypertension may decrease acrosome reaction and increase ROS production, which in turn triggers apoptosis in sperm cells. Apoptosis induction can increase ROS production in intertesticular levels that reduces fertility in men \(^9\).

Ground cherry (\textit{Physalis angulata} L.) is an herbaceous plant containing saponins, flavonoids, and also polyphenols \(^10\). Bioflavonoids are antioxidants that play an important role as a scavenger of free radicals from a disease, aging, and toxic effects of a substance \(^4\). Previous studies have shown that \textit{Physalis angulata} L. has the ability to suppress lipid peroxidation evaluated by MDA level measurement \(^11\).

This study aims to test the capacity of \textit{Physalis angulata} L. extract in preventing disruption of sperm motility in male Wistar strain rats model of hypertension through oxidative stress reduction and cytosolic calcium regulation.

**Material and Method**

The capacity is measured through MDA testicular measurement, calculation of sperm intracellular calcium and sperm motility. This study Male used white wistar strain rats (\textit{Rattus novergicus}) aged 2-3 months, and 150-200 gram in weight as experimental animal. The experimental animals model of hypertension were inducted with L-NAME intraperitoneally with systolic blood pressure >120 mmHg. The simplicia ingredient used was \textit{Physalis angulata} L. leaf water extract obtained and identified from Materia Medika Medicinal Plant Body, Batu-Malang.

**Experimental Protocol:** In this study the rats were divided into 5 groups, i.e. negative control (1) given NS solution intraperitoneally without treatment, positive control group (2) hypertension without treatment, group 3 (3) hypertension + treatment dose of 250mg/kgBW, group 4 (4) hypertension + treatment dose of 500mg/kgBW, and group 5 (5) hypertension + treatment dose of 1000mg/kgBW. Induction of hypertension and administration of extract were given simultaneously for 14 consecutive days. Induction of hypertension was using L-NAME 40mg/kgBW intraperitoneally\(^4\).

**MDA Testis:** MDA level calculation is the measurement indicator of oxidative stress measured on mouse testicular organs. MDA tissue was measured using Thiobarbituric Acid test. The specimen tissues were weighed as much as 0.1 grams and then homogenized and added Trichloracetic Acid (TCA) 15\%, Thiobarbituric Acid 0.375\% and 0.25 mol/l HCL (in a comparison of 1: 1: 1)\(^12\). Then it was heated for 15 minutes on boiling water. After cooling, the precipitate in the tube was separated by centrifuging at 1000 rpm for 10 minutes. Then the supernatant absorbance was calculated using spectrophotometry at a wavelength of 532 nm \(^4\).

**Sperm Suspension:** Cauda epididymis was taken and inserted into a petri dish containing NaCl 0.9\% solution, chopped with a scalpel until the liquid was cloudy. The obtained spermatozoa suspension can be used for the analysis of the number of spermatozoa motility and Sperm Intracellular Calcium.

**Sperm Intracellular Calcium:** 10 μl sample of sperm suspension was added with 10 μl of Fluo-3 (Sigma-Aldrich) 40 μM, and then it was incubated for 30 min. Then 60 μl PBS (-) was added and centrifuged at 1500 rpm for 5 minutes, it was then observed under Olympus FV 1000 confocal microscope. The PBS (-) is without Ca and Mg content. PBS (-) composition consisted of NaH\(_2\)PO\(_4\) 18 g, NH\(_2\)PO\(_4\) 0.64 g, NaCl 4 g and then sterilized water was added until reaching 250 ml in volume.

**The Number of Motile Sperm:** The evaluation was done by observing spermatozoa in ten different fields of view with 400 x magnification light microscope. The spermatozoa would then be grouped into several categories according to WHO criteria of progressive mobility (A + B), non-progressive mobility (C), and immobile (D) \(^13\).

**Statistical Analysis:** One-Way ANOVA Test was used to see all treatment groups, and continued with Post hoc test. Pearson - Linear Regression correlation analysis was used to analyze the relationship of dose and motility. Meanwhile, Path Analysis was used to analyze the relationship between variables.
Results

MDA Testis: Notation differences in the histogram describe that there are significant differences based on Tukey test ($p < 0.05$; figure 1). The testicular MDA levels of the positive control were significantly higher compared to the negative control. The MDA testicular level at dose 1 was significantly lower compared to the positive control but not significant to the negative control.

Sperm Intracellular Calcium: The amount of intracellular calcium was calculated based on Fluo-3AM color intensity observed under a confocal microscope (figure 2). The amount of sperm intracellular calcium of positive control was significantly higher compared to that of the negative control. The amount of sperm intracellular calcium in all three doses was significantly lower compared to the positive control (figure 3).

The Number of Motile Sperm: The motile sperm number of positive control was significantly lower compared to the negative control (figure 4). The numbers of motile sperm in all 3 doses were significantly higher compared to the positive control but not significant to the negative control.

The Effect of MDA Testis and Sperm Intracellular Calcium on Sperm Motility: Based on the result of testicular MDA correlation, $r$ value = 0.789 with $p = 0.002$ was obtained which means that there is a very strong and significant correlation between the doses of ground cherry leaf water extract with testicular MDA levels. Based on path analysis, results were obtained as in Figure 5. The results of this study show that MDA testis and sperm intracellular calcium do not significantly influence the number of motile sperm.

Figure 1. Diagram of the Mean and Standard Deviation of Malonaldehyde (MDA) Testis Levels.

Figure 2. Results of sperm staining with fluo-3AM
Discussions

Testicular MDA levels were significantly higher in the positive control group compared to the negative controls. L-NAME-induced hypertension condition increases both vascular and systemic oxidative stress characterized by decreased antioxidant activity in the testes and increased lipid peroxidation due to decreased NO bioavailability (4).

The lowest testicular MDA content was found in the treatment group given Ground cherry leaf water extract of 250 mg/kgBW and was not significantly different from negative control. It shows that a dose of 250 mg/kgBW of Ground cherry leaf water extract can lower testicular MDA level to normal. This is caused by the antioxidant content of Ground cherry leaf water extract. Antioxidants are compounds that can delay, slow down, and prevent lipid oxidation processes. The inhibition mechanism of lipid peroxidation by Physalis angulata L. leaf water extract involves compounds that are capable of counteracting free radicals. One of the compounds that can inhibit lipid peroxidation to capture free radicals is polyphenol compounds, especially flavonoid compounds (14). Flavonoid ability as antioxidants is because flavonoids act as free radical scavengers. The presence of a 3', 4' (ortho-dihydroxy) hydroxyl group on flavonoid B ring, 2,3 conjugated double bond with 4-oxo group (1.4-pyrrole group) on C-flavonoid ring and
hydroxyl group (5-OH) on flavonoid ring A\(^{(14)}\). Several studies have concluded that bioflavonoids can prevent changes of tissue function by increasing NO level in the testicular tissue \(^{(4)}\). Thus, *Physalis angulata* L. leaf water extract can be used to prevent elevated testicular MDA level at doses of 250 mg/kgBW. Increased MDA level in the treatment groups can be assumed as an early marker of the pathogenesis of complications. This is consistent with research that conclude that MDA levels determine the pathogenesis of type 2 DM complications because increasing MDA illustrates antioxidant use to fight free radicals which leads to a decrease in total antioxidant status \(^{(15, 16)}\).

The results of this study revealed that the amount of sperm intracellular calcium was significantly higher in the positive control group compared to the negative control. This is due to a condition in hypertension from L-NAME induction, decreasing NO bioavailability and increasing ROS occur \(^{(4)}\). The decrease in Nitric oxide (NO) causes soluble guanil cyclase (sGC) not to be activated. As a result, the concentration of cyclic Guanin Monophosphate (cGMP) decreases and calcium increases. The decrease of cGMP gives an effect to inactivate the potassium channel so that the calcium canal is open due to increased voltage, so that there is an increase of Ca\(^{2+}\) entry to intracellular \(^{(17)}\).

In addition, the amount of intracellular calcium is also affected by ROS. ROS can induce increased cytosolic Ca\(^{2+}\) concentration through releasing from its storage and due to changes in clearance system. In oxidative stress state, there is an imbalance between calcium release and its storage. In mitochondrial dysfunction, there is an increase in Ca\(^{2+}\) uptake and Ca\(^{2+}\) release and in the endoplasmic reticulum Ca\(^{2+}\) uptake also increases. Therefore, an increase in intracellular Ca\(^{2+}\) happens \(^{(18, 19)}\).

In all three doses administered to the treatment groups, the amount of sperm intracellular calcium was significantly lower compared with the positive control group. The possible mechanism of antioxidant action of *Physalis angulata* L. leaf water extract was through releasing from mitochondrial and cytoplasm, and resulting in decreased number of sperm, activity, motility, and morphological changes \(^{(4)}\).

Excessive ROS in hypertension causes cell membrane damage because the cell membrane consists of fatty acids, which can be oxidized (lipid peroxide) and the cytoplasm has only small concentration of enzyme to neutralize ROS. Lipid peroxidation on the cell membrane cell causes cell membrane to lose its integrity and increase the permeability, so it inactivates cellular enzymes, DNA damage, and cell apoptosis, and resulting in decreased number of sperm, activity, motility, and morphological changes \(^{(4)}\).

However, data analysis on all three doses showed a significantly higher number of motile sperm compared to the positive control. This is because of the role of NO and antioxidants contained in *Physalis angulata* L. leaf water extract. Previous research show that *Physalis angulata* L. leaf can increase NO. NO affects increased sperm motility through dissolved gallyl cyclase (sGC) activation. Increased NO will be followed by increased cGMP cystesis \(^{(21)}\). In addition, NO can also increase motility through increased energy production in mitochondria \(^{(22)}\). Another mechanism that is assumed to be involved in increasing number of motile sperm...
is the activity of antioxidants. Reactive Oxygen Species (ROS) in the body is controlled by the body’s antioxidant system. So it is assumed that the antioxidant activity in *Physalis angulata* L. leaf water extract can decrease ROS as free radical, so the number of motile sperm increases. Thus it can be concluded that three given doses of *Physalis angulata* L. leaf water extract can increase the number of motile sperm.

This study shows that the levels of testicular MDA and sperm intracellular calcium can not be used as variables that directly or indirectly affect sperm motility. This is consistent with the other research showing that administration of *Physalis angulata* L. ethanol extract may have hypoglycemic effects without affecting sperm quality (23). Sperm motility can also be influenced by several factors, such as sperm flagellar length, intracellular pH, and intracellular calcium (24). Spermatogenesis abnormalities are influenced by endogenous and exogenous factors. Endogenous factors include hormone, psychology, and genetic. Exogenous factors can be chemical, drug, heavy metals, temperature, X-ray radiation, ultrasonic vibration, vitamin, nutrition, trauma, and inflammation. The effects of heavy metals such as lead also affect spermatogenesis process resulting in decreased sperm quality in terms of number, morphology, motility and abnormal forms of spermatozoa (25).

**Conclusions**

Administration of *Physalis angulata* L. leaf water extract dose of 250 mg/kgBW is proven to prevent increasing number of testicular MDA level and prevent increasing number of sperm intracellular calcium in male white Wistar strain rat model of hypertension. Administration of the three doses of *Physalis angulata* L leaf water extract is proven to prevent decreasing number of motile sperm in male white Wistar strain rat model of hypertension.

**Acknowledgments:** This study was funded by INSINAS (Insentif Riset Sinas I) RD 2016-0142. Dr. drg. Nur Permatasari MS as head of research project, who is gratefully acknowledged for his valuable discussion of this manuscript.

**Ethical Approval:** This study was approved by the Research Ethics Committee of Faculty of Medicine, University of Brawijaya, Indonesia (114/EC/KEPK/03/2017).

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding:** None

**References**


Estimation of Syphilis Serostatus on the Safety of Infertile Patients

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Abstract

Background: Infertility is a case assuming approximately 15 percent of couples in the world. At Italy, the evaluated percentage increases to 20 percent. There are many reasons for this case, among that a significant function appears to be manipulated by infections of the genital tract.

Aim of the Study: For assessments the influence of syphilis on the safety of infertile patients.

Materials and Method: All specimens of serum were initial evaluated utilizing a non–Treponema pallidum serologic (Ag) analysis to estimated for syphilis disease, & then a Treponema pallidum serologic (Ag) analysis was proceed to assert the positive specimen of syphilis recognized via the checking test.

Results: a total of 137 cases of infertile patients were collected (83 cases in male, 54 cases in female), from 83 cases of infertile male founded that 20 cases were suspected to T. pallidum infection while from 54 case of infertile female were founded that 15 cases were suspected to infection with Treponema pallidum bacteria. Also these results show that patients with continuous infertility have significant level of T. pallidum in females with age 41-50 years (54.55) while males with age 31-40 years (34.62) than the age suspected for T. pallidum is > or = 41 years.

Conclusions: A positive date of syphilis contagion may decrease the average of clinical gestation by sexual contact. Also, this decreasing in the average of clinical gestation needs a diversity of agents, including density of endometrial, grown oocytes number, the number of pollinated, splited oocytes under normal conditions, & the average of implantation.

Keywords: Infertility, T. pallidum, syphilis disease (STD), in vitro fertilization, rapid plasma regain, TPPA test.
initial & minor infertility respectively. Prevalence of a rising infertility is appeared in South Asia, and Africa\(^3\).

However, there are several agents that are responsible for weakness of sexual role of fertility in male & female. These agents involve disorders in hormone, condition of psychological. Every these agents can lead to weakness in the genital organs function, the reproductive cells production, quality of semen, transport cell of sperm to the oocyte, fruitfulness & stages of implantation in embryo\(^4,5\). However, syphilis can be defined as is a disease transmitted by sexual contact caused by bacterium \(T.\ pallidum\), & it's firstly prevalence through sexual contact, from blood or from mother to fetus \(^6\).

Also, infection of reproductive tract can cause approximately 8 percent & 35 percent of every situations of man infertility, respectively \(^7\). In female, it may result in obstruction of fallopian channel & inflammation of endometrium. Approximately 72.4 million people in the world have problems of infertility. Also, in vitro fertilization may be the end refuge for couples trying to control infertility \(^8\). On the other hand, if syphilis disease is left without treatment, the illness may continue for years & result in the incidence of severe complications, as well as granulomas, and paralysis \(^9\).

Also, Pregnant female which is infected with this disease may transport \(T.\ pallidum\) to the fetus, & this leads to reverse consequences of pregnancy, including stillbirth, fetus deaths \(^10\). On the other hand, testing of syphilis, connected with suitable and stimulate treatment of penicillin for infected patients, is proposed by the World Health Organization to stop syphilis transportation\(^11\).

### Materials and Method

**Selection of Patients:** Couples which flopped to conceive after minimum one year of sexual contact without contraception were deemed to be infertile. Infertility was caused by dysfunction of fallopian channel & factors related to man (a detection of asthenozoospermia depending on the World Health Organization laboratory manual for the investigation\(^12,13\).

Every patients afford new ET through the initial rotation & didn’t acquire any treatment for three months before in vitro fertilization. However, patients were precluded if they had ovary tumor, multiple cyst ovarian disorder, disease of thyroid gland, disease of adrenal gland, and diabetes.

Function of ovarian was investigated, and specimen of blood were collected on 2-4 days of menses to investigate the main FSH, LH, & levels of estrogen. Also, tests of sperm phenotype was managed\(^14\). Every participants received serological investigations in the laboratory (the rapid plasma regain \([RRR]\) and agglutination of \(T.\ pallidum\) particle tests \([TPPA]\) to test for the existence infection of syphilis before the treatment of in vitro fertilization.

**Test of syphilis:** All specimens of serum were initial evaluated utilizing a non-\(Treponema pallidum\) serologic (Ag) analysis to estimated for syphilis disease, & then a \(Treponema pallidum\) serologic (Ag) analysis was proceed to assert the positive specimen of syphilis recognized via the checking test\(^15,16,17\). For the rapid plasma regain test, cardiolipin is applied as an Ag to discover antibodies directed against cardiolipin in the patients serum\(^18\). Every specimens of serum for the rapid plasma regain test were gradually diluted (1:1-1:32) in natural saline solution for titer definition\(^19\). In the \(T.\ pallidum\) particle agglutination test, granules of gelatin sensitive to \(T.\ pallidum\) attach to antibodies against \(T.\ pallidum\) in the human serum. The collections of the rapid plasma regain & \(T.\ pallidum\) particle agglutination tests is commonly utilized to the identifying of syphilis through every stages of the illness with appropriate susceptibility & particularity\(^20\).

### Results

**Demographic features of the patient specimen:** SPSS (version 21) was utilized to analyze the current data. Important differences were acquired by utilizing the chi-squared test. Differences between variables were setting as significant in 5% (\(P \leq 0.05\)) & hardly Significant in 1% (\(P \leq 0.01\)).
Table (1): Explain infertile patient & related to the *T. pallidum* with male and female:

**A. Classification cases of infertile patients into male and female (Total=137 cases, 83 cases in male, 54 cases in female).**

| Age groups | No. of cases infertile patients | Male | | Male | Female | | Female | P value |
|------------|---------------------------------|------| | | | | | |
|            |                                 | M    | | | | | | |
|            |                                 | %    | | | | | | |
| 20-30yrs   | 66                              | 42   | | 24 | 36.36 | |       | 0.024* |
| 31-40yrs   | 45                              | 26   | | 19 | 42.22 | |       |       |
| 41-50yrs   | 26                              | 15   | | 11 | 42.31 | |       |       |
| Total      | 137                             | 83   | | 54 | | | | |

* = significant at P≤0.05, Chi-squared test, df=5, α=0.05

**B. Male infertile patients suspected to *T. pallidum* (Total=20 cases)**

| Age groups | No. of cases infertile Male | T. Pallidum + | | T. Pallidum - | P value |
|------------|-----------------------------|--------------| | | | |
|            |                             | M | | M | |
|            |                             | % | | % | | |
| 20-30yrs   | 42                          | 3 | | 39 | 7.14 | | 92.86 | <0.01** |
| 31-40yrs   | 26                          | 9 | | 17 | 34.62 | | 65.38 |       |
| 41-50yrs   | 15                          | 8 | | 7  | 53.33 | | 46.67 |       |
| Total      | 83                          | 20 | | | | | | |

** = significant at P≤0.05, Chi-squared test, df=5, α=0.01

**C. Female infertile patients suspected to *T. pallidum* (Total=15 cases).**

| Age groups | No. of cases infertile female | T. Pallidum + | | T. Pallidum - | P value |
|------------|-------------------------------|--------------| | | | |
|            |                              | F | | F | | | |
|            |                              | % | | % | | | |
| 20-30yrs   | 24                            | 2 | | 22 | 8.33 | | 91.67 | <0.01** |
| 31-40yrs   | 19                            | 7 | | 12 | 36.84 | | 63.16 |       |
| 41-50yrs   | 11                            | 6 | | 5  | 54.55 | | 45.45 |       |
| Total      | 54                            | 15 | | | | | | |

** = significant at P≤0.05, Chi-squared test, df=5, α=0.01

In the above table, a total of 137 cases of infertile patients were collected (83 cases in male, 54 cases in female), from 83 cases of infertile male founded that 20 cases were suspected to *T. pallidum* while from 54 case of infertile female were founded that 15 cases were suspected to infection with *Treponema pallidum* bacteria. Also these results show that patients with continuous infertility have significant level of *T. pallidum* in females with age 41-50 years (54.55) while males with age 31-40 years (34.62) than the age suspected for infection with *T. pallidum* is ≥ 41 years.

**Discussion**

This survey was directed to estimate the appearance of infections in couples with problems of fertility in Iraq. Urogenital tract inflammations are indirectly or directly a main reason of infertile patients in couples since they can damage the genital organ either in female & male, & because *T. pallidum* can perform to the motile sperm agglutination, a modifications in the morphological characteristics of the cell [21,22].

However, the patients plurality were negative & the percent of positive subject was elevated in male and female. Furthermore, in female there are a vast diversity of bacterial types responsible for the infections compare to man. Both these forms can be demonstrated regarding that female is more sensitive to infections of genitourinary tract because the urethra of female is wider and smaller compare to the urethra in the man &
because the vaginal region nearly the vaginal cavity is colonized with potential pathogen.

Also, infection with *T. pallidum*, the bacteria causing syphilis that is a general cause infertility in man[23]. Human immunodeficiency virus-seropositive female have been observed to be co-infected with the *T. pallidum*, and human papillomavirus[24].

However, there is a connection between sex steroids & danger factors of cardiovascular system, quality of semen, and levels of lipid[25]. Low-densitylipoprotein cholesterol and seminal plasma triglyceride may be useful biochemical signals for evaluating infertility in man[26].

A rising number of infertility in patients require aided genital technology treatments. Patients are exposed for viruses & bacteria, as well as HCV, cytomegalovirus, HIV, *T. pallidum*, and *Chlamydia trachomatis* before aided genital technology depending on the European community of person proliferation[27].

At least 90% of female is investigated for syphilis disease before birth & 90 percent of seropositive pregnant male acquire appropriate treatment[28].

Syphilis (as an sexual transmitted disease) may cause pelvic inflammation, that may lead to impairment of endometrium. Moreover, this deterioration produces renewal method, which may thicken the lining of endometrium & lead to functioning of abnormal endometrium & decreased receptivity of endometrium, producing infertility[29,30].

Every female must be investigated for *T. pallidum* through the initial investigation before birth & again in gestation but late[31].

In addition, cytokines and anti-cytokineantibody may influence the fertility of patients infected with syphilis toa particular extent. Also, ACAs are usually present in the patients serum & can suppress the segregation of Langhans layer into syntiotrophoblasts, therapy detrimental cultivated blastocysts which have clusters of an internal cells that forms fetus[32]. However, cytokines are carefully linked to all guise of the genital procedure & can be utilized to foretell the clinical consequence in vitro fertilization[33].

Conclusions
A positive date of syphilis contagion may decrease the average of clinical gestation by sexual contact. Also, this decreasing in the average of clinical gestation needs a diversity of agents, including density of endometrial, grown oocytes number, the number of pollinated, splited oocytes under normal conditions, & the average of implantation.

Ethical Clearance: Ethics committee refer there is no plagiarism and there is no mistakes or wrong results in this work.

Conflict of Interest: The authors reported there are no collision of interest.

Founding Source: None.

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Study of Some Immunological Markers of People with Parasitic Infestation and their Relationship to Colorectal Cancer

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¹Research, ²Assit. Prof., University of Al-Qadisiyah/College of Science/Department of Biology, Iraq

Abstract

The aims of this study to find the link between each of the parasites (E. histolytic and Giardiasis) infection and intestinal cancer. This study contain 4 groups: - Group (G1) People with cancer and diarrhea due to the parasite (42) Group (G2) People with cancer and diarrhea without parasites (8) Group (G3) People with diarrhea and parasites (24) and Group (G4) Control (30), blood samples were collected from patients suffering from diarrhea and parasite infection of both types, as well as cancer, Elisa kits were used in our study the proteins (mucin 2, TFF3, CALP) level were measure by using Elisa kit that provided from the China Origin Company Elabscience. The results of the current immunological study showed the level of serum (mucin 2, TFF3, CALP) among the study groups, where the levels of mucin 2 values were (14305.00), (10595.00), (13145.00) and (9350.00) in group (1), and group (2), group (3) and group (4) respectively, and the level of serum values (TFF3)(43.15),(11.90),(29.65) and (8.60) with the same sequence of groups above, and the level of serum values CALP(16320.00),(11220.00),(15275.00) and (8690.00) with the same sequence of groups above as well. The results of the statistical analysis showed that there is a significant difference between the study groups below the probability level (P<0.001). (mucin 2, TFF3, CALP) with both (carcinogenic parasite) and (parasitic infestation only) and (carcinogenic infection) with different high levels compared to other groups.

Our study was concluded there was relationship between E. histolytic and Giardia lamblia infection and intestinal cancer.

Keywords: Colorectal cancer, mucin 2, TFF3, CALP.

Introduction

Cancer is a group of diseases involving abnormal cell growth with the potential to invade or spread to other parts of the body(1). These contrast with benign tumors, which do not spread(2). Possible signs and symptoms include a lump, abnormal bleeding, prolonged cough, unexplained weight loss, and a change in bowel movements. While these symptoms may indicate cancer, they can also have other causes. Over 100 types of cancers affect humans(3). Intestinal parasites are one of the most serious health problems in developing countries, especially in tropical and subtropical regions(4). Parasites are a serious public health threat being living organisms that consume their food and other requirements from a host. Medicinal parasites are classified into three main groups: protozoa and helminthes (and some arthropods)⁵. This study aims to find out the link between each of the parasites (E. histolytic and Giardiasis) infection that causes diarrhea and cancer through some vital indicators that were taken in this study.

Materials and Method

Experimental design:

This study contain from 4 groups:

- Diarrhea Parasite and cancer group (G1).
- Diarrhea and cancer without parasites group (G2).
- Diarrhea and Parasite group (G3).
- Control group (G4).

Samples collection (Stool and Blood): Stool samples were collected from patients with diarrhea and parasite infections, as well as cancer. And blood
was collected from the same patients in addition to the control group.

**Immunological Examination:** Serum separation - Blood samples (EDTA-free) were left for 20 minutes at room temperature until the blood clotted, then the samples were centrifuged using a centrifuge at 3000 rpm for 10 minutes, separating the serum from other blood components using a pipette. Min and put into 10 mL tube. Then the tubes containing the serum were preserved at a degree of (-20 ° C) until immunological tests were performed on them. (A) Immunological detection of vital signs: The serum separated by this test is used to estimate the ratio of mucin proteins, trifoyl protein, and calprotectin, using a technique called Enzyme-linked immunoassay (ELISA) technology. immunology assay according to the manufacturer’s instructions (Elabscience).

Statistical analysis: - All results in this study were subjected to statistical analysis to find out the significant differences of the studied variables using the tests (kruskalwallis test) at a probability level ($p<0.001$).

**Kits:** Elisa kits in this study were obtained from the China Origin Company Elabscience.

**Results**

**Mucin (ng/ml):** The results of the study showed that the concentration of mucin 2, the serum levels were 14305.00 (3912.50), 10595.00 (387.50), 13145.00 (175.00) and 9350.00 (90.00) in group of cancer with parasite, cancer with no parasite group, diarrhea and parasite group and healthy control group, respectively. There was highly significant variation in mucin 2 level among study groups ($p<0.001$). The level was highest in group of cancer and parasite followed by diarrhea parasite group, then by cancer no parasite group and finally by healthy control group, table(1)(4) and figure(1). Thus both cancer and parasite infestation are associated with an increase in the serum level of mucin 2.

![Fig (1): Box plot shows the average level of mucin serum 2 in study totals.](image)
Table (1): Measure and Compare Serum Level (Mucin 2) between study groups.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Cancer diarrhea parasite</th>
<th>Cancer diarrhea no parasite</th>
<th>Diarrhea Parasite</th>
<th>Healthy Control</th>
<th>p</th>
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</thead>
<tbody>
<tr>
<td><strong>Mucin 2</strong></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Median (IQR)</td>
<td>14305.00 (3912.50)</td>
<td>10595.00 (387.50)</td>
<td>13145.00 (175.00)</td>
<td>9350.00 (90.00)</td>
<td>&lt; 0.001 K</td>
</tr>
<tr>
<td>Range</td>
<td>10000.00 -15500.00</td>
<td>10400.00 -11000.00</td>
<td>10000.00 -13400.00</td>
<td>9230.00 - 9500.00</td>
<td>HS</td>
</tr>
</tbody>
</table>

IQR: inter-quartile range; K: Kruskal Wallis test; HS: highly significant at p ≤ 0.01

**TFF3 (ng/ml):** The results of the study showed that the concentration of TFF3 TFF3, the serum levels were 43.15 (37.90), 11.90 (0.65), 29.65 (2.45) and 8.60 (0.70) in group of cancer with parasite, cancer with no parasite group, diarrhea and parasite group and healthy control group, respectively. There was highly significant variation in TFF3 level among study groups (p< 0.001).

The level was highest in group of cancer and parasite followed by diarrhea parasite group, then by cancer no parasite group and finally by healthy control group, table (2)(4) and figure (2). Thus both cancer and parasite infestation are associated with an increase in the serum level of TFF3.

Table (2): Measure and Compare Serum Level (TFF3) between study groups.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Cancer diarrhea parasite</th>
<th>Cancer diarrhea no parasite</th>
<th>Diarrhea Parasite</th>
<th>Healthy control</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TFF 3</strong></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median (IQR)</td>
<td>43.15 (37.90)</td>
<td>11.90 (0.65)</td>
<td>29.65 (2.45)</td>
<td>8.60 (0.70)</td>
<td>&lt; 0.001 K</td>
</tr>
<tr>
<td>Range</td>
<td>2.50 -59.50</td>
<td>11.00 -12.20</td>
<td>24.10 -33.30</td>
<td>7.50-9.50</td>
<td>HS</td>
</tr>
</tbody>
</table>

**Fig (2):** Box plot shows the average level of TFF3 serum in study totals.
CALP ng/ml: The results of the study showed that the concentration of CALP, the serum levels were 16320.00 (5342.50), 11220.00 (332.50), 15275.00 (240.00) and 8690.00 (170.00) in group of cancer with parasite, cancer with no parasite group, diarrhea and parasite group and healthy control group, respectively. There was highly significant variation in CALP level among study groups \((p < 0.001)\). The level was highest in group of cancer and parasite followed by diarrhea parasite group, then by cancer no parasite group and finally by healthy control group, table (3)(4) and figure(3). Thus both cancer and parasite infestation are associated with an increase in the serum level of CALP.

Table (3): Measuring and comparing the level of serum (CALP) among study totals.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Cancer diarrhea parasite</th>
<th>Cancer diarrhea no parasite</th>
<th>Diarrhea Parasite</th>
<th>Healthy control</th>
<th>p</th>
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</thead>
<tbody>
<tr>
<td>CALP</td>
<td>Median (IQR)</td>
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<td></td>
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</tr>
<tr>
<td></td>
<td>16320.00 (5342.50)</td>
<td>11220.00 (332.50)</td>
<td>15275.00 (240.00)</td>
<td>8690.00 (170.00)</td>
<td>&lt; 0.001 K</td>
</tr>
<tr>
<td></td>
<td>Range</td>
<td>11000.00 -16900.00</td>
<td>11000.00 -12000.00</td>
<td>1570.00 -15700.00</td>
<td>8490.00 -8850.00</td>
</tr>
</tbody>
</table>

Fig (3): Box plot shows the average level of CALP serum in study totals.

Table (4): Concentration of mucin, TFF3 and CAPL in patients with cancer, parasites and diarrhea.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Cancer diarrhea parasite</th>
<th>Cancer diarrhea no parasite</th>
<th>Diarrhea parasite</th>
<th>Healthy control</th>
<th>Pvalo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mucin 2</td>
<td>Median (IQR)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>14305.00 (3912.50)</td>
<td>10595.00 (387.50)</td>
<td>13145.00 (175.00)</td>
<td>9350.00 (90.00)</td>
<td>&lt; 0.001 K</td>
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<tr>
<td></td>
<td>Range</td>
<td>10000.00 -15500.00</td>
<td>10400.00 -11000.00</td>
<td>10000.00 -13400.00</td>
<td>9230.00 - 9500.00</td>
</tr>
</tbody>
</table>
Characteristic Cancer diarrhea parasite Cancer diarrhea no parasite Diarrhea parasite Healthy control Pvalo

<table>
<thead>
<tr>
<th></th>
<th>Median (IQR)</th>
<th>Range</th>
<th>Median (IQR)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>TFF 3</td>
<td>43.15 (37.90)</td>
<td>2.50 -59.50</td>
<td>11.90 (0.65)</td>
<td>11.00 -12.20</td>
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<tr>
<td></td>
<td>29.65 (2.45)</td>
<td>24.10 -33.30</td>
<td>8.60 (0.70)</td>
<td>7.50-9.50</td>
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<td></td>
<td>&lt; 0.001 K</td>
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<td>HS</td>
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<tr>
<td>CALP</td>
<td>16320.00 (5342.50)</td>
<td>11220.00 (332.50)</td>
<td>15275.00 (240.00)</td>
<td>8690.00 (170.00)</td>
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<td></td>
<td>11000.00 -16900.00</td>
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<td></td>
<td>&lt; 0.001 K</td>
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</table>

**Discussion**

The results of the study showed a significant increase in the concentration of TFF3 protein in the serum in patients with Parasites and cancer with diarrhea compared to the group of uninfected people and also a significant increase in the group of infected parasite. The reason for the increased concentration of TFF3 in the person with the parasite is its important role in protecting and repairing the mucous layer of the gastrointestinal tract and into cell migration, usually TFF3 increases when the gastrointestinal tract is damaged and in the case of cancer(7). The anomalous expression of trivoyl protein is associated with gastroenteritis and precancerous tumors(8). The results of the current study are consistent with what it did(9) where the concentration of TFF3 in serum for people with Giardia lamblia parasite increases and the reason is due to the important role of TFF3 in protecting the mucosa and also agrees with the study of(10).

The results of the current study showed a significant increase in the level of Mucinemymycin in the serum in patients with the parasite when compared with the healthy control group. Mucine is considered the type of MUC2 is the main mucous material secreted in the gut. The reason for the high level of mucin in patients with intestinal parasites is due to the important role that myosin plays in protecting the epithelial layer of the intestinal cavity and also works as a barrier to prevent penetration of germs and parasites into the intestinal wall when eating contaminated food and water Parasiteshosts the mucous layer of the intestine in which colonies are present (11) The presence of bacteria in the mucous layer of the intestine stimulates the immune response of the digestive system and enhances its health(12) when invading and colonizing the parasite of the mucous layer of the intestine It stimulates cystic cells in the intestinal cavity from mucus secretion and this reason leads to increased mucus secretion (13) as a fungal defensive state of the gastrointestinal surface layer of the intestine (14). The parasite has a virulence factor that, upon infection, can Stimulating excessive mucus secretion in the intestine and consequently the storage of myosin, which enables it to adhere to the outer mucous layer of the intestine · Myosin plays a protective role through the continuous regeneration of cystic cells and is excreted in the intestinal cavity and does an important job in capturing pathogenic and coexisting parasites and parasites, myosin eventually flows to remove these microorganisms during defection.(15) The current study is consistent with the study of(16) Also with the study of(17) that showed a high level of MUC2 expression after exposure to the parasite of Giardia lamblia also consistent with the study of(18) that showed a high level of myosin concentration in parasitic infections and agreed with(19) that confirm the high level of myosin in people People with the parasite Giardia lamblia, who adopted the reason for the increase to the pathological physiological response of the parasite Giardia, which develops disease and diarrhea and works to disrupt the mucous layer of the intestine and impede the absorption process.

The present study found an increase in the serum level of calcipectin in patients with the parasite compared with the control group. Also, there is a slight increase in the serum level of CALP in favor of the infected group compared with the group of infected. This increase may be due to differences in Statistics, sample size and working method can be an increase in the serum level of calcipectin due to intestinal parasites infection. Parasitic infections have a strong effect on the health of the digestive system, especially when the parasite is invasive like E. histolytica. This parasite invades the mucous membrane of the intestine and reaches To the epithelial layer which leads to the formation of calculus ulcers(20) upon parasitic infection, white blood cells multiply and calbrotectin is released,
which activates the action of neutrophils in the intestinal lining, as it participates in the binding and adhesion of white blood cells to the intestinal lining. The effect of infection with the parasite on the blood level in general, especially white blood cells, where the percentage of hemoglobin is low in a person. Injured patients, and this decrease in the percentage of hemoglobin in the blood can be explained by the persistent diarrhea that affects the necessary elements such as iron, copper, and zinc\(^{(21)}\). Fecal calprotectin (CF) is considered a vital indicator for the diagnosis of IBD but it is not accurate in the diagnosis, The calcipectin protein is profuse in the leukocytes of neutrophils as it is found in the epithelial cells of the intestine and in the monocytes and monocytes, and the level of calcipectin in the feces is proportional to the level of neutrophil in the gut\(^{(22)}\). Mucous membranes increase the liberation of calcipectin and can be found in serum and other body fluids as a clinical inflammatory indication\(^{(23)}\). It is due to an increase in white blood cells as an immune response against infection.

**Conclusion**

Our study was concluded there was relationship between \textit{E. histolytica} and \textit{Giardia lamblia} infection and colon rectal cancer.

Correlation of elevated serum value of mucin 2, TFF3 and CALP with carcinogenicity, parasite infection and co-infection (parasite with cancer) compared with other indicators.

**Ethical Clearance:** Nil

**Source of Funding:** self

**Conflict of Interest:** Nil

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Physiological Research/Academia Scientiarum 
Effect of Shift Report Training Program for Nurses on Quality of Reporting

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2Professor of Nursing Administration Faculty of Nursing, Ain Shams University

Abstract

Background: Shift report has crucial on achieving effective, safe, and high quality communication when the responsibility for the patient care is transferred from one nurse to another in suitable manner.

Aim of Study: The study aimed to develop quality of reporting among nurses after implementation of shift report training program.

Subjects and Method: The study was conducted at Shoubra General Hospital which affiliated ministry of health hospitals Total bed capacity is (200) bed. Two groups of subjects participated in the study, namely head nurses, staff nurses; 50 head nurses and their assistants in the designated setting, the only selection criterion for this group was working in the selected units during the time of the study; and 129 staff nurses out from 194 according this equation. Three data collection tools were used to carry out this study namely, knowledge questionnaire sheet, Observational check list, Audit sheet. The study involved assessment, planning, implementation, and evaluation phases at the end of training and three months follow-up.

Results: No one of the staff nurses in the study sample had satisfactory total knowledge scores at the pre-intervention phase and reach 100% at the post-intervention and follow up phases. No one of the head nurses in the study sample had satisfactory total performance scores at the pre-intervention phase and reach 100% at the post-intervention phase, while the follow-up phase showed some declines, down to 70% in total performance scores.

Conclusion and Recommendations: There was a statistically significant correlation between head nurses’ total knowledge, performance, and audit scores with p-value > 0.01, also, there was a statistically significant correlation between nurses’ total knowledge, performance, and audit scores with p-value > 0.01. The study recommends Periodic assessment of head nurses and their staff for reporting skills. Regular implementation of training programs regarding shift report.

Keywords: Shift report, Training program, Nurses, Quality of reporting.

Introduction

Nursing is an art and a science by which people are assisted in learning to care for themselves whenever possible and cared for by others when they are, unable to meet their own needs. Nurses coordinate care and apply their knowledge and skills to deliver care. Breakdown of communication between, nurses can interfere with the client’s treatment (Delaune and Ladner, 2016). Communication in nursing is at the heart of nursing and is essential in conveying caring and applying nursing skills and knowledge (Berman et al., 2015).

On a daily basis, in every “healthcare facility, the responsibility for the care of patients is transferred between care providers. This process occurs in active and interruptive environments that are typical of those in healthcare today. The communication of patient information to the next care provider can be known as “report,” “end-of-shift report,” “handoff,” or “handover.” This communicates the information necessary for
patient care to continue as planned; and for the purpose of this Project, the term “handover” will be used. Three primary things are transferred during every handover: information, authority and responsibility (Epstin, 2017).

Intradepartmental communication at the unit level among nurses and other health caregivers has been identified as a key factor in patient safety, particularly during an interaction called nurse to nurse handoff (Kentucky and Streeter, 2018). Intradepartmental communication with other members of the healthcare team affects patient safety and the work environment. Breakdown in communication is the more frequent cause of serious injuries in healthcare settings when patients move from one nursing unit to another; so accurate communication is essential to prevent errors (World Health Organization, 2007).

The ability of the team members to understand and communicate the information enables them to work together collaboratively and coordinate communication (Reader et al., 2015). Communication of information in healthcare is a vital component to provide safe patient care. Communication is necessary to report critical patient changes in a timely clear manner; such communication may be from nurse to physician, from nurse to patient, or from nurse to nurse as well as to other, members of the healthcare team (Harvey, 2017).

Reporting is the verbal communication of data regarding the client’s health status, needs, treatments, outcomes, and responses. When a report is given, it needs to summarize the current critical information? that facilitates clinical decision making and continuity of care. Recording and reporting are based on the nursing process, standards of care, and legal and ethical principles. The nursing process provides structures for an organized report, a challenge inherent in verbal communication. In order to do efficient verbal communication and well ‘organized report, the nurse must consider what needs to? be said, why it needs to be said, how to say it and what the expected’ outcomes are needed. Considering these aspects of; reporting before the communication happen will provide a concise, organized report (Daniels et al., 2015).

There are three patient-centered positive outcomes associated with nurse-to-nurse bedside’ shift report as patient empowerment, patient involvement and patient becoming an additional resource in diagnosis and treatment. Bedside shift reporting saves; time and allows the incoming nurse to ask questions. The nurses begin to know patients at the, beginning of the shift and doing assessments, so they can. carry out their clinical care tasks. This also gives them baseline, knowledge of the patients so they can monitor, changes or risks (Byers et al., 2019).

A bedside shift report reassures the’ patient that the nursing staff works as a team that everyone ‘ knows the plan of care. By working together, patients witness a safe, professional transfer of? responsibilities; patients can ask questions, allowing the nurse and- patient an opportunity to share information; and promotes involvement and improved satisfaction and patients’ empowerment (Anderson and Mangino, 2016). Bedside shift- report has been shown to empower nursing staff, improve patient involvement, and allow for a safe’ transition of care between providers. It establishes and promotes. trusting relationships between ‘patients and staff members, which serve as a foundation for teamwork (Bettyanne, 2015).

Continuing assessment of the patient’s needs and conditions requires accurate documentation. This documentation helps promote the -continuity of care given by nurses and- other healthcare providers. Because one nurse cannot provide twenty-four-hour coverage, significant information- must be passed on to others through reports, nursing processes- notes and care plans (Berman et al., 2016).

Power is necessary to be able to influence an individual or group. Nurses need power to be able to influence patients, physicians, and other healthcare- professionals, as well as each other. Powerless nurses are ineffective- nurses, and the consequences of nurses’ lack of power have only recently come to light. Powerless nurses are less satisfied with their jobs, and more susceptible to -burnout and depersonalization. Lack of nursing power may also contribute to poorer patient outcomes. Meanwhile, there are compelling reasons to promote power in nursing (Manjlovich, 2015).

Empowered employees provide exceptional service and experience this first-hand. Empowered employees have the power to make decisions without a supervisor. They are entitled to go off script, bend the rules, do what they see fit if they believe it is the right thing to do for the customer. More than any other kind of employee, the empowered employee is able to create a feeling of true customer service that ultimately yields much greater customer loyalty (Richard, 2015).
Most managers would agree that feedback is essential in order to keep employees on course and to help them reach their goals. However, giving employees feedback is difficult for many managers. Effective managerial feedback can be defined as verbal and nonverbal communication with employees regarding their performance, based on mutually agreed upon goals (Berman et al., 2016). Feedback is described as an integral ingredient in the communication process because it lets everyone in the interaction know that the message, has been received and also lets the sender know how those, who received it have interrupted it. Feedback is evident from both verbal and nonverbal responses equally and clarifies whether interpretation or understanding of the messages is mutual or shared (Timmins and McCabe, 2017).

Communication is the life blood of any organization and its main purpose is to affect change to influence, action. It is the chain of understanding that integrates the members of an organization from top to bottom, bottom to top, and side to side (Basaavanthappa, 2009). It is important, that all healthcare team members communicate with each other regarding assessment, intervention outcomes, and client status. Poor communication can lead to frustration of members of the healthcare team, and poor, documentation of complications or severity lead to significant lost revenue. Also, it has significant impact on quality, costs and revenue, and affects patients, safety (Salman, 2010). Accurate documentation is needed to protect patients from fragmented and possibly, dangerous care (Perry et al., 2016).

Significance of the study: Special emphasis on the hand-over procedures and nursing personnel must be acquainted with the different types of (intra-departmental reports with periodic training and re-training to refresh nursing personnel knowledge. Actually, the observation of handoff among staff nurses during change (of shifts in the study setting was inadequate and lead to lack of knowledge of (incoming nurse about all information related to the patient (Shazly, 2003). Therefore, the present study was conducted to improve the intradepartmental communication among nurses through providing evaluative feedback regarding their (performance of shift report and finding out its effects on nurses’ and patient’s empowerment.

Aim of the Study: The aim of this study is to develop quality of reporting among nurses after implementation of shift report training program.

Subjects and Method

Research Design: Quasi experimental research design was used in carrying out the current study.

Setting: This study was conducted at Shoubra General Hospital which affiliated ministry of health hospitals. Total bed capacity is (200) bed. It consists of the following units and departments; medical department, surgical department, neonatal intensive care unit, intensive care unit, cardiac care unit, burn department, emergency department, obstetric and gynecological department, hemodialysis unit, pediatric department, and ten outpatient clinics.

Subjects: The study subjects consisted of two groups of subjects participated in the study, namely head nurses, staff nurses. Head nurses group: It consisted of 50 head nurses and their assistants in the designated setting. The only selection criterion for this group was working in the selected units during the time of the study. Staff nurses group: It included 129 staff nurses out from 194 according this equation.

Data collection tools: Three data collection tools were used to carry out this study namely, knowledge questionnaire sheet, Observational check list, Audit sheet.

1. Knowledge questionnaire sheet: - (Appendix I)

It aimed to assess nurses knowledge regarding shift report. This tool will consist of two parts:

Part 1: It aimed to collecting data regarding characteristics of study subject as, age, gender, qualifications, years of experience as well as attendance of training course

Part 2: It developed by, (Shazly, 2003, Abd- Elal, 2014 and Atef, 2015) and will be modified by the researcher. It included (40 multiple choice questions), cover certain scopes as definition of shift had, importance and content of shift hand over.

Scoring System: Nurses response were scored (one) for the correct answer and (zero) for incorrect answer. Mean and standard deviation was calculated and then converted into percent score. The knowledge was considered satisfactory if percent score was 60% or more and unsatisfactory if less than 60%

2. An observational check list: (Appendix II): It aimed to assess nurses’ performance regarding shift
report. It developed by (Shazly, 2003, Abd-Elal 2014 and Atef, 2015). It covers three main domains namely; 1) pre report hand over preparation, 2) practice during the hand over procedure, and 3) hand over the department.

**Scoring System:** The observation scoring systems were “done” and “not done” which scored one and zero respectively. The scores of the items of each part were summed up and the total divided by the number of items, giving a mean score for the part. These scores were converted to percent score. Total score of nurses’ performance regarding shift report considered adequate if total percent score was 60% or more and inadequate if the total percent score was less than 60%.

3. **Audit Sheet:** This sheet was aimed to assess quality of report. It adopted from (Abed Elal 2014). It included the criteria for shift report (11 items) and the content of shift report (20 items).

**Scoring System:** Nurses’ response was; “present”, or “not present” and scored one and zero respectively. The scores of the items were summed up and the total divided by the number of items, giving a mean score. These scores were converted to percent score. Total score accepted if total percent score was 60% or more and not accepted if the total percent score was less than 60%.

**Tools validity and reliability:** Face and content validity of the tools was assessed by jury group consisted of five experts in nursing administration in faculty of nursing at, (Ain shams, Cairo university and shobra general hospital). Jury group members judge tools for comprehensiveness, accuracy and clarity in language. Based on their recommendations correction, addition and/or omission of some items were done. Study tools were tested for its internal consistency by Cronbach’s Alpha. It was 0.783 for knowledge questionnaire sheet and 0.815 for the observation checklist.

**Fieldwork:** Once official permissions were obtained, the fieldwork was started. The researcher met with the nursing director of the hospital to determine the suitable time to collect the data and confirm the days and times to implement the training program. The study was carried out through an assessment of nurses’ knowledge regarding shift report using a structured questionnaire sheet, nurses’ performance regarding shift report were assessed using the observation checklist. The questionnaire sheet took from 20:30 minutes to be completed while the observation checklist took from 30:45 minutes.

**Administrative Design:** An approval to conduct the study was obtained from the Faculty of Nursing at Ain-Shams University, and from Shoubra General Hospital which affiliated ministry of health hospitals.

**ethical Considerations:** Prior study conduction, ethical approval was obtained from the scientific research ethical committee of the faculty of nursing, Ain Shams University. The researcher met both medical and nursing directors of the hospital where the nurses worked to clarify the aim of the study and take their approval. The researcher also met the study subjects to explain the purpose of the study and to obtain their approval to participate. They were reassured about the anonymity and confidentiality of the collected data, which was used only for the purpose of scientific research. The subjects’ right to withdraw from the study at any time was assured.

**Statistical Analysis:** Data entry and statistical analysis were done using (SPSS) statistical software package. Quality control was at the stage of coding and data entry. Data were presented using descriptive statistics in the form of frequencies and percentage for qualitative variables; mean and standard deviation for quantitative variable. Qualitative categorical variables were compared Chi-square (X2) test; the hypothesis that the row and column variables are independent, without indicating strength or direction of the relationship, Analysis of variance (ANOVA) test. Statistical significance was considered at (P-value <0.05).

**Results**

Table 1 showed that, half of head nurses (50%) had from 30 to 40 years, majority of head nurses (90%) were females and three fifth of them (60%) were married, regarding half of them (50%) had bachelor of nursing science. Majority of the head nurses (80%) had 10 – 20 years of experience.

Table 2 shows that nearly half of staff nurses (48.8%) had more than 30 years, majority of staff nurses (85.3%) were females and nearly two thirds of them (64.3%) were married, nearly half of them (46.5%) had technical institute diploma. Nearly two thirds of the staff nurses (65.1%) had 5 – 10 years of experience.

Table 3 displays, highly statistically significant improvement in all mean scores as well as in total mean scores.
of head nurses’ shift report knowledge. There are highly significant changes between head nurses’ shift report knowledge in the pre and post and between pre and follow up knowledge with p-value <0.01.

Table 4 illustrates that, highly statistically significant improvement in all mean scores as well as in total mean of staff nurses’ knowledge. There are highly significant changes between staff nurses’ knowledge in the pre and post and between pre and follow up knowledge with p-value <0.01.

Table 5 states that highly statistically significant improvement in all mean scores as well as in total mean of head nurses’ performance. There are highly significant changes between head nurses’ performance in the pre and post and between pre and follow up performance with p-value <0.01.

Table 6 indicates that highly statistically significant improvement in all mean scores as well as in total mean of staff nurses’ performance. There are highly significant changes between staff nurses’ performance in the pre and post and between pre and follow up performance with p-value <0.01.

Table 7 demonstrates highly statistically significant improvement in all mean scores as well as in total mean of head nurses’ audit scores. There are highly significant changes between head nurses’ audit scores in the pre and post and between pre and follow up audit scores with p-value <0.01.

Table 8 shows that highly statistically significant improvement in all mean scores as well as in total mean of staff nurses’ audit scores. There are highly significant changes between staff nurses’ audit scores in the pre and post and between pre and follow up audit scores with p-value <0.01.

Table 9 shows that, there was a statistically significant correlation between nurses’ total knowledge, performance, and audit scores with p-value > 0.01.

Table 1: Demographic characteristics of head nurses in the study sample (n=50)

<table>
<thead>
<tr>
<th>Demographic characteristics</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- &lt;30 years</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>- 30-40 years</td>
<td>25</td>
<td>50</td>
</tr>
<tr>
<td>- &gt;40 years</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>2. Gender:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Male</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>- Female</td>
<td>45</td>
<td>90</td>
</tr>
<tr>
<td>3. Marital status:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Single</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>- Married</td>
<td>30</td>
<td>60</td>
</tr>
<tr>
<td>- Widowed</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>- Divorced</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>4. Nursing qualification:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Doctorate in nursing science</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>- Master in nursing science</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>- Bachelor of nursing science</td>
<td>25</td>
<td>50</td>
</tr>
<tr>
<td>- High average diploma</td>
<td>19</td>
<td>38</td>
</tr>
<tr>
<td>5. Years of Experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- &lt;10 years</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>- ≥10 years</td>
<td>40</td>
<td>80</td>
</tr>
</tbody>
</table>

Table 2: Demographic characteristics of staff nurses in the study sample (n=129)

<table>
<thead>
<tr>
<th>Demographic characteristics</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- &lt;25 years</td>
<td>53</td>
<td>41.1</td>
</tr>
<tr>
<td>- 25-30 years</td>
<td>13</td>
<td>10.1</td>
</tr>
<tr>
<td>- &gt;30 years</td>
<td>63</td>
<td>48.8</td>
</tr>
<tr>
<td>2. Gender:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Male</td>
<td>19</td>
<td>14.7</td>
</tr>
<tr>
<td>- Female</td>
<td>110</td>
<td>85.3</td>
</tr>
<tr>
<td>3. Marital status:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Single</td>
<td>21</td>
<td>16.3</td>
</tr>
<tr>
<td>- Married</td>
<td>83</td>
<td>64.3</td>
</tr>
<tr>
<td>- Widowed</td>
<td>6</td>
<td>4.7</td>
</tr>
<tr>
<td>- Divorced</td>
<td>19</td>
<td>14.7</td>
</tr>
<tr>
<td>4. Nursing qualification:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Bachelor of nursing science</td>
<td>38</td>
<td>29.5</td>
</tr>
<tr>
<td>- Technical institute diploma</td>
<td>60</td>
<td>46.5</td>
</tr>
<tr>
<td>- Diploma in nursing</td>
<td>31</td>
<td>24</td>
</tr>
<tr>
<td>5. Years of Experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- &lt;5 years</td>
<td>20</td>
<td>15.5</td>
</tr>
<tr>
<td>- 5 – 10 years</td>
<td>84</td>
<td>65.1</td>
</tr>
<tr>
<td>- &gt; 10 years</td>
<td>25</td>
<td>19.4</td>
</tr>
</tbody>
</table>
Table 3: Head nurses’ total shift report knowledge mean scores throughout the intervention

<table>
<thead>
<tr>
<th>Items</th>
<th>No. of Items</th>
<th>Mean score</th>
<th>Paired Sample Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pre ±SD</td>
<td>Post ±SD</td>
</tr>
<tr>
<td>Communication skills</td>
<td>11</td>
<td>2.2±4.42</td>
<td>10.1±0.93</td>
</tr>
<tr>
<td>Shift report</td>
<td>17</td>
<td>5.3±1.46</td>
<td>15.1±1.39</td>
</tr>
<tr>
<td>Patient safety</td>
<td>12</td>
<td>2.8±1.38</td>
<td>11.3±0.52</td>
</tr>
<tr>
<td>Total knowledge</td>
<td>40</td>
<td>10.6±3.93</td>
<td>36.4±2.06</td>
</tr>
</tbody>
</table>

Table 4: Staff nurses’ total shift report knowledge mean throughout the intervention

<table>
<thead>
<tr>
<th>Total shift report knowledge</th>
<th>No. of Items</th>
<th>Mean score</th>
<th>Paired Sample Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pre ±SD</td>
<td>Post ±SD</td>
</tr>
<tr>
<td>Communication skills</td>
<td>11</td>
<td>1.9±1.37</td>
<td>10.1±0.64</td>
</tr>
<tr>
<td>Shift report</td>
<td>17</td>
<td>2.9±1.82</td>
<td>15.5±0.95</td>
</tr>
<tr>
<td>Patient safety</td>
<td>12</td>
<td>1.8±1.16</td>
<td>11.2±0.93</td>
</tr>
<tr>
<td>Total knowledge</td>
<td>40</td>
<td>6.7±2.73</td>
<td>36.7±1.26</td>
</tr>
</tbody>
</table>

Table 5: Distribution of head nurses’ total performance mean scores by the main categories throughout the intervention (n = 50).

<table>
<thead>
<tr>
<th>Total performance</th>
<th>No. of Items</th>
<th>Mean score</th>
<th>Paired Sample Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pre ±SD</td>
<td>Post ±SD</td>
</tr>
<tr>
<td>Pre report hand over preparation</td>
<td>6</td>
<td>1.9±0.84</td>
<td>5.7±0.46</td>
</tr>
<tr>
<td>Handover procedure</td>
<td>45</td>
<td>7.2±5.74</td>
<td>42.9±1.71</td>
</tr>
<tr>
<td>Handover the department</td>
<td>8</td>
<td>1.05±0.67</td>
<td>7.9±0.31</td>
</tr>
<tr>
<td>Total performance</td>
<td>59</td>
<td>8.7±6.9</td>
<td>56.6±1.89</td>
</tr>
</tbody>
</table>

Table 6: Distribution of staff nurses’ total performance mean scores by the main categories throughout the intervention (n = 129).

<table>
<thead>
<tr>
<th>The main categories</th>
<th>No. of Items</th>
<th>Mean score</th>
<th>Paired Sample Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pre ±SD</td>
<td>Post ±SD</td>
</tr>
<tr>
<td>Pre report hand over preparation</td>
<td>6</td>
<td>1.6±1.77</td>
<td>5.7±0.71</td>
</tr>
<tr>
<td>Handover procedure</td>
<td>45</td>
<td>18.2±7.51</td>
<td>40.1±5.51</td>
</tr>
<tr>
<td>Handover the department</td>
<td>8</td>
<td>4.3±3.19</td>
<td>7.3±0.56</td>
</tr>
<tr>
<td>Total performance</td>
<td>59</td>
<td>23.7±8.46</td>
<td>53.2±7.37</td>
</tr>
</tbody>
</table>

Table 7: Distribution of head nurses’ total audit mean scores by the main categories throughout the intervention (n = 50).

<table>
<thead>
<tr>
<th>The main categories</th>
<th>No. of Items</th>
<th>Mean score</th>
<th>Paired Sample Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pre ±SD</td>
<td>Post ±SD</td>
</tr>
<tr>
<td>Criteria of shift report</td>
<td>11</td>
<td>3.2±0.88</td>
<td>10.8±0.61</td>
</tr>
<tr>
<td>Content about personal information</td>
<td>7</td>
<td>2.4±1.29</td>
<td>6.8±0.61</td>
</tr>
<tr>
<td>Content about nursing procedures</td>
<td>13</td>
<td>1.8±1.74</td>
<td>12.5±0.68</td>
</tr>
<tr>
<td>Total audit scores</td>
<td>31</td>
<td>7.4±2.97</td>
<td>30.1±1.23</td>
</tr>
</tbody>
</table>
### Table 8: Distribution of staff nurses’ total audit mean scores by the main categories throughout the intervention (n = 129).

<table>
<thead>
<tr>
<th>Total audit mean scores</th>
<th>No. of Items</th>
<th>Mean score</th>
<th>Paired Sample Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pre Mean ±SD</td>
<td>Post Mean ±SD</td>
</tr>
<tr>
<td>Criteria of shift report</td>
<td>11</td>
<td>3.7±2.16</td>
<td>10.6±0.72</td>
</tr>
<tr>
<td>Content about personal information</td>
<td>7</td>
<td>3.2±1.77</td>
<td>6.8±0.78</td>
</tr>
<tr>
<td>Content about nursing procedures</td>
<td>13</td>
<td>5.2±3.19</td>
<td>12.5±0.23</td>
</tr>
<tr>
<td>Total audit scores</td>
<td>31</td>
<td>12.3±4.56</td>
<td>29.8±2.16</td>
</tr>
</tbody>
</table>

### Table 9: Correlation between staff nurses’ total knowledge, performance, audit scores

<table>
<thead>
<tr>
<th>Total knowledge scores</th>
<th>Total performance scores</th>
<th>Total audit scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>p-value</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>0.436</td>
<td>1</td>
</tr>
<tr>
<td>p-value</td>
<td>.000**</td>
<td>-</td>
</tr>
<tr>
<td>R</td>
<td>0.662</td>
<td>0.779</td>
</tr>
<tr>
<td>p-value</td>
<td>.000**</td>
<td>.000**</td>
</tr>
</tbody>
</table>

(**) Highly statistically significant at p<0.01

### Discussion

Getting a good nursing report before starting shift is vitally important. It is not only important for the nurse but for the patient as well. Nursing report is given at the end of the nurses shift to another nurse that will be taking over care for that particular patient. Nurses’ shift reports are routine occurrences in healthcare organizations that are viewed as crucial for patient outcomes, patient safety and continuity of care. Nursing report is usually given in a location where other people cannot hear due to patient privacy (Inanloo, et al., 2017).

One of the major responsibilities of nursing profession is how to communicate, report, take report, and record information. Nursing report is the official exchange of information between nurses in written or oral form at the end of each shift. Besides recording the written report of nurses, oral report is a communication method which its purpose is to transfer essential and key information about patients’ medical care. As mentioned, one of the practical reports of nurses is work shift delivery report when the responsible nurse for caring the patient provides the other nurses with a summary of patient’s activities and condition at the time of leaving the unit to rest or deliver his or her shift (Ghosh, et al., 2018). So, the current study aimed to developing quality of reporting among nurses after implementation of shift report training program.

Regarding demographic characteristics of head nurses, the current study revealed that half of head nurses had from 30 to 40 years, majority of head nurses were females and three fifth of them were married, regarding half of them had bachelor of nursing science. Majority of the head nurses had 10 – 20 years of experience. Nearly three quarter of the head nurses attended training courses.

This result was in agreement with Mio, Fasan, & Costantini, (2020) who found that the majority of head nurses were female, and married. Also, this result was in congruence with Mardis, et al., (2016) who found that the majority of head nurses had bachelor of nursing science, and their year experience were from 10 to 20 years. Conversely, this result was in disagreement with Grimshaw, et al., (2020) who found that the majority of head nurses not attended training courses, and three quarter of them had technical institute of nursing.

Regarding demographic characteristics of nurses, the current study revealed that nearly half of nurses had
more than 30 years, majority of participants were females and nearly two thirds of them were married, nearly half of them had technical institute diploma. Nearly two thirds of the nurses had 5 – 10 years of experience. Also, two third of the nurses attended training courses.

This result was in agreement with Inanloo, Mohammadi, & Haghani, (2017) who found that the majority of nurses were female, and married. Conversely, this result was in disagreement with Ito, & Iijima, (2018), who found that the majority of nurses had bachelor of nursing science, and their experience year were from 3 to 5 years.

Regarding participants’ total knowledge throughout the intervention, the current study showed that no one of head nurses and nurses in the study sample had satisfactory total knowledge scores at the pre-intervention phase while all of them had satisfactory knowledge at the post-intervention. This result may be due to head nurses and staff nurses were very interested with training program that increased their knowledge.

This result was in congruence with Mitchell, et al., (2018) who found that the majority of nurses’ knowledge about communication skills improved at post intervention phase after implementation of the program. Also, this result was in agreement with La Torre, et al., (2019) who found that majority of nurses’ knowledge about shift report were generally low before the intervention, and improved after intervention.

Regarding participants’ total performance scores, the current study revealed that no one of the head nurses and nurses in the study sample had satisfactory total performance scores at the pre-intervention phase while all of them had adequate performance at the post-intervention phase. The follow-up phase showed some declines. This result may be due to staff nurses were compliance with training courses that improved their performance with shift report.

This result was in agreement with Biondi, Dumay, & Monciardini, (2020) who found that the no one of nurses had satisfactory performance during hand-over procedure before the intervention. Also, this result was in agreement with Buus, Hoeck, & Hamilton, (2017) who found that majority of nurses had satisfactory performance during hand-over procedure after the intervention.

Regarding participants’ total audit scores, the current study revealed that no one of the head nurses and nurses in the study sample had satisfactory total audit scores at the pre-intervention phase while all of them had satisfactory audit scores at the post-intervention phase, while the follow-up phase showed some declines.

This result was supported with Hajibabaee, et al., (2014) who found that the majority of nurses had unsatisfactory total audit scores at the pre-intervention phase. Also, this result was in agreement with Waage, et al., (2014) who found that the majority of nurses had satisfactory total audit scores at the post intervention phase.

Regarding correlation between head nurses’ total knowledge, performance, audit scores, the current study revealed that there was a statistically significant correlation between head nurses’ total knowledge, performance, and audit scores.

This result was supported with Prang, & Jelsness-Jørgensen,. (2014) who found that there was a statistically significant correlation between head nurses’ total knowledge, and audit scores. Also, this result was in congruence with Mardis, et al., (2016) who found that there was a statistically significant correlation between head nurses’ total knowledge, and performance.

Regarding correlation between staff nurses’ total knowledge, performance, audit scores, the current study revealed that there was a statistically significant correlation between nurses’ total knowledge, performance, and audit scores.

This result was in agreement with Inanloo, Mohammadi, & Haghani, (2017) who found that there was there was a statistically significant correlation between nurses’ total performance, and audit scores. Conversely, this result was in disagreement with Ito,, & Iijima, (2018) who found that there was no statistically significant correlation between nurses’ total knowledge, and audit scores.

Conclusion

The current study concluded that: Presence of improvement in nurses, knowledge and performance regarding shift hand over and quality of report after implementing the program.

Recommendation: In the light of results of this study, the following recommendations were suggested:
• Periodic evaluation of the nurses practice regarding shift report
• Conducting training program regarding shift report in different settings
• Provide continuous support to the nursing staff to enhance their writing skills.

References


Detection of Virulence Genes for the *Entamoeba Histolytic* Parasite in People with Colorectal Cancer

Ali Slwmee Serhan Al-halaly¹, Habeeb Waseel Kadhumand², Ahmed Sabah Ali³, Bashar Abd Alkadhim Najį⁴

¹Research, ²Assit. Prof., ³Research, ⁴Research,
University of Al-Qadisiyah/College of Science/Department of Biology, Iraq

Abstract

The aims of this study are to determine the virulence factors of parasitic infestation, especially of the *E. histolytic* parasite, for persons with cancer and parasites. This study contain 2 groups: Group (G1) People with cancer and diarrhea due to the parasite (50) and (G2) People with diarrhea and parasites (24). Stool samples were collected from both groups for the purpose of confirming the diagnosis of the microscopically diagnosed parasite, Molecular testing is used to confirm the diagnosis of the parasite first and then determine or diagnose its virulence factors, The result of the diagnosis of the parasite is (89.189%) in the study groups as a result of the PCR examination and the result of the diagnosis of the parasite’s virulence factor is 100.0%.

The study concluded that all parasitic infestations had virulence factors cysteine protease (CP).

Keywords: Virulence factor, *Entamoeba histolytica*, PCR, colorectal cancer.

Introduction

Parasites are among the serious health problems that threaten the public health of the human being due to their consumption of large quantities of the host’s food in addition to being a major cause of other health problems, the most important of which is diarrhea, which is a cause of death, especially in children under five years of age, as well as anemia, as hemoglobin levels may decrease, especially when Children infected with worms and other intestinal parasites. There are some other pathological effects caused by infection with intestinal parasites such as weight loss, loss of appetite, flatulence with pain, nausea, vomiting and fever, as well as causing unacceptable gaps that lead to Limiting or preventing absorption of proteins, carbohydrates and vitamins. The most common intestinal parasite is *E. histolytica*, which causes amebiasis, which causes about fifty million infections, with a mortality rate of more than 100,000 cases annually. Numerous studies indicate that infection with intestinal parasites, including the *E. histolytic* parasite, has a direct effect on the immune response, which prompts the recruitment of white blood cells from the bloodstream to the sites of infection, where the mucous layer of the intestine acts as a barrier to protect against infection with intestinal diseases, where the immunoglobulin IgA is the main component Which is stimulated by the mucous layer of the intestine against intestinal injury, as it works to prevent pathogens from attaching to and remove the mucous barrier. Also, having amebic dysentery causes a change in the protein (TFF3), which is a replacement protein secreted at the site of infection, which promotes reorganization. The cytoskeleton and prevents programmed cell death, and also there are many studies confirming an elevated level of mucin 2 in the serum of people with amebic dysentery, as well as other vital signs that the parasite plays an important role in changing it is the level of lipids, which increases the level of triglycerides. The *E. histolytic* destroying tissues and enabling the amoeba to survive and form colonies in the intestine, and among these factors is the production of the tissue-hemolytic amoeba, the cysteine protease (CP) has a role in analyzing the host cells. The cysteine stimulates the mucous layer of the colon to secrete mucus from the capsular cells, and the mucus is very attracted to the protein to bind to the Gal/lectin protein present on the surface of the TM, which in turn allows the parasite to form colonies in the intestine and works to inhibit the mucosal barrier.

Another virulence factor is the production of the protein Lectin Galactose N-acetyl-D-galactosamine,
which helps the parasite to attach to the mucous layer of the colon and form colonies. Formation of amebopores to kill host cells. The ability of the amoeba to produce a protein capable of forming holes in the lipid membranes of the lumen of the intestine. This protein is found in three types A, B, and C, all of which are present in the histolytic amoeba. This protein is composed of 77 amino acids that work to destroy and devour bacteria. According to the amoeba.

**Materials and Method**

**Experimental design:**

This study contains from 2 groups:

- Diarrhea and Parasite group (G1).
- Diarrhea Parasite and cancer group (G2).

**Samples collection (Stool):** Stool samples were collected from patients with diarrhea and parasite infections, as well as cancer.

**Molecular Examinations for the *E. histolytic* parasite and virulence factors:**

**Stool DNA extraction:** For parasite and virulence factor: DNA was extracted from human stool samples using the (Stool DNA extraction presto) kit provided by (Geneaid) Taiwan, according to the company’s instructions.

**DNA profile:** For parasite and virulence factor: The DNA extracted from stool samples was detected by using a Nano drop spectrophotometer, which is used to detect the concentration of DNA, by determining the concentration of the DNA (ng/µl DNA), it is detected.

**Diagnostic method using PCR examination:** This method included diagnosing the parasite with (PCR) as well as diagnosing the pathogen genes (PCR) for the diagnosed parasites. The PCR technique was performed by using the primers of 18SrRNA genes responsible for diagnosing (*E. histolytica*) parasite species from DNA extract by filtering (PCR) also from human stool samples according to the method. The PCR technique was performed using the primers of the virulence factor genes of *Entamoeba histolytica*, namely (*Entamoebahistolytica* cysteine protease (ECP) gene), which is responsible for diagnosing the virulence factor of the parasite.

**Gel electrophoresis (PCR) results of diagnosed parasites and their virulence factors:** Electrophoresis was performed using a 1.5% agarose gel to read the result of the polymerase chain reaction, PCR product analysis, according to the instructions of the manufacturer of the kit.

**Statistical Analysis:** All results in this study were subjected to statistical analysis to find out the significant differences of the studied variables using the tests (One way anova and Fischer exact test) at a probability level (p < 0.001) (Schiefer, 1980).

Kits: Provided by (Geneaid) Taiwan

**Results**

**The results of Molecular tests for the diagnosis of parasites:** The polymerase chain reaction (PCR) examination was used to identify the presence of the small ribosomal RNA gene associated with the parasites recorded in the current study and to show the results by gel electrolysis as in Figure (1-1), where Table (1-1) shows the number of patients. Those who suffer from infection with parasites were by (89.189%) in the study groups as a result of the PCR examination, where the PCR method was successful in identifying cases infected with parasites within the group of people with cancer and diarrhea with a rate of (84.0%). The results of the statistical analysis showed a significant difference below the level of probability \( P = (0.048) \).

<table>
<thead>
<tr>
<th>P</th>
<th>Percentage</th>
<th>Total Infection</th>
<th>The Examined</th>
<th>Percentage</th>
<th>The Infection</th>
<th>The Examined</th>
<th>Percentage</th>
<th>The Infection</th>
<th>The Examined</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 0.048 F S</td>
<td>89.18</td>
<td>66</td>
<td>74</td>
<td>100.0</td>
<td>24</td>
<td>24</td>
<td>84.0</td>
<td>42</td>
<td>50</td>
</tr>
</tbody>
</table>

F: Fischer exact S: significant
Figure (1-1): The electrophoresis image of agarose gel that showed the analysis of the results of the polymerase chain reaction (PCR) of the small ribosomal RNA gene in the histolytic amoeba from human faecal samples. Where, (M) (2000-100bp): - Sequential scale markers of DNA in the agarose gel Line (1-15) showed the PCR product of the small ribosomal RNA gene in the histolytic amoeba and the positive and negative bundles of the PCR product in (PCR 301bp).

The results of Molecular tests for the diagnosis of virulence factors: The molecular characterization of the cystine protease of E. histolytica was done using the PCR method, and all investigated and diagnosed cases with PCR and gel electrophoresis showed positive results as shown in Table (1-2) and Fig. (1-2).

Descriptive table (1-2) showing the results of virulence genes by PCR examination

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Total the Injured</th>
<th>Total the Examined</th>
<th>Percentage</th>
<th>The Injured</th>
<th>The Examined</th>
<th>Gene of parasite cystine protease</th>
</tr>
</thead>
<tbody>
<tr>
<td>100.0%</td>
<td>58</td>
<td>58</td>
<td>100.0%</td>
<td>58</td>
<td>58</td>
<td>E. histolytica</td>
</tr>
</tbody>
</table>
to damage and destruction of blood-forming stem cells that the direct effect of radiation and chemotherapy leads the causes and cases of decreased immunity, as it stated rate of infection when immunity decreased, explaining patients histolytica and others are common in patients with the intestinal parasitic infections such as Entamoeba acquisition and parasitic infections and their consideration as a risk group for microbial drugs Chemical and radiological immunosuppression patients who are undergoing some treatments or who transplant organs and primary immunodeficiency especially colorectal cancer patients, as well as patients the high rate of parasitic infection in cancer patients, cases of parasite infestation, and the reason is due to PCR, has succeeded in identifying the vast majority of of optical microscopy and molecular diagnostics, the statistical analysis showed a significant difference under the probability level P = (0.048). The method of optical microscopy and molecular diagnostics, the PCR, has succeeded in identifying the vast majority of cases of parasite infestation, and the reason is due to the high rate of parasitic infection in cancer patients, especially colorectal cancer patients, as well as patients who transplant organs and primary immunodeficiency patients who are undergoing some treatments or drugs Chemical and radiological immunosuppression and their consideration as a risk group for microbial acquisition and parasitic infections. In short, most of the intestinal parasitic infections such as Entamoeba histolytica and others are common in patients with primary immunodeficiency and in the group of cancer patients.A study stipulated an increase in the rate of infection when immunity decreased, explaining the causes and cases of decreased immunity, as it stated that the direct effect of radiation and chemotherapy leads to damage and destruction of blood-forming stem cells and that many chemotherapy agents used in Treating malignant diseases damages lymphocytes and thus suppresses cellular immunity, and that chemotherapy and X-ray therapy by killing cancer cells as a treatment through programmed cell death is generally considered an immunosuppressive, as well as radiotherapy affects many immune mechanisms in body tissues as well as a decrease in immune interleukins As well as the effect of direct radiation on tumors by modifying the phenotype of cancer cells to make them more likely to kill T cells, and therefore these radiation-induced changes in the tumor immune microenvironment promote greater infiltration into T cells (immune cells) and thus damage these cells, as mentioned previously., and immunotherapy must be combined with surgical intervention and chemotherapy. Table 1-2 shows the molecular characterization of the cystine protease and E. histolytica using the PCR method, and all investigated and PCR diagnosed cases showed positive results. As all results of gel electrophoresis were positive.

The results of completely positive infection of the examined samples are due to the fact that all the diagnosed parasites contain the virulence factors (cystine protease), which is known as a protein that the E. histolytica secretes for the purpose of survival within the host due to the immune defense lines that the host members use to resist the parasite invasion This protein is naturally produced by parasites during their invasion of the host due to the host’s immunity and resistance to this invasion, as its presence indicates the presence of the parasite infection through the mechanisms that we will explain in detail below and in order for the protozoan parasites to cause an invasive intestinal infection, in order to lead to its pathogenicity and great mortality. The protective mucus layer must be disrupted by the secretion mechanism of the cysteine protein, as the cysteine proteins secreted from the amoeba parasite disrupt the protective mucous network of the gastrointestinal tract, thus overcoming the protective mucus barrier, as the mechanism of this protein breaks down the MUC2, which is the main structural component of the mucous chain Processes by targeting myosin and protein lysis, The main cleavage site degrades MUC2 polymers, thus inactivating the protective mucus gel. The ability of cysteine proteases to dissolve mucus gels can be seen by treating mucus from the MUC2-producing cell line with amoeba proteases, These results indicate a major role for cysteine proteases in overcoming the mucus protective barrier and the parasitic infection of
invasive amebiasis occurs, the use of a specific cleavage mechanism used by an intestinal pathogen to disrupt the polymeric nature of mucin gel (19). Intestinal pathogens must overcome a series of innate host defenses before contacting the intestinal epithelium. The first herpetic I encounter during an invasion is protection by the mucus barrier, mucus plays a protective role by being constantly renewed from epithelial cells and expelled in the intestine. The mucus traps both commensal and pathogenic microorganisms, and this mucus outflow ultimately removes these microorganisms during defecation, after successful colonization of the mucous layer. From the digestive system by parasites the mucus barrier must be overcome, The present study also agrees with the study of (20).

Conclusion
The current study concluded with determining the virulence factors of the amoeba histolytic parasite, as it was observed that all positive cases in the above parasite diagnosis contained a virulence factor and that all samples were positive for determining the virulence factor.

The partial examination was more accurate, sensitive and specific than the microscopic examination in diagnosing the above parasite

Ethical Clearance: Nil

Source of Funding: Self

Conflict of Interest: Nil

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Medico-legal Update, April-June 2021, Vol. 21, No. 2  103


Role of Vitamin AD3E in Pregnancy Period and Calving of Dairy Cattle Strain Friesian

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Abstract

Utilization of vitamin AD3E during three periods of pregnancy for Friesian cows by injection and non-injection at the same periods was studied in different places in Shaqlawa technical institute farm and private local farms. (Vitamin and energy requirements are covered in their feed for all groups of treatments) Nine of female cows divided into three group’s three cows for each the control group (C) non-pregnancy and non-injection of vit AD3E, first group and the second group were pregnancies divided each of them in three treatments. The first group was non-injection but the second group was injection with vit.AD3E. Each of group first and second had three treatments treatment one (T1) first three months of pregnancy, treatment 2(T2) last three month of pregnancy and treatment three (T3) after two weeks of parturition. The results shows that was a significant increase (p≤0.01) and best value observed for [White blood cell(WBC)/×10⁹/L in G1T1(11.97), Red blood cell (RBC)/×10¹²/L in G1T3(19.90), Packed cell volume (PCV)/Fl in G2T3 (43.22), Hemoglobin (HB)/g/Dl in G1T1(77.33), Mean size cell volume RBC (MCV)/Fl in G2T3(55.96), and Mean corpuscular Hemoglobin(MCH)/pg in G1T3(16.93)]. Its concluded from this results that vitamin AD3E of a (It can be concluded from this study that vit. AD3E have useful impact on blood parameters during pregnancy and after parturition due their high demands to these vitamins)

Keywords: Vitamin AD3E, Friesian strain, pregnancy, calving and blood parameters.

Introduction

Composition of Vit AD3E, Contains per ml:
Vitamin A, retinol palmitate 80000 IU. Vitamin D3, holocalciferol 40000 IU. Vitamin E, α-tocopherol acetate 20 mg. Excipients ad1 ml. (Vitamin A is very important in the process of formation and conservation of epithelial tissues and mucous membranes functions, is essential for fertility and is fundamental for vision. Vitamin D3 controls and remedies calcium and phosphate metabolism in blood system and plays a critical role in absorption of calcium and phosphate from the digestion tracts. Particularly in young, growing animals, vitamin D3 is fundamental for the normal development of skeleton and teeth. Vitamin E is, as a fat-soluble intracellular antioxidant, involved in stabilising unsaturated fatty acids, thereby preventing toxic lipo-peroxides formation.)

Some vitamins have been recognized as having unique influence on immunity during vaccination, affecting both humoral and cell mediated response [⁸]. This immune- stimulatory effect reported is proven in vitamin A, E and D in livestock[⁹]. Several researched showed that vaccination efficacy can be more improved by supplementations especially vitamins which have effect on immune system such as vitamin A,E and D[⁷].

Some studies refer to that the deficiency in the vitamins & minerals may increase the incidence of retained fetal membrane (RFM) in dairy cows [³] [²]. (Injection of AD3E weekly during second stage of pregnancy before calving progressed the reproductive performance with normal placental expulsion, rapid uterine involution and increase the incidence of pregnancy protection).

Another study done by concluded that the supplementing per parturient lactating buffalo with protected fat and injecting vitamin AD3E mixture increase milk production efficiency throughout the final 100 days of lactation[⁶]. Fat soluble vitamins (A and E) are potently antioxidants. Ruminants cannot synthesize these vitamins in their body, therefore
supply these vitamins in feedstuff are very essential to cover physiological requirements and to preserve their high production performance) during the per-parturient period (transitional period) the concentrations of these vitamins reduce dramatically in the peripheral blood [5] and [12]. Thus, animals are venerable to different metabolic disorders, contagious diseases and a reduction in milk production and quality during this period [4]. The aim of the current study is to evaluate the effect of AD3E vitamins in blood parameters during different reproductive periods in dairy cattle.

**Materials and Method**

**Experimental Intervention:**

(The study was performed on local private farms and shaqlawa technical institute farms)

**Vitamin AD3E dosage:** In this study vitamin A 80,000 IU, vitamin D3 40,000 IU and vitamin E 20 mg .4 ml/50 kg per body weight were used as intramuscular injection weekly, the vitamin solution was preserved in slandered techniques.

**Animals groups under experiment:** The scheme and design of experiment was using nine dairy cattle were used in this study and divided in three groups, control group (C) non pregnancy, Group one (G1) Without injection Vit. AD3E and Group two (G2) With injection Vit.

(In this study, nine dairy cattle were used for the project and design of the experiment and were divided into three groups each one includes 3 animals, non-pregnancy as control group (C), first group (G1) without vit. AD3E injection and second group (G2) With vit. AD3E injection, each of G1 and G2 consists of three treatments covering various phases of pregnancy and postpartum, T1 (first three months of pregnancy), T2 (last three months of pregnancy), T3 (last two weeks of parturition) in three groups).

**Blood samples and tests:** At the end of the treatment period, blood samples were collected and send to the lab to make several tests, like hemoglobin concentration, PCV, ESR, RBCs and WBCs counting.

**Statistical Analysis:** (The complete random design of the experiment and two groups in each group contained three treatments for statistical design and data analysis)

Treatments were determined. Data in all experiments were subjected to ANOVA procedures appropriate for a completely randomized design and the significance of differences between the means estimated using Duncan test Duncan’s All statistical analyses were performed using the software SPSS 17.5 for Windows®[11].

**Results**

The present work was undertaken to evaluate the effect of different of Vitamin AD3E in different reproductive periods in dairy cattle, it was observed that the usage of the vitamin increased the concentration of hemoglobin, ESR, PCV, total RBCs counting, in group of after parturition and in lower rate in late pregnancy group. These findings agreed with Sarker et al[10], showing that the use of AD3E which significantly improves hemoglobin, PCV, ESR development in broilers)

**WBC:** From the table (1) the results of experiment shows that insignificant (P≥0.01) between T2, T3 in G1 but significant (P≤0.01) among all another treatments (G1 & G2).

(Among all other therapies, T1 G1 is considered important (G1 & G2) compared with control (T1, T3) and T2 G2 which was insignificant with T1, T3 in the same groups, but important with all G1 and control treatments).

**RBC:** (As the effect of Vit AD3E on the number of RBCs in two different groups depends on statistical analysis, the table shows that insignificant treatments in group 2 but significant with G1 were, on the one hand, insignificant in G1 C and T1, on the other hand, significant with each of T2 and T3 in the same group and, by looking at the accuracy of T2, T3 between them, are significant within G1 unite)

**PCV:** (Several references have published that the standard PCV range in milk cattle blood about 40-60 depends on several variables such as diet, estrous status, hormone irrigation, pregnancy, etc. Our findings show that the lowest PCV was in T2 G1 and the high value was clearly prominent in T3 G2)

**HG:** Normal average of HG is around 80-150 in blood of dairy cattle the (The normal HG average in milk cattle blood is around 80-150; the lower level of this average is in C of our treatment (80.53(g/dL)); however, the function of the level of nutritional composition of this treatment may be important among all treatments in both group 1 and 2, at the start of G2.)
### Table (1) Effect of vitamin AD3E on treatments

<table>
<thead>
<tr>
<th>Properties/unit</th>
<th>Control Group No pregnancy</th>
<th>Group 1 Without injection Vit. AD3E</th>
<th>Group 2 With injection Vit. AD3E</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>T2</td>
<td>T3</td>
<td>T1</td>
</tr>
<tr>
<td>WBC/(×10^9/L)</td>
<td>*9.33±0.15 c</td>
<td>11.97±0.59 d</td>
<td>2.57±0.55 a</td>
</tr>
<tr>
<td>RBC/(×10^12/L)</td>
<td>8.97±0.49 b</td>
<td>8.83±0.21 b</td>
<td>12.40±0.80 c</td>
</tr>
<tr>
<td>PCV/(Fl)</td>
<td>36.53±0.50 bc</td>
<td>35.00±1.00 bc</td>
<td>24.67±1.52 a</td>
</tr>
<tr>
<td>HB/(g/dL)</td>
<td>80.53±0.50 d</td>
<td>77.33±2.51 c</td>
<td>30.00±1.00 b</td>
</tr>
<tr>
<td>MCV/(fl)</td>
<td>15.50±0.44 b</td>
<td>13.07±1.55 a</td>
<td>15.00±1.41 ab</td>
</tr>
<tr>
<td>MCH/(pg)</td>
<td>4.77±0.32 a</td>
<td>4.10±0.96 a</td>
<td>16.93±5.05 b</td>
</tr>
</tbody>
</table>

a,b,c,d,e means with different superscript within row are significantly different (P< 01)

*Values are X±Std. Deviation of each treatment 3 dairy cattle

#### MCV: MCV mean size cell volume RBC this harmonic with decrease of Vit B12 and related with low level of iron and peroxide while some diseases infection or low level of nutrition. (The usual MCV range is between (40-60fl/L) by international unit in G2 the number begins to increase as shown in T2,T3 in the same group and they are insignificant between them but significant with T1 in the same group and well level compared to measure arrangement level but at least better than G1, as shown in the table T3 significant with all G1 and G2 treatments while T2G1 insignificant with C, T1 in the same g)

#### MCH and MCHC: Table 1 showed that MCH in G1 was insignificantly consistent with C in T1 with the same outcomes or all treatment in G2. On C for MCH, we found a low percentage of iron in feed stuff for that cause, also insignificantly analyzed. But low than of normal percentage suppose be, at the last three month of pregnancy the cows need more of feed stuff to be keep balance for embryo so herdsman make more interesting and bring balance of feed stuff for that reason returned. According to the results showed in table (1) there is a slight elevation in WBCs counting in after parturition group while there was significant decrease in lymphocyte counting in after parturition group in comparison with other groups. Also there was a significant increase in monocyte counting in before pregnancy group and significant decrease in Neutrophil and in group after parturition on different blood parameters.

#### Discussion

**WBC:** For results in table 1 observed about WBC this can be attribute by the again in dairy cattle by effect of release estrogen hormone be incentive of LH, FSH and prolactin hormones to be sensitive of strange body so increase of WBC at first period of pregnancy after that build of corpse luteum the percentage of WBC come back, this case without injection of Vit AD3E but in G2 established of percentage just calcite differs but insignificant, this clearly shows of role Vit AD3E to arrangement of incentive hormones while ovulation, these result agree with[6].

**RBC:** For results showed on RBC in same table. It can be explain this phenomenon at the growth of embryo need more of hemoglobin and o2 for burn energy by increasing of growth hormone so increase of RBC while in opposite we noticed regaled of RBC in G2 but by investigated of the reasons we discovered the low level of nutrient in feedstuff which bring to G2 (after seeking on real with farmer) even it treat by injection of Vit AD3E. Because suppose must be increased we did not find another reason while this group in accept situation of health[10].

**PCV:** Results of range number PCV compared with range number of many studies can be says in our experiment this can be explain role of Vit AD3E to returned from uterus to normal situation after two week of parturition while in other side table shows significant for G1 especially in T2 as significant with other treatment
of all treatment in both groups 1 and 2, the T1,T2 G1 were insignificant even they in low level of range but not affected of decrease PCV but in last period of pregnancy was clear affected this can be attribute of growth embryo need a huge of RBC [3]. This state agree with results of [7] while they studies on effect of vitamin AD3E supplementation for hemorrhagic septicemia vaccine in laboratory mice. The animals were also different, but the percentage of PCV in the blood had the same effect. On the other hand, the role of VitAD3E injection in all G2 treatments was significantly increased.

HG: The level of HG decrease related with advance time of pregnancy more less than in G1 even all treatment in this group are insignificant just calculated simple differs, the same insignificant between T2, T3 G1. These results explained same reason and agree reached results of [11].

MCV: The results of MCV clearly shown role of Vit AD3E in G2 and low level of iron content in feedstuff of G1 these results agree with results of [6].

MCH and MCHC: (Analysis (MCH) or what is known as the pellet average of himocalobin (Mean Corpuscular Hemoglobin) is an analysis based on a blood test to assess the average amount of hemoglobin in a blood sample by averaging the mass of hemoglobin in the red blood cells separately, therefore, is an important measure of the iron content of the blood that is part of the blood that serves as president in oxygen carrying, as is this analysis, and that also gives red blood cells their color, and in the same way, this analysis is part of the CBC or full blood count analysis)

The results indicate a decrease in the levels of hemoglobin Central pellet under the normal range iron-rich feed stuff. But if the results indicate an increase in the levels of hemoglobin pellet average above normal (normal average in airy cattle 11.0-17.0pg) it may be due to the incidence of certain other types of anemia, which may also indicate the existence of problems in the thyroid gland, which is mainly engaged in work on the secretion of important of the various hormones and functions of the body organs. It involves an analysis of hemoglobin pellet Usually divided this type of analysis within the analysis of a complete blood count (CBC) along with white blood cells, red blood cells, red pellet size (MCV), hemoglobin concentration of particulate matter (MCHC), platelet size. The normal level of hemoglobin pellet average is between 26 and 33 pg, but if the level of more than 34, considered this too high, due usually to a large poverty in the blood due to a lack in levels of vitamin B12 or folic acid, which leads to disorder in the blood works on not produce enough red blood cells.

(But if the average level of hemoglobin pellets is less than 26, it is known to be very poor, owing to long-term blood loss, due to the incidence of poverty in microscopic blood, which means that small red blood cells are abnormally compared to other red blood cells, which means smaller quantities of hemoglobin. Thus, the attribute of loose hug of blood with parturition can be relied on or results with this specific scientific knowledge. Such findings agree with the outcomes of [8].

**Conclusion**

Role of vit AD3E in period of last three month of pregnancy will helpful for well growth embryo and for easy born calve further that increase of blood content especially WBC but in condition care of type nutrition.

**Recommendation:** On depended the results we recommend

1. At the last of 3 months pregnant must the raiser take more care of management, nutrition and by Follow program of veterinary vaccination.
2. It can be make more experiment on different type genetic of dairy cattle under on condition they have same period of pregnancy and prefer same age with same number of pregnancy.
3. Vit AD3E as a co-enzyme prefer to do may experiment with different level injection to find effected on blood parameter.

**Acknowledgments:** The team of this work presents the whole thanks after Lord God to Officinal of Shaqlawa technical institute and much thanks to Shaqlawa veterinary center office for their advice and help seeking for private local farm and provides all appropriate conditions for research.

**Conflict of Interest:** None

**Funding:** Self

**Ethical Clearance:** Not required

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11. SPSS INC. IBM (NYSE: IBM) announced it has completed its acquisition of SPSS Inc. (Nasdaq: SPSS), a publicly-held company headquartered in Chicago. IBM announced a definitive agreement to acquire SPSS on July 28, 2009.
Evidence Based of Effects and Protection Mechanism of Lycium Barbarum Polysaccharide on Ethanol-Induced Liver Injury

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Abstract

Excessive ethanol intakes have been reported to be linked to liver diseases such as hepatitis and cancer-related diseases of ethanol. Excessive ethanol can lead to the accumulation of reactive oxygen species (ROS) and to the depletion of glutathione (GSH) in the liver. Ethanol-induced oxidative stress substantially increases peroxidation of the lipid and decreases GSH levels in human hepatocyte and animal models. Ethanol contributes to sterol regulating element-binding protein activation (SREBP)-1 by regulating main genes such as Acetyl-CoA carboxylase (ACC) and Stearoyl-CoA desaturase 1 (SCD1) to facilitate lipid accumulation in the liver. The liquid fraction derived from wolfberry is lycium barbarum polysaccharide (LBP). In many animal disease models, it is an effective antioxidant and tissue protective agent. Researchers have shown hepato-protective functions in acute hepatic injury, NAFLDs, drugs-induced liver injury and hepatocellular carcinoma models. The protection effect of L. barbarum polysaccharides (LBP) in this study on ethanol-induced injury in human hepatocytes was explored. In addition, the influence of LBP on oxidative stress protein activity was examined.

Keywords: L. barbarum polysaccharides (LBP) - ethanol-induced injury - drugs-induced liver injury - reactive oxygen species (ROS).

Introduction

A spectrum of hepatic injuries, from steatosis to cirrhosis, is encompassed by alcoholic hepatic disease (ALD). Alcohol misuse continues to be a significant global health and social burden. Alcohol-related diseases account for 9.2 percent of all lifespan adjusted for disabilities in the developing world¹. Chronic alcohol intake contributes to steatosis in more than 90% of heavy drinkers².

Advanced hepatitis, fibrosis, and even hepatocellular carcinoma (HCC) may be advanced from prolonged alcoholic fatty liver intake. Whilst several key events have been identified during the development of ALD, the disease’s comprehensive pathological mechanisms and associations with other risk factors (for instance, age, obesity and smoking) are still not clear³. Increased inflammation of the liver and oxidative stress are thought to play crucial roles in the development of ALD among these defined mechanisms⁴,⁵.

From 2006–2010, excessive alcohol consumption caused about 88 000 deaths, shortening lives in the United States by 30 years⁶,⁷ While many new, target drugs are currently being tested, strict abstinence and nutritional support appear to be the best choice for alcohol diseases of the liver⁸.

Ethanol is first metabolized by alcohol dehydrogenase to acetaldehyde and cytochrome enzymes P450 in hepatocytes after consumption. Excessive acetaldehyde induces oxidative hepatic stress
which reduces β-oxidation and increases lipogenesis in fatty acids\(^9\).

Excessive ethanol intakes have been reported to be linked to liver diseases such as hepatitis and cancer-related diseases of ethanol\(^10\). Excessive ethanol can lead to the accumulation of reactive oxygen species (ROS) and to the depletion of glutathione (GSH) in the liver\(^11\). Ethanol-induced oxidative stress substantially increases peroxidation of the lipid and decreases GSH levels in human hepatocyte and animal models\(^12\)\(^\text{-}^13\).

Ethanol contributes to sterol regulating element-binding protein activation (SREBP)-1 by regulating main genes such as Acetyl-CoA carboxylase (ACC) and Stearyl-CoA desaturase 1 (SCD1) to facilitate lipid accumulation in the liver\(^14\).

It is widely agreed that women are affected by alcohol-mediated liver disease\(^15\). Whilst the underlying mechanism is not completely determined, clinical results clearly indicate an association of sex hormones with ALD\(^16\). Estrogen receptors (ERs), primarily expressed in the cells of Kupffe and in sinusoidal endothelial cells\(^17\) and have a very low expression level in hepatocytes\(^18\) are believed to mediate the production of pro-inflammatory cytokines and reactive oxygen species during hepatic ethanol metabolism\(^19\).

The evidence has shown the closely associated pathogenesis of alcoholic liver disease (ALDs) with ROS and malondialdehyde (MDA) as well as ethanol metabolism by-products and toxic metabolization. Because of their few side effects, herbal medicine was commonly applied in research into drug discoveries. Lycium Barbarum is part of a Solanaceae family plant and its fruits have been used in China for thousands of years as traditional medicine and edible food. L. barbarum fruit usage was first recorded about 2,300 years ago. L. barbarum fruits have a number of biological and pharmacological functions and they prevent and treat chronic conditions like diabetes, hyperlipidemia, hepatitis, the function of hypo-immunity, thrombosis and infertility among males\(^20\).

The treatment of ALDs includes free radical scavengers or antioxidants\(^21\). L. Barbarum is effective for the eyes, liver, and kidney as an anti-oxidative and nutritive agent. Polysaccharides have been isolated from fruits and tested in various models as the major component of antioxidant activity\(^22\). Extracts of L. barbarum, for instance, by the increased superoxide dismutase (SOD) activity is used to exert an anti-oxidative effect in brain and heart tissue of the mice\(^23\).

The liquid fraction derived from wolfberry is lycium barbarum polysaccharide (LBP). In many animal disease models\(^24\), it is an effective antioxidant and tissue protective agent. Researchers have shown hepatoprotective functions in acute hepatic injury\(^25\)\(^\text{-}^26\), NAFLDs\(^27\)\(^\text{-}^28\), drugs-induced liver injury\(^29\) and hepatocellular carcinoma models\(^30\).

This study aimed to explore the protection effect of L. barbarum polysaccharides (LBP) on ethanol-induced injury in human hepatocytes. In addition, the influence of LBP on oxidative stress protein activity was examined.

**Materials and Method**

**Material Preparation:** For 2 hours in a water bath at 60°C, LBP powder (100 g) was extracted with 1.000 ml water. The extracts have been purified and concentrated at a reduced pressure of 348 K to 200 ml in the revolving evaporator RE-52C. In addition to the concentrated extract, ethanol (75%) allowed for 4 hours, was filtered, concentrated and dried to obtain a polysaccharide extract. At −20°C, the dry extract was screened and placed in a refrigerator. In order to obtain sufficient concentrations, the extract was diluted with deionized water.

**Experimental Cell Culture and Treatment:** Human normal liver cell l-02 in humidified 5 percent CO2 atmosphere has been developed at 37°C in the medium of RPMI-1640 with an addition of 10 percent fetal serum bovine as well as 1 percent antibiotic penicillin and streptomycin. The cells (5 = 103 cells/well) have been seeded and grown overnight on the 96-well plate and treated at various LBP concentrations for 24 hours, followed by 5% ethanol (0, 12, 24, 48, 96, 192 μg/ml) treatment for another 4 hours. Or 5% ethanol treated for 4 hours and followed by a LBP treatment (0, 12, 24, 48, 96, 192 μg/ml) with different concentrations for an additional 24 hours.

The MTT assay assessed the cell viability. A 96-well plate has been used in cultivating and growing cells overnight (5 × 103 cells/well). 20 μl MTT (5 mg/ml) were applied to each well after LBP and ethanol were treated. The culture medium was extracted and formazan precipitate dissolved in 150 μl DMSO after incubation for a period of 4 hours at 37°C. A spectrophotometer (BioTek Instruments Inc., Winooski, VT, USA) was
used to test absorbance at 492 nm. Cell viability ratio was determined using the formula:

\[
\text{Cell viability ratio (\%)} = 1 - \left( \frac{\text{OD}_{\text{control}}}{\text{OD}_{\text{treated}}} \right) \times 100\%
\]

The cell apoptosis rate was analyzed by flow cytometry. L-02 was harvested and re-suspended at a density of \(5 \times 10^5\) cells/ml in PBS buffer. Cells were stained with FITC-Annexin V and propidium iodide (PI) and the findings were analyzed using an Amnis ISXmkII flow cytometer fitted with IDEAS v6.0 image analysis software according to manufacturer’s instructions. At least three times all the experiments have been replicated.

**ROS generation measurement in vitro**: In the complete growth medium L-02 cells (1.5\times10^5 cells/well) were seeded and grown overnight in 12-well plates. Cells were trypsinised and centrifuged at 1500 rpm at room temperature for 10 min following treatment with lbp and ethanol. Then removed the supernatant and re-suspend the cellular pellet in a full medium of 0.5 ml, then added 1 ml DCFH-DA at a final concentration of 10 \(\mu\text{mol/L}\), incubated in a water bath for 20 minutes at 37 °C, and mixed and inverted once every 3–5 min to permit the spectrum to fully contact the cells. Then, the cells were washed three times with serum-free medium, and laser confocal microscopy (Olympus, Japan) was used to observe for the fluorescent state of the cells, with a fluorescence spectrophotometer measuring the amount of the reactive oxygen species in the cells (Perkin Elmer, USA). Finally, the findings are shown in relation to control as the percentage of cells with a rise in ROS levels.

**Biochemical Assay**: The biochemical experiments were carried out in compliance with the instructions of the manufacturer using commercial detection kits.

**Total protein detection and automated capillary western blot**: Plated cells were treated with LBP, Silybin, and ethanol, in six-well plates and \(5 \times 10^6\) L-02 cells extracted and washed with PBS. Cytoplasmic proteins, nuclear proteins, and total proteins were collected from the cytoplasmic nuclear protein extraction kit and the RIPA cell lysate, respectively. The extracted protein has been tested with a BCA protein quantification kit for protein concentration and is ready for machine use.

**Ethical consideration**: Taking acceptance from ethical committee faculty of medicine, Assuit University in March 2019.

**Statistical Analysis**: The statistical software SPSS 21.0 was used for data analysis. In the case of variances not uniform, the ranking sum test was used for results analysis and data analysis results were mean±standard deviation. The Multi-group comparisons of the means were calculated in the analysis of a one-way variance analysis (ANOVA) test with post hoc comparisons. The \(\alpha\)-test level was statistically important when compared to the model group * \(p < .05\), * * \(p < .01\), * \(p < .05\), * * \(p < .01\) was statistically relevant compared with the control group.

**Results**

![Figure (2): Effect of ethanol on the viability of cells as well as ALT and AST content.](image_url)
Establishment of the liver cell model induced by alcohol: The final concentrations of L-02 cells were 2%, 3%, 4%, 5% and 6% (v/v) in the medium ethanol for 4 hours, and changes to the cell viability were studied. Figure 2(a) indicates the results. Their operation was significantly lower than normal control group (CON, p < 05) following treatment of ethanol cells at different concentrations during 4 hours. With increasing concentration of ethanol, cell viability steadily declined. The ethanol levels were set to 5% (v/v) for hepatocyte damage and to ensure an adequate numbers of cells for the subsequent step of the test. Their vitality was 60.7%±4.19%.

After ethanol injury to hepatic cells, the content of ALT and AST was detected in the supernatant. In comparison with the model group, the ALT and AST contents of cells in the group CON increased respectively by 128.27% and 254.45% (MOD, p < .01). The AST content in the model group was greater than the ALT content (p<01, Figure 2b). A model was successfully developed for ethanol-induced hepatocyte injury in vitro. Induced injury to the L-02 cells at 5 percent ethanol (v/v) for 4 hours.

(a) The effect on the viability of liver cells of various ethanol concentrations. In regular L-02, cell viability 2%, 3%, 4%, 5%, 6%; cell viability 2%, 4%, 5%, 6% in alcohol-intoxicated L-02, 5%, 6%. Cell viability in normal l-02

(b) The ethanol-induced hepatocyte injury ALT and AST content. Con: normal L-02 ALT and AST; MOD: Ethanol-induced L-02 ALT and AST content. *p < .05, **p < .01

LBP intervention concentration screening: Figure 3a demonstrates the effects on the viability of L-02 cells of different LBP concentrations. LBP interfered without proliferation or toxicity 24 hours with L-02 cells at concentrations of 12, 24, 48, 96, and 192 μg/ml. The LBP and L-02 cells were co-cultured at test concentration over 24 hours without the exception of LBP’s false-positive and false-negative effects on hepatocytes and had no effect on the hepatocytes. The concentration gradient could therefore be used to screen the intervention concentration.

Figure 3b, c show cell viability at different LBP concentrations in the 24-hour prevention group (24 hours after incubation and 4-hour ethanol injury) and 48-hour prevention group (48 hours after incubation and 4-hour ethanol injury) respectively. The protective effect of LBP was compared with a hepatic protective agent in the same test. The positive control was Silybin (SM) at 24 μg/ml. LBP has achieved its maximum capacity of 24 μg/mL on increasing cell viability. The disparity between model group is statistically significant (p<0.05) but is not statistically significant (78.34 %±3.31 %, p>0.05), as compared to models. When 24 μg/ml of LBP was added to cells for 24 hours, cell viability was up to 81.61 %±3.12 %.

Figure 3d demonstrates cell viability at variable concentrations of LBP in the 24-hour repair group (first with ethanol for 4 hours before LBP for 24 hours). Figure 3e shows cells in a 48-hour repair group with different concentrations of LBP (first ethanol for 4 hours and LBP for 48 hours).

Figure 3e indicates a higher cell viability at 24 μg/ml than at the other four stages. The viability of cells at 24 hour repaired was 87.51 percent±3.02 percent (p < 0.05), and the percentage was above that of SM group 83.89 %±3.69 % (p < 0.05). Cells in the LBP repair group were selected at 24 μg/ml and were better than the preventive model (p < -05, for the 24-hour treatment).

Figure (3): Cell viability effect of LBP.
(a) The effect on the viability of L-02 cells of various LBP concentrations.

(b-c) Effects of LBP prevention for viability of PA hepatocyte wound induced with alcohol at various concentrations for 24 hours (b) and 48 hours (c).

Figure (3): Cell viability effect of LBP. (d-e) LBP repair of alcoholic hepatocyte cell viability injured at different concentrations for 24 h (d) and 48 h (e).

Evaluation of the LBP Hepatic Function in Alcoholic Hepatocyte Injury Prevention and Repair:
Figure 4 shows the levels of ALT and AST to avoid and restore hepatocyte injury from alcohol with LBP. The ALT content in the LBP repair group was higher than in the CON Group (2.489±0.34 U/L) and lower than in the MOD. The ALT content in the LBP repair group is less than in the CON group. The differences in cells that were treated with alcohol were statistically significant (p < 0.05). These findings have shown that after ethanol injury, LBP repair decreased ALT and AST levels. The activity in the LBP prevention group was greater than in the control group, with the ALT (4.40±0.64 U/L) and AST (3.818 ± 0.54 U/L), and statistically relevant differences (p < .05). The prevention effect of LBP was stated by these findings. Following ethanol injury, LBP also decreased ALT and AST levels.

ALT content in normal L-02; LBP-Pre: LBP followed by ethanol followed by ethanol; Silybin-Pre: Silybin-Pre: LBP; LBP-Pre: Ethanol followed by ethanol; Silybin-Post: ethanol followed by silybin; LBP-Pre: ethanol followed by LBP: Con: ALT in normal L-02

Figure (4): ALT and AST LBP content in alcoholic hepatocyte injury prevention and repair
LBP effect in L-02 cells on ethanol-induced ROS:
The effect on ROS levels in ethanol-injured hepatocytes is shown in Figure 5. The impact of LBP action on the ROS levels in alcoholic hepatocytes has been identified qualitatively and quantitatively and oxidative stress in L-02 cells has already been observed. The control group had a large density, a transparent cytoplasm and the fluorescence intensity was weakest and the ROS was 147.83±10.55 the lowest. The cell density was considerably decreased, the nucleus condensed and after ethanol stimulation cell debris occurred. The intensity of the fluorescence within the cells increased dramatically and the amount of ROS rose by 2.99. The cell density increased and the intensity of fluorescence decreased following LBP interference. The rate of LBP repairs and prevention decreasing in comparison with the model group by 56.91% and 56.89% respectively (p < 0.1). LBP decreased the amount of ROS intracellularly, likely due to LBP ROS inhibition or clearance. The cell state of the fluorescence channel under the Laser Confoal Spiegel is observed in Figures A1, B1, C1, and D1. In non-fluorescent channel microscopes, cells are A2, B2, C2, and D2, respectively. The fluorescence spectrophotometer will detect A3, B3, C3, and D3 quantitatively.

Figure (5): LBP reaction to ROS levels in ethanol-injured hepatocytes. (a) Control group (b) model group (c) LBP prevention group (d) LBP group repair group.

The LBP effect in the L-02 cell liver-induced liver-injury anti-oxidation pathway of a nuclear factor (Nrf2)/heme-oxygenase-1 (HO-1):
Hepatocyte expression levels were observed in hepatocytes of Nrf2 expression levels, NRf2 expression levels, NQO1 extension, and GCLC proteins. The expression of Nrf2 and its HO-1, NQO1 and GCLC downstream proteins is shown as illustrated in Figure 6. The Nrf2 protein expression bands in cytosol and nucleus are shown in Figure 6a. The expression of Nrf2 in model group cytoplasm was substantially greater than in the nucleus, suggesting the nuclear expression of cytosolic Nrf2 for the internal cytosolic reference β-actin and the internal nuclear reference PCNA. The volume was minimal and the injury incurred by free radicals could not be resisted. Increased nuclear translocation of the NoRF2 cytoplasm in a varying degrees was demonstrated by the LBP prevention and repair groups.

The expression Nrf2 in the LBP repair group decreased by 30.44% (p<.01) in the quantitative expression histogram as shown in Nrf2 in Figure 7c, compared to models for the LBP prevention group, Nrf2 exposition also declined by 20.05 percent, compared to a rise of 153.04% (p<.01) of the LBP repair group. Thus the nuclear transport of the cytoplasm of NRF2 to the nucleus was encouraged by LBP. Nuclear Nrf2 was higher than the preventive group (p < 0.05) in the repair group. The results indicate that LBP is controlling the Nrf2 protein and that its repair effect could increase the promotion of Nrf2’s nuclear expression.

In this paper the alterations in the Nrf2 pathway’s downstream protein expression after LBP intervention were examined. Figure 6b will use the protein expression bands to qualitatively demonstrate that HO-1, NQO1 and GCLC are the weakest in the model group. Expression levels of these three proteins have increased to various degrees in the LBP repair and prevention groups. The expression levels of HO-1, NQO1, and GCLC in the LBP repair groups increased by 109.65%, 754.81% and 74.76% respectively in comparison with the model cells, as shown by the quantitative histogram in Fig. 6d. The LBP prevention group did not have an improvement in expression of HO-1, compared to NQO1 and GCLC, which respectively grew by 418.27% and 186.18%.
Discussion

The development of liver disease including alcoholic steatosis, alcoholic hepatitis, cirrhosis and hepatocellular cancer can be caused during long-term alcohol consumption. Ethanol flows into the liver and causes hepatic damage as a result of oxidative stress and hepatocytic lipid accumulation. Therefore, inhibiting oxidative stress and ethanol-induced lipid accumulation will stop and treat ALD.

Edible foods or medicinal herbs are generally compatible with natural antioxidants, and it is thus an important method for the prevention and treatment of ALD. In this study, a regulation of oxidative stress associated with the enzymes in L-02 cells elucidated its protective potential against ethanol-induced oxidative stress.

The cell culture medium in the preliminary experiments included a dose-dependent dose of ethanol at 2 percent – 6 percent (v/v) gradient concentration and four hours of co-incubation. The rate of survival was decreased to 40% following 5% of ethanol injury for 4 hours. However, the cell survival rate improved significantly when LBP was pre-treated for 24 hours, treated for 4 hours with ethanol, and pre-treated for 4 hours with LBP and then treated with LBP for 24 hours, which indicated a hepatitis protection effect of LBP. LBP ‘s maximum capacity was reached at 24 μg/ml in terms of rising cell viability. The cell viability increased
sharply at lower concentrations, steadily rising with the LBP concentration. It was believed. The levels ALT and AST are commonly tested as biochemical liver injury markers.

In this research, LBP reduced the ALT/AST of ethanol-treated cells significantly and demonstrated its anticipatory and repair effects on hepatotoxicity of ethanol. LBP decreased significantly the ALT and AST levels, generation of MDA and ethanol-induced intake of GSH, demonstrating that LBP had an effect on the liver injury caused by ethanol. This safety is likely due to the antioxidant properties of LBP, as evidenced by the slowdown in ethanol-induced L-02 cells for ROS and MDA production. SOD is the major enzymatic mechanism for protecting the body from oxygen-free radicals. If there is not enough SOD activity, antioxidant activity could not be exercised in due course, and radicals without oxygen assault the cells and cause cell harm. GSH-Px is a central enzyme that catalysis hyperoxide decomposition. The reduction reaction of GSH to hydrogen peroxide can be precisely catalyzed and cell membrane structure and functions are preserved. In this study, after 4 hours of ethanol treatment, the SOD activities and GSH – Px decreased significantly.

The SOD and GSH-Px behavior in each group increased after LBP intervention. There was a substantial difference between them and the injury group. Increased activities in SOD and GSH-Px suggested that LBP could increase the activity in cells of the active oxygen-scavenging enzyme, enhancing the body’s antioxidant protection mechanism. Instead of accumulating in cells, oxygen-free radicals could therefore be eliminated in time. The peroxidation of cell lipids causes damage to the cell. The decrease in lipid per-oxidants and the increase in cell antioxidant capabilities will decrease cells’ oxidative stress harm. By preserving the activity of antioxidants such as SOD and GSH-Px, LBP show their antioxidant activity and thus reduce the level of active oxygen. Thus, LBP protects liver cells by increasing antioxidant enzyme activity and by inhibiting hepatocyte apoptosis and decreases the incidence of alcohol hepatic harm.

The Early Apoptotic Hepatocyte Prevention and Repair Groups, induced with ethanol, increased in that experiment. LBP had protective and repair effects on the early apoptotic cells after the stimulating factors were removed, but the later apoptosis cells eventually died. The LBP repair group’s apoptotic rate was almost the same as that of the control group. The LBP’s reparative effect was stronger than the preventive impact on ethanol-induced liver injury cells, suggesting LBP has greater capacity to restore hepatocytes than to prevent harm. Therefore, in alcoholic liver disease, LBP has defensive capabilities. The findings of this research help therapeutic substance use potentially. However, further analysis is needed of the basic mechanism.

This study showed that LBP could reduce the production of O2 by increasing antioxidant enzymes after alcoholic hepatic cell injury, reducing other oxygen-free radical production of radicals-based radicals and improving the resistance to superoxide and free radicals. A large amount of oxygen-free radicals was reduced by the chain reaction which alleviated L-02 cell injuries and had a therapeutic effect.

**Conclusion**

Finally, our current research has shown clearly that LBP has a protective impact on liver cell injuries caused by ethanol. Cell apoptosis and oxidative stresses may be included in the potential process.

**Source of Funding:** Self

**Conflict of Interest:** Nil

**References**


17. Vickers AE, Lucier GW. Estrogen receptor levels and occupancy in hepatic sinusoidal endothelial and Kupffer cells are enhanced by initiation with diethylnitrosamine and promotion with 17α-ethinylestradiol in rats.


A Single-center, Single Blinded, Randomized Controlled Trial Protocol of Therapeutic Listening Programme Versus Traditional Music Therapy on Depression and Quality of Life in Institutionalized Adolescents

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Abstract

Introduction: Depression is a typical, constant, and debilitating issue occurring during adolescence and influencing near a fourth of all grown-ups. In adolescents, depression related with impaired social connections, lower educational accomplishment, poor scholarly execution, family and social brokenness, physical sick wellbeing and expanded danger of self-destruction. Music therapy intervention could essentially diminished symptoms of depression, increased cognitive functioning and improved quality of life

Objective: To determine the effects of therapeutic listening programme versus traditional music therapy on Depression and Quality of Life in Institutionalized Adolescents.

Method: A single-center, single blinded, two group pretest-posttest randomized controlled trial of 36 institutionalized adolescents with depression will be recruited through the simple random sampling. Recruited institutionalized adolescents will be randomized into one of the two groups namely, therapeutic listening programme group and traditional music therapy group through block randomization. Both the groups will receive their respective interventions for 30 minutes a day, 2 days a week for 8 weeks. Participants in dance group performed, 30 minutes of dance for 3 days/week for 6 weeks. The primary outcome measures will be Children’s Depression Inventory (CDI) and Youth Quality of Life Instrument – Short Form (YQOL-SF). Urine test and electroencephalogram (EEG) will be recorded in addition to CDI and YQOL-SF. All the outcome measures will be measured at baseline and 8 weeks post intervention.

Results: Normality of the collected data will be analyzed using Shapiro-Wilk test of normality. Descriptive statistics will be expressed in mean±Standard deviation/mean (95% confidence interval) with range and parametric tests/non-parametric tests, paired t-test/Wilcoxon signed rank test and independent t-test/Mann-Whitney U-test will be used for within and between group comparisons based on normality.

Conclusion: The study outlines the importance of therapeutic listening programme on institutionalized adolescents with depression. Successful completion of this RCT will create evidence on the best treatment options for institutionalized adolescents with depression.

Keywords: Adolescents; depression; music therapy; quality of life; therapeutic listening programme.

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Introduction

More than 264 million of world population are suffering from depression. Injuries, and Risk Factors Study 2017 (GBD 2017 The worst consequences of depression is suicide which ranks second in leading cause of death among the age groups between 15 and 29
Depression is a typical, constant, and debilitating issue occurring during adolescence and influencing near a fourth of all grown-ups. Around 21–28% of youth encountering major depression by the age of 19 years.3 World Health Organization evaluates that depression is the third leading cause for worldwide illness, anticipated to be the second cause by 2020, and will be the first leading causes by 2030.4 Depression is related with numerous physical, passionate, mental, and social changes in youngsters. They experience intense emotions and may go through many stressful events in this period. These rapid changes in all aspects of their life affect their mental health and increase the risk of depression.

In adolescents, depression related with impaired social connections, lower educational accomplishment, poor scholarly execution, family and social brokenness, physical sick wellbeing and expanded danger of self-destruction.5 Depression is the significant reasons for morbidity among youths, frequently taking a constant, repetitive, and episodic course.4 Major Depression Episode are weigh or appetite changes, sleep difficulties (sleep deprivation or hypersomnia), exhaustion or loss of vitality, psychomotor agitation or impediment, reduced capacity to concentrate, sentiments of uselessness or guilt, and suicidal thoughts. Cognitive dysfunction, age, psychosis, joblessness, self-destruction thoughts are related with severity of depression.6 named main criteria. Although the secondary symptoms can be divided into somatic and non-somatic clusters, the DSM-5 identify depression in all or none fashion. In contrast, depression severity is a continuous variable. Therefore, it is commonly assessed with scales such as the Hamilton Depression Rating Scale (HAMD)

Bill Ahessy surveyed if investment in music therapy can decrease depressive symptoms and improve quality of life and cognitive functioning in older population. In the music therapy group, depressive symptoms were decreased by 54%, 57% improvement in Quality of life score and there was a critical increment in cognitive functioning. The investigation inferred that music therapy intervention essentially diminished symptoms of depression, increased cognitive functioning and improved quality of life.7

One such strategy, Therapeutic Listening® utilizes electronically modified music using high-quality headphones. Auditory input adds to arousal, self-guideline, and emotions.8,9 Therapeutic Listening created by Sheila Frick in 1990s for people with sensory processing difficulties.10 According to advanced brain technologies (ABT) therapeutic listening program (TLP) uses psycho-acoustically modified classical music listened through a set of sennhieser headphones focusing on certain recurrence extends that guarantee to affect functional capabilities.11 relating to 28 individual school-based programs, were identified through the Cochrane Library, PsyInfo and PubMed databases. A large proportion of the programs identified were based on cognitive behavioural therapy (CBT It was initially recommended that auditory intervention training (AIT) was gainful for youngsters with listening tuning and attentional troubles.

Therapeutic listening activates the vestibular-cochlear framework by means of the vestibular nuclei, and helps to strengthen muscles of middle ear and improving the capacity to tolerate sound. Modulated music exercises and retrain the tensor tympani and stapedius muscles to permit them to contract. The adjusted music is prepared utilizing low pass- high pass channel. In high pass channel, sounds over 1,000 Hz pass continuous while sounds underneath 1,000 Hz are quieted. Music triggers centers in the brainstem that are involved in basic sensorimotor modulation and integration where the sound is modulated and just the low and high sounds are sent up to the cortex. AIT animates reticular activating system, role in neuroplasticity, gets information from vestibular system and release neurotransmitters which aid in arousal, learning and emotion.10,12

Therapeutic listening programme (TLP) expands on altered music in recurrence zones. These frequencies zones affects the functional capabilities. Zone one lower-recurrence sounds (0–750 Hz) help with sensory integration which incorporates rhythm, coordination, balance, muscle tone, laterality and right/left discrimination, sense of direction and body awareness. Zone two spotlights on midrange recurrence sounds (750–4000 Hz) and connected to language and speech development. Abilities in this zone incorporate language, speech, focus, memory, attention and vocal control. Zone three connect to high-recurrence sounds (4000 Hz or more) intended to improve abilities, for example ideas, energy, spirituality, intuition and creativity.9,12–15

There is a dearth of evidence supporting the use of TLP in people having depression. Literature on therapeutic listening had been limited to children with sensory processing disorders.10,12,16,17 implementing.
The Listening Program(R Till date only conservative and traditional interventions along with music therapy are used to treat depression in adolescent. Hence, we aimed to explore the effect of therapeutic listening on severity of depression and quality of life in institutionalized adolescent. The objectives of our proposed study are to explore the effects of therapeutic listening over traditional music on severity of Depression and quality of life in institutionalized adolescents.

Materials and Method

**Ethical Statement:** The study protocol for the Single blinded Randomized Controlled Trial was approved by the institutional ethics committee and the study will be performed according to the principles laid by, declaration of Helsinki (Revised 2013), Council for International Organizations of Medical Sciences (CIOMS) guidelines, International ethical guidelines for health-related research involving humans (2016) and National guidelines for biomedical and health research involving human participants by Indian council of Medical Research (ICMR), 2017. The ethical guidelines that followed the national ethical guidelines for biomedical and health research involving human participants by Indian council of Medical Research (ICMR), 2017. Consent for participation in the study will be obtained from the participants and their parents/guardian prior to the start of the study.

**Recruitment:** Qualified therapist will screen the institutionalized individuals and recruit the study participants based on the inclusion and exclusion criteria displayed below as the selection criteria.

**Selection Criteria:**

**Inclusion Criteria:**

- Institutionalized Adolescent boys and Girls (age 12-18 years)
- Participants Assessed by Children depression Inventory (having average/lower, high average and elevated)

**Exclusion Criteria:**

- Presence of any other psychiatric disorder (Schizophrenia, Bipolar Disorder, Anxiety Disorder etc).
- Patients with Hearing impairment
- Patients with untreated active ear infection

After screening, the participants will be recruited thirty six samples by the simple random sampling method from NGO (Gur aasra, Mohali & Prabh Aasra, Kurali). After obtaining the consent, their demographics will be recorded.

**Randomization:** Total recruited sample size 36 will be randomly allocated by Block Randomization method by SNOSE (Sequentially numbered opaque sealed envelope) method by Principle investigator into one of the two groups, therapeutic listening programme group (TLPG) and traditional music therapy group (TMTG). The blocks will be in even numbers and the matrix will be $4 \times 9$ (36). There will be total 4 blocks and 9 rows. Then subjects will be allocated in the blocks by using random allocation sequence. Randomization will be done by $4 \times 9$ matrix design. There will be random blocks of 4, with each block randomizing 4 participants into TLPG and TMTG each with two participants. The participants will be allotted to group based on the generated randomized sequence. Once the block will be allotted next row block sequence will be opened for the recruitment. Thus equal number of participants will be assigned to both the group overtime. The outcome assessor will be blinded and hence, the randomized controlled trial will be single blinded.

**Study Intervention:** Intervention will be administered by an experienced physiotherapist who is certified and trained in therapeutic listening programme. Participants in the experimental group will receive therapeutic listening therapy for the duration of 30 min per session twice a day for 5 days a week for 8 weeks. Detailed week wise therapeutic listening protocol is listed below in Table 1. The sound to be used will be of rhythm and Rhyme, Peach Jamz, Nature Winds, Mozart for modulation and Strawberry Jamz, Vivaldi for modulation. Traditional music therapy group will receive traditional music therapy intervention using earphones with duration of 2 sessions of 30 minutes each per day, 5 days a week for 8 weeks. Intervention will be delivered in a quiet room using Headphones - High-quality Sennheiser headphones which has high resistance-impedance with a minimum of 150 ohms and 23,000 Hz frequency sensitivity. Therapist will be maintaining the treatment record of each participants. Post intervention evaluation of the outcomes will be measured by using Children’s Depression Inventory (CDI), Youth Quality of Life Instrument – Short Form (YQOL-SF), Urine test and EEG. If the participants develops unexpected seizures or syncope during the ongoing therapeutic listening, the study will be discontinued.
### Table 1: Week wise proposed intervention for the therapeutic listening program

<table>
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<tr>
<th>S.No.</th>
<th>Total Duration</th>
<th>Mode</th>
<th>Weeks</th>
<th>Album Title</th>
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<td>1.</td>
<td>4 Weeks</td>
<td>Engagement</td>
<td>Week 1</td>
<td>Rhythm &amp; Rhyme</td>
<td>30 min per session twice a day for 5 days a week</td>
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<td>Week 2</td>
<td>Peach Jamz</td>
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<td>Week 3</td>
<td>Nature winds</td>
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<td></td>
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<td>Week 4</td>
<td>Mozart for modulation</td>
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<tr>
<td>2.</td>
<td>2 Weeks</td>
<td>Interaction</td>
<td>Week 5</td>
<td>Strawberry Jamz</td>
<td>30 min per session twice a day for 5 days a week</td>
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<td>Week 6</td>
<td>Vivaldi for Modulation</td>
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<td>3.</td>
<td>2 Weeks</td>
<td>Discrimination</td>
<td>Week 7 &amp; Week 8</td>
<td>More Mozart for modulation</td>
<td>30 min per session twice a day for 5 days a week</td>
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</table>

### Outcome Measures:

**Children’s Depression Inventory (CDI):** The Children’s Depression Inventory (CDI) was developed by Kovacs and Beck in 1977. From Beck’s Depression Inventory as a downward revision, CDI was developed originally. This is the commonly used depression measures to assess the severity of depression among the children between 7 and 17 years. CDI has 27 items and takes approximately 10 to 15 minutes to complete the test. CDI has acceptable reliability and validity with other psychometric properties.

**Youth Quality of Life Instrument–Short Form (YQOL-SF):** Youth Quality of Life Instrument – Short Form (YQOL-SF) derived from 41-item instrument through Rasch methodology. Youth Quality of life developed to measure the quality of life among youth aged 12 to 18 years. YQOL-SF has 16 items and four domains to measure, self, social relationships, environment, and general quality of life. Psychometric properties of YQOL-SF is acceptable to measure quality of life among the youth with and without chronic disease and disabilities.

**Other Outcome Measures:** Urine test will be performed to check the levels of Serotonin, cortisol, testosterone, estrogen and electroencephalogram (EEG) to measure the electrical activity of brain to music.

All the outcome measures will be measured at baseline and 8 weeks post intervention.

### Results and Discussion

Normality of the collected data will be analyzed using Shapiro-Wilk test as the sample size is less than 50. If the data follows normal distribution, then descriptive statistics will be expressed in mean±Standard deviation and parametric tests, paired t-test and independent t-test will be used for within and between group comparisons. On contrary, if the data does not follow normal distribution, then descriptive statistics will be expressed in mean (95% confidence interval) with range and non-parametric tests, Wilcoxon signed rank test and Mann-Whitney U-test will be used for within and between group comparisons. For all the statistical analysis, p<0.05 will be set as significant.

This will be the first RCT to be conducted to gain deeper understanding on the effect of therapeutic listening technique on depression and outlines the importance of therapeutic listening programme on institutionalized adolescents with depression. Successful completion of this RCT will create high level of evidence on the best treatment options for institutionalized adolescents with depression.

### Conclusion

The feasibility of implementing therapeutic listening programme will be tested by the end of this trial and therapeutic listening programme could be an adjunct tool along with exercises to decreases the depressive symptoms in adolescent.

### Author(s) Contribution:

GKB participated in the conception, design, search, and statistical analysis plan of the research data, writing of the scientific article and forwarding of the scientific article. Preethi John and Gokulakannan Kandasamy participated in the conception, design, and plan for statistical analysis of research data and critical review, and forwarding of the scientific article.
Conflict of Interest: None of the authors have competing interest declared

Funding: No funding

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Factors Affecting Adolescents in Determining the Ideal Number of Children

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Abstract

The preference of ideal number of children among adolescents can predict future fertility rates and population growth. This study aims to analyze the determinants of preference of ideal number of children in adolescents aged 15-24 years in Indonesia. The method used in this study is descriptive with data analysis of IDHS 2017. The results show that the preference of ideal number of children among adolescents in Indonesia is 2.7 children. This figure increase from the average preference of ideal number of children in 2012 and is higher than the 2015 Total Fertility Rate, which is 2.28. Factors that influence the preference of ideal number of children among adolescents are the characteristics and socio-demographic background, exposure to media, and the discussion on adolescent reproductive health.

Keywords: Preference of ideal number of children, Adolescents, Determinants of preference of ideal number of children.

Introduction

The total population of Indonesia is 237.6 million (2010 Population Census). This count has increased to 255.18 million people based on the 2015 Inter-Census Population Survey. Central Bureau of Statistics projects that the total population in Indonesia will increase until 2025. Currently, Indonesia is ranked fourth in the country with the most total population in the world. First place is China with 1.4 billion total population of the 7.8 billion total population in the world. Based on the Indonesian Population Projection for 2015-2045, the growth rate is 1.04%. There are several components that affect population growth. These components include birth (fertility), death (mortality), and movement (migration). Total Fertility Rate (TFR) in 2020 is 2.1¹.

Data from the Central Bureau of Statistics in 2019 shows that the number of adolescents (18-24 years old) in Indonesia is 44,209.8 million². Adolescence is a period of transition from children to adults. One of the things that marked this transition was starting a new life by forming a family. Starting a family life, of course, must be carefully planned by the adolescents. This planning cannot be separated from the desire to have children, including the preference for the number of children. Preference is a form of expressing feelings of preferring something. Preference has in common with closed behavior. Skinner (1938) in Notoadmodjo (2010) states that closed behavior occurs when the response to a stimulus cannot be clearly observed by others. The responses that appear are only limited to attention, perceptions, feelings, and attitudes. Therefore, the preference for the number of children in adolescents can be interpreted as a form of expression for the number of children they want to have. The preference for the ideal number of children desired can be used to predict future fertility rates³.

National Population and Family Planning (NPFP) introduced the Family Development, Population and Family Planning (Bangga Kencana) Program at the end of 2019 as a change in the name of the Population, Family Planning and Family Development (KKBPK)

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program. To realize that program, NPFP 2020-2024 Strategic Plan (Renstra) was used as a reference in program implementation. One of the strategic issues that must be considered in developing Renstra is the population structure. Indonesia has the opportunity to get a demographic bonus with the increasing proportion of the population of productive age in the demographic structure. This structure must be maximally utilized, one of which is by keeping the TFR at a certain level. Therefore, this study aims to analyze the determinants of preference for the number of children in adolescents aged 15-24 years with unmarried status in Indonesia.

**Method**

The research was used Indonesian Demographic and Health Survey (IDHS): Adolescent Reproductive Health in 2017. The research method used was descriptive. Data were collected by means of literature study and analyzed descriptively. The samples of this study were young men and women aged 15-24 with unmarried status in Indonesia. The number of samples was adjusted to the number of samples in the Adolescent Reproductive Health IDHS 2017, which was 22,583 people. As many as 12,612 boys and 9,971 girls.

**Result**

**Preference for Ideal Number of Children in Adolescents:** Based on data from the 2017 IDHS for Adolescent Reproductive Health, the average preference for the ideal number of children for both male and female adolescents in Indonesia is 2.7. This figure has increased from 2012. For male adolescents, the average preference for the ideal number of children has increased from 2.5 children to 2.7 children. Meanwhile, female adolescents increased from 2.3 to 2.7 children.

![Figure 1. Average Preference of Ideal Number of Children by Adolescent in 2012 and 2017](image)

**Characteristics and Social Demographic Background of Adolescents:** Based on data from the IDHS2017, the majority of adolescent respondents in Indonesia are 15-19 years old (64%). In addition, the majority of respondents were male adolescents (56%), the highest level of education was not graduating from high school (50%), and mostly on highest economic status (23%).

**Table 1. Characteristics and Social Background of Adolescent**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Category</th>
<th>n</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>Men</td>
<td>12.612</td>
<td>56%</td>
</tr>
<tr>
<td></td>
<td>Women</td>
<td>9.971</td>
<td>44%</td>
</tr>
<tr>
<td>Age</td>
<td>15-19</td>
<td>14.463</td>
<td>64%</td>
</tr>
<tr>
<td></td>
<td>20-24</td>
<td>8.120</td>
<td>36%</td>
</tr>
</tbody>
</table>
Average ideal number of children is 2.8 children. Adolescent aged 20-24 years have a higher preference when compared to adolescents aged 15-19 years. Based on the level of education, the highest average preference for ideal number of children is owned by adolescents with a tertiary education level and not completing elementary school, both for male and female adolescents. The highest average preference for ideal number of children based on economic status is owned by male adolescents with the lowest economic status. While the average preference for the ideal number of children in urban and rural adolescents was not found to be different, as many as 2.7 children.

Figure 2. Preference of Ideal Number of Children in Adolescents Based on Age and Sex

Figure 3. Preference for Ideal Number of Children in Adolescents Based on Education Level
Mass Media Exposure: The most dominant mass media for obtaining information on reproductive health is television. At least in the last week, as many as 77% of young women watched television, 12% listened to the radio, and 11% read printed newspapers or magazines. Meanwhile, 73.1% of male adolescents watch television, 11.4% listen to the radio, and 10.4% read print media. In addition, the majority of young men and women also used the internet to get information about reproductive health during the last 12 months prior to the survey.

Percentage of male and female adolescents exposed to the three mass media has decreased when compared to 2012 and 2007. Boys who access the three mass media have decreased from 14%, 9%, to 4%. Likewise, the percentage of young women decreased from 13%, 8%, to 4%.

Youth Discussion About Reproductive Health: Most of adolescent men and women in Indonesia discuss reproductive health with friends. Respectively, 51.1% of the total male respondents and 61.6% of female respondents discussed with friends. Adolescents also discuss reproductive health with teachers, mothers and fathers. For male adolescents, respectively 42%, 10.8%, and 8.3% of the total male adolescent respondents. Meanwhile, female adolescents were respectively 47.1%, 53% and 4.3% of the total female respondents.

Discussion

Preference for Ideal Number of Children in Adolescents: The average preference for the ideal number of children based on the IDHS 2017 data for Adolescent Reproductive Health is 2.7 children, which is higher than the average preference in 2012, the 2015 TFR, and the 2020 TFR projection can be used to predict future fertility rates. This is because the preference for the ideal number of children in adolescents can determine the number of children they have in life(4).

As with the definition of fertility according to demographics, fertility is more related to the number of children born alive. Fertility also influences the
population growth rate in a positive way. This means that the higher the fertility rate, the higher the population growth rate\(^{(5)}\). In addition, with controlled fertility rates, Indonesia can take full advantage of the demographic bonus.

Preference for the ideal number of children to have depends on how one views the value of children. In adolescence, of course, it is still quite strange about this. However, that does not mean that teenagers cannot plan what family life will be like, including the number of children they want to have in the future. These decisions and plans are of course inseparable from the influence of various factors such as characteristics, mass media exposure, and discussions on reproductive health.

**Characteristics and Social Demographic Background of Adolescents:** Both male and female adolescents aged 20-24 years have a desire for more children than adolescents aged 10-19 years. Preference for the number of children desired by young women and men in the future. A more mature age encourages adolescents to think further about what kind of family they want to form, including the ideal number of children they want to have\(^{(6)}\).

In addition, education is also a factor that influences a person in planning the number of children he wants. The results showed that adolescents with incomplete primary and secondary education had a higher average preference for ideal number of children compared to other levels of education. A person’s knowledge will increase along with the education taken. It also affects the mindset to be broader and more open. Teens with higher education are more likely to consider the number and limits of children they want to have. Even so, it does not rule out if adolescents with higher education want to have children in large numbers\(^{(7)}\).

Another factor that drives decisions in planning the number of children is economic. When viewed from an economic point of view, the number of children desired is closely related to the costs and benefits that are obtained from a child. Economic status and how a person perceives the value of children will influence the demand or desire for the number of children in the future. For some people or adolescents, children can be seen as workers. Children are considered as contributors to income for families with low economic levels so that the preference for the ideal number of children is higher compared to other economic statuses\(^{(8)}\).

There are differences in the value of children in underdeveloped communities (low economy) and advanced communities (high economy). Low economic society places more emphasis on the quantity or number of children they have. The number of children born can be a guarantee and bring many benefits to the family. One of them is increasing productivity and family income\(^{(9)}\). The presence of children is considered to be able to help the family economy when parents are not productive so that their needs can still be met. Whereas for high economic communities, children are invested in quality\(^{(10)}\). Children who are born tend to be few but their growth and development are optimized. Starting from fulfilling nutrition, education and health with the hope that children can compete in the labor market. In addition, children are the successors of the offspring who will then carry the good name of the family\(^{(11)}\).

Based on the research results, it can be seen that the preference for the ideal number of children in urban and rural adolescents was not found to be different. Adolescents in urban and rural areas, of course, have different behavior patterns. However, this does not mean that the preferences for having children in the future will be significantly different. The exposure of adolescents to mass media which provides information about certain reproductive health can explain this.

**Mass Media Exposure:** Understanding of reproductive health is influenced by several factors, one of which is access to information\(^{(12)}\). The majority of adolescents get information about reproductive health through television channels. The results also showed that most teenagers had used the internet to get information. One of the information obtained is about family planning. Getting information about family planning can certainly influence adolescents in making plans for family life in the future. This includes deciding the ideal number of children they want to have.

**Youth Discussion About Reproductive Health:** Children are a natural thing for discussion among married people. However, discussing reproductive health issues and the number of children they want is certainly a foreign topic among adolescents. Adolescent tend to think more about present than planning about family life. This makes Adolescent think that the ideal number of children can be decided after marriage\(^{(13)}\).

The idea that the number of children does not need to be eliminated now certainly indicates that
adolescents need to have further discussions about reproductive health. In the modern era, adolescents are more preoccupied with daily activities and activities related to academics or non-academics. The results showed that the majority of adolescents discussed reproductive health with friends. Listyaningsih and Sumini (2015) state that adolescent more discussion about introductions, friendships, and dating. Teens do not feel the need to discuss the problem of family size, including the number of children they will have\textsuperscript{(14)}. This becomes a challenge in itself considering the rampant phenomenon of promiscuity. It is feared that teenagers cannot plan their own lives.

The role of discussion on reproductive health is very important to guide adolescents into a planning generation. Families, especially fathers and mothers, have a big role to play in providing knowledge about reproductive health in adolescents. Even though as many as 53\% of young women discussed with their mothers about reproductive health, there was still a low number of discussions among boys. Likewise, the discussion rate for adolescents regarding reproductive health with fathers only reached 8.3\% for male adolescents and 4.3\% for female adolescents\textsuperscript{(15)}.

For some parents, information regarding the number of children is not appropriate for adolescents, especially those aged 15-19 years. This condition can encourage adolescents to discuss with peers who have almost the same understanding. The values that are absorbed by adolescents from their families and the environment can influence their preferences for the number of children they want. Adolescents tend to wish to have the same number of children as their current family condition.

Apart from families, schools, including teachers, also have an important role in discussions about reproductive health for adolescents. Information about the number of children, children’s grades, benefits and reasons for having children can be obtained at the secondary school level. Furthermore, this information can trigger teenagers to have further discussions with the people around them. Fertility preferences show adolescents with reproductive knowledge are more likely to choose the recommended number of children. Having discussions and interactions with parents, teachers and friends will increase adolescent knowledge and make adolescents trained to plan and make decisions regarding the ideal number of children they want to have\textsuperscript{(4)}.

### Conclusion

The preference for the ideal number of children among adolescents (15-24 years) based on the IDHS data for Adolescent Reproductive Health is 2.7 children. This figure is an increase from the preference for the ideal number of children in 2012 and is higher than the Total Fertility Rate (TFR) in 2015 of 2.28 children. This will affect the fertility rate and have an impact on increasing population growth rates and demographic bonuses if not controlled properly.

The factors that influence the preference for the ideal number of children among adolescents are the characteristics and socio-demographic background of adolescents including age, education and economy. Another factor is exposure to mass media and youth discussions about reproductive health.

**Conflict of Interest:** The authors have no conflict of interest with the material presented in this paper

**Sources of Funding:** None

**Ethical Clearance:** None. My paper is an idea and policy analysis to solve population problems

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Characterization of NPM1 and FLT3-ITD Mutations in Iraqi Patients with AML

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Abstract

Acute myeloid leukemia is a malignant disease results from mutation in a multipotent haemopoietic stem cell. The study aimed to investigate NPM1 and FLT3-ITD mutations in Iraqi patients with AML and correlate results with other clinical and laboratory findings. Fifty-eight AML patients, admitted to Baghdad Teaching Hospital from October 2019 till March 2020 in addition to 25 normal controls, were included in the study. A detailed history, laboratory investigations including FLT3-ITD and NPM1 mutations were collected from and analyzed. FLT3-ITD was detected in 17.24% of patients, NPM1 mutation in 10.34%. Most of the patients are presented with pallor. FLT3-ITD mutation had a higher blast cell count (74%) while NPM1 mutation had higher WBCs count.

Conclusion: AML is common in middle age group, patients with NPM1 mutation had significantly higher WBCs count while patients with FLT3-ITD mutation have higher blast percentage compared with non-mutated patients.

Keywords: AML, NPM1, FLT3.

Introduction

Acute myeloid leukemia (AML) is characterized by clonal explanation of differentiated myeloid precursors which results in bone marrow failure.¹ Fundamentally, the investigation of the genome profile in AML has Changed the approach of patients with AML. AML Patients are regularly tested for the existence of FMS-related tyrosine kinase 3 (FLT3) and Nucleophosmin 1 (NPM1) gene mutations.² NPM1 is a predominantly nucleolar of protein with important homeostasis and cell growth functions, including regulation of ribosome biogenesis and response of stress.³ Disruption of NPM1, either by chromosomal translocation or mutation, disturbs its normal function as a transporter protein leading to the notion that NPM1 mutation plays a role in early leukemogenesis as recorded in about 35 percent of AML cases.⁴

FLT3 encodes a tyrosine kinase receptor preferentially expressed in hematopoietic progenitor cells and mediates the differentiation and proliferation of stem cells.⁵ This receptor is activated by binding to its extracellular domain of the fms-related tyrosine kinase 3 ligand (FL), which induces the formation of homodimers in the plasma membrane and autophosphorylation.⁶ About 30 percent of all AML cases, (FLT3) gene mutations occur, with internal tandem duplication (ITD) being the mainly widespread form of FLT3 mutation which constitute about 25 percent from all cases of AML.⁷ FLT3-ITD has consistently been related to increased white blood cell levels, higher bone marrow (BM) cell counts, increased risk of relapse, and lower survival rates.⁸ These results indicate that the mutation of the FLT3-ITD gene plays an important role in the development of leukemia, rather than initiation.

The aim of this study is to investigate the characterization of NPM1 and FLT3-ITD mutations
in Iraqi patients with AML and correlate the presence of these mutations with other clinical features and laboratory findings.

**Material and method**

After the approval of the Ethical Committee at Faculty of Biology, University of Baghdad and taking informed consents from the patients, the current experimental work was carried out at the Laboratory Department, Hematology Center and the National Center of Educational Laboratories at Medical City Complex, over a period extending from October 2019 till March 2020. A total of 58 patients, admitted to Baghdad Teaching Hospital, Medical City Complex, recently diagnosed with AML on the basis of findings of blood smear, bone marrow (BM) examination and flow-cytometry immunophenotyping, were included in this study with an age ranged from 14 to 72 years in addition to another group of 25 apparently healthy individuals with an age ranging from 15 to 65, those subjects were not found to have medical issues with normal investigations, therefore were used as normal controls for comparison with AML patients. A detailed information including residence, occupation, family history, past medical history, previous exposure to radiation or chemicals, smoking history and clinical presentation were collected from all patients and controls. The LeukoStrat® FLT3 Mutation kit (Cat No./ID: 9-412-0091, Invivoscribe) and ipsogen NPM1 MutaScreen Kit (Cat No./ID: 677013, Qiagen) were used to detection of FLT3-ITD and NPM1 mutations according to manufacturer’s instructions. All Primers, materials and protocol were provided with the kits. Regarding molecular detection of FLT3-ITD and NPM1 mutations in brief; DNA was extracted using Qiagen extraction kit (Cat No./ID: 69504), FLT3-ITD mutation was detected by conventional PCR (AppliedBiosystems) with gel electrophoresis. NPM1 mutation was investigated by real time PCR (Rotor-gene Q). Hematological parameters were obtained by Nihon Khoden Celltac F Automatic CBC analyzer. Hematological parameters result that obtained were subjected to statistical analysis and p < 0.05 was considered significant.

**Results**

This study was conducted on 58 patients with AML and 25 healthy subjects all of them were selected randomly in relation to age and sex. the age of patient ranged from 14 -72 years, of median age of 30.5 years, and a mean of 42.9 years, 31 patients were male and 27 were female with a male to female ratio of 1: 14.1 While in control group the age ranged from (15 – 65 years, with a median of 26 years and a mean of 30.6 years,12 were males and 13 were female and as shown in figure (1) and table (1).

![Figure 1: Age mean of acute myeloid leukemia patients and control. Different letters represent a significant difference between the means (p < 0.001).](image-url)
Table 1: Gender distribution in leukemic patients and controls.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Leukemia Patients (N = 58)</th>
<th>Control (N = 25)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Male</td>
<td>31</td>
<td>53.45</td>
</tr>
<tr>
<td>Female</td>
<td>27</td>
<td>46.55</td>
</tr>
</tbody>
</table>

Statistical Analysis

Pearson’s $\chi^2 = 0.208$; D.F. = 3; p = 0.649 (NS)

NS: Not significant (p > 0.05).

FLT3-ITD mutation was detected in 10 out of 58 AML patients (17.24%) while NPM1 mutation was detected in 6 patients (10.34%) and as shown in table (2). FLT3-ITD mutation was detected in 7 (12.1%) females and in 3 (5.2%) males, on the other hand, NPM1 mutation was positive in 5 (8.6%) males and in 1 (1.7%) female as in table (2). The most common AML subtype according to FAB classification was AML-M5 which constitute about 18 (31.03%) of the patients followed by AML-M2 in 14 (24.13%), and as shown in table (2). Most of the patients are presented with pallor which was seen in 35 (60.34%) of them followed by fever in 22 (37.9%) and bleeding in 17 (29.31%) as shown in table (2).

Table 2: FLT3-ITD and NMP1 Mutations relation to the characteristic of AML patients.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Type of AML (58)</th>
<th></th>
<th></th>
<th></th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NPM1 (+ve)</td>
<td>FLT3-ITD (+ve)</td>
<td>AML Patients</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Frequency of Mutations</td>
<td>42</td>
<td>72.14</td>
<td>10</td>
<td>17.24</td>
<td>6</td>
<td>10.34</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>26</td>
<td>44.83</td>
<td>3</td>
<td>5.2</td>
<td>5</td>
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<tr>
<td></td>
<td>Female</td>
<td>16</td>
<td>27.59</td>
<td>7</td>
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<td>1</td>
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<tr>
<td>FAB subtype</td>
<td>AML Patients</td>
<td>FLT3-ITD (+ve)</td>
<td>NPM1 (+ve)</td>
<td>Total</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>M0</td>
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<td>1</td>
<td>11</td>
<td>18.97</td>
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</tr>
<tr>
<td>M1</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>6.9</td>
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<td></td>
</tr>
<tr>
<td>M2</td>
<td>12</td>
<td>2</td>
<td>14</td>
<td>24.14</td>
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<tr>
<td>M3</td>
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<td>M4</td>
<td>8</td>
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<td>17.24</td>
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<tr>
<td>M5</td>
<td>12</td>
<td>5</td>
<td>18</td>
<td>31.03</td>
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<tr>
<td>M6</td>
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<td>1</td>
<td>1.72</td>
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<td>M7</td>
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<tr>
<td>Clinical Presentation</td>
<td>AML Patients (58)</td>
<td></td>
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<tr>
<td>Pallor</td>
<td>35</td>
<td>60.34</td>
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<tr>
<td>Fever</td>
<td>22</td>
<td>37.9</td>
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<td>Bleeding</td>
<td>17</td>
<td>22.4</td>
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<tr>
<td>LAP</td>
<td>11</td>
<td>18.9</td>
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<td>HM</td>
<td>11</td>
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<td>SM</td>
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<td>Join pain</td>
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<tr>
<td>Weight loss</td>
<td>7</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skin lesion</td>
<td>2</td>
<td>3.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Regarding the bone marrow blast cells percentage mean was 74±0.13 in patients with FLT3-ITD mutation, 66±0.10 in patients with NPM1 mutation and 62±0.22 in non-mutant patients as shown in figure (2). Regarding the relation of FLT3-ITD and NPM1 mutation to hematological parameter of the patients, the mean WBC count in NPM1 was (49.56±15.77×10^9/L) which was significantly higher than in patients without the mutation for NPM1 & FLT3-ITD (29.36±16.52×10^9/L) and as shown in figure (3).

![Figure 2: Mean of bone marrow blasts percentage among AML patients. Different letters (a and b) on the error bars indicate significant differences (p < 0.05), while similar letters represent no significant difference between means (p > 0.05).](image)

![Figure 3: Evaluation of WBC count in AML Patients. A. WBCs in AML patient and control samples. B. WBC count of leukemia patients in relation to presences of mutations. Different letters (a, b, c and d) on the error bars indicate significant differences (p < 0.05).](image)

Regarding RBC count, Hb level and platelets count, there was no significant correlation with FLT3-ITD and NPM1 mutations as shown in table (3).
Table 3: Hematological parameters of AML patients in relation to mutations and control.

<table>
<thead>
<tr>
<th>Groups</th>
<th>RBC (10^9/L)</th>
<th>HGB (g/dL)</th>
<th>PLT (10^9/L)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean±SD</td>
<td>Mean±SD</td>
<td>Mean±SD</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>4.91±0.69</td>
<td>13.56±1.8</td>
<td>261.52±68.97</td>
<td>NS</td>
</tr>
<tr>
<td>AML Patients</td>
<td>2.56±0.90</td>
<td>7.56±2.45</td>
<td>102.63±60.19</td>
<td>NS</td>
</tr>
<tr>
<td>FLT3-ITD</td>
<td>2.36±0.50</td>
<td>7.5±1.85</td>
<td>78.8±42.21</td>
<td>NS</td>
</tr>
<tr>
<td>NPM1</td>
<td>2.68±0.41</td>
<td>8.03±1.32</td>
<td>95.17±60.49</td>
<td>NS</td>
</tr>
</tbody>
</table>

The Data is presented as the mean ±SD. NS: Not significant (p > 0.05).

**Discussion**

Acute myeloid leukemia is a heterogeneous disease results from mutation in a multipotent hematopoietic stem cell. It is a common malignant myeloid disorder in adults. A total 58 AML patients were enrolled in this study, the mean age was 42.9 years, comparable to Tawfiq et al with a mean age of 42 years. Male to female ratio was 1.14 : 1 which agrees with Figueroa et al and Dhahi et al who reported male to female ratio of 1:2: 1 for both, this slight male predominance could be due to being more exposed to environmental carcinogenic risks than females. FLT3-ITD mutation was detected in (17.24%) of our patients similar to Yusoff et al where (16.1%) of their patients had the mutation. Female have FLT3-ITD mutation more than male, in (12.1%) and (5.2%), respectively, comparable to Juliusson et al with detectable mutation in (29%) of female and (22%) of males. However, Chauhan et al disagree in reporting FLT3-ITD mutation in males more than females. NPM1 mutation was found in (10.34%) of the patients and this was not so far from Abdulateef et al who detected it in (18.86%) of the patients. NPM1 mutation was reported more in males in (16.1%) of them than in females (3.7%), this results are similar to Abdulateef et al with a detection in (28.1%) of males and (4.7%) of females. On the other hand, this differs from Dhahir and Dhahi who reported NPM1 mutation in (60%) of females more than seen in males (37.5%). The variation of results between studies may be due to possible differences in sample size as well as different method that have been used to evaluate these mutations. Regarding morphology, AML-M5 was the most common FAB subtype constitutes (31.03%) of the cases followed by AML-M2 (24.13%), parallel to Govedarovic and Marjanovic, 2011cƘ. On the other hand, this results are different from Khan, 2018 where AML-M2 was reported in (59%). However, study the subtype of AML is very important because it help to choose the best treatment and also affects a patient’s outlook. For instance, the acute promyelocytic leukemia (APL) subtype is often treated using drugs that are different from those used for other subtypes of AML. Pallor was the most common presentation followed by fever, equivalent to findings of Dhahi et al but different from Chauhan et al which hepatosplenomegaly was the common clinical feature followed by lymphadenopathy. This variation may be due to the different immunological and physiological status of individuals among different populations. Patients with FLT3-ITD mutation had significantly higher mean B.M. blast cell percentage of (74%) when compared with NPM1 mutation and AML without these mutations in (66%) and (62%), respectively. This close to Notopuro et al with blast cells of (79.5%). Patients with NPM1 mutation had significantly higher WBC count mean (49.56±15.77×10^9/L) as compared with AML without any mutation (29.36±16.52×10^9/L) similar to findings of Döhner et al and 22 but different from Abdulateef et al which reported that WBC count was non-significantly higher than in non-mutated group. Despite low mean of RBC count, hemoglobin levels and platelets count in AML patients, there were no significant difference among different groups, low levels of these parameters is a logical consequence with AML which is a cancer of the myeloid lineage of blood cells, characterized by the rapid growth of abnormal cells that impede normal blood cell production and this will cause anemia, pallor and bleeding tendency. Indeed, study the features of BM blasts may not only allow us to better know the biology circulation of bone marrow blasts, but may also help in better understanding and developing a new strategy of therapeutic. Also, many studies have shown that genotypic subgroup and WBC count without FLT3-ITD are independent predictors of effect.
the molecular markers including NPMc and FLT3-ITD on outcome of patients is still not clear18.

**Conclusion**

AML is common in middle age group with slight male predominance, AML-M5 was the most common FAB subtype, most of the patients presented with pallor, patients with NPM1 mutation had significantly higher WBC counts while patients with FLT3-ITD mutation have higher blast percentage comparable to other local and worldwide reports.

**Conflict of Interest:** None

**Funding:** Self

**Ethical Clearance:** Not required

**References**


15. Chauhan PS, Ihsan R, Singh LC, Gupta DK, Mittal V, Kapur S. Mutation of NPM1 and FLT3 genes in acute myeloid leukemia and their association with
clinical and immunophenotypic features. Disease markers. 2013 Jan 1;35.


Assessment of Associated Factors and Complications for Women with Poly Cystic Ovarian Syndrome in Baghdad City

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Abstract

Objectives: To assess the associated factors and complication for women with poly cystic ovarian syndrome.

Methodology: A descriptive study conducted on purposive sample of (65) women whom attended Hospitals in Baghdad city suffering polycystic ovarian syndrome for the period of (20th October 2019 through 25th February 2020). Descriptive & Inferential statistical analyses were used to analyze the data.

Results: The highest percentages (50%) in age group were (19-22) years, primary schools graduates, housewife, from “urban area”, with irregular cycle. Take high grains, fat, sugar in their food And suffered from obesity, hirsutism, acne, amenorrhea, infertility among short term complication.

Conclusions: The study concluded that there is significant relationship between occupation, body mass index, food consumption, dietary habits, environmental factors, with short term complication of PCOS.

Recommendations: Need to developed training program to upgrade their knowledge and skills about healthy food and life style to reduction the complication of PCOS.

Keywords: Assessment, Associated Factors, Complication, Poly Cystic Ovarian Syndrome.

Introduction

The life style ways, environmental and genetics factors it could be the reasons to some of diseases, one of these diseases is polycystic ovary syndrome which affects about one in 15 women in the world(¹).

Polycystic ovary syndrome defines as hormonal and endocrine disorder affect women in their reproductive age which described in 1935 by Stein and Leventhal, as represents of an estimate of 10 small cysts of a diameter ranging between 2 and 9 mm develop on one or both ovaries and/or the ovarian volume in at least one ovary exceeds 10 mL(²).

These syndrome can diagnosed if two of three symptoms are found: (1) hyperandrogenism (detected by clinical and/or biochemical testing) in meaning hormonal disturbances of LH, Prolactin and testosterone levels (2) ovulation abnormalities, and/or (3) 12 or more cysts on one ovary and/or ovarian volume > 10 mL(³)(⁴).

Insulin resistance effect about (44-70%) of women with PCOS which consider the main causes of metabolic disturbance that lead to hyperinsulinemia, hyperglycemia, and increased oxidative all these factors contributes to occurrence the condition(⁵).

Many sign and symptom can appear in woman with pcos with leading to health complication, the most common abnormalities associated with PCOS include menstrual disorders (amenorrhea or oligomenorrhea), often leading to infertility (in 73–74% of the cases), abdominal obesity (30–70%) and type 2 diabetes (approximately 10%). Other frequent disorders include hirsutism (85–90%), arterial hypertension (approximately 20%)⁶.

The long complications like dyslipidaemia, cardiovascular disease, endometrial cancer occur when the ovarian syndrome leave untreated so we concern with this factors and complications in this study⁷.
**Methodology**

A descriptive study was applied to assess the associated factors and complication of poly cystic ovarian syndrome among purposive sample of (65) women aged between (19-34) years old attended the hospitals in Baghdad city. Data is collected through using the questionnaire format which consisted of three parts, including demographic, associated factors of PCOS, included reproductive characteristics, food consumption, environmental factors, and complications of PCOS included short and long term complication, the items of questionnaire are rated by (yes) scored as (2) and (no) scored as (1) expect food consumption is scored by (3) for always (2) for sometimes (1) for never. Data are collected through using the study instrument and the interview technique in purpose of data collection after agreement of woman which suffering from PCOS which implemented for the period of (20th October 2019 through 25th February 2020). The reliability and Content validity of the questionnaire are determined through a panel of (6) experts and the. Descriptive and inferential statistical analyses were used to analyze the data by using frequency (F), percentage (%), mean of score (MS), assessment (ASS), and Bivariate Pearson correlation, through SPSS program the statistical procedures tested at p ≤ 0.05.

**Result**

**Table (1): Reproductive History**

<table>
<thead>
<tr>
<th>Variables</th>
<th>S Group</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at Menarche</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(9-12) years</td>
<td>53</td>
<td>81.5</td>
<td></td>
</tr>
<tr>
<td>(13-16) years</td>
<td>12</td>
<td>18.5</td>
<td></td>
</tr>
<tr>
<td>Menstrual cycle characteristic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regularity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Irregular</td>
<td>65</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(25-28) days</td>
<td>3</td>
<td>4.6</td>
<td></td>
</tr>
<tr>
<td>(29-32) days</td>
<td>11</td>
<td>16.9</td>
<td></td>
</tr>
<tr>
<td>(33 and more) days</td>
<td>51</td>
<td>78.5</td>
<td></td>
</tr>
<tr>
<td>Duration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2-7) days</td>
<td>63</td>
<td>96.9</td>
<td></td>
</tr>
<tr>
<td>8 days and more</td>
<td>2</td>
<td>3.1</td>
<td></td>
</tr>
<tr>
<td>Amount of blood</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Oligomenorrhoea</td>
<td>44</td>
<td>67.7</td>
<td></td>
</tr>
<tr>
<td>Polymenorrhoea</td>
<td>4</td>
<td>6.2</td>
<td></td>
</tr>
<tr>
<td>Desmenorhea</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amenorrhoea</td>
<td>17</td>
<td>26.2</td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>23</td>
<td>35.4</td>
<td></td>
</tr>
</tbody>
</table>

F: Frequency, %: Percentage

This table shows that the highest percentage (81.5%) study groups are in age of menarche at (9-12) years old, (100%) had irregular menstrual cycle,(78.5%) are at (33days and more) for frequency of menstrual cycle, (96.9%) are at (2-7 days) for duration of menstrual cycle, (67.7%) are suffered from oligomenorrhoea, (54.6) have sever dysmenorrhoeal.
Table (2): Assessment of Food Consumption for Women with Poly Cystic Ovarian Syndrome

<table>
<thead>
<tr>
<th>List</th>
<th>Food Consumption</th>
<th>Never</th>
<th>Sometimes</th>
<th>Always</th>
<th>M.S</th>
<th>ASS</th>
<th>T.S</th>
<th>Adequately</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>F</td>
<td>%</td>
<td>F</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Grains</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>65</td>
<td>100</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>White bread (2 thin slices)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>65</td>
<td>100</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Rice (1 cup)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>65</td>
<td>100</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Corn (¾ cup)</td>
<td>65</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Meats (50-75gm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Red meat</td>
<td>0</td>
<td>0</td>
<td>26</td>
<td>44.6</td>
<td>36</td>
<td>55.4</td>
<td>2.55</td>
</tr>
<tr>
<td></td>
<td>White meat</td>
<td>0</td>
<td>0</td>
<td>46</td>
<td>70.8</td>
<td>19</td>
<td>29.2</td>
<td>2.29</td>
</tr>
<tr>
<td>3</td>
<td>Fats</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fast Foods (50-75gm)</td>
<td>0</td>
<td>0</td>
<td>26</td>
<td>40</td>
<td>39</td>
<td>60</td>
<td>2.6</td>
</tr>
<tr>
<td></td>
<td>Fatty Soup (1 bowl)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>65</td>
<td>100</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Cooking oil (1 teaspoon)</td>
<td>9</td>
<td>13.8</td>
<td>0</td>
<td>0</td>
<td>56</td>
<td>86.2</td>
<td>2.72</td>
</tr>
<tr>
<td>4</td>
<td>High sugar foods</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wight sugar (1 teaspoon)</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>7.7</td>
<td>60</td>
<td>92.3</td>
<td>2.92</td>
</tr>
<tr>
<td></td>
<td>Desserts (1 slices)</td>
<td>0</td>
<td>0</td>
<td>25</td>
<td>38.5</td>
<td>40</td>
<td>61.5</td>
<td>1.61</td>
</tr>
<tr>
<td></td>
<td>Processed Juice (1 glass 150 ml)</td>
<td>1</td>
<td>1.5</td>
<td>25</td>
<td>38.5</td>
<td>39</td>
<td>60</td>
<td>2.58</td>
</tr>
<tr>
<td></td>
<td>Energy drinks(1 glass 150 ml)</td>
<td>51</td>
<td>78.5</td>
<td>9</td>
<td>13.8</td>
<td>5</td>
<td>7.7</td>
<td>1.29</td>
</tr>
<tr>
<td></td>
<td>Pepsi(1 glass 150 ml)</td>
<td>2</td>
<td>3.1</td>
<td>1</td>
<td>1.5</td>
<td>62</td>
<td>95.5</td>
<td>2.92</td>
</tr>
<tr>
<td>5</td>
<td>Milk and dairy foods</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Milk (1 glass 200ml)</td>
<td>0</td>
<td>0</td>
<td>37</td>
<td>56.9</td>
<td>28</td>
<td>43.1</td>
<td>2.43</td>
</tr>
<tr>
<td></td>
<td>Dairy foods (1 portion pack)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>65</td>
<td>100</td>
<td>3</td>
</tr>
</tbody>
</table>


This table reveals that all Food Consumption items are high in assessment except white meat and milk drinking are moderate, taking corn and energy drinking are low.

Table (3): Assessment of Women’s Environmental Factors

<table>
<thead>
<tr>
<th>List</th>
<th>Environmental Factors</th>
<th>Yes</th>
<th>No</th>
<th>M.S</th>
<th>ASS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>F</td>
<td>%</td>
<td>F</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>Use of Plastic-packaged food.</td>
<td>52</td>
<td>80</td>
<td>13</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>Use of disposable plastic cup for drinking.</td>
<td>53</td>
<td>81.5</td>
<td>12</td>
<td>18.5</td>
</tr>
<tr>
<td>3</td>
<td>Exposure to cooking oil fumes.</td>
<td>65</td>
<td>100</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>Exposure to organ chlorine pesticides.</td>
<td>6</td>
<td>9.2</td>
<td>59</td>
<td>90.8</td>
</tr>
</tbody>
</table>

F: Frequency, %: Percentage, M.S: Mean of scores, Ass: Assessment, L: Low, M: Moderate, H: High

This table presents that all Environmental Factors items are high in assessment except Exposure to organ chlorine pesticides is low.
Table (4): Assessment of Short Term Complications of Poly Cystic Ovarian Syndrome

<table>
<thead>
<tr>
<th>List</th>
<th>Short Term Complications</th>
<th>Yes</th>
<th>No</th>
<th>M.S</th>
<th>ASS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>F</td>
<td>%</td>
<td>F</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>Obesity.</td>
<td>51</td>
<td>78.5</td>
<td>14</td>
<td>21.5</td>
</tr>
<tr>
<td>2</td>
<td>Hirsutism.</td>
<td>49</td>
<td>75.4</td>
<td>16</td>
<td>24.6</td>
</tr>
<tr>
<td>3</td>
<td>Acne.</td>
<td>52</td>
<td>80</td>
<td>13</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>Diabetes mellitus.</td>
<td>0</td>
<td>0</td>
<td>65</td>
<td>100</td>
</tr>
<tr>
<td>5</td>
<td>Hypertension.</td>
<td>5</td>
<td>7.7</td>
<td>60</td>
<td>92.3</td>
</tr>
<tr>
<td>6</td>
<td>Amenorrhea.</td>
<td>42</td>
<td>64.6</td>
<td>23</td>
<td>35.4</td>
</tr>
<tr>
<td>7</td>
<td>Infertility.</td>
<td>51</td>
<td>78.5</td>
<td>14</td>
<td>21.5</td>
</tr>
<tr>
<td>8</td>
<td>Pelvic pain.</td>
<td>35</td>
<td>53.8</td>
<td>30</td>
<td>46.2</td>
</tr>
<tr>
<td>9</td>
<td>Acanthoses Nigerians.</td>
<td>33</td>
<td>50.8</td>
<td>32</td>
<td>49.2</td>
</tr>
</tbody>
</table>

F: Frequency, %: Percentage, M.S: Mean of scores, Ass: Assessment, L: Low, M: Moderate, H: High

This table depicts that all Short Term Complications of PCOS items are high in assessment except pelvic pain and acanthoses Nigerians are moderate, diabetes mellitus and hypertension are low.

Table (5): Relationships between Studied Variables and Short Term Complications of Poly Cystic Ovarian Syndrome

<table>
<thead>
<tr>
<th>Studied Variables</th>
<th>Pearson Correlation</th>
<th>P-value (2-tailed)</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Years)</td>
<td>-0.083</td>
<td>0.513</td>
<td>NS</td>
</tr>
<tr>
<td>Marital status</td>
<td>0.111</td>
<td>0.381</td>
<td>NS</td>
</tr>
<tr>
<td>Education</td>
<td>-0.125</td>
<td>0.323</td>
<td>NS</td>
</tr>
<tr>
<td>Occupation</td>
<td>0.251</td>
<td>0.044</td>
<td>S</td>
</tr>
<tr>
<td>Place of Residence</td>
<td>-0.035</td>
<td>0.782</td>
<td>NS</td>
</tr>
<tr>
<td>Body Mass Index</td>
<td>0.213</td>
<td>0.088</td>
<td>S</td>
</tr>
<tr>
<td>Consanguinity</td>
<td>0.022</td>
<td>0.861</td>
<td>NS</td>
</tr>
<tr>
<td>Family History</td>
<td>-0.124</td>
<td>0.324</td>
<td>NS</td>
</tr>
<tr>
<td>Reproductive Status</td>
<td>0.062</td>
<td>0.622</td>
<td>S</td>
</tr>
<tr>
<td>Food Consumption</td>
<td>0.238</td>
<td>0.056</td>
<td>S</td>
</tr>
<tr>
<td>Dietary Habits</td>
<td>0.235</td>
<td>0.059</td>
<td>S</td>
</tr>
<tr>
<td>Environmental Factors</td>
<td>0.222</td>
<td>0.075</td>
<td>S</td>
</tr>
</tbody>
</table>

P-value: Probability level, S: Significant, NS: Not significant

This table shows that most of studied variables had significance relationship with Short Term Complications of PCOS, and not significant with age, marital status, education, place of residence, consanguinity and family history.

Discussion

The study show that the most women are in the age group (19-22) year old, was married, primary school graduates, housewife, live in urban, suffered from obesity, and they relative in consanguinity. The age and education level considered important factors that effect the woman health and make her more susceptible to pcosthis finding is agreement with the study done in los Angeles the majority of the study sample was (18-30) years old with low education level another substantial factor leading to PCOS is the obesity, obesity or overweight infect 50% of women with PCOS in a study conducted in Italy.
Reproductive characteristic results (Table 1) illustrates that most of their menstrual age are (9-12) years old with irregular cycle, oligomenorrhea and severe dysmenorrhea, begin every (33 days and more), stayed (2-7) days, these characteristic of menstrual cycle put the women at risk for development PCOS this finding is constant with the study in Aristotle University of Thessalonik which found that patients with amenorrhea, oligomenorrhea and irregular menstrual cycles are more likely to progressive PCOS from woman with regular cycles (10).

Food consumption in table (2) reported that most food taken by women are: (grains, meats, fats, high sugar foods, milk, and diary food), these unhealthy food lead to obesity which is among the associated factors these result agreement with the study done in Shiraz, Iran that seems that PCOS has augmented in adolescent girls due to unhealthy food habits and obesity (11).

Environmental factors items in table (3) as: use of plastic-packaged food, disposable plastic cup for drinking and exposure to cooking oil fumes are most factors found in this study which contribution to ovulatory dysfunction that causes PCOS correspond with study done in china (12).

Short term complications of PCOS items in table (4) as: (obesity, hirsutism, acne, amenorrhea, infertility) which represents the most common complications that appear in affected women with PCOS which compose a great risk to their health unless treated, in the other study shows that the diagnosed of PCOS is depended on the presence of hyperandrogenism with lead to hirsutism, acne, oligo-anovulation resulted to amenorrhea, infertility, and Insulin resistance (IR), with increasing body mass index (13).

To define the relationship between studied variables and short term complications of PCOS the study used the Pearson correlation test (Table 5), which depicts that there is significant relationship between occupation, body mass index, food consumption, dietary habits, environmental factors, and short term complication of PCOS, while not significant in age, marital status, education, place of residence, consanguinity, family history with short term complication of PCOS, all these factors if not mange correctly will perform to the complication of PCOS, these result is similar to the study done in India that indicated to the main risk factors of complication of PCOS; (Hirsutism, acne, dysmenorrhea and oligomenorrhea) are Obesity, socioeconomic status, family history, insulin resistance (14).

This study shows there are no long term complication of PCO as: (dyslipidaemia, cardiovascular disease, endometrial cancer), and the reason for that is short time comes in collecting the sample, as is known, the complications for a specific disease needs a long period of time to appear, which indicated in a different study conducted in India indicates that women with PCOS are more likely to develop complications as: (obstetric, cardiovascular, metabolic and psychological) with the time (15).

Conclusions

The study concluded that there is significant relationship between occupation, body mass index, food consumption, dietary habits, environmental factors, with short term complication of PCOS.

Recommendations: The study recommended to developing study about management to women with PCOS, training program to upgrade their knowledge and skills about healthy food and life style to reduction the complication of PCOS and more study with long time to identify the long term complication of PCOS.

Ethical Clearance: Nil

Source of Funding: The source of funding is Self

Conflict of Interest: Is obtained from the Ministry of Health/Al-Russafa Health Directorate (Kamal Al-Samarraee Hospital and Elweya Maternity Teaching Hospital), and All women with PCOS participants in the research have been approved before the questionnaire is started.

Reference


8. Sharon Stein Merkin, Ricardo Azziz, Teresa Seeman, Ronit Calderon-Margalit, Martha Daviglus, Catarina Kiefe, Karen Matthews, Barbara Sternfeld, and David Siscovick, Socioeconomic Status and Polycystic Ovary Syndrome, JOURNAL OF WOMEN’S HEALTH, 2011 MAR; 20(3): 413–419, HTTPS://WWW.NCBI.NLM.NIH.GOV/PMC ARTICLES/PMC3115419/


Comparison among Four Method for Diagnosing Rubella Virus in Pregnant Women

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Abstract

This study was intended to determine rubella virus seroprevalence in pregnant women. The samples included 240 women who attended during the duration from October 2018 to May 2020 Al-Batool Gynecology Hospital in Baqubah District. Women’s age ranged from 16-45 years; their age mean was 26.38 years. Data including age, number of previous abortions. Sera were collected from each woman, and the levels of rubella IgG and IgM were detected by use Electrochemiluminescence (ECLIA), enzyme-linked immunosorbent assay (ELISA) and On Site Rubella IgG/IgM Rapid (OnSite) tests. Also, RT-PCR test are used to detect rubella viral RNA. The results revealed that anti-rubella IgG antibodies for the 240 pregnant women were ranges from 84.58 % to 89.58 % depending on the method tested used. While the anti-rubella IgM antibodies for the 240 pregnant women were ranges from 5 % to 5.41 % depending on the method tested used. Only 8 from 240 specimens of pregnant women are rubella viral RNA positive with (3.33 %) percentage by RT-PCR test. In relation to the history of abortion, the seropositivity of rubella antibodies were (61.42 %) of pregnant women had history of abortion with significant relation P< 0.05, however the abortion frequency among Pregnant patients have the past of one or more abortions with the nonsignificant P>0.05 relation.

Keywords: Rubella, IgG, IgM, ELISA, Electrochemiluminescence.

Introduction

Rubella is caused by an RNA virus belonging to genus Rubivirus and family Matonaviridae (formerly belonged to Togaviridae)[1]. Most infections with rubella cause mild, self-limiting measles-like disease, the real danger occurs when the fetus is infected with the rubella virus[2]. Before 20 weeks of pregnancy, problems such as miscarriage or birth defects can occur if contaminated by childbearing women [3]. As the virus may attack any portion of the growing fetus, any organ may be damaged[4], this number of congenital malformations known as congenital rubella syndrome (CRS) may involve the brain, heart, hearing, and vision. [5]. Laboratory studies for CRS include immunoglobulin rubella M (IgM) in cord blood or baby serum, immunoglobulin G (IgG), and chain reaction polymerase (PCR). The infection of maternal rubella sometimes goes unnoticed, as there is always no rash [6]. Reliable laboratory confirmation of confirmed cases of rubella is a prerequisite to successful control of this disease's removal process [7]. This study was planned to analyze a sample of the awareness of pregnant Iraqi women about the risk of rubella during pregnancy; assessing their attention to pre-conception prevention and knowledge of their serological status, correlated with the miscarriage and rubella congenital syndrome, to verify the likelihood of achieving the elimination of rubella congenital syndrome. Therefore, the goal of that analysis was to determine seroprevalence of the rubella virus; precisely the seropositivity of rubella immunoglobulin G (IgG) and immunoglobulin M (IgM) rates, compared to three laboratory method for rubella IgG and IgM detection. Additionally, molecular viral infection detection through real-time polymerase chain reaction (RT-PCR). Also study the relationship between rubella infection in a sample of pregnant Iraqi women with and without prior history of abortion.

Materials and Method

The study consisted of 240 pregnant women who suffered from gestational disruption or had a history of previous abortions. The age of pregnant women varied between 16- 45, age mean of them was 26.38 years. A
consent form explaining the dimensions of the study was obtained from each woman either as a written form or an oral form. Data including age, number of previous abortions, via a straightforward interview. Samples from these persons were collected only if we had no records of serious or extreme diseases. Blood collection was done using disposable syringes and needles. Each individual had obtained 5 ml of venous blood in the appropriate vein. The blood collected was passed directly into sterile plain gel activator tube then allowed to stand at room temperature for 10 minutes to give the clot activator included in the tube time to react, And then centrifuged at room temperature to remove the serum at 5000 rpm for 10 minutes. The serum was dispensed through three closely packed, Sterile, and polished eppendorf tubes (-20 °C) screened for detection of IgM and IgG against Rubella in serum specimens by using three techniques: the enzyme-linked immunosorbent assay (ELISA) method, (Abnova kit, Spain), Rubella IgG/IgM Rapid on-site (OnSite) (Biotech, Germany) and Electrochemiluminescence (ECLIA) immunoassay method (using Rubella IgG, IgM Cobas Entegra 411 kit (Roche/Germany). Also RT-PCR test are used to molecular detect rubella viral RNA by use (RNA extraction kit and Real-time PCR search for qualitative identification of Infectious rubella, both were from Sacace, Italy).

Statistical Analysis: The machine helped in processing results. Statistical research the test was performed using SPSS (Statistical Social Science Package), version 20 of the program. Distribution of frequencies and percentage was done for the element you chose. The standalone t-test was used, and a significant amount of P-Value less than 0.05 was deemed.

Results and Discussion

Table 1 Results of ECLIA, ELISA, OnSite tests for detection of IgG, IgM and both IgG & IgM antibodies of Rubella Virus in pregnant women

<table>
<thead>
<tr>
<th>Method</th>
<th>Result of IgG</th>
<th>Result of IgM</th>
<th>IgG &amp; IgM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive n(%)</td>
<td>Negative n(%)</td>
<td>Positive n(%)</td>
</tr>
<tr>
<td>ECLIA</td>
<td>210(87.50)</td>
<td>30(12.50)</td>
<td>12(5.00)</td>
</tr>
<tr>
<td>ELISA</td>
<td>203(84.58)</td>
<td>37(15.41)</td>
<td>12(5.00)</td>
</tr>
<tr>
<td>OnSite</td>
<td>215(89.58)</td>
<td>25(10.41)</td>
<td>13(5.41)</td>
</tr>
</tbody>
</table>

Table 2 Result of Real-Time PCR test for the qualitative detection of Rubella Virus

<table>
<thead>
<tr>
<th>Method</th>
<th>Viral RNA Positive</th>
<th>Percentage %</th>
<th>Viral RNA Negative</th>
<th>Percentage %</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT-PCR</td>
<td>8</td>
<td>3.33 %</td>
<td>232</td>
<td>96.66 %</td>
<td>240</td>
</tr>
</tbody>
</table>

Table 3 Relation of Seropositive Rubella IgG Antibodies in Pregnancy with History of Abortion and Abortion Frequency

<table>
<thead>
<tr>
<th>No. of pregnant women with anti-rubella IgG antibodies</th>
<th>History of abortion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No abortion</td>
</tr>
<tr>
<td></td>
<td>No.</td>
</tr>
<tr>
<td>210</td>
<td>81</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The results in a table (1) showed that anti-rubella IgG complete seroprevalence in pregnant women that are obtained in the present study ranged from 84.58 % to 89.58 % depending on the method tested used. This result is almost similar to a previous study conducted in the target population, Diyala province, Iraq, has obtained higher rate (91%) of rubella IgG[8]. While the Synchronized study conducted in Zakho City,
Kurdistan Region, Iraq has obtained a slightly lower rate (83%)⁹, another study also Synchronized with this study conducted in Baghdad has obtained a higher rate (95%) for IgG and (9.8 %) percentage for IgM antibodies [10].

Studies in the other countries had reported variable results. The seropositivity rate of rubella virus in pregnant women of Turkey are recorded (86.5%), (0.5%) for IgG and IgM respectively[11]. In Sweden, rubella seropositivity had (89 %) of all female and (93.4%) of the male donors tested [12].

Seroprevalence studies offer information on the susceptibility to infection of certain populations, including women of childbearing age [12]. Nonetheless, all of these studies refer to the same message: that some women of childbearing age may be susceptible to rubella given that CRS is a serious concern for rubella infection during pregnancy, immunity to rubella is of particular importance in post-young women. Consequently, it advises (i) taking any opportunity to evaluate rubella immunity in women of childbearing age (e.g., consultation with preconceptions), (ii) all pregnant people must be tested for their rubella serostatus, and (iii) prone adults must be vaccinated either preconception or postpartum due to removal from the hospital [13].

In this study only 12 (5 %) of cases were positive for IgM antibodies, that’s as rubella IgM typically declines the next 2-3 months post-infection [14], this result proposes that women positive for IgM can have an active infection by the virus. The specimen’s women of IgM positive and IgG negative reflects the occurrence of the new seroconversion (a new infection with rubella virus) or reinfection [15]. While those who exhibited IgG positive sera with negative IgM reflects those immunized or previously infected persons, which instituted the majority of the studied populations.

These differences in results among laboratory techniques that are used in this study (ECLIA, ELISA, The rapid onsite diagnosis method can be attributed to many chief factors such as its variance in the gray zone, cutoff, and the antigens that using in Complete virus assays (or recombinant antigens). In Iraq, many test procedures are used to identify persons whether or not they are contaminated or immunized with the rubella virus. The rapid onsite diagnosis method is used in private laboratories on a large scale and the Electrochemiluminescence method is used in the laboratories of government health centers and the ELISA method is used on a smaller scale.

The development of rapid and perfect laboratory competencies for the identification of pathogens is essential in the application of effective prevention and control strategies against infectious diseases [16]. Although much progress has been made in diagnostic testing such as that for the care of individual patients or the quick detection of pathogens during disease outbreaks, several of these testing modalities need a skillful operation and complex equipment, which has restricted their use for onsite testing [17].

According to the statistics of the Iraqi Ministry of Planning, central statistical organization; the population of Iraq is approximately thirty-nine 39 million in 2019. And by performing a calculation, 48% of the Iraqi population is female, this means nearly 18.7 million women in the Iraqi population, and 49% of these women are of childbearing age, which approximately 9.16 million women at childbearing age [18]. According to our study, 12.5% of specimens were negative for rubella IgG antibodies, that is, approximately 1.145,000 of Iraqi women are of childbearing age and at risk of contracting rubella virus and developing CRS. Taking into consideration that Iraqi women who become 32 years old or older were not immunized against rubella, as MMR schedule was incorporated into the Iraq National Immunization Program in 1988.

The results in a table (2) showed that only 8 from 240 specimens of pregnant women are rubella viral RNA positive with (3.33 %) percentage, while 232 specimens of pregnant women are rubella viral RNA negative with (96.66 %) percentage. The results in the present study were also consistent with the results of another study, the result has been reported by [19] showed only 6 (10.5%) were positive for Rubella virus by use RT-PCR test from 46 (80.7%) are positive by ELISA test. This negative result is very low concerning the positive result when measuring the samples depending on the presence or absence of rubella IgG and IgM antibodies. Where from 12 or 13 positive IgM results, which represent an acute infection, only 8 of them appeared positive in a way of RT-PCR. This result can be explained on the basis that the positive result with the RT-PCR technique appears only when the RNA of the virus is present in the sample.

A conclusion in a table (3) indicates the association between anti-rubella antibodies and abortion and the number of abortions. The total rate of abortion was 61.42 %. The rate of abortion number was 32.85 %, 15.71 %, and 12.85 % for one, two, and three abortions.
or more respectively. Furthermore, pregnant women that had a history of abortion with significant relation P< 0.05, however, the abortion frequency were had no more deferent recorded among pregnant women with a history of one abortion or more with non-significant relation P>0.05. The current study showed a significant relationship between the history of miscarriage and the presence of rubella antibodies (as shown in Table 3), 61.58% from the total seropositive pregnant women had a history of abortion. The miscarriage may be due to the effect of rubella on systemic and local (placenta) immunological response. There was non-significant relation (P>0.05) between the presence of rubella antibodies and the number of abortions, this finding may reveal the ability of the rubella virus to cause miscarriage only one time. This finding is consistent with the findings of most other studies that found a history of miscarriage and is significantly associated with rubella seropositivity[20,21].

Conclusion

Most women are seropositivity of rubella IgG. Rubella virus is presented as an etiologic factor for spontaneous abortion in this area of Iraq; therefore routine screening rubella is needed for pregnant women. This study limitation, future study including children and adolescents of various ages would allow the knowledgeable susceptible women and determine the outcome of the pregnancy and hazardousness of CRS in our province. The differences in results among laboratory techniques that are used in this study (ECLIA, ELISA, The rapid onsite) diagnosis method can be attributed to many chief factors such as its variance in the gray zone, cutoff, and the recombinant antigens that using in complete virus assays.

Conflict of Interest: None

Funding: Self

Ethical Clearance: Not required

References


Effect of Brochure Concerning to Early Postpartum Hemorrhage on Enhancing Nurses’ Knowledge and Practices

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Abstract

Aim: To investigate the effect of brochure concerning to early postpartum hemorrhage on enhancing nurses’ knowledge, practices and satisfaction.


Results: The result of the present study findings was highly significant improvement in total knowledge and total practical skills among the studied sample pre intervention compared to immediate and eight weeks post intervention. P= < 0.01 Additionally 83% among studied sample satisfied with the advanced knowledge included in the brochure.

Conclusion: The present study findings concluded that a significant improvement among studied sample’ knowledge and practices post intervention. Also the majority among the studied sample were satisfied the implemented brochure.

Recommendations: Nursing standards, protocols and guideline must be designed to enhance nurses’ knowledge, practices and satisfaction.

Keywords: Improving Nurses’ Practices, Early Postpartum Hemorrhage.

Introduction

A brochure is an informative paper document that can be folded into a template, pamphlet or leaflet. Brochures are promotional documents, primarily used to introduce services for decreasing maternal, fetal and neonatal morbidity and mortality from early Postpartum hemorrhage (PPH). Early postpartum hemorrhage is defined as blood loses over 500 ml or more from the genital tract within the first 24 hours post the vaginal birth of neonate. Incidence of early postpartum hemorrhage is accounting for a quarter of all maternal deaths. In total there are 14 million cases of hemorrhage occurred every year in association with pregnancy and childbirth. According to world health statistics 2015, every day, approximately 830 women died from preventable causes related to childbirth. Among 830 deaths occurs daily, 250 women are died due to early postpartum hemorrhage (PPH).(10) Causes of early postpartum hemorrhage can be explained by the 4T’s theory: Tone – Uterine a tony (70-90%), Retained tissue that was estimated for 6–10% of all cases, Trauma leading to 20% of all cases and coagulation defects that accounting for 1% of all early PPH mortality.(1) Furthermore, immediate complications of early postpartum hemorrhage are disseminated intravascular coagulation (DIC), Hypovolemic shock, severe anemia, clotting disorders, acute renal failure, sepsis, wound infection, pneumonia, venous thrombosis or embolism and acute lung injury, damage to the anterior pituitary gland may result in delay or failure of lactation as well as secondary infertility and
Less commonly myocardial ischemia\(^9\). Moreover, the successful management of early PPH must be focused on three components, medical therapy, Mechanical procedures and surgical therapy\(^4\). Nurses play a multidisciplinary role as a direct care provider, health educator and counselor, as a manager and as a researcher for patients with early postpartum hemorrhage.

**Significance of the Study:** In Egypt, especially in rural areas, postpartum hemorrhage (PPH) is still one of the main causes responsible for maternal morbidity and mortality. That’s it still needs a radical solution. Moreover, According to Damanhur teaching hospital statistics 2017, approximately, the incidence of early postpartum hemorrhage (PPH) was 12.5%. Furthermore, early postpartum hemorrhage (PPH) was the nursing concern because she plays a multidisciplinary role as a care giver for early detection, screening and referring patients with early postpartum hemorrhage to minimize maternal and fetal morbidity and mortality. No previous studies implemented brochure for early postpartum hemorrhage at Damanhur teaching hospital.

**Aim of the Study:** To investigate the effect of brochure concerning to early postpartum hemorrhage on enhancing nurses’ knowledge, practices and satisfaction.

**Research Hypothesis:** Nurses who received brochure about early postpartum hemorrhage has shown better knowledge, practices and satisfaction more than those who didn’t participated.

**Subject and Method**

**Setting:** The study was conducted at obstetric departments in Damanhur teaching hospital at Beheira Governorate.

**Study Design:** A Quasi-experimental (an intervention study) pre and post test

**Sampling:**

(a) **Size:** All nurses (44 nurses) who were working at obstetric departments and accepted to participate in study, at previously mentioned study setting.

(b) **Type:** purposive sample was included.

**Exclusion Criteria:**

1. Age less than 18 year and more than 40 years.
2. Working as an administrator nurse.
3. Education with Bachelor of Nursing.

**Tools of Data Collection:** Three tools were used by the researcher after reviewing the advanced related literature. All tools of data collection implemented pre intervention then immediate and eight weeks post intervention but satisfaction tool was implemented eight weeks post intervention only.

**First Tool:** Structured interviewing questionnaire schedule which included two parts: The first part: assessed nurse’s general characteristics (age, level of education, qualification, area of residence, years of experience and attendance of training programs).

The second part: assessed nurses’ knowledge regarding early postpartum hemorrhage. Which involved 14 multiple choice questions.

The knowledge scoring system was 2 score for correct answer and 1 score for incorrect answer. The total knowledge correct score was \((\geq 60\%)\) while, the total knowledge for the incorrect score was \((<60\%)\).

The second tool was an observational checklist: To assess nurse’s practices while providing patient’s care every 15 minute for the first four hrs with early postpartum hemorrhage. **Scoring system for an an observational checklist was evaluated as 2 score for correct practice and 1 score for incorrect practice.** The total correct practice was scored as \(\geq 60\%)\) while incorrect practice total scored as \(<60\%\).

The third tool was “Nurse Satisfaction tool” adopted from (Sayed, et al., 2015), and included two parts.

**First part:** Assessed nurses’ satisfaction regarding an instructional supportive guideline which involved eight statements. Upon which nurses respond as satisfied, dissatisfied and uncertainly satisfied.

**Second part:** Assessed barriers that prevent nurses to comply with implemented guideline while providing patient’s care which involved six statements. This was evaluated eight weeks post intervention.

**An instructional Supportive brochure** was designed by researcher according to nurses learning needs pre intervention based upon advanced related literature.

**Content validity and reliability:** All tools of data collections were developed and sent to three specialized university Prof. according to their comments, modification were considered.
Pilot Study: A pilot study was conducted for 10% from total number of sample to evaluate the simplicity and clarity of tools that was used in the study.

Field work or Operational design: The study was implemented through three phases included the preparatory, implemented and evaluation phase.

Phase one (preparatory Phase): The researcher was reviewed the current advanced national and international literature related to the study topic, then prepared tools for data collection and designed an instructional supportive brochure. Finally, pilot study was conducted.

Phase two (implementation phase): Firstly, the researcher was interviewed three nurses/day according to sequence of their attendance in hospital registration book and explain the aim of the study to obtain their oral consent. Interview was conducted in a separate place to maintain confidentiality of the study. (duration of each interview 20 min).

• Secondly, nurses' practices were assessed using an observational checklist, while they are providing patients care with early postpartum hemorrhage.

• Each day, two nurses’ practices were assessed from 9 Am to 9 pm.

• After the completion of assessment of nurses’ practices. An instructional supportive brochure was implemented through 10 sessions for each program for six months duration of each session was 20 minute, number of participant (6) nurse/each session. Three sessions for theoretical learning and seven sessions were implemented for practical training.

• Method of teaching were (group discussion, lectures, brain storming, demonstration and bed side teaching).

• Media were (lab-top computer, figures, flip chart as well as audiovisual aids (data show presentation) and role play.

Phase three (evaluation Phase): This phase was utilized to evaluate the effect of implemented brochure on enhancing nurses’ knowledge and practices among patients with early postpartum hemorrhage. All tools of data collection were used pre intervention then immediately and 8 weeks post intervention but the nurses’ satisfaction tool was used only eight weeks post intervention. Nurses’ practice was assessed on three patients three times then the mean was obtained for statistically analysis.

Results

Table (1): Frequency distribution according to the studied sample total correct and incorrect knowledge related to early postpartum hemorrhage pre, immediate and eight weeks post intervention. (n=40).

<table>
<thead>
<tr>
<th>Items</th>
<th>Pre-instructional supportive guideline</th>
<th>Immediate Post-instructional supportive guideline</th>
<th>Eight weeks post instructional supportive guideline</th>
<th>Friedman test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N  %</td>
<td>N  %</td>
<td>N  %</td>
<td>X² %</td>
</tr>
<tr>
<td>Correct</td>
<td>10 25</td>
<td>32 80</td>
<td>28 70</td>
<td>34.19</td>
</tr>
<tr>
<td>Incorrect</td>
<td>30 75</td>
<td>8 20</td>
<td>12 30</td>
<td></td>
</tr>
</tbody>
</table>

Table (2): Frequency distribution according to the studied sample total correct and incorrect practices related to early postpartum hemorrhage pre, immediate and eight weeks post intervention. (n=40).

<table>
<thead>
<tr>
<th>Items</th>
<th>Pre-instructional supportive guideline</th>
<th>Immediate Post-instructional supportive guideline</th>
<th>Eight weeks post instructional supportive guideline</th>
<th>Friedman test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N  %</td>
<td>N  %</td>
<td>N  %</td>
<td>X² %</td>
</tr>
<tr>
<td>Correct practical</td>
<td>12 30</td>
<td>30 75</td>
<td>25 62.5</td>
<td>32.74</td>
</tr>
<tr>
<td>Incorrect practical</td>
<td>28 70</td>
<td>10 25</td>
<td>15 37.5</td>
<td></td>
</tr>
</tbody>
</table>
Table (3): Frequency distribution according to the studied sample satisfaction eight weeks post intervention regarding the implemented guideline (n=40).

<table>
<thead>
<tr>
<th>Items</th>
<th>Satisfied</th>
<th>Uncertainly Satisfied</th>
<th>Unsatisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>The guideline enhances nurses’ practices.</td>
<td>33</td>
<td>82.5</td>
<td>4</td>
</tr>
<tr>
<td>Guideline language was clear and easily to be understood and effective.</td>
<td>32</td>
<td>80</td>
<td>6</td>
</tr>
<tr>
<td>The aim of the guideline was matched with its content.</td>
<td>28</td>
<td>70</td>
<td>7</td>
</tr>
<tr>
<td>The place of implementing guideline was comfortable with good ventilation and lighting.</td>
<td>31</td>
<td>77.5</td>
<td>8</td>
</tr>
<tr>
<td>Number of participant was suitable to the place of training.</td>
<td>27</td>
<td>67.5</td>
<td>9</td>
</tr>
<tr>
<td>The implemented guideline contribute to the development and updating nursing knowledge regarding early PPH.</td>
<td>30</td>
<td>75</td>
<td>8</td>
</tr>
<tr>
<td>Session time did not interfere with hospital working schedule.</td>
<td>22</td>
<td>55</td>
<td>12</td>
</tr>
<tr>
<td>Guideline was recommended to be replicated for another nurses and another setting in the future.</td>
<td>28</td>
<td>70</td>
<td>8</td>
</tr>
</tbody>
</table>

Table (4): Correlation between total knowledge and practices among studied sample related to early postpartum hemorrhage at pre, immediate post and eight weeks post intervention. (n=40)

<table>
<thead>
<tr>
<th>Item</th>
<th>Total practice at pre- guideline.</th>
<th>Total practice at immediate post - guideline.</th>
<th>Total practice at eight weeks post - guideline.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r</td>
<td>P- value</td>
<td>r</td>
</tr>
<tr>
<td>Total knowledge at pre- guideline.</td>
<td>0.452</td>
<td>.000**</td>
<td></td>
</tr>
<tr>
<td>Total knowledge at immediate post- guideline.</td>
<td></td>
<td></td>
<td>0.462</td>
</tr>
<tr>
<td>Total knowledge at eight weeks post - guideline.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(*) Statistically significant at p<0.05

Discussion

The present study was aimed to investigate the effect of brochure concerning to early postpartum hemorrhage on enhancing nurses’ knowledge, practices and satisfaction. This aim was significantly approved within the framework of the present study’s research hypothesis which was nurses who received brochure about early postpartum hemorrhage has shown better knowledge, practice and satisfaction more than those who didn’t participated. Concerning nurses’ knowledge related to early postpartum hemorrhage. The present study research findings revealed that, there was a highly significant improvement of nurses’ knowledge post intervention compared to pre intervention. The present study findings was agreed with(6) who found that there was significantly improvement of nurses’ knowledge post intervention compared to pre intervention because he found that educational programs (both booklet and education) for the prevention and management of early PPH led to significant improvements in the knowledge of obstetric nurses.

Also, the present study was agreed with(2) who illustrated that there was a highly significant improvement among nurses regarding total knowledge score post intervention compared to pre intervention. Furthermore, a study was conducted by(3). Who pointed out that, there was highly statistically significant difference between pre and post intervention among nurses’ knowledge regarding early PPH. This similarity may be due to their sample was from Egyptian community and the same culture.

Concerning nurses’ practices, the present study findings had revealed that a significant improvement in nurses’ practices immediately and eight weeks post intervention. This result is in line with(4) who found that
nurses had incorrect practice at pre intervention phase and highly improved immediately and three months post intervention. Additionally, this result is in the same line with the present study (6) who reported that a significant improvement in nurses’ practices regarding early PPH after implementation of brochure.

These findings point out the successful effect of implementation of brochure to maternity nurses as method for continuous updating and improved their knowledge and skills to promote and improve their competences. Thus, there is a clear role in continuing professional development activities of nurses which have ultimate reflection on improving patient’s care outcome.

Finally, it was observed from present study findings that highly significant relations between nurses’ knowledge and their practices. This because nurses’ knowledge was considered the base for their practices. This result was supported by (5), who had found highly significant association between obstetric nurses’ knowledge and their practices. As well (7), who reported that positive statistically significant correlation between the studied subjects’ knowledge score and their practices.

The present study findings had pointed out our attention toward the importance of implemented brochure because it was illustrated from the present study findings that there was a highly retention of study sample knowledge and practices eight weeks post intervention. This is due to the effectiveness and practicability of the implemented brochure. The majority nurses among studied sample were satisfied with the implemented brochure the majority had reported that the brochure language was easily understood and the aim was matched with its content. Also, the place of implemented brochure was comfortable with good ventilation and lighting.

Additionally, the implemented brochure contributes to the development and updating with advanced knowledge regarding early PPH and enhance nurses’ practices. Moreover, the majority among studied sample was suggested to replicate the present study brochure to other nurses in another setting in the future to enhance nurses’ knowledge and practices and the majority among nurses was highly satisfied with implementation brochure.

**Conclusion**

It was observed in the present study findings a highly significant on enhancing nurse’s knowledge, practices and satisfaction post intervention compared to pre intervention. Additionally, the majority among the studied sample was highly satisfied with the application of nursing brochure.

**Recommendations:**

- Hospital administrator must direct their attention toward relieving nurses from administrative work and to devote their time for nurses’ activities only.
- Design and implement monitoring system to evaluate nurses’ practices at obstetric department continuously.
- Designing nursing standards, protocols and brochure for all nurses at obstetric department.
- The present study, implemented brochure was recommended to replicate at another setting and on larger sample.
- Periodically planned pre service, in-service and on job training programs related to early post-partum hemorrhage.
- Further study investigates health team immediate intervention related to early Postpartum Hemorrhage at obstetric department.

**Ethical Clearance:** Taken from the Scientific Research Committee at the Faculty of Nursing, Ain Shams University.

**Source of Funding:** Self

**Conflict of Interest:** Nil

**Reference**

3. Hassan, S; M.E. A study of the effect of nursing intervention program on reduction of postpartum hemorrhage, Faculty of Nursing Menoufiya
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Effect of Injection of Hatching Eggs in Different Concentrations of Nano Silver at Age 17.5 Days of Embryonic Age in Some Histological Traits of Broiler Ross 308

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¹Lecturer, University of Babylon/DNA Research Center; ²Prof., Lecturer, University of Al-Qasim Green-College of Agriculture/Animal Production Department

Abstract

This study was conducted in the hatchery belonging to Al-Anwar Poultry Company, by injecting the hatching eggs at the age of 17.5 days from the age of the embryos with nano Silver, after that, and raised hatching chicks from the injected eggs in the field of poultry belonging to the Department of Animal Production, College of Agriculture, University of Al-Qasim Green for the period from 6/8/2017 until 9/9/2017, and after that the laboratory work was done, as it used 168 broiler chickens and was reared in cages 1 x 1.5 m, the chicks were randomly divided into seven treatments, and each treatment had three replicates, including each replicate of 8 chicks. Nano-silver was used by injecting it into the eggs in concentrations (0, 4, 6, 8, 10, 12, 14 ppm) for treatments (T1, T2, T3, T4, T5, T6, T7) respectively. The chicks were raised in the field for a period of 35 days, and in this study we reached the following results, a significant excelled (P<0.01) of the T3 treatment in the length and width of the villi in the Jejunum and the excelled of the two treatments T3, T7 in the depth of crypts of Lieberkuhn, and in the ileum there was a significant excelled (P<0.01) for the treatment T2 in the villi length, while the treatment T7 excelled in the villi width and the treatment T5 and T6 treatment was excelled in the crypts depth

Keywords: Broiler Ross 308, Nano silver, Histological traits.

Introduction

The poultry industry has recently witnessed multiple technologies, including nanotechnology, which is the study of materials on the Nano scale, where the size of the particles ranges between (1-100) nanometers4,11, where nanomaterial’s are distinguished in that they take up a very small area but it has relatively large surface areas, and as a result, when massive materials are reduced to Nano, their surface becomes chemically more effect and the physical properties of the material change without changing their chemical properties4. The expansion of the ratio of the surface area to the volume allows the nanoparticles to be more diversified and hence more frequent, as nanomaterial’s can be used alone or carrying other materials for the purpose of connecting them inside the body or coated with other materials21, and the nanoparticles have been used as diagnostic and therapeutic agents in the medical field Human for some time, although its application in veterinary medicine and animal production is still relatively new. In recent times, the demands for the production of nanomaterial’s and their uses in the poultry industry have increased due to the fact that the use of antibiotics as a treatment for disease infections of birds has become ineffective due to the increase in cases of bacteria resistant to antibiotics16 and this determines the need to find suitable alternatives, as the nanoparticles As a good antimicrobial to improve the growth of birds9. The sources showed that the injection of Nano-silver increased the immunity of the incubated chicks17,10,13,14 indicated that the injection of hatching eggs with Nano-silver promoted the absorption of yolk fat in embryos and stimulated growth and embryonic development where the Nano-silver is silver Nano is an anti against a large number of germs.2 also indicated that the injection of hatching eggs with silver nanoparticles at concentrations (12, 14, 16, 18 ppm) increased the length and width of villi, therefore the present study aims to know the effect of injecting hatching eggs at the age of 17.5 days from the age of embryos at different levels of Nano-silver in some
hatching traits and in the histological traits of the chicks hatched and determining the best level of injection.

**Materials and Method**

Salt solution (NaCl) was used in the preparation of egg injection solutions. A Nano-silver material was obtained from the Nanosany Corporation company (20nm) and morphological (spherical). Use 168 broiler chickens and raised in cages 1x1.5m. The chicks were randomly divided into four treatments. Each treatment included three replicates, each replicate included 8 chicks. Nano-silver was used by injection into eggs at concentrations (0,4,6,8,10,12,14 ppm) for treatments (T1,T2,T3,T4,T5,T6,T7) respectively, where hatching eggs were injected at the age of 17.5 days From the age of the embryos and injected (0.25 ml/egg).

**Feed Treatment:** The chicks were fed on the starter diet from the age of one day until the third week of the bird’s life, after that they were replaced by the final diet (finisher) until the end of the fifth week. Feed and water were provided in a free manner (ad libitum) and the diet used is as shown in the table below.

Table 1: Shows the percentages of diet components in the study and their chemical composition

<table>
<thead>
<tr>
<th>Feeding Materials</th>
<th>% Starter Diet</th>
<th>% Final Diet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow corn</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>Wheat</td>
<td>28.25</td>
<td>24</td>
</tr>
<tr>
<td>Soybean meal (48%protein)</td>
<td>31.75</td>
<td>24.8</td>
</tr>
<tr>
<td>Protein concentrate *</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Sunflower oil</td>
<td>2.9</td>
<td>4.4</td>
</tr>
<tr>
<td>Limestone</td>
<td>0.9</td>
<td>0.6</td>
</tr>
<tr>
<td>DCP Calcium Diphosphate</td>
<td>0.7</td>
<td>0.9</td>
</tr>
<tr>
<td>Salt</td>
<td>0.3</td>
<td>0.1</td>
</tr>
<tr>
<td>Mix vitamins and minerals</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td>General protein (%)</td>
<td>23</td>
<td>20</td>
</tr>
<tr>
<td>Calculated energy represented (kilo calories/kg feed)</td>
<td>3027</td>
<td>3195.3</td>
</tr>
<tr>
<td>Lysine (%)</td>
<td>1.2</td>
<td>1.1</td>
</tr>
<tr>
<td>Methioinine (%)</td>
<td>0.49</td>
<td>0.46</td>
</tr>
<tr>
<td>Cystine (%)</td>
<td>0.36</td>
<td>0.32</td>
</tr>
<tr>
<td>Methioinine+cysteine (%)</td>
<td>0.85</td>
<td>0.76</td>
</tr>
<tr>
<td>Available phosphorus (%)</td>
<td>0.45</td>
<td>0.49</td>
</tr>
<tr>
<td>C/P%</td>
<td>131.61</td>
<td>159.77</td>
</tr>
</tbody>
</table>

*BROCON-5 SPECIAL W protein concentrate: Chinese origin, each kg contains: 40% crude protein, 3.5% fat, 1% fiber, 6% calcium, 3% phosphorous available, 3.25% lysine, 3.90% methionine + cysteine 2.2% sodium, 2100 kcal/kg energy represented, 20,000 IU vitamin A, 40,000 IU vitamin D3, 500 mg vitamin E, 30 mg vitamin K3, 15 mg vitamin B1+ B2, 150 mg B3, 20 mg B6, 300 B12 mg, 10 mg folic acid, 100 mcg biotin, 1 mg iron, 100 mg copper, 1.2 mg manganese, 800 mg zinc, 15 mg iodine, 2 mg selenium, 6 mg cobalt, 900 mg antioxidant (BHT).** According to the chemical analysis of the diet according to NRC (15).

**Preparing the histological sections:** The two birds were slaughtered from each replicate. The tissue samples were taken for the shortest possible time period to ensure that the bird’s body tissue is not damaged. A section (2 cm) in length was taken from the second part of the small intestine (jejunum). The contents of the intestine were removed, all the sections taken with tap water were washed and the processes of preparing the histological sections were performed, according to him (16).

**Examination of histological sections:** The histological sections were examined using a compound-type Olympus BH2 of Japanese origin. The histological sections were imaged by a digital camera attached to a Lenovo computer. The small intestine (jejunum) were examined using an accurate ocular micrometer of 100x magnification for the purpose of recording measurements of the small intestine (villi length, villi width and crypts depth) in microns 10-3 mm, and used the stage micrometer for the purpose of Calibration of the Eyepiece according to what he mentioned (6). The villi length was measured from the top of the villi until its association with the villi mysteries, while the crypt depth was defined as the depth or distance of immersion between adjacent villi (3,8). As for the villi width, it was measured according to what he mentioned (3). It was measured from the middle of the villi height or from the curvature of the villi that divides the villi while (5) the villi width was estimated from the base of the villi, so the villi width was measured (3) by taking the average for the two readings, knowing that all measurements were made for (10) readings for each measurement and taking average.

**Statistical Analysis:** The statistical program (18) was used in data analysis to study the effect of different factors on the studied traits according to a completely randomized design (CRD), and The significant
differences between the averages were compared to the Duncan (7) polynomial test

Mathematical Model:

\[ Y_{ij} = \mu + T_i + e_{ij} \]

Results and Discussion

The length and width of the villi and crypts depth in the Jejunum and Ileum: Table (3) shows the effect of injecting hatching eggs with Nano silver on the length and width of the villi and the crypts depth in the Jejunum at the age of 35 days from the age of birds. While T3 treatment was significantly excelled (P<0.01) on villi length traits on the rest of the treatments followed by treatments T7 and T4, respectively. While treatment T2 excelled on the treatments T1,T5, and T6, while treatment T6 excelled on treatments T1,T5,while the T5 excelled on control treatment T1.As for the villi width, the T3 treatment continued to excelled, as P<0.01) significantly excelled on the rest of the treatments, while the T2 treatment was excelled on the T1,T4,T5,T6,T7 treatments, while the T4, T5 treatments were excelled on the T1,T6,T7 treatments. The T7 and T6 treatments were excelled on the control treatment T1 and there was no significant difference between the treatments T4, T5 and T6, T7 treatments. At the Lieberkuhn crypts depth, the T3,T7 treatments were significantly excelled on the rest of the treatments while the T5, T4, T2 treatments were excelled to the T1 and T6 treatments, and no significant difference occurred between T2,T4,T5 treatments, while the T6 treatments was excelled on treatments T1. In the Ileum, Table (4) showed a significantly excelled (P<0.01) in the villi length traits for the T2 treatment on the rest of the treatments and the T6, T7 treatments were excelled on the T1, T3, T4, T5 treatments and the T3 treatment was excelled on the T1, T4, T5 treatments, While treatments T5 was excelled on treatments T1 and T4,The T4 treatment was excelled on the T1 treatment. In the villi width,P7 treatment was significantly excelled on the T7 treatment, and the T2,T3 treatments were excelled on the T1,T4,T5 and T6 treatments, and the T4 and T6 treatment excelled on the T1 and T5 treatments. While the T5 treatment was excelled on the T1 treatment and in the crypts depth, the T5,T6 treatments were significantly excelled on the rest of the treatments, and the T3,T7 treatments were excelled on the T1,T2,T4 treatments, and the T2,T4 treatments on the T1 treatment (18) mentioned that nano-silver could affect the outer layer of the intestinal wall and consequently a change in the length and width of villi and depth of crypts also found (12) that feeding on nano-silver at a concentration of 5 mg/kg feed resulted in an increase of 11% in the average length And the width of villi and 7% in the depth of crypts and the reason may be due to the fact that nano-silver improved the intestinal environment and thus led to an increase in the length and width of villi and depth of crypts, This study agrees with(2), which found that the injection of hatching eggs with nanosilver at concentrations (12,14,16,18 ppm) improved the intestinal environment because it is a bacterial antagonist, it increases the length and width of villi and depth of crypts. The histological sections of the Jejunum region of the small intestine of different nano-silver injection treatments were studies, The results showed a significant increase in the length and width of villi and regularity of their forms, as well as an increase in crypts depth for injection treatments at the age of 35 days compared to the positive and negative control treatments (images 1-7), Also, the cellular activity in the intestine sections showed an increase through the multiplication of intestinal cells in the crypts region, as well as in the surface of villi, especially in injections with nano-silver at a concentration of (4 ppm), as another section appears in the Jejunum region to treat the injection with a concentration (6 ppm), which shows an increase in the width and regularity of villi, In the Ileum, we note the treatment of injections with a concentration of (8 ppm). The regularity of the villi forms appeared with the increase of their lengths and the appearance of cell propagation in the crypts of Lieberkuhn. As for the injections with a concentration of (10,12,14 ppm). The prolongation of the villi appears with its regularity and an increase in cellular activity in the crypts region. As for the control treatment, it is found that the length and width of the villi are varied and their forms are irregular. And the reason for the excelled of the nano-silver injection treatments to the control treatment may be that the nano-silver injection into the Amniotic fluid of the embryo is swallowed orally by the fetus in the last third of the incubation (19 days), which causes the activity of the gastrointestinal tract in general and the gut region and in the Jejunum, in particular, This led to an increase in the length and width of villi and an increase in crypts depth(1).
Table 2: The effect of injecting hatching eggs with nanosilver on the length and width of villi and crypts depth in the Jejunum for broilers.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Average±standard error (mm)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length of villi</td>
<td>width of villi</td>
</tr>
<tr>
<td>T1</td>
<td>8.07±0.12 f</td>
<td>1.59±0.05 e</td>
</tr>
<tr>
<td>T2</td>
<td>9.87±0.07 d</td>
<td>2.80±0.05 b</td>
</tr>
<tr>
<td>T3</td>
<td>11.45±0.05 a</td>
<td>3.15±0.03 a</td>
</tr>
<tr>
<td>T4</td>
<td>11.09±0.03 b</td>
<td>2.36±0.02 c</td>
</tr>
<tr>
<td>T5</td>
<td>6.53±0.03 g</td>
<td>2.27±0.05 c</td>
</tr>
<tr>
<td>T6</td>
<td>9.17±0.01 e</td>
<td>1.84±0.01 d</td>
</tr>
<tr>
<td>T7</td>
<td>10.56±0.04 c</td>
<td>1.87±0.01 d</td>
</tr>
</tbody>
</table>

Level of significance

** **

The averages that have different letters within one column differ significantly among themselves at the level of **(P<0.01). The T7,T6,T5,T4,T3,T2,T1 treatments are a control treatment without injection and injection, at concentrations of 14,12,10,8,6,4 of the silver nano solution, respectively.

A: The control treatment T1, Irregular length and width of villi are observed in Jejunum (hematoxylin and eosin tincture) 200x
B: treatment T2, regular length and width of villi are observed in Jejunum and the activity of the crypts region (hematoxylin and eosin tincture) 200x.
C: treatment T3, and an increase in cellular activity is observed in the crypts region in the Jejunum (hematoxylin and eosin tincture) 200x.
D: T4 treatment. It is noted that the length and width of the villi are regular and the cellular activity increases in the crypts region in the ileum (hematoxylin and eosin tincture) 200x.

Figure (1) The effect of treatments on some histological traits of Broiler Ross 308
Table 3: The effect of injecting hatching eggs with nanosilver the length and width of villi and depth of crypts in the Ileum of the broilers.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Length of villi</th>
<th>Width of villi</th>
<th>Depth of crypts</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>4.90±0.05 f</td>
<td>1.13±0.02 e</td>
<td>1.47±0.02 d</td>
</tr>
<tr>
<td>T2</td>
<td>9.33±0.03 a</td>
<td>2.19±0.01 b</td>
<td>2.54±0.03 c</td>
</tr>
<tr>
<td>T3</td>
<td>7.86±0.03 c</td>
<td>2.20±0.02 b</td>
<td>2.88±0.02 b</td>
</tr>
<tr>
<td>T4</td>
<td>6.01±0.08 e</td>
<td>1.82±0.02 c</td>
<td>2.51±0.06 c</td>
</tr>
<tr>
<td>T5</td>
<td>7.05±0.10 d</td>
<td>1.61±0.01 d</td>
<td>3.14±0.01 a</td>
</tr>
<tr>
<td>T6</td>
<td>8.51±0.05 b</td>
<td>1.86±0.03 c</td>
<td>3.12±0.01 a</td>
</tr>
<tr>
<td>T7</td>
<td>8.64±0.01 b</td>
<td>2.46±0.02 a</td>
<td>2.89±0.04 b</td>
</tr>
</tbody>
</table>

Level of significance: **(P<0.01)**

The averages that have different letters within one column differ significantly among themselves at the level of *(P<0.05)* and ***(P<0.01)**. The T7, T6, T5, T4, T3, T2, T1 coefficients are a control treatment without injection and injection, at concentrations of 14, 12, 10, 8, 6, 4 of nanosilver solution, respectively.

Figure (2) The effect of treatments on some histological traits of Broiler Ross 308
Conclusions

It can be concluded from the experiment to add different concentrations of nano Silver concentrations (0,4,6,8,10,12,14ppm) at age 17.5 days of embryonic age. A significant effect in improving some histological traits of Broiler Ross 308, We recommend using other nanomaterials and injection them at different ages of the hatching eggs and knowing their effect on some histological traits of Broiler Ross 308.

Conflict of Interest: None

Funding: Self

Ethical Clearance: Not required

References
14. Lane Pineda, André Chwalibog, Ewa Sawosz, Anna Hotowy, Jan Elnif, and Filip Sawosz.. Investigating the Effect of In Ovo Injection of Silver Nanoparticles on Fat Uptake and Development in Broiler and Layer; J.Nanotechnol. 2012. 8,02-786.
Targeting Gut Microbiome and the Recovery of Muscle Loss Associated with Cancer (Cachexia): An Overview of the Possible Effect of Bee Products

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Abstract

Current research emphasizes the contribution of gut microbiome to numerous health conditions including cancer and skeletomuscular disorders. Cachexia is a debilitating condition of progressive loss of body tissues. It occurs in up to 80% of patients with tumors, and it impairs their functioning and quality of life and increases morbidity and premature death. Several randomized trials indicate that interventions, which target gut microbiome can correct and revert tissue loss in aged people. However, less is known about the effect of such strategies in cachectic muscle loss. This report briefly sheds the light on the role of gut-muscle axis in cachexia and demonstrates few examples on interventions addressing gut microbiome and their effect on cachectic muscle. It also speculates the literature for the skeletal muscle-promoting activity of bee products, particularly bee honey and propolis (which are quite handy), within the context of cachexia. Implications for future studies are discussed.

Keywords: Bee honey, cachexia, cancer, gut microbiome/microbiota, gut-muscle axis, probiotics, propolis, skeletal muscle loss.

Introduction

Overview of Cachexia: Excessive unintentional weight loss is a common feature of neoplastic disorders. Cachexia is a syndrome characterized by progressive weight loss due to tissue loss that involves fat and non-fat components of the body. It occurs in 50–80% of cancer patients.1-3 Cachexia increases sense of fatigue, alters patients’ functioning, decreases mobility, threatens their wellbeing and quality of life, and heightens morbidity. Cachexia is a direct cause of mortality in 20% of cancer patients while cachectic patients with neoplasms exhibit a one-year mortality rate of 80%.2

There is less agreement on the definition of cachexia, and several models have been proposed (Table 1). The common feature among all the available classifications is unintentional weight loss.4,6 According to a proposal set by the SCRINIO Working Group, unintentional loss of 10% or more of body weight is sufficient to diagnose cachexia in cancer patients.5 Fearon and others defined
cachexia as either weight loss >5% within the last 6 months, weight loss >2% along with a body mass index < 20 kg/m², or fat free mass index < 14.6 and 11.4 kg/m² for men and women, respectively. According to Evans and colleagues cachexia diagnosis is based on weight loss and low body mass index, in addition to the presence of 3 of 5 criteria: fatigue, anorexia, muscle wasting, muscle weakness, and abnormal biochemistry including high levels of inflammatory markers e.g., c-reactive protein or anemia indicated by low hemoglobin level.

Table 1. Different classifications of cachexia.

<table>
<thead>
<tr>
<th>Cachexia classifications</th>
<th>Diagnosis criteria</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCRINIO Working Group</td>
<td>Unintended weight loss ≥ 10% from habitual weight.</td>
<td>5</td>
</tr>
<tr>
<td>Fearon and colleagues</td>
<td>Unintended weight loss&gt;5% within the last 6 months or weight loss &gt;2% along with a BMI &lt; 20 kg/m² or fat free mass index &lt; 14.6 and 11.4 kg/m² for men and women, respectively.</td>
<td>6</td>
</tr>
<tr>
<td>Evans and colleagues</td>
<td>Unintended weight loss ≥ 5% within the last year or BMI &lt; 20 kg/m² plus 3 of these criteria: anorexia, muscle weakness, fatigue, fat free mass index &lt; 17.0 and 15.0 kg/m² for men and women, respectively, disturbed biochemistry e.g., serum albumin &lt;32 g/L, or c-reactive protein &gt;5.0 mg/L or hemoglobin&lt;12 g/dl.</td>
<td>4</td>
</tr>
</tbody>
</table>

The mechanism of cachexia: The dynamic of cachexia is multifaceted. The immune system of individuals with neoplasms is continuously activated, which is associated with high production of pro-inflammatory cytokines and free radicals. Tumors also induce major alterations in the cellular antioxidant system in host tissues. Disturbed redox and high levels of cytokines accelerate the activity of molecules involved in proteolysis and lipolysis. In fact, cumulative evidence attributes the progressive nature of muscle loss occurring in cachexia to excessive accumulation of factors that negatively regulate protein turnover in skeletal muscle. Common molecules that derive muscle atrophy in cachectic muscle include atrogin-1, ubiquitin-proteasome system, muscle ring finger-1, myostatin, etc.

Anorexia and decreased food intake experienced by most cancer patients is a major contributor to cachexia. On one hand, low food intake decreases body supply with nutrients necessary for cellular function, which promotes break down of proteins and lipids in major stores in the body (e.g., skeletal muscle) as an alternative source of energy. Thus, inadequate protein intake promotes muscle wasting. Therefore, cachexia is associated the development of malnutrition and other wasting disorders e.g., sarcopenia and frailty. On the other hand, improper dietary supply evokes major alterations in the structure of the resident intestinal flora.

A wealth of studies reports a strong causal relation between gut microbiome and pathologies contributing to many serious disorders such as cancer, obesity, insulin resistance, depression, major neurodegenerative disorders such as Alzheimer’s disease and Parkinson’s disease and even the current coronavirus disease 2019. What is common between all these conditions is that ingestion of pathogenes, toxins, and unhealthy food such as food high in fat and low in fiber promote the growth of toxic intestinal microbes and limit the growth of beneficial bacteria. Metabolites of toxic bacteria cause local insults to the gut (permeability or dysbiosis) and pass to the systemic circulation where they reach many organs and trigger gene mutations that support pathogenesis. Recent studies confirm the presence of a strong association between gut microflora and skeletal muscle wasting, which is mediated by numerous physiological alterations that promote muscle protein degradation such as insulin resistance as well as increased production of free radicals and inflammatory mediators in skeletal muscle (Figure 1). These studies strongly suggest the presence of a gut-muscle axis.

Generalized wasting and muscle weakness associated with cachexia lead to serious functional decline, general weakness, exhaustion, and promote inactivity. Limited physical activity promotes extra muscle loss via multiple mechanisms involving gut microbiome alteration, oxidative stress, and metabolic...
dysfunction. In addition, refeeding attempts through the use of amino acids fail to counteract anabolic resistance (i.e., increase protein synthesis) under conditions of low physical activity.

**Targeting cachexia through gut promoting interventions:** The literature shows that dietary proteins and amino acids promote muscle protein synthesis during early stages of muscle atrophy, which is associated with preservation of body tissues. However, cachectic individuals respond poorly to refeeding. In other words, cachectic muscle mass does not increase with increasing dietary intake of proteins. In the meantime, treatment options for people with cancer-induced cachexia are quite limited, and treatment effects are rather discouraging, which entails poor quality of life in this group of patients.

Gut bacteria represent a major factor in anabolic resistance since pathogenic ones degrade amino acids and impede the delivery of amino acids to skeletal muscle in order to trigger muscle protein synthesis. Experimental evidence shows that the development of cancer alters the composition of microbiome of the gut by promoting flagellated pathogens, which boost the production of inflammatory cytokines and reactive oxygen species resulting in cachexia. The classical phenotype of cachexia associated with tumors involves reduced levels of *Lactobacillales* and propagation of *Enterobacteriaceae* and *Parabacteroides*. Experimentally, blocking activin receptors, which regulate the continuously occurring turnover of the epithelial membrane of the gut, could not correct cancer-induced alterations in gut microbiota. However, cumulative knowledge denotes that manipulation of the gut microbiota through fecal microbiota transplant as well as prebiotics and probiotics may treat cachexia in laboratory animals.

**Figure 1.** Schematic illustration of the contribution of gut alterations to muscle loss along with the protective role of interventions that target microbial community in the gut.

Probiotics have been increasingly used in the last few decades as a treatment approach that involves implanting live microorganisms in specific doses e.g., *Lactobacilli* and *Bifidobacteria*. “Prebiotics” is a closely related approach, which involves nutritional modifications that nurture beneficial gut microflora. Health-promoting species of gut microbiome contribute to health of the host by activating xenobiotic metabolism system, stimulating mucosal immunity (secretory IgA), inhibiting the growth of endotoxic bacteria, enhancing the expression of mucin, which promotes stability of the mucosal barrier, and synthesizing beneficial substances e.g., short-chain fatty acids, amino acids, antioxidants, and vitamin K.
Evolving knowledge denotes effectiveness of probiotics in the treatment of muscle wasting in cachectic animal models. Oral consumption of probiotics containing *lactobacillus* (*L.*) *reuteri*, *L. gasseri*, and *L. plantarum* by cachectic mice was associated with restoration of the normal structure and balance of bacterial phyla in the gut as well as with less intestinal permeability. Accordingly, circulating levels of toxic bacterial metabolites dropped resulting in significant reduction in the production of inflammatory mediators and negative regulators of muscle protein turnover such as Atrogin-1, MuRF1, LC3, Cathepsin L, and negative regulators of muscle protein turnover such as Atrogin-1, MuRF1, LC3, Cathepsin L in the gastrocnemius and tibialis muscles. It is noteworthy that not all lactobacillus species can affect microbiota of the gut in a fashion that allows suppression of the activity of molecules involved in muscle atrophy. For instance, treating cachectic rats with *L. acidophilus* could not inhibit inflammatory responses in skeletal muscle or prevent muscle atrophy. In addition, successful administration of probiotics is rather challenging since secretions of the upper gastrointestinal tract e.g., gastric and pancreatic secretions contribute to the damage of a considerable portion of externally administered probiotic bacteria, especially when administered in a free form.

Research reports limited diversity of gut microbiome in people with musculoskeletal dysfunction such as frailty and cachexia. People with altered gut-microbiome profile express nutritional deficiencies and higher production of inflammatory markers. Healthy foods represent a major source of amino acids and prebiotic dietary elements, which can modify the structure of gut microbiome and promote its diversity. Evidence denotes that around 35% of lactic acid bacteria in fresh fruits and vegetables can successfully survive gastric conditions and reach the intestine.

Bee honey contains a variety of health-promoting lactic acid bacteria e.g., *Bifidobacterium*, *Fructobacillus*, and *Lactobacillaceae*. These bacterial species demonstrate strong antimicrobial activity even against the most antibiotic-resistant pathogens. Moreover, honey’s high contents of phenolic acids and internal hydrogen peroxide inhibit the growth of endotoxic bacteria in the gut. In fact, honey is considered a full food, which is consumed by bee workers during winter where foraging decreases or stops. It is rich in carbohydrates, proteins, amino acids, vitamins, flavonoids, and oligosaccharides. The latter function as prebiotics, which promote the growth of healthy intestinal microflora such as *Bifidobacterium*.

Propolis is a multifunctional bee product that bee workers produce by mixing their saliva and bee pollen with plant exudates they collect from various plants. Propolis is rich in more than 400 bioactive compounds, including phenols, flavonoids, amino acids, vitamins, and trace elements. It expresses several pharmacological activities such as being an antioxidant, anti-inflammatory, anti-aging, anti-microbial, anti-cancer, anti-lipidemic, immunomodulatory, etc. Owing to its countless bioactivities, propolis is widely used as a dietary supplement to promote health and well-being.

Bee products such as honey were reported to hinder skeletal muscle wasting and promote weight gain, body fat, and nitrogen contents in cachectic rodents with Walker 256 carcinoma, which mimics the human neoplastic syndrome. These effects were achieved via a multidimensional mechanism that involves attenuation of chronic inflammation, oxidative damage, and catabolism. A mixture of honey and *Aloe vera* (*L.*) *Burman* modulated the antioxidant system in rats injected with tumors. Antioxidant enzymes such as super oxide dismutase (SOD) and catalase represent the first defense against oxidative stress where SOD catalyzes the dismutation of the superoxide anion (*O*₂) into oxygen and hydrogen peroxide (*H*₂*O*₂) while catalase subsequently converts them into water and oxygen. Honey also downregulated calcium-dependent protein degradation pathway, a key contributor to cell death in cachectic muscle, by modulating the activity of its upstream effector, cysteine protease calpain. It also decreased the chymotrypsin-like activity in the gastrocnemius muscle. The chymotrypsin-like activity corresponds to the catalytic core of the 20S subunit of the ubiquitin–proteasome pathway, which is considered the most important pathway for intracellular protein degradation under catabolic conditions. Likewise, a combination of grape seed polyphenols and propolis, also known as bee glue, attenuated the production of proinflammatory cytokines and corrected muscle wasting in cachectic rats with chronic adjuvant-induced arthritis. Positive effects occurred in animals on continuous low doses compared with animals receiving five different high doses—signifying that correction of cachexia requires chronic treatment. Although the effect of honey and propolis on gut microbiota was not examined in these studies, the contribution of these bee products to the resident microflora could not be excluded. This is because honey and propolis were orally consumed,
and there’s a probability that they expressed their strong antimicrobial activity in the gut, at least in part, leading to gut healing and repair.

Honey is reported to modify gut microbiome in constipated mice, mice with ulcerative colitis, and human intestinal microbe culture. Experimental evidence shows that honey promotes the growth of health promoting species such as indigenous Bifidobacterium in cultures from human colon while co-administration of bee honey with probiotic Bifidobacterium prevents the destruction of these bacteria by gastric secretions allowing a large number of cells to reach the intestine to produce their health-inducing activity. In the same way, propolis, which expresses bioactivities similar to those of honey, can positively alter the structure of gut microbiome. For instance, diabetic rats receiving propolis extracts exhibited increased growth of beneficial bacterial species in the gut. This effect was associated with increased production of health-promoting bacterial metabolites (e.g., short chain fatty acids) and levels of tight junction proteins in the ileum denoting correction of gut dysbiosis. Accordingly, levels of fasting blood glucose and glycosylated hemoglobin significantly dropped while glucose tolerance and insulin sensitivity index remarkably increased. It is well-known that glucose-metabolism dysregulation is a key contributor to skeletal muscle loss in diabetes. The mechanism involved entails impairment of protein anabolism in muscle fibers and alteration of the structure of blood vessels resulting in less blood supply to skeletal muscle. Moreover, propolis is reported to correct gut microbiome in rodents on high-fat-diet (HFD). HFD creates pathogenic patterns of gut microbiome involving colonization of bacteria that promote intestinal aberration and promote inflammation and multiple dysfunctions in various remote organs including skeletal muscle, a condition known as sarcopenic obesity—muscle loss along with high fat mass. Interestingly, modifications in gut microbiome induced by propolis were associated increased muscle mass in treated animals.

Bee products, although distinct in their composition and pharmacological activities, share some of their composition and bioactivities. The effect of bee products on gut microbiome has been examined in many studies including cancer samples. In this regard, trans-10-hydroxy-2-decenonic acid (10-HDA, also known as queen bee acid or royal jelly acid) expressed strong antimicrobial activity against numerous pathogenic bacterial species in human cancer colon cells. In addition, 10-HDA is considered a strong anti-inflammatory and anti-oxidant agent, which demonstrates protective effects against skeletal muscle wasting by modulating muscle metabolic functioning and glucose uptake.

To our knowledge, natural honey and propolis are the only bee products known to restore cachectic muscle. In the light of the presented literature, the current article sets a number of questions that worth investigation in future studies: do honey/propolis improve muscle loss in cachexia through modulation of gut microbiome? If so, what is the exact nature of change e.g., in terms of microbial phyla affected, change in bacterial metabolites, repair of gut dysbiosis, and signaling cascades involved in oxidative and inflammatory reactions both locally in the gut and in skeletal muscle? What constituents of honey/propolis are likely to therapeutically affect gut microbiome? Are other bee products (e.g., bee venom, bee pollen, royal jelly, and their key constituents) capable of improving metabolic gut microbiome composition and correcting metabolic and inflammatory dysregulations in cachexia? If so, what are the most muscle promoting agents among all bee products? Accordingly, further investigations of the role of such natural products in cachectic models would promote the development of successful randomized trials in the future.

**Conclusion**

Use of probiotics and multifunctional foods such as bee honey/propolis is likely to decrease muscle atrophy in cachectic models. Probiotics improve muscle condition by altering gut microbiome structure. Although honey/propolis decreased systemic inflammation and improved skeletal muscle mass in cachectic rodents, their effects on the composition and functionality of gut microbiome were not examined yet, which worth investigation in future studies. Evaluation of the effect of other bee compounds (e.g., bee venom, royal jelly, and bee pollen) on cachectic muscle is also necessary for identification of the most effective substances.

**Conflict of Interest:** None.

**Funding:** This work was not supported by any source of fund.

**Ethical Clearance:** Not required.

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Optically Sensing for Thyroid Profile Hormones in Blood

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Abstract

Optical biosensors present great characteristics compared to traditional analytical techniques because they allow direct, realistic, and label-free detection of many biological and chemical materials. Thyroid hormones are created by the thyroid gland, which is found in the abdomen of the thyroid cartilage. Thyroid hormone governs metabolic processes necessary for normal outgrowth and evolution in addition to regulating metabolism in adults. It is established that the condition of the thyroid hormone is related to body weight and energy disbursement. This work using a single-mode tapered fiber biosensor to detect changes in the level of thyroid hormone by measurement of the intensity changing with the concentration of hormone by using a diode laser (450 nm) wavelength as an optical source, the single-mode tapered fiber as the sensor connected with ocean (HR 2000) spectrum analyzer by an adapter and finally connected to the pc to show the result. The lowest intensity of transmitted light recorded with a higher concentration of the hormone because of the high matching and specific selection of laser wavelength with the structure of the thyroid hormone in which give the specific amount of the hormone present in the sample. Thyroid hormone can be detected by using a laser biosensor. The higher concentration of thyroid hormone referred to the lowest intensity of light.

Keywords: Optically sensing, thyroid profile, hormones.

Introduction

Thyroid hormone governs metabolic processes necessary for normal outgrowth and evolution in addition to regulating metabolism in adults. It is established that the condition of the thyroid hormone is related to body weight and energy disbursement. Hyperthyroidism, promotes excessive metabolic status characterized by increased energy consumption during rest, weight loss, low cholesterol levels, increased fat decomposition, and glucose formation. On the contrary, hypothyroidism, low levels of thyroid hormone, is associated with a lack of metabolism which is characterized by low resting energy consumption, weight gain, increased cholesterol levels, low-fat degradation, and reduced sugar development. TH catalyzes both lip formation and fat decomposition, although TH levels are high, the net effect is fat lack [¹].

The core volume of single-mode fiber is little. The size of the core (diameter) is usually about 8 to 10 micrometers (µm). The core of fiber of that volume is allowed only to place the platform or minimum to spread around the wavelength of 1300 nm (nm). Single-mode fibers are spread in only one mode because the base size approaches the operational wavelength (λ). This is accomplished using lasers as a source of light [²]. The primary refraction coefficient can be referred to as n, which is larger than the n cladding refraction coefficient. The little diameter of the nucleus lets the transfer of one position of the light. No dispersion, no degeneration of the signal transmitted through the fiber, low attenuation due to the number of waves spreading along with the core of the fiber giving the signal ability to spread over long distances and faster. As shown in figure (1)

![Figure (1): Schematic_configuration of (single mode–multimode single mode fiber) structure](image)
Optical biosensors present great characteristics compared to traditional analytical techniques because they allow direct, realistic, and label-free detection of many biological and chemical materials. Its features include high privacy, sensitivity, little size, and cost-effectiveness [5]. Biochemical processes play a very important role in medicine, biology, and biotechnology. However, it is very rough to convert biological data directly into an electrical signal, biosensors can transform these signals and biological sensors to this difficulty. In recent years, thanks to improved technologies and devices, the use of these products has increased [6].

While sensors have himself group of components: light sources and optical fiber to direct light between them and the optical detectors. So Understanding the principle of the action of different fiber optic sensors, it is important to find out the optical components used [7]. The study aimed to assess of the level of concentrations of thyroid hormones (Thyroid-stimulating (TSH) and thyroxin (T4) & Triiodothyronine (T3)) by using a single-mode optical sensor (SMF) as a new method.

**Material and Method**

**Sample Collection:** Ten ml was taken from the blood sample of each patient, each sample then centrifuged to get serum and this serum is divided into two parts, each part is five ml, the first part is used for manually detection of (T3 and T4 and TSH) by using Vida’s device, the other part (5 ml) is used for detection the three hormone (T3, T4, and TSH) by using a single-mode optical sensor (SMF).

**Biological Measurement:** The levels of serum thyroid hormone (T3, T4, TSH) were measured by Vida’s device is an automated quantitative test for use on Vida’s family instruments for the quantitative measurement of total thyroid hormone (T3, T4, TSH) in human serum (lithium heparin) using the ELFA technique (Enzyme-Linked Fluorescent Assay).

**Fabrication of SMF:** A (30 cm) long fiber sensor is considered a traditional optical fiber cut a length of about (2 cm) in the middle of the fibers using a cut Make grooves on each side. The buffer was removed byways of dipping the pieces in 40% acetone concentration for (30 minutes). Washed with distilled water. to get rid of impurities and clean it well. A part of the fiber is immersed in pure hydrofluoric acid (HF) 40 %. to remove the cladding of the fiber, in a (10-minutes) setup and then washed with distilled water. The full fibers (30 cm), was put in the aplastic device using an adhesive silicone. The ends of the fibers are connected to a transformer device. The terminal tools are connected to optical fibers by optical fiber connectors. Splicing has been used to Join two organized fibers to form an unending optical waveguide. The first end is connected to a laser exporter (blue diode laser) and power supply. Diode laser, (450) nm wavelength, and an output power<50,000 MW was used. The Laser wavelength matches the absorption peaks of the three thyroid hormones (T3, T4and TSH). So it connected to a stable power supply. This laser was selected depending on the absorption spectra of the hormones which were measured by using a spectrophotometer. Another part is connected it is a spectrum analyzer (ocean HR2000) to get an intensity signal.

Optical Spectrum Analyzer (Ambient Optics HR2000) with accuracy (0.035 nm) of high wavelength and works at a wavelength of (200-1100 nm), and connects the spectrometer Via a USB port or serial port to a laptop or desktop computer.

<table>
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<th>Types of thyroid hormone</th>
<th>Standard Concentration n mol/L (Measured by Vida’s Device)</th>
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<td>T4</td>
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<td>TSH</td>
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Table [2]: Samples concentration and intensity.

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<th>Intensity in single mode fiber (SMF) biosensor</th>
<th>T4</th>
<th>Concentration of T4 n mol/L (Measured by Vida’s Device)</th>
<th>Intensity in single mode fiber (SMF) biosensor</th>
<th>T3</th>
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Assess variation in thyroid hormone level by using a single-mode fiber optical biosensor. As shown in figures (2,3,4)

![Figure (2) T3 specimen and stander Intensity peak in SMF](image-url)
Figure (3) T4 specimen and stander Intensity peak in SMF

Figure (4) TSH specimen and stander Intensity peak in SMF
Results and Discussion

Tables 1 and 2 show the concentration of the standard hormone which obtained from the ELFA kit and the concentration of the hormone after using the ELFA technique (Enzyme-Linked Fluorescent Assay). Method and the intensity of each concentration obtained from the optical biosensor. From the result inverse relationship between the concentration and the absorbance intensity, the highest the intensity was in the lowest concentration and that indicates the low amount of thyroid hormone present in the serum and because of the specific absorbance and high matching in the 450 nm wavelength for thyroid hormone we could know the specific amount of the hormone in the sample by using the Single-Mode Fiber sensor and this agrees with the manufactured one sensor using type of fiber (SMF) for detection some on types of female hormones (LH) by using a diode laser (blue) at a wavelength (450um) as a source of light. This agrees with where she manufactured one sensor using Mach-Zehnder interferometer (MZI) for detection of the hemoglobin concentration in human blood was designed by Green laser with a wavelength of 532 nm and input power of 12.2 nw has been used as a source of light.

Conflict of Interest: None

Funding: Self

Ethical Clearance: Not required

Conclusion

Use a single-mode optical fiber sensor with a laser source (450 nm) to detect the thyroid hormone level. From the result of the study, we found that the maximum laser intensity indicates the lowest concentration of the hormones. A sensor is most accurate, with a rapid diagnosis, less costly method than the method.

References

Association between Nitric Oxide (Sputum Induction and Asthma Control Level on Asthma Outpatients

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Abstract

Background: Asthma is a heterogeneous disease with chronic inflammatory characteristics of the respiratory tract. (Nitric Oxide) (NO) levels increased significantly in patients with inflammation such as asthma in this study. Nitric Oxide (NO) levels in normal people and asthma patients are different, but no sputum of Nitric Oxide (NO) levels are associated with asthma control levels.

Method: Thirty-patients consecutive sampling was conducted at asthma unit Dr. Soetomo Teaching Hospital Surabaya. The subjects were met the inclusion and exclusion criteria that assessed their asthma control with asthma control test (ACT) then measured by NO levels.

Results: In this study, the subjects were divided into asthma control level; full-controlled was 4 subjects (13,3%), partially-controlled was 8 subjects (26,7%), and uncontrolled was 18 subjects (60,0%). The mean asthma control level was 18.3±4.2 with the lowest Asthma control test (ACT) score was 8 and the highest ACT score was 25. The mean NO sputum induction level was 92.043±29.040 μM, with the lowest NO was 14.566 μM and the highest NO was 138.350 μM. The result of the statistical test showed a negative correlation significantly between NO-induced sputum level and asthma control level (p <0,05).

Conclusion: The examination of NO sputum level could be used as an indicator in determining the level of asthma control.

Keywords: Asthma, nitric oxide, induced sputum levels, asthma control level, asthma control test score.

Introduction

Asthma is a heterogeneous disease with chronic inflammatory characteristics of the respiratory tract. This diagnosis is based on a history of respiratory symptoms such as wheezing, shortness of breath, heavy chest, and cough with long and intense time, along with the limitation of expiratory airflow.(1) An estimated 300 million people worldwide are suffering from asthma.

The rates of global prevalence of asthma was 1% to 18% over various countries(1), it mentioned that asthma prevalence was 4%(2) (Basic Health Research data In Indonesia 2007). Although asthma was not the main cause of death the impact of illness on asthma causes work productivity to decrease due to absent from work or school. Mortality rates in asthma increase steadily over the time(3). The 1986 Household Health Survey (QRT) showed that asthma ranked fifth out of ten causes of morbidity along with chronic bronchitis and emphysema(4).

Diagnosis and monitoring of asthma are performed based on clinical symptoms, the degree of respiratory tract obstruction and bronchial hyperactivity. The clinical symptoms reported by the patient depending on the patient’s perception and subjective, also the degree of respiratory tract obstruction that detected

DOI Number: 10.37506/mlu.v21i2.2669
by the measurement of the expiratory peak (APE) or the first forced velocity (VEP1). Whereas, bronchial hyperactivity could be detected by stimulation (bronchial challenge test) such as histamine or methacholine and measure the function of the lung phase thereafter. International Guidelines recommend assessment of APE series or spirometry to establish the diagnosis of asthma.\(^{(3),(4),(5),(6)}\)

Nitric oxide (NO) plays an important role in the physiological function of the and as an indicator of respiratory tract inflammation. NO could be detected in the animal expiratory air. Some studies advocate NO assessment of expiratory air which is a non-invasive inflammatory marker in asthma. Mild asthma patients often provide normal values in VEP1, thus NO expiratory and sputum airborne measurements are proposed as noninvasive testing to assess respiratory tract inflammation in asthma. Bronchial challenge test for methacholine or histamine is a measure of bronchial hyperactivity, but it is difficult to assess the degree of inflammation.\(^{(6),(7),(8),(9),(10)}\)

Research on the measurement of nitric oxide (NO) levels began to grow wider and NO levels increased significantly in patients with inflammation such as asthma.\(^{(8),(9)}\) Administration of corticosteroids lowering the NO levels in asthmatics and in air expiration that showed the correlation of the degree of respiratory tract hyperelastic and the number of eosinophils sputum. Thus, it could be used as a marker of respiratory tract inflammation and plays an important role in diagnosing asthma.\(^{(7)}\) 15 people with asthma and 10 normal people get NO sputum rate of asthma patients was higher than control (p <0.01).\(^{(11)}\) In another study from 23 samples studied, higher NO sputum levels were found in asthma compared to control (p <0.01).\(^{(12)}\) The Normal NO value of sputum is set 502 μmol/L with a standard deviation of 41413. The half-life of NO in the tissue is very short (about 1-5 seconds), the direct NO test is not easy to do so the examination is performed indirectly using Griess reaction.\(^{(13)}\)

Further research suggests that Nitric oxide (NO) levels of expiratory or sputum air could be used as a tool to monitor respiratory tract inflammation and assess whether asthma is controlled or no\(^{(7),(8),(9)}\). Although it is known that NO levels of normal people and asthma patients are different, NO sputum levels are associated with asthma control levels, especially in Dr. Soetomo Teaching Hospital, Surabaya Indonesia. Based on this background, then through this research, it will be examined about the correlation between induced sputum NO and asthma control level in asthma patients.

**Method**

This type of research was observational analytical cross-sectional. Research samples that met the inclusion criteria were; Patients who had diagnose bronchial asthma and control routinely in Asthma Unit/chronic obstructive pulmonary disease (COPD) Dr. Soetomo Teaching Hospital, Surabaya Indonesia (Age >15 y/o), do not consume food and drink containing nitrate 1 hour before nitric oxide (NO) test, Inhaled steroid users, Willing to participated the research also sign informed consent.

Materials needed consisting of sputum induction were 3% NaCl, 0.1% DTT (dithiothreitol), phosphate-buffered saline solution, Eppendorf tube, sputum pot, and filter paper. Data analysis using SPSS 17.0 statistic program with significance level p <0.05. Analysis of the association between NO sputum induction of bronchial asthma with ACT score was used Pearson correlation test while, comparative analysis of NO-induced sputum content with each group was used student T-test or ANOVA test.

**Results**

**Normality Test:** The result of the normality test of the research data variable was using the kolmogorov smirnov test. Table 1 explains that the kolmogorov smirnov test on the data of the research variables yielded a p>0.05. These results conclude that the study variable data were normally distributed.

**Table 1. Normality Test**

<table>
<thead>
<tr>
<th>Data</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (y/o)</td>
<td>0.245</td>
</tr>
<tr>
<td>BMI</td>
<td>0.961</td>
</tr>
<tr>
<td>FEV1/Pred (%)</td>
<td>0.955</td>
</tr>
<tr>
<td>ACT score</td>
<td>0.446</td>
</tr>
<tr>
<td>No level (µM)</td>
<td>0.272</td>
</tr>
</tbody>
</table>

BMI: Body Mass Index, FEV: First Forced Velocity, ACT: Asthma control test, NO: Nitric oxide

On the other hand, figure 4 describes the education of 30 research subjects, there were 11 people with high school education (36.7%), 6 were undergraduate (20.0%), 5 of were an elementary school and junior high
school (16.7%), and 1 person educated were D3, D4 and S2, respectively (3.3%). Figure 5 shows the body mass index BMI mean was 24.59, with the lowest was 16.23 and the highest was 36.44, it was known that 2 subjects (6.7%) were underweight, 14 subjects were normal weight, 11 subjects (36.7%) were overweight, and 3 people (10.0%) were obese. The first forced velocity FEV1/Pred average was 91.1%, with the lowest FEV1/Pred 42% and the highest FEV1/Pred 160%.

**Asthma Control Test (ACT) Score Correlation with NO Sputum Induction Level:** Pearson correlation was used to find out whether there was a relationship between ACT scores with induced sputum NO levels. The result of pearson correlation between ACT score and NO-induced sputum level was in Table 5.

<table>
<thead>
<tr>
<th>Table 2. Correlation of ACT Score with NO-induced sputum level</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Score Category</td>
</tr>
<tr>
<td>Skor ACT</td>
</tr>
<tr>
<td>Pearson correlation</td>
</tr>
</tbody>
</table>

ACT: Asthma control test, NO: Nitric oxide

From Table 2, it got the coefficient of pearson correlation was the negative value that equal to -0.562 with value p <0.05. This result concludes that there was a negative correlation significant between ACT score and NO-induced sputum level, that the higher the ACT score the lower the induced sputum NO level.

<table>
<thead>
<tr>
<th>Table 3. Comparison of NO sputum levels by ACT Score category</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT Score Category</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Uncontrolled</td>
</tr>
<tr>
<td>Partially controlled</td>
</tr>
<tr>
<td>Fully controlled</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

ACT: Asthma control test, NO: Nitric oxide

From Table 3 we can make a comparison graph of induced sputum NO content based on ACT score category as follows. While in Figure 7 shows the average of the lowest control induced NO-induced sputum rate and the highest uncontrolled induced NO sputum content level. One way ANOVA NO-induced sputum content based on ACT score category yielded p-value <0.05, meaning that there was a significant difference in induced sputum NO content based on ACT score category. This result reinforces that the higher the ACT score the lower the NO-induced sputum level.

**Correlation of First Forced Velocity (FEV1)/Pred, Age, and IMT with ACT Score**: The following will present the results of pearson correlation between first forced velocity FEV1/Pred, age, and body mass index (BMI) with ACT scores of study subjects in Table 7 that known pearson correlation between FEV1/Pred, age, and BMI with ACT scores was p>0.05. These concluded that there was no significant correlation between FEV1/Pred, age, and BMI with ACT score.
Table 4. Correlation of FEV1/Pred, age and BMI with ACT score

<table>
<thead>
<tr>
<th>ACT Score Category</th>
<th>FEV1/Pred (%)</th>
<th>Age (y/o)</th>
<th>BMI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Correlation Coefficient</td>
<td>Nilai p</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.051</td>
<td>0.788</td>
<td>30</td>
</tr>
</tbody>
</table>

ACT: Asthma control test, BMI: Body mass index

Correlation of Sex, Job, and Education with ACT Score Category: The following chi-square test results were between the sexes, jobs, and education with the ACT score category in Table 8 which p>0.05.

Table 5. Correlation of sex, job, and educational with ACT score category

<table>
<thead>
<tr>
<th>ACT Score Category</th>
<th>Sex</th>
<th>Job</th>
<th>Educational</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Civil Servants</td>
<td>E.S</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>J.H.S</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>S.H.S</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>S1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>S2</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>Teacher</td>
<td>S.H.S</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>S1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>S2</td>
</tr>
</tbody>
</table>

| | Partially Controlled | Fully Controlled |
| | Uncontrolled | 3 | 5 | 1 | 3 | 0.859 |
| | 0 | 0 | 0 | 0 | 0 | 0.058 |
| | 0 | 0 | 0 | 0 | 0 | 0.675 |

ACT: Asthma control test

This result concludes that there was no significant relationship between sex, job, and education with the ACT score category of research subjects.

Discussion

The statistical test of the correlation between induced sputum induction and ACT score was using one way ANOVA, which showed the lowest controlled NO sputum rate, and the highest uncontrolled NO sputum level was p <0.05. This means that there were significant differences in induced sputum NO content based on ACT score category. These results support that the higher ACT scores the lower NO sputum level. In some studies, NO levels increased in severe asthma and uncontrolled asthma. The result of the study using NO expiratory air level correlated with ACT score showed median NO in uncontrolled asthma was 40 ppb and controlled asthma 27 ppb also there was a statistically significant difference (p <0.002). The ACT ratio to NO expiratory air level, the median value of NO in full
controlled asthma was 19 ppb, in partially controlled asthma was 20 ppb, and in uncontrolled asthma was 43 ppb with statistical test result showed that overall there were significant difference(20).

The results according to the body mass index(BMI) distribution showed the mean was 24.59, with the lowest was 16.23 and the highest was 36.44. There were 2 (6.7%) subjects classified as underweight, 14 subjects as normal weight, 11 (36.7%) subjects as overweight, and 3 (10.0%) subjects as obese. The result of the statistical test with pearson correlation between BMI and ACT score was p>0.05. These results concluded that there was no significant association between BMI with ACT score. This was inconsistent with research that stated there was a significant relationship between ACT and BMI (p = 0.03) and asthma severity (p = 0.003).(14).

This study showed the mean of first forced velocity(FEV1)/Pred was 91.1%, with the lowest was 42% and the highest was 160%. Statistical test with pearson correlation states there was no correlation between FEV1/Pred value with asthma control test (ACT) score. The validated ACT was a questionnaire that performed briefly, simply, easily on its own, available, and shows continuous accuracy. In this study, the level of asthma control measured by ACT score was 18 (60.0%) as uncontrolled, 8 (26.7%) partially controlled, and 4 (13.3%) as fully controlled. The mean ACT score of bronchial asthma subjects was 18.3±4.2, with the lowest was 8 and the highest was 25. The prevalence of uncontrolled asthma was greater compared to a controlled (75.7 and 24.3%)(14). This was also consistent with research in Persahabatan Hospital consisting of uncontrolled asthma was 47(49%) higher than 41(42.7%) partially controlled asthma and 8 (8.3%) fully controlled asthma(17). Similarly, the results of a study consisting of uncontrolled asthma was 12 (40%), partially controlled was 8 (26.7%), and fully controlled was 10 (33.3%) (18). In this study low population with full controlled asthma might cause by various factors, such as low adherence to therapy or possible resistance to treatment.

This study measured nitric oxide(NO) sputum level using the Griess method. Sputum NO concentration could be used as an inflammatory process in the respiratory tract as in asthma. Several factors might affect NO levels such as NO measurement techniques, smoking habits, genetics, infections, anti-inflammatory drugs, and nitrate-containing diets. To avoid bias, this study has been included in the criteria of inclusion and exclusion of research. All of the study subjects included in the study, asthma patients in the non-exacerbated condition and no other accompanying infections such as acute respiratory infections. The result of measurement was the average of NO concentration was 92.043±29.040 μM, with the lowest was 14.566 μM and the highest was 138.350 μM.

The result of the variable normality test with kolmogorov smirnov was p>0.05. This concludes that the research variable data were normally distributed, so to investigate whether there was a correlation between asthma control test (ACT) score with nitric oxide(NO) sputum content of induction was used pearson correlation. Pearson correlation coefficient is the negative value equal to -0.562 with p <0.05. This result concludes that there was a significant negative correlation between ACT score with NO-induced sputum, the higher the ACT score the lower the NO sputum content of induction of the research subjects

**Conclusion**

The results showed that subjects with fully controlled asthma control were 4 (13.3%) subjects, partially controlled was 8 (26.7%) subjects, uncontrolled was 18 (60.0%) subjects. The mean asthma control level was 18.3±4.2, with the lowest asthma control test (ACT) score was 8 and the highest was 25. The result of induced sputum nitric oxide (NO) level with the mean sputum measurement was 92.043±29.040 μM, with the lowest was 14,566 μM and the highest was 138.350 μM. In this study, there was a significant negative correlation between ACT score with NO-induced sputum NO and asthma control (p <0.05).

**Conflict of Interest:** There is no conflict of interest in this research.

**Source of Funding:** This research uses individual funding.

**Ethical Clearance:** This research has ethical clearance from the Faculty of Medicine, Universitas Airlangga.

**References**

2. Dasar RK. Badan Penelitian dan Pengembangan


Knowledge Among Women at Reproductive Age About Intrauterine Device in Baquba City

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1Scholar Researchers, College of Medicine, Diyala University, Iraq

Abstract

Background: The intrauterine device (IUD) is the most popular form of reversible long-acting contraception in the world which is inserted into a woman’s uterus to prevent pregnancy.

Objectives: To study knowledge among women at reproductive age about intrauterine device in baquba city. Subjects and Method: a cross-sectional study was conducting among women at reproductive age who attended outpatient clinics of Al-Batool Teaching Hospital in Baquba City from the period of the 1st of January to the 30th of June 2020.

Results: Among 900 women who included in this study, with mean age about 32.2±8 years old, about 77.1% of women respondents had poor knowledge about this method of birth control. The knowledge score was affected significantly by level of education, age, residency, occupation, years of marriage, number of parity as well as the use of IUD. The main source of information is friends and relatives who represent about 93.3% and a limited role of health care providers. This may cause negative beliefs as well as many myths and rumors about IUD. Conclusion: in this study women were unaware about the basic knowledge of IUDs.

Keywords: Knowledge, women, contraception, IUD.

Introduction

There are various and significant current health issues around the world, but enhancing the quality of maternal health is a significant matter for researchers globally. Family planning in definition is the use of method and practices that allow couples and individuals to anticipate and attain their desired number of children and make the proper spacing and timing of their births. It is obtained through use of contraceptive method and the treatment of involuntary infertility. The ability of a woman to space and limit her pregnancies has a direct impact on her health and well-being as well as on the outcome of each pregnancy.[1]

The intrauterine device is the most widely used reversible method of contraception in the world which is reported by the world Health Organization that about 160 million women use IUCDs globally today.[2]

It is a method surrounded by misconceptions among women, especially about IUD awareness. In this way, many assume that cancer or infertility may be induced, which is not suggested for young or nulliparous women either, and some show considerable concern or fear regarding the procedure of insertion[3,4]. In Iraq, among women who are already using IUDs the fears and misbeliefs about IUD contributed to discontinuation of use in almost half of the women requesting IUD removal[5].

Such perceptions and fears are common; however, research addressing such problems shows that if health providers have accurate and sufficient knowledge about the method, trust in the IUCD may be strengthened, thus increasing the incentive to utilize it[6].

The IUCDs are very safe, effective, and convenient for postpartum, post-abortion, non-pregnant, and breastfeeding mothers. While it is not protective against Human Immunodeficiency Virus (HIV) transmission, it is safe in HIV infected women. It is equally effective and safe for use in the young and/or nulliparous, older women, and women unable to use hormonal method for preventing pregnancy[7,8].

Intrauterine device users are among the most satisfied women who use contraceptive procedures.
Contraception satisfaction is correlated with high rates of continuity of use\textsuperscript{[9,10]}.

**Subject and Method**

A cross-sectional study including 900 women at reproductive age who attended Al-Batool Teaching Hospital in Baquba City, was conducted between the 1\textsuperscript{st} of January to 30\textsuperscript{th} of June 2020. A structured questionnaire was used by the researcher to interview the participants. The first part of the questionnaire included information about socio-demographic characteristics of women: age, residency, level of education, marital age and parity. The second part of the questionnaire contained questions related to women knowledge about IUD and included nine questions. The questions were in the form of (YES, NO and Don’t know) questions, where 1 score was put for right answer and 0 score for wrong answer and don’t know answer. And the total scores were categorized as: > 50% (0-4 knowledge score) was poor score, 50-75% (5-7 knowledge score) was fair and those with more than 75% (8-9 knowledge score) was very good score.

**Statistical Analysis:** data was analyzed using statistical package for the social sciences (SPSS version 23) computer software program. Descriptive statistics were presented as frequency tables, variables were expressed as mean ± standard deviation and categorical variables as numbers and percentages.

**Results**

A total of (900) women were enrolled in this study, the mean ±SD of women was 32.2±8 years. The knowledge score about IUD for the studied women has shown that 77.1\% (694) of women had poor knowledge about IUD with mean score 2.63, fair score was found in 21.8\% (196) of women with mean score 5.75 and only 1.1\% (10) of women had very good knowledge, table 1.

<table>
<thead>
<tr>
<th>Knowledge score</th>
<th>Number</th>
<th>Percentage</th>
<th>Mean ±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>694</td>
<td>77.1%</td>
<td>2.63±1</td>
</tr>
<tr>
<td>Fair</td>
<td>196</td>
<td>21.8%</td>
<td>5.75±0.7</td>
</tr>
<tr>
<td>Very good</td>
<td>10</td>
<td>1.1%</td>
<td>8.3±0.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>900</td>
<td></td>
<td>3.37±1.7</td>
</tr>
</tbody>
</table>

Table 2: The knowledge of participants about various aspects of IUD.

<table>
<thead>
<tr>
<th>Knowledge questions</th>
<th>Number of right answer</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>The types of IUDs</td>
<td>97</td>
<td>10.8%</td>
</tr>
<tr>
<td>The rate failure in preventing pregnancy</td>
<td>369</td>
<td>44%</td>
</tr>
<tr>
<td>likely to cause an infection</td>
<td>96</td>
<td>10.7%</td>
</tr>
<tr>
<td>An IUD can cause infertility</td>
<td>31334.8%</td>
<td></td>
</tr>
<tr>
<td>An IUD can cause Cancer</td>
<td>233</td>
<td>25.9%</td>
</tr>
<tr>
<td>An IUD can cause Harmful bleeding time</td>
<td>517</td>
<td>57.4%</td>
</tr>
<tr>
<td>Woman after normal vaginal delivery as good candidate for IUD</td>
<td>871</td>
<td>96.8%</td>
</tr>
<tr>
<td>Woman after c/s as good candidate for IUD</td>
<td>435</td>
<td>48.3%</td>
</tr>
<tr>
<td>A newly married childless couple as good candidate for IUD</td>
<td>78</td>
<td>8.7%</td>
</tr>
</tbody>
</table>

The poor knowledge score percentage decreased with the increase in the age of women from 88.7\% in women with ages less than 20 years to 70.7\% in women with ages 40-49 years. The poor knowledge score percentage in women who lived in urban areas were higher than the poor knowledge score percentage in women who lived in rural areas (94.3\% VS 69.9\%). With the raise in the education level, there was a decrease in poor knowledge score percentage, table 3.
### Table 3: Frequency Distribution of knowledge score among socio-demographic characteristics of studied women.

<table>
<thead>
<tr>
<th>Socio-demographic characteristics</th>
<th>Knowledge score</th>
<th></th>
<th></th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poor</td>
<td>Fair</td>
<td>Good</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20 years</td>
<td>55(88.7%)</td>
<td>7(11.3%)</td>
<td>0</td>
<td></td>
<td>62</td>
</tr>
<tr>
<td>20-29 years</td>
<td>232(84.4%)</td>
<td>43(15.6%)</td>
<td>0</td>
<td></td>
<td>275</td>
</tr>
<tr>
<td>30-39 years</td>
<td>277(73.1%)</td>
<td>98(25.9%)</td>
<td>4(1.1%)</td>
<td></td>
<td>379</td>
</tr>
<tr>
<td>40-49 years</td>
<td>130(70.7%)</td>
<td>48(26.1%)</td>
<td>6(3.3%)</td>
<td></td>
<td>184</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>900</td>
</tr>
<tr>
<td>Residency</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>250(94.3%)</td>
<td>15(5.7%)</td>
<td>0</td>
<td></td>
<td>265</td>
</tr>
<tr>
<td>Urban</td>
<td>444(69.9%)</td>
<td>181(28.5%)</td>
<td>10(1.6%)</td>
<td></td>
<td>635</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>900</td>
</tr>
<tr>
<td>Educational level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>18(94.7%)</td>
<td>1(5.3%)</td>
<td>0</td>
<td></td>
<td>19</td>
</tr>
<tr>
<td>Read &amp; write</td>
<td>53(100%)</td>
<td>0</td>
<td>0</td>
<td></td>
<td>53</td>
</tr>
<tr>
<td>Primary</td>
<td>136(88.9%)</td>
<td>17(11.1%)</td>
<td>0</td>
<td></td>
<td>153</td>
</tr>
<tr>
<td>Secondary</td>
<td>300(75.6%)</td>
<td>97(24.4%)</td>
<td>0</td>
<td></td>
<td>397</td>
</tr>
<tr>
<td>Collage &amp; above</td>
<td>187(67.3%)</td>
<td>81(29.1%)</td>
<td>10(3.6%)</td>
<td></td>
<td>278</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>900</td>
</tr>
</tbody>
</table>

The poor knowledge score in women with more than five years of marriage was lower than poor knowledge score in women with less than 5 years of marriage. Also, the poor knowledge score in women who had never used IUD (84.9%) was higher than women who currently used IUD(61.6%) or past used IUD(75.6%), Table 4.

### Table 4: Frequency Distribution of the knowledge score among obstetrical history of studied women.

<table>
<thead>
<tr>
<th>Obstetrical history</th>
<th>Knowledge score</th>
<th></th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poor</td>
<td>Fair</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>Duration of marriage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤5 years</td>
<td>171(85.5%)</td>
<td>29(14.5%)</td>
<td>0</td>
<td>200</td>
</tr>
<tr>
<td>6-10 years</td>
<td>217(73.3%)</td>
<td>79(26.7%)</td>
<td>0</td>
<td>296</td>
</tr>
<tr>
<td>&gt;10 years</td>
<td>306(75.7%)</td>
<td>88(21.8%)</td>
<td>10(2.5%)</td>
<td>404</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>900</td>
</tr>
<tr>
<td>Parity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Para one and two</td>
<td>230(78.2%)</td>
<td>63(21.4%)</td>
<td>1(0.3%)</td>
<td>294</td>
</tr>
<tr>
<td>Para three and four</td>
<td>336(76.7%)</td>
<td>93(21.2%)</td>
<td>9(2.1%)</td>
<td>438</td>
</tr>
<tr>
<td>Para five and more</td>
<td>123(76.2%)</td>
<td>40(23.8%)</td>
<td>0</td>
<td>168</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>900</td>
</tr>
<tr>
<td>practice of using IUD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current user</td>
<td>132(61.7%)</td>
<td>76(35.5%)</td>
<td>6(2.8%)</td>
<td>214</td>
</tr>
<tr>
<td>Past using</td>
<td>167(75.6%)</td>
<td>50(22.6%)</td>
<td>4(1.8%)</td>
<td>221</td>
</tr>
<tr>
<td>Never used</td>
<td>395(84.9%)</td>
<td>70(15.1%)</td>
<td>0</td>
<td>465</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>900</td>
</tr>
</tbody>
</table>

The sources of information about IUD were health care provider in 15.8%(143), friends represent 93.3%(840) of sources, mass media represented 15%(135) of sources and other sources which was self-experiment and readings represent 11.6%(105), figure 1.
Discussion

The majority of women had inaccurate knowledge about the IUD, for example, 10.8% of women know about two types of IUD (the majority know about copper IUD and had no knowledge of LNG-IUS) (table 2). This can be attributed to the fact that copper IUD is available free of charge in public sector family planning clinics, while the levonorgestrel-IUS is not available to women accessing these services. This finding agrees with a study done in USA in which nearly all sexually active women know about Cu-IUD and 20% of them know the levonorgestrel-IUS [11]. Also 89.3% of women announced that IUD causes infection (table 2), while infection associated with IUD, only would occur in the first 20 days of insertion and it is due to cervical infection which is not diagnosed during the IUD placement. The World Health Organization found that the risk of development of pelvic inflammatory disease (PID) in women with IUD is the same as or less than the risk of PID in women without IUDs [12]. In Iran, a study 50.8% of the participants had wrong knowledge about IUD in increasing the risk of infection [13]. A high percentage of women believed that IUD causes cancer, infertility and heavy bleeding (table 2). This agrees with a study done in USA in 2011 in which the common misperceptions about intrauterine contraception included concerns that intrauterine contraception increases the risk of an ectopic pregnancy, infertility, cancer, or a sexually transmitted infection [14], along with a study in Uganda (2016) where over 40% of the participants had incorrect information about the IUD in relation to breastfeeding, return to fertility, and protection against STIs. Participants also believed incorrectly that IUDs causes cancer and damages the womb [15].

In addition, women couldn’t recognize the appropriate candidate for IUD use (table 2). Where half of women believed that after caesarian section are good candidates for IUD use and the majority believed that nulliparous women are not candidates for IUD use. This can be attributed to the inadequate clients counseling about the IUD, and while this method would be suitable for many women, they avoid using it because they think it is not a good contraceptive option.

However, the general knowledge regarding intrauterine contraceptive devices was limited (table 3), even among IUD users and the existence of myths and rumors about IUD was obvious among the study sample. This may result in discontinuing their IUD use as well as propagate false beliefs amongst their peer groups. This agree with another Iraqi study in Baghdad which is entitled “influence of IUD perceptions on method discontinuation” showed that almost half of the women asked to take the IUD out; fears and false beliefs were the cause of IUD discontinuation [5]. Therefore, by training and consulting the clients about possible side effects and how to confront them would remove their concerns.

Interestingly, differences in knowledge about IUD emerged between age groups, duration of
A possible explanation for that may be due to the idea that most women with increasing age, duration of marriage and parity, had completed their families and they feel that they need more spacing for preserving their health, so they began to seek advice about the safest ways of contraception. This findings is agree with USA study[^14] which reported that current age of the mother, years of marriage and parity were significant predictors for knowledge about intrauterine contraception. Residency also reflected differences in knowledge about IUD, suggesting that there are differences in levels of awareness based on women’s life state. Also, educational level and occupation showed differences in knowledge about IUD. This agree with Indian study that found a strong association between education & working status of participants to their awareness about IUD[^16].

The major source of information about IUD were friends and relatives in 93.3% of the women with secondary minimal role of health care providers & mass media (figure 1). This is agree with Indian study in 2015[^16] which has shown that 90% of information about IUD were from friends, and also agree with a study done in Saudi Arabia 2010 in which the main source of women’s knowledge was the family members, media came next. Health workers were reported by small proportion of the participants[^17]. This highlights the failure of mass media in creating awareness about IUDs and the failure of health care providers in providing contraception knowledge where it should be prioritized as it is a two way communication process and will provide correct and complete information as compared to friends or mass media.

**Conclusions**

**It is concluded that:**

1. Women in this study were unaware of the basic knowledge regarding IUD.
2. Age of women, residency, educational level, occupation, duration of marriage, parity, history of use of IUDs significantly affect the knowledge scores of the participants regarding IUD.
3. The main persons affecting the decision regarding IUD use were the relatives and friends of respondents.

**Conflict of Interest:** None

**Funding:** Self

**Ethical Clearance:** Not required

**References:**


Effect of Dissemination of Resources and Information Method for Overnutrition Prevention Behavior on Primary School Children in Makassar

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Abstract

The prevalence of overnutrition among primary school aged children, which ranges from the risk of obesity globally including Indonesia, is currently increasing. This study aimed to assess the difference in behavior change in physical activity and habit of soft drinks consumptions before and after the intervention with the dissemination method of resources and information. The research was conducted at primary schools in Makassar City. This research used a Quasy Experiment approach with a pretest and post-test examination through control group design. The study was conducted for 3 months by providing health information related to overnutrition and obesity while monthly visit or monitoring of children was carried out using a 24 hour food recall. The sampling technique was carried out by means of proportional random sampling. Data were analyzed by univariate, bivariate, and multivariate analysis. The results showed that there was an effect of dissemination of resources and information on physical activity (p = 0.000) and soft drink consumption habits (p = 0.000) before and after the intervention. The conclusion is that the application of the method of dissemination of resources and information is effective in changing the behavior of preventing overnutrition in primary school children. It is expected that efforts in schools such as the method of dissemination of resources and information with peer education will become a reference in efforts to prevent more nutrition in improving students’ healthy eating patterns through dissemination of resources and information.

Keywords: Physical Activity; Soft Drink Consumption; Overnutrition.

Introduction

The prevalence of overnutrition among primary school aged children in the world has increased over the last few decades due to changes in shifting eating habits such as soft drinks consumption and low physical activity with the following risks(1). Globally, the prevalence of overweight and obesity in children of 5-17-old years is 10%(2). Based on Riskesdas (2018), it shows that the prevalence of overweight in South Sulawesi province is 13.6% obese and 21.8% obese. Meanwhile, in Makassar City children are 13.9% overweight and 16.5% obese(3). School age children who are overweight and obese are included in the vulnerable group(4).

The consequences of obesity for schoolaged children will have an impact on social stigma. They are being bullied by their playmates, have experienced discrimination, and appear to have low self-esteem. Preventing overnutrition is prioritized in primary
prevention efforts, namely promotion efforts, which means it is started from the school and home environment. Preventive action is the best and safest way for school aged children who are still in their infancy. The basic principle of preventing over nutrition in primary school children is to increase physical activity, increase movement and limit the consumption of foods that contain calories\(^{(5)}\). The nutrition education method used in primary school children can involve students so that students feel responsible for determining the healthy behavior they should do and are given nutritional information. In addition, many studies that analyze the factors affecting that cause obesity and determine obesity prevention method in primary school age children have not been widely carried out recently. This is the gap research and can be done by the method of dissemination of resources and information. This method is carried out in the form of providing nutritional information\(^{(6)}\). Therefore, there is still a need for a method of obesity prevention based on peer nutrition education in an effort to reduce the prevalence of obesity and improve children’s health status by means of dissemination of resources and information. This study aimed to assess the differences in changes in physical activity and consumption habits before and after the intervention using the dissemination of resources and information method. Further study on the factors affecting is needed to conduct so that we can prevent the cases of obesity and overweight primary school aged children.

### Method

This research uses a “Quasy Experiment” design, namely pretest and post-test with a control group design. The research was conducted at primary schools in Makassar City. The research intervention was conducted with three months period by providing dissemination of resources and information related to obesity and overnutrition cases in children. Monthly student visit or monitoring was conducted regularly. The research instrument were a form of recall food, digital scales, and microtise, determining the student BMI using the WHO Anthroplus software. The sampling technique was carried out by means of Sample Size Determination in Health Studies and proportional random sampling\(^{(7)}\). Data were analyzed using the chi-square test, Independent T-Test, Mann Whitney, Wilcoxon test, and hotelling test. The results then reflected to the case of obesity in primary school aged children.

### Results

The distribution of student characteristics can be seen in Table 1, which shows the largest proportion of the age group before the intervention, namely 9 years of age in the intervention group (52.5%), the majority of whom were female (52.5%), and were in class IV (70.0%). While in the control group, the oldest children was aged 9 years (45%), the majority were male (60.0%), and were in class IV and V (50% and 50% respectively from both classes). The results showed that there was no difference in the proportion of age, sex, and class before the intervention ($p>0.05$). Based on the average BMI/age before the intervention, the highest in the intervention group was 20.60 ± 2.21, while there was a difference in the average before nutrition education was given in the treatment group and the control group ($p<0.05$).

### Table 1. Students Characteristics Distribution on Each Group of Primary School Children in Makassar City

<table>
<thead>
<tr>
<th>Variable</th>
<th>Intervention (n=40)</th>
<th>Control (n=40)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ±SD/%</td>
<td>Rerata±SD/%</td>
<td></td>
</tr>
<tr>
<td>Age Group (1-year-old)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>22 (53.5)</td>
<td>19 (46.0)</td>
<td>0.160*</td>
</tr>
<tr>
<td>10</td>
<td>13 (34.0)</td>
<td>9 (24.0)</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>5 (13.4)</td>
<td>12 (30.0)</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>19 (47.5)</td>
<td>24 (60.0)</td>
<td>0.262*</td>
</tr>
<tr>
<td>Female</td>
<td>21 (52.5)</td>
<td>16 (40.0)</td>
<td></td>
</tr>
<tr>
<td>Class</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>28 (70.0)</td>
<td>20 (50.0)</td>
<td>0.068*</td>
</tr>
<tr>
<td>V</td>
<td>12 (30.0)</td>
<td>20 (50.0)</td>
<td></td>
</tr>
<tr>
<td>BMI/A</td>
<td>20.60±2.21</td>
<td>19.14±4.15</td>
<td>0.030***</td>
</tr>
</tbody>
</table>

*Chi Square; **Independen T-Test; ***Mann Whitney
Table 2. Changes in Students’ Physical Activities Before and After Intervention

<table>
<thead>
<tr>
<th>Aktivitas Fisik</th>
<th>Pre</th>
<th>Post 1</th>
<th>p*</th>
<th>Δ1</th>
<th>Post 2</th>
<th>p*</th>
<th>Δ2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>22.93±1.40</td>
<td>34.05±1.53</td>
<td>(0.000)</td>
<td>↑10.13±1.84</td>
<td>43.78±1.18</td>
<td>(0.000)</td>
<td>↑19.85±1.62</td>
</tr>
<tr>
<td>Control</td>
<td>13.35±1.76</td>
<td>19.33±1.18</td>
<td>(0.000)</td>
<td>↑5.98±1.77</td>
<td>24.40±0.87</td>
<td>(0.000)</td>
<td>↑11.05±1.63</td>
</tr>
<tr>
<td>p**</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Δ1 = Difference of Pre–Post 1; Δ2 = Difference of Pre–Post 2; *Wilcoxon Test; **Mann Whitney Test

The highest average score of physical activity in Table 2 in the pre group is in the intervention group, which is 22.93. Likewise at post-test 1, the highest average value was found in the intervention group, which is 34.05. Based on the Wilcoxon test results, it showed that both the intervention and control groups had a significant difference between pretest and post-test 1 (p <0.05) of the physical activity scores. In addition, there was an increase in physical activity scores from pretest to post-test 1 for each group, where the highest increase was in the intervention group, which is 10.13. Based on the Mann Whitney test, there was a significant difference (p <0.05) from the difference in score improvement for the two groups. Meanwhile, the average score of physical activity at post-test 2 was the highest in the intervention group, namely 43.78. Based on the Mann Whitney test, there was a significant difference (p <0.05) from the difference in score improvement for the two groups.

Figure 1. Changes in Students’ Physical Activities

It can be seen that the average score of high students’ physical activity in the intervention group compared to the control group from baseline has increased, from the beginning of the experiment, the progress happened in post-test 1, and the progress happened in post-test 2.

Table 3. Changes in Students’ Soft Drink Consumption Before and After Intervention

<table>
<thead>
<tr>
<th>Soft Drink Consumption</th>
<th>Pre</th>
<th>Post 1</th>
<th>p*</th>
<th>Δ1</th>
<th>Post 2</th>
<th>p*</th>
<th>Δ2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>70.95±1.66</td>
<td>58.75±1.99</td>
<td>(0.000)</td>
<td>↓12.20±1.47</td>
<td>45.83±2.76</td>
<td>(0.000)</td>
<td>↓25.13±2.46</td>
</tr>
<tr>
<td>Control</td>
<td>71.78±0.57</td>
<td>68.85±0.66</td>
<td>(0.000)</td>
<td>↓2.93±0.76</td>
<td>61.83±0.67</td>
<td>(0.000)</td>
<td>↓9.95±0.81</td>
</tr>
<tr>
<td>p**</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Δ1 = Difference of Pre–Post 1; Δ2 = Difference of Pre–Post 2; *Wilcoxon Test; **Mann Whitney Test
Table 3 shows the highest average score of soft drink consumption habits in the pretest is in the control group, which is 71.78. While at post-test 1, the lowest average value was in the intervention group, which is 58.75. Based on the Wilcoxon test results, it showed that both the intervention and control groups had a significant difference between the scores for the habit of soft drink consumption at pretest and post-test 1 (p <0.05). In addition, there was a decrease in the score of soft drink consumption habits from pretest to post-test 1 for each group (intervention and control group), where the highest decrease was in the intervention group, which is 12.20. Based on the Mann Whitney test, there was a significant difference (p <0.05) from the difference in score reduction for the two groups. While the average score for the habit of soft drink consumption at post-test 2 was the lowest in the intervention group, which is 45.83. Based on the results of the Wilcoxon test, there was a significant difference between the scores for the habit of soft drink consumption at pretest and post-test 2 (p <0.05).

Figure 2 shows that the average score of students’ soft drink consumption habits was higher in the control group than the average score of students’ soft drink consumption habits at the intervention group at the beginning of the measurement. Between post-test 1 and post-test 2, the average score of students’ soft drink consumption habits was lower in the intervention group than in the control group. Multivariate analysis was used to simultaneously assess both groups before and after intervention/treatment applied to the intervention group.

Table 4 shows that the results of statistical tests with Hotelling’s T test obtained the value of F = 3716.72 and p = 0.000 (p <0.05). This means that there are differences in the students’ physical activities who did not receive the treatment of dissemination of resources and information with students’ physical activities who did not receive the treatment of dissemination of resources and information. Based on the results of the analysis, it was found that the students’ physical activity variable was the most influential among the other variables due to
the reinforcing factor of the treatment of dissemination of resources and information so that there was an increase in understanding of students’ physical activity after the intervention and greatly influenced the formation of preventive behavior patterns for students resulting in changes in decreasing the incidence of overnutrition cases in primary school aged children.

Discussion

Health and Nutrition Education through Dissemination of Resources and Information Method on Students’ Physical Activities: Physical activity is one of over nutrition prevention forms. Physical activity can burn calories in students while the use of technology can positively prevent obesity. If we combine both ways to prevent obesity in children, the case of diseases caused by obesity will decrease. Children physical activity is needed in the form of running, playing basketball, playing soccer, and playing futsal. Beside decreasing obesity cases, physical activities can improve daily childrens’ health. Therefore, the role of teachers, health workers, and parents of students is very important to provide information related to the importance of moving and doing physical activity, can prevent overweight in students, and can monitor students’ physical activity continuously by applying the rules of a healthy lifestyle in the environment, at school, and at home. Based on the Wilcoxon test, the p value was obtained <0.05, which means that there was a difference in physical activity between the treatment group and the control group at post 1 and post 2. Based on the results of the analysis there were differences in the physical activity of students after the treatment in the intervention and control groups, changes in physical activity indicated that there was increase to 100% in the third month while the physical activity of the control group students decreased. This proves that there is an effect of the dissemination of resources and information method intervention on students’ physical activities.

The physical activity of obese children increases and can reduce and reduce the consumption of food and drinks that have an impact on weight loss. Strenuous physical activity and more sweating is very effective in losing more weight than by adjusting only a diet. Therefore, doing physical activity can maintain human body functions to be more optimal, so that it can reduce the risk of obesity. Proper and optimum metabolism can help enhancing good body shape. The high student consumption of calorie intake that exceeds the need has a negative impact on increasing body weight over normal body weight. It is influenced by increased family income and the ease of buying food and drinks so that more nutritional sufferers increase and become a risk factor for obesity. The incidence of overweight in primary school students in Makassar City tends to be light activities compared to heavy student activities. This is in line with Erni Yeti (2018) research showing that fat intake is higher in students with less activity levels so that students who are less active in movement have the opportunity to experience more nutrition or fat. In this study, activities that are usually carried out in the home environment are cycling and playing football, while at home children sometimes play video games, computers, and watch television. In physical activity, it can be seen that there is a decrease in physical activity in the third month of the intervention due to the influence of the rainy season, so that children’s activities are being at home by playing video games or watching television which can also affect changes in students’ body mass index. It can lead to fluctuated body mass index in students and students’ health.

Health and Nutrition Education through Dissemination of Resources and Information Method on Students’ Soft Drink Consumption Habits: Soft drinks are carbonated drinks added with flavorings and sweeteners such as additive ingredients and sugar. Soft drink consumption habits put a negative impact on health to both short term and long-term period. Unfortunately, students tend to consume these kinds of drink. The results showed that all students owned soft drinks consumption habits obtained from the post-test 1 and post-test 2 which decreased when the scores were compared to the pretest. It shows that there are differences in the soft drink consumption habits between the pretest and post-test 1 and post-test 2 in both the intervention and control groups. This is influenced by the method of dissemination of resources and information. The decline in soft drink consumption habits was higher in the intervention group than in the control group. The results of the Wilcoxon test obtained that a p value <0.05, which means that there is a difference in soft drink consumption habits between the intervention group and the control group at post-test 1 and post-test 2. One of several factors cause an increase in the prevalence of overnutrition globally in students is soft drink consumption habits. This finding was obtained because the students’ soft drink consumption habits were influenced by the factor of knowledge, where the
knowledge of lack of nutrition was caused by rarely getting information or nutrition counseling related to the adverse effects of consuming soft drinks. In addition, consuming soft drinks can increase body weight so that students can become overweight if they have consumed soft drinks continuously. The high glucose content can lead to overnutrition and more importantly can lead to obesity cases among children. A study by Collins et al. (2015) concluded that students who have a hereditary history of obesity have the opportunity to be overweight due to the habit of consumption high-sugar fast food. The increased risk of overnutrition can be prevented and limited by consuming low sugar levels of foods and drinks. It can also be maintained by actively engaged in regular physical activities such as running, cycling, and playing basketball. Students also need to get used to consuming fruits and vegetables (13). Prevention of overnutrition at school and family environment can be done by implementing a healthy diet according to a balanced menu, monitoring children’s foods and drinks, limiting pocket money, scheduling reports on children’s foods and drinks consumed for one day, and measuring the children’s weight regularly to map the difference between before and after the measurement at least once a week. Children’s physical activities can also be increased actively.

Conclusions

The conclusion of this study is that there is an effect of the method of dissemination of resources and information before and after the intervention on students’ physical activity and students’ soft drink consumption habits which have an impact on increasing student overnutrition prevention behavior and reducing the prevalence of overweight cases.

Funding Sources: The funding sources in this study were established from personal funds during the research conducted and analysis of factors affecting in students’ overnutrition cases. This research was supported by the Directorate of Research and Community Service, the Directorate General of Research and Development Strengthening.

Acknowledgments: The authors wish to thank all the Public Health students who helped in the collection of the data during the research of children overnutrition cases. We also acknowledge the Makassar City Government, the Health Office, and the Head of the Community Health Center in Makassar which had given the research permission. We also like to thank all of respondent who have been willing to give their consents and time during the interview process.

Internal Conflict: The author(s) declare that they have no conflict of interest during the research conducted and analysis of factors affecting in students’ overnutrition cases in Makassar City.

Ethical Clearance: Ethical approval of this study has been obtained from Ethical Commission of Health Research, Faculty of Public Health, with the protocol number of UH910183005.

References


Risk Analysis of Microplastic in Fish (*Nemiptus Japonicas & Rastrelliger Sp.*) in Communities in the Coast Area of Tamasaju, Galesong Takalar

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Abstract

Plastic waste has become one of the most serious threats to the marine environment. Among the plastic waste of special concern is microplastic because of its small size. This study aimed to analyze the level of risk of microplastic exposure through fish consumption in communities in the coastal area of Tamasaju Village, North Galesong District, Takalar Regency. Microplastic abundance found as many as 18 particles, microplastic types found are the shape of a line or fiber with different color and size variations. Blue fiber dominates at 77.77%. The average microplastic concentration (C) in fish is 0.2 mg/kg. The respondents interviewed were 30 people and mostly fishermen. Average intake rate (R) ± 155 grams/day, Average frequency of exposure (FE) of fish consumption ± 190 days/year, Average duration of exposure (Dt) of fish consumption ± 39 years and. Average respondent’s weight (Wb) ± 58 kg. The average Non-Carcinogenic Intake Rate in fish consumption is 0.004754 mg/kg/day and the average Carcinogenic Intake Rate in fish consumption is 0.009328 mg/kg/day. The results of calculations with one-way ANOVA obtained P-Value = 0.009867 <value α = 0.05, then there is a strong relationship with microplastic concentration, intake rate, frequency of exposure, and duration of exposure to Intake Rate or Risk (RQ).

Keywords: Risk Analysis, Microplastic, Coastal Areas, Fish.

Introduction

Plastic has become a part of everyday life, from clothing to coatings and vehicles to cleaning products. So that the losses caused by the abundance of plastic waste are very visible in the environment. A particular concern among plastic waste is microplastics due to their small size[1,2]. Microplastics are defined as small pieces of plastic smaller than five millimeters in size [3–5]

Globally, the discharge of primary microplastics into the sea is estimated at 1.5 million/year[3]. Most of the microplastics come from a land that enters the marine environment, including those flowing through rivers[6,7]. Microplastics have been found in drinking water, bottled water ranges from 0 to more than 104 particles/ltr with an average value of 103 particles/ltr[8].

The consumption of microplastics by fish is closely related to plastic pollution in the marine environment[2,9,10]. Microplastics digested by fish are dominated by microplastics that are < 1 mm in size, film-like shaped, and transparent in color[11,12]. Also, microplastic particles are found in sediments and filter-feeding animals [13].

In Indonesia, plastic waste pollution has reached serious limits, according to Jambeck et al. (2015) Indonesia occupied 2nd rank as a country that produces vast plastic waste[14]. Indonesia contributes 0.48 - 1.29 million metric tons of plastic waste to the sea every year.
Thus, in Indonesia, total plastic waste is predicted to reach 9.52 million tonnes in 2019 [15]. The identification of microplastics in the Makassar region has not found any alarming cases, including their effects on humans [16–19]. However, research, as conducted by Rochman (2015) at TPI Paotere Makassar, showed quite high results, namely the number of particles in each fish ranged from 0 – 21 particles/individual [20].

One of the famous auction place of fish in Makassar is Beba North Galesong in Takalar district. Various types of seafood are traded at this auction [21,22], even visitors or buyers who come can directly enjoy the catch of fishermen which are provided in food stalls along the entrance to Beba auction place of fish, Tamasaju village, including a village that is very close to Beba auction place of fish. In this village, people have the main profession as fishermen, and most of the people here use seafood as their daily side dish.

The presence of microplastics in marine species that are often consumed by the people raises concerns about the level of risk of microplastics to human health. Therefore, in this study, we will examine the evidence of seafood contamination (fishes) by microplastics, and the level of risk from the presence of microplastics in the marine environment to human health.

**Methodology**

**Type of Research:** The type of research is descriptive analysis with the Environmental Health Risk Analysis approach, by using questionnaires, interviews, laboratory examinations, and calculations using its formula. This research will be conducted in May-June 2020. Fish samples were taken for 1 day at 06.00 - 07.00 a.m. on June 25, 2020, at the Beba auction place of fish. Fish samples were taken by random sampling, namely as many as 20 fish, 10 each of red kurisi, and 10 mackerel. Furthermore, fish samples are stored in a coolbox and taken to the laboratory for analysis.

**Laboratory analysis:** Microplastic analysis consists of several stages [20]. These stages are sample preparation, dissolve organic matter with KOH% solution, microplastic observation with a microscope, microplastic measurement using ImageJ software. The fish sample is dissected and separated from the intestine. The fish intestines are broken and then placed into the sample to extract plastic debris from the fish intestines. Each sample pot containing 10 grams of fish intestine was filled with 20% (20-50 ml) KOH (Potassium Hydroxide) solution up to 3 times the volume of tissue in ultrapure water and incubated for 7 days at room temperature to digest organic matter. For each sample, the digested material was carefully sorted and examined under the euromax nexus zoom trinocular microscope.

**Statistical Analysis** The statistical analysis method used in this research is a descriptive statistical test and one-way ANOVA.

**Results Dan Discussion**

**Microplastic Identification in Fish:** The fish found based on the respondent’s consumption map were red kurisi fish (Nemiptus japonicus) and mackerel fish (rastrelliger sp.). Red kurisifish is demersal fish most often consumed by almost all coastal fishing families in Tamasaju village. Meanwhile, mackerel fish is pelagic fish which is also the favorite fish of the coastal residents of Tamasaju village, besides the price is very cheap it is also because the texture of this fish meat is very tasty after being processed.

<table>
<thead>
<tr>
<th>No</th>
<th>Names of species</th>
<th>Identification of fishes in reference</th>
<th>Type of fishes found</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Demersal fish: red kurisi fish (Nemiptus japonicas)</td>
<td><img src="source" alt="Image" /> [23]</td>
<td><img src="source" alt="Image" /></td>
</tr>
<tr>
<td>2</td>
<td>Pelagic fish: mackerel fish (rastrelliger sp.)</td>
<td><img src="source" alt="Image" /> [23]</td>
<td><img src="source" alt="Image" /></td>
</tr>
</tbody>
</table>

The identification result of microplastics in red kurisi fish is shown in the table below.
Table 2. Analysis result of microplastic in red kurisi fish

<table>
<thead>
<tr>
<th>No</th>
<th>Code of sample</th>
<th></th>
<th>Microplastic</th>
<th>Abund (M/I)</th>
<th>Rearing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Parameter</td>
<td>Shape</td>
<td>Color</td>
<td>Size (mm)</td>
</tr>
<tr>
<td>1</td>
<td>Blanko D</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>D1</td>
<td></td>
<td>Line</td>
<td>Blue</td>
<td>1,394</td>
</tr>
<tr>
<td>3</td>
<td>D2</td>
<td></td>
<td>Line</td>
<td>Blue</td>
<td>0,678</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Line</td>
<td>Blue</td>
<td>1,317</td>
</tr>
<tr>
<td>4</td>
<td>D3</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>D4</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>D5</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>D (Red kurisi fish) Nemiptus japonicas (Bleeker, 1851)</td>
<td>D6</td>
<td></td>
<td>Line</td>
<td>Mix</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Line</td>
<td>Blue</td>
<td>1,152</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Line</td>
<td>Blue</td>
<td>1,365</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Line</td>
<td>Blue</td>
<td>2,505</td>
</tr>
<tr>
<td>8</td>
<td>D7</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>9</td>
<td>D8</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>D9</td>
<td></td>
<td>Line</td>
<td>Purple</td>
<td>1,721</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Line</td>
<td>Blue</td>
<td>2,168</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Line</td>
<td>Green</td>
<td>1,327</td>
</tr>
<tr>
<td>11</td>
<td>D10</td>
<td></td>
<td>Line</td>
<td>Blue</td>
<td>0,68</td>
</tr>
</tbody>
</table>

Microplastic content was only found in samples D1, D2, D6, D9, and D10 as shown in Table 2. Total microplastics found in red kurisi fish were 11 particles. Generally, the types of microplastics found are line-shaped microplastics, consisting of blue, mix, purple, and green colors[24]. The largest microplastic size of 2.168 mm is found in sample D9 in the form of blue lines, and the smallest microplastic size of 0.68 mm is found in sample D10 in the form of a blue line. The largest abundance of microplastics was found in sample D6, namely 4 microplastics/individual, and the smallest abundance of microplastics was found in samples D1 and D10, namely 1 microplastic/individual. While, samples D3, D4, D5, D7, D8 were not found to contain microplastics.

The identification result of microplastic in mackerel fish is shown in the table below.
Table 3. Analysis result of microplastic in mackerel fish

<table>
<thead>
<tr>
<th>No</th>
<th>Code of sample</th>
<th>Parameter</th>
<th>Microplastic</th>
<th>Abund (M/I)</th>
<th>Rearing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Shape</td>
<td>Color</td>
<td>Size (mm)</td>
<td>Weight (gram)</td>
</tr>
<tr>
<td>1</td>
<td>P</td>
<td>Blanko</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>P1</td>
<td>Line</td>
<td>Blue</td>
<td>3,122</td>
<td>0,0004</td>
</tr>
<tr>
<td>3</td>
<td>P2</td>
<td>Line</td>
<td>Blue</td>
<td>0,713</td>
<td>0,0001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Line</td>
<td>Blue</td>
<td>0,921</td>
<td>0,0001</td>
</tr>
<tr>
<td>4</td>
<td>P3</td>
<td>Line</td>
<td>Blue</td>
<td>3,584</td>
<td>0,0003</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Line</td>
<td>Mix</td>
<td>2,08</td>
<td>0,0004</td>
</tr>
<tr>
<td>5</td>
<td>P4</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>P5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>P6</td>
<td>Line</td>
<td>Blue</td>
<td>2,03</td>
<td>0,0001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Line</td>
<td>Blue</td>
<td>0,926</td>
<td>0,0001</td>
</tr>
<tr>
<td>8</td>
<td>P7</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>P8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>P9</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>11</td>
<td>P10</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

Microplastic content was only found in samples P1, P2, P3, and P6 as shown in Table 3. The total microplastics found in mackerel fish were 7 particles. Generally, the types of microplastics found are line-shape microplastics, which consist of blue and mix colors. The largest microplastic size of 3.854 mm was found in the P3 sample in the form of a blue line, and the smallest microplastic size of 0.713 mm was found in the P2 sample in the form of a blue line. The abundance of microplastics in samples P2, P3, and P6 is 2 microplastics/individual and the abundance of microplastics is 1 microplastic/individual in sample P1. Meanwhile, samples of P4, P5, P7, P8, P9, and P10 were not found to contain microplastic.

**Microplastic Abundance of Fishes:** Generally, the type of microplastic found was line-shaped microplastic, consist of blue, mix, purple, and green colors.

Table 4 shows the shape of microplastic found in the fish’s body is generally line and fiber-shaped. Meanwhile, the most dominant of amount color is blue as many 77.77%.

Table 4. The proportion of microplastic found in fishes by shape and color

<table>
<thead>
<tr>
<th>No</th>
<th>Shape</th>
<th>Color</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Line</td>
<td>Blue</td>
<td>14</td>
<td>77.77%</td>
</tr>
<tr>
<td></td>
<td>Mix</td>
<td></td>
<td>2</td>
<td>11.11%</td>
</tr>
<tr>
<td></td>
<td>Purple</td>
<td></td>
<td>1</td>
<td>5.50%</td>
</tr>
<tr>
<td></td>
<td>Green</td>
<td></td>
<td>1</td>
<td>5.50%</td>
</tr>
<tr>
<td></td>
<td>Total Particle</td>
<td></td>
<td>18</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Risk Analysis of MPs Exposure to Human:** The step of EHRA is a risk characteristic that conducted to determine the risk or one other hand to determine whether the risk agentsat a certain concentration of EHRA by the Directorate General of PP and PL, the Ministry of Health[25] and relevant study about health risk assessment [26] were analyzed for risky EHRA arise health disturbance by the communities or not. Risk analysis of microplastic exposure for humans refers to the guideline book.

The Calculation of Ingestion Path Intake Rate

The following is the calculation result of Intake rate through ingestion exposure (digested):
Table 5 shows that the mean body weight of respondents is ± 58 kg, with the lowest body weight in the BC2 sample, namely 38 kg, and the highest body weight in the SA6 sample, namely 85 kg. The average intake rate is ± 155 grams/day of processed dry weight, where the minimum intake rate value is 40 grams/day in the BC2 sample and the maximum intake rate value is 320 grams/day in the BB5 and the CA8 samples. Generally, fish consumption by respondents is 1-2 fish/day and 6 fish/week. The average frequency of exposure to fish consumption is ± 190 days/year with a minimum frequency of exposure of 104 days/year is found in the BC4 and the BC5 samples and the maximum value of frequency of exposure 260 days/year are found in BB3, CA1, CA2, CA5, and CA6 samples. The average duration of exposure to fish consumption was ± 39 years with a minimum exposure duration value of 10 years in BC 1 and BC 7 samples, and the maximum duration of exposure was 60 years in SA1 and BB7 samples.

Based on the above tables is obtained the calculation result of the intake rate for respondents both carcinogenic and non-carcinogenic. If the intake rate <RfD (Reference Dose) then it is safe, otherwise if the intake rate >RfD (Reference Dose) then it is not safe. Meanwhile, RfD of microplastic is not yet determined by EPA, then the first RfD microplastic must be found by using the derivation of NOEL’s formula.

<table>
<thead>
<tr>
<th>No.</th>
<th>Code of Resp.</th>
<th>C mg/kg</th>
<th>R kg/day</th>
<th>FE day/yr</th>
<th>Dt years</th>
<th>Wb kg</th>
<th>I Non-Carc</th>
<th>I Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SA1</td>
<td>2.5</td>
<td>0.08</td>
<td>208</td>
<td>60</td>
<td>50</td>
<td>0.005</td>
<td>0.002</td>
</tr>
<tr>
<td>2</td>
<td>SA2</td>
<td>2.5</td>
<td>0.16</td>
<td>156</td>
<td>30</td>
<td>50</td>
<td>0.003</td>
<td>0.001</td>
</tr>
<tr>
<td>3</td>
<td>SA3</td>
<td>5</td>
<td>0.08</td>
<td>208</td>
<td>22</td>
<td>60</td>
<td>0.003</td>
<td>0.001</td>
</tr>
<tr>
<td>4</td>
<td>SA4</td>
<td>2.5</td>
<td>0.16</td>
<td>156</td>
<td>45</td>
<td>62</td>
<td>0.004</td>
<td>0.002</td>
</tr>
<tr>
<td>5</td>
<td>SA5</td>
<td>2.5</td>
<td>0.16</td>
<td>208</td>
<td>20</td>
<td>60</td>
<td>0.003</td>
<td>0.001</td>
</tr>
<tr>
<td>6</td>
<td>SA6</td>
<td>1</td>
<td>0.2</td>
<td>156</td>
<td>44</td>
<td>85</td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>7</td>
<td>SA7</td>
<td>4</td>
<td>0.1</td>
<td>208</td>
<td>21</td>
<td>45</td>
<td>0.004</td>
<td>0.002</td>
</tr>
<tr>
<td>8</td>
<td>SA8</td>
<td>5</td>
<td>0.08</td>
<td>208</td>
<td>45</td>
<td>52</td>
<td>0.007</td>
<td>0.003</td>
</tr>
<tr>
<td>9</td>
<td>BB1</td>
<td>2.5</td>
<td>0.24</td>
<td>208</td>
<td>37</td>
<td>60</td>
<td>0.007</td>
<td>0.003</td>
</tr>
<tr>
<td>10</td>
<td>BB2</td>
<td>2.5</td>
<td>0.16</td>
<td>156</td>
<td>50</td>
<td>70</td>
<td>0.004</td>
<td>0.002</td>
</tr>
<tr>
<td>11</td>
<td>BB3</td>
<td>2.5</td>
<td>0.16</td>
<td>260</td>
<td>20</td>
<td>65</td>
<td>0.003</td>
<td>0.001</td>
</tr>
<tr>
<td>12</td>
<td>BB4</td>
<td>2.5</td>
<td>0.16</td>
<td>208</td>
<td>55</td>
<td>63</td>
<td>0.007</td>
<td>0.003</td>
</tr>
<tr>
<td>13</td>
<td>BB5</td>
<td>1.25</td>
<td>0.32</td>
<td>208</td>
<td>40</td>
<td>60</td>
<td>0.005</td>
<td>0.002</td>
</tr>
<tr>
<td>14</td>
<td>BB6</td>
<td>2.5</td>
<td>0.16</td>
<td>208</td>
<td>55</td>
<td>45</td>
<td>0.009</td>
<td>0.004</td>
</tr>
<tr>
<td>15</td>
<td>BB7</td>
<td>2.5</td>
<td>0.16</td>
<td>208</td>
<td>60</td>
<td>50</td>
<td>0.009</td>
<td>0.004</td>
</tr>
<tr>
<td>16</td>
<td>CA1</td>
<td>3.33</td>
<td>0.12</td>
<td>260</td>
<td>36</td>
<td>60</td>
<td>0.006</td>
<td>0.002</td>
</tr>
<tr>
<td>17</td>
<td>CA2</td>
<td>5</td>
<td>0.08</td>
<td>260</td>
<td>45</td>
<td>65</td>
<td>0.007</td>
<td>0.003</td>
</tr>
<tr>
<td>18</td>
<td>CA3</td>
<td>2</td>
<td>0.1</td>
<td>208</td>
<td>42</td>
<td>45</td>
<td>0.004</td>
<td>0.002</td>
</tr>
<tr>
<td>19</td>
<td>CA4</td>
<td>2.5</td>
<td>0.24</td>
<td>208</td>
<td>48</td>
<td>72</td>
<td>0.008</td>
<td>0.003</td>
</tr>
<tr>
<td>20</td>
<td>CA5</td>
<td>2.5</td>
<td>0.16</td>
<td>260</td>
<td>40</td>
<td>50</td>
<td>0.008</td>
<td>0.003</td>
</tr>
<tr>
<td>21</td>
<td>CA6</td>
<td>5</td>
<td>0.08</td>
<td>260</td>
<td>55</td>
<td>56</td>
<td>0.009</td>
<td>0.004</td>
</tr>
<tr>
<td>22</td>
<td>CA7</td>
<td>2.5</td>
<td>0.16</td>
<td>156</td>
<td>36</td>
<td>62</td>
<td>0.003</td>
<td>0.001</td>
</tr>
<tr>
<td>23</td>
<td>CA8</td>
<td>1.25</td>
<td>0.32</td>
<td>156</td>
<td>46</td>
<td>62</td>
<td>0.004</td>
<td>0.002</td>
</tr>
<tr>
<td>24</td>
<td>BC1</td>
<td>2</td>
<td>0.2</td>
<td>156</td>
<td>10</td>
<td>50</td>
<td>0.001</td>
<td>0.000</td>
</tr>
<tr>
<td>25</td>
<td>BC2</td>
<td>10</td>
<td>0.04</td>
<td>156</td>
<td>57</td>
<td>38</td>
<td>0.009</td>
<td>0.004</td>
</tr>
</tbody>
</table>
Table 6. Result of carcinogenic and non-carcinogenic intake rate

<table>
<thead>
<tr>
<th></th>
<th>I Non Carcinogenic</th>
<th>I Carcinogenic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>0.004754</td>
<td>0.002037599</td>
</tr>
<tr>
<td>Median</td>
<td>0.004103</td>
<td>0.001758547</td>
</tr>
<tr>
<td>Mode</td>
<td>0.003546</td>
<td>0.001519635</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>0.002549</td>
<td>0.001092592</td>
</tr>
<tr>
<td>Range</td>
<td>0.008378</td>
<td>0.003590718</td>
</tr>
<tr>
<td>Minimum</td>
<td>0.00095</td>
<td>0.000407045</td>
</tr>
<tr>
<td>Maximum</td>
<td>0.009328</td>
<td>0.003997763</td>
</tr>
<tr>
<td>Sum</td>
<td>0.142632</td>
<td>0.061127963</td>
</tr>
<tr>
<td>Count</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

The table above shows that deviation standard I-non carcinogenic = 0.002549 < mean = 0.004754. The minimum value of Intake Rate Non Carcinogenic = 0.00095 found in BC7 sample, and the maximum value of Intake Rate Carsinogenic = 0.009328 found in CA6 sample. Meanwhile, deviation standard I-Carsinogenic = 0.001092592 < mean = 0.002037599. The minimum value of Intake Rate Carsinogenic = 0.000407045 found in BC7 sample, and the maximum value of Intake Rate Carsinogenic = 0.003997763 found in CA6 sample.

Based on the calculation by using ANOVA is obtained p-value = 0.009867 < α = 0.05, then there is a relationship with microplastic concentration, intake rate, exposure frequency, and exposure duration on Intake Rate or magnitude of risk (RQ).

**Conclusion**

Microplastic as found in red kurisi fish *(Nemiptus japonicas)* is 11 particles, and mackerel fish *(rastrelliger sp.)* is 7 particles. Microplastic is found in the line or fiber-shaped only. Blueline dominates other colors is 77.77%. These lines or fiber-shaped microplastic is predicted comes from the degradation of fishnets, cover tarpaulin of fisherman boat, and seat layer along the edge of the coastal of Beba, Tamasaju village.

The calculation result of Intake Rate, both non-carcinogenic and carcinogenic showed a strong relationship with the concentration (C) of microplastics in fish, intake rate (R), frequency of exposure (FE), duration of exposure, and body weight (Wb) of respondents.

**Acknowledgments:** Thanks to the Chief of Research and Community Service Institute of Hasanuddin University for providing the opportunity to research, the Laboratory of Aquatic Productivity and Fertility of the Hasanuddin University, Faculty of Marine and Fisheries Affairs for providing laboratory facilities, and to the communities of Tamasaju village that participates in this research so that this research can finish well and no obstacles.

**Ethical Clearance:** Our study was not directly applied on human, hence ethical clearance was not required.

**Source of Funding:** Chief of Research and Community Service Institute of Hasanuddin University.

**Conflict of Interest:** The authors have no affiliation with any organization with a direct or indirect financial interest in the subject matter discussed in the manuscript.
References


Physiological and Molecular Study of Iraqi Women with Polycystic Ovary Syndrome

Zainab Khidhair Hussain
Lecturer, Department of Biology, College of Science, University of Baghdad, Baghdad, Iraq

Abstract
Polycystic ovary syndrome is define as illness in women that a reproductive age because common endocrinopathy and lead to reproductive dysfunction also infertility. PCOS is usually alignment with insulin resistance and metabolic syndrome, it is think that PCOS is the outcome of genetic effect addition to ecological factor. In this study (100) samples which divided into 40 samples of heath women and 60 samples of women with PCOS. It diagnosed by ovarian morphology on ultrasound also test the fasting blood sugar, insulin, insulin resistance and testosterone hormone by biochemical method also used molecular method to detect the genotype of TCF4 gene (rs290487) by RFLP-PCR technique. The results revealed that the frequency of allele T was recorded a highly significance (P<0.01) in patients (0.81%) while in control (0.89%), the frequency of allele C allele significant (P<0.01) in patients (0.19%) while in control (0.11%). We can be concluded from this study that the genetic variation in Iraqi women of gene (TCF4) was linked with PCOS while contrary in control (healthy women).

Keywords: Ovary, Testosterone, gene, polycystic, polymorphism, Insulin resistance.

Introduction
Polycystic ovary syndrome (PCOS) is a symptom because endocrinopathy or elevated androgens (male hormones) in females at reproductive age, with a incidence of upper 10% of women [1]. PCOS is produce to a mixture of genetic and environmental factors [2]. Rate of alterations among people may reveal that the effect of factors on the phenotype such environmental features, ethnic origin and race [3]. Many factors such as increased adiposity, mainly visceral adiposity lead to waist circumference (waist-to-hip) ratio elevation, may be related with hyperandrogenemia, glucose intolerance, dyslipidemia, and insulin resistance [4]. In actuality, about fifty percent of women with PCOS women have obesity or overweight [5]. Overweight in women suffer from PCOS align endocrine syndromes than in women with non over weight [6]. One of the most complaints in women with PCOS is an ovulatory (infertility), also have risk factor as cardiovascular analogous to metabolic syndrome [7]. Stein and Leventhal who first explained PCOS since 1935 after they introduced and published it about seven women has amenorrhea, enlarged ovaries showed with polycystic shape, hirsutism, also obesity[8]. Actuality, PCOS known since 1844 via [9]. PCOS, also describe via ultrasonography (the occurrence of cyst about (2-8) mm in width or diameter, the number of it 10 or extra cysts, placed either peripherally position in core of stroma or scattered in it lead to stroma and ovarian volume increasing), this very most important diagnostic way for PCOS[10,11], the aim of study was to estimate some physiological and molecular parameters of Iraqi women with polycystic ovary syndrome

Material and Method
Experimental design: The study was directed afterward gaining ethical approval from Scientific Research Committee University of Baghdad/College of science/Department of biology, fulfillment this work in laboratories in Department of biology/College of science. The samples of study included (100) Iraqi women with PCOS the age of women about 18-45 years old, all of it diagnosed by morphology on ultrasound added to the biochemical method. They were divided into two main groups: the first group included 40 healthy women and the second included 60 women with PCOS.

Collection of Blood Sample: Blood was collected after more than 12 hours fasting by syringes from vein. Venous blood was transported into tube covering with
EDTA for extraction of DNA and other amount of blood used to measurement some physiological parameters.

**Biochemical Tests:** Serum was separated after clot for 15-25 minutes at room temperature by centrifugation at (3500 rpm 15 min) to measurement biochemical tests. The fasting blood glucose test determined by (biosystem kit, Spain). Serum concentrations of insulin and testosterone were assessed using an ELISA kit (DRG Instruments Mbh, Germany).

**Table 1: The optimum condition of amplification TCF₄ (rs290487)**

<table>
<thead>
<tr>
<th>No.</th>
<th>Phase</th>
<th>Tm (°C)</th>
<th>Time</th>
<th>No. of cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Initial Denaturation</td>
<td>94°C</td>
<td>3 min.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Denaturation -2</td>
<td>94°C</td>
<td>35 sec</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Annealing</td>
<td>53°C</td>
<td>35 sec</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Extension-1</td>
<td>72°C</td>
<td>35 sec</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Extension -2</td>
<td>72°C</td>
<td>7 min.</td>
<td></td>
</tr>
</tbody>
</table>

The PCR product was 153-bp after electrophoresed on polyacrylamide gel with red stain. It was digested for 50 min with BstUI by RFLP- PCR, reaction conditions in table (2)

**Table 2: Reaction condition of Restriction Enzyme BstUI**

<table>
<thead>
<tr>
<th>Protocol</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product PCR</td>
<td>µl 1.5</td>
</tr>
<tr>
<td>R. E.</td>
<td>µl 1</td>
</tr>
<tr>
<td>Buffer</td>
<td>µl 4</td>
</tr>
<tr>
<td>Temperature/Time</td>
<td>60°C/50 min</td>
</tr>
</tbody>
</table>

**Molecular Study:** Total Genomic DNA was extracted from blood sample using G-spin™ kit. DNA was stored at -70 °C, the PCR technique used to amplify of (rs290487) in TCF₄. Amplification of the region with forward primer 5’- AGGAGGCTGCCATATTGTTACTT-3’ and reverse primer 5’-ACACCTTTCTCATTTTCAATTTCG-3’. The condition of PCR in (table 1).

**Table 3:**

<table>
<thead>
<tr>
<th>Protocol</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women with PCOS</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td></td>
</tr>
<tr>
<td>92.20 ± 9.66</td>
<td></td>
</tr>
<tr>
<td>56.80 ± 3.10</td>
<td></td>
</tr>
<tr>
<td>Fasting blood level</td>
<td></td>
</tr>
<tr>
<td>177.20 ± 14.23</td>
<td></td>
</tr>
<tr>
<td>92.78 ± 5.67</td>
<td></td>
</tr>
<tr>
<td>Insulin hormone concentration in serum</td>
<td></td>
</tr>
<tr>
<td>42.10 ± 1.98</td>
<td></td>
</tr>
<tr>
<td>24.06 ± 2.81</td>
<td></td>
</tr>
<tr>
<td>Testosterone hormone concentration in women</td>
<td></td>
</tr>
<tr>
<td>228.88 ± 98.24</td>
<td></td>
</tr>
<tr>
<td>49.40 ± 10.78</td>
<td></td>
</tr>
</tbody>
</table>

**Statistical Analysis:** The program is system SAS 2012 was used to compare between difference of means such as Least significant difference test (ANOVA).

**Results and Discussion**

The study revealed that the differences in values of biochemical parameters as fasting blood level also hormones like insulin and testosterone, also level of insulin resistance when compare this result between women with PCOS and normal cases. The study showed high significant increasing (P≤0.01) (23.401) in weight of patients (92.20 ± 9.66) if compare with control (56.80 ± 3.10). At the same time, high significant increasing (P≤0.01) (35.333) of fasting blood level (177.20 ± 14.23) while in healthy women (92.78 ± 5.67). The differences high significant increasing (P≤0.01) (7.929) in insulin hormone concentration in serum in patient’s women with PCOS (42.10 ± 1.98) while in control group (24.06 ± 2.81), insulin resistance showed high significant (P≤0.01) (4.549) in patients with PCOS (15.61 ± 1.61) that differ from healthy women (7.23 ± 1.13). Also the same result, high significant (P≤0.01) (127.91) of testosterone hormone concentration in women with PCOS (228.88 ± 98.24) while in healthy women (49.40 ± 10.78) Table 3.

The differences of genotype and allele frequency in patients with PCOS and control showed in (Figure-1). It was performed by RFLP- PCR, restriction enzyme BstUI digested products of PCR and were separated on agarose gel. Red stain was used of bands to stain in the gel.
Table 3: Biochemical parameters of women with PCOS and control

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Mean ± SE</th>
<th>T-test</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Patients (PCOS)</td>
<td>Control</td>
<td></td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>92.20 ± 9.66</td>
<td>56.80 ± 3.10</td>
<td>23.401**</td>
</tr>
<tr>
<td>FBS (mg/dl)</td>
<td>177.20 ± 14.23</td>
<td>92.78 ± 5.67</td>
<td>35.333 **</td>
</tr>
<tr>
<td>Insulin (ng/ml)</td>
<td>42.10 ± 1.98</td>
<td>24.06 ± 2.81</td>
<td>7.929 **</td>
</tr>
<tr>
<td>Insulin resistance</td>
<td>15.61 ± 1.61</td>
<td>7.23 ± 1.13</td>
<td>4.549 **</td>
</tr>
<tr>
<td>Testosterone (ng/ml)</td>
<td>228.88 ± 98.24</td>
<td>49.40 ± 10.78</td>
<td>127.91 **</td>
</tr>
</tbody>
</table>

** (P≤0.01).

Figure (1): Electrophoresis arrangement of produce PCR of (2%). Lane’s 2,3,4,5,6,7,8,9,19 heterozygous: TC genotype; Lane’s 9,10,11,12,13,14,15,16,17,18 homozygous: TT genotype . M: molecular marker of DNA (50 bp) size.

The genotype variation of TCF4 (rs290487) polymorphism and allele frequency in patients with PCOS and control result revealed that the genotype TT showed high significant differences (P-value = 0.0082, $\chi^2 = 6.339$) in patients with PCOS (61.36%) and in control (77.42%), also the genotype TC demonstrated significant differences (P-value = 0.0082 $\chi^2 = 6.339$) in patients with PCOS (38.64%) and in control (22.58%). While the genotype CC seen no significant differences between patients and control. In addition, the frequency of allele T was recorded a highly significance (P<0.01) in patients (0.81%) while in control (0.89%), the frequency of allele C allele significant (P<0.01) in patients (0.19%) while in control (0.11%) Table-4.

Table 4: Genotype and allele frequency of TCF4 (rs 290487) gene in patients with PCOS women and control.

<table>
<thead>
<tr>
<th>Genotype</th>
<th>Control</th>
<th>Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>TT</td>
<td>48</td>
<td>77.42</td>
</tr>
<tr>
<td>TC</td>
<td>14</td>
<td>22.58</td>
</tr>
<tr>
<td>CC</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Total</td>
<td>62</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Allele</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>0.89</td>
</tr>
<tr>
<td>C</td>
<td>0.11</td>
</tr>
</tbody>
</table>

** (P≤0.01).
In this study we depended on biochemical tests and ultrasonic method to determine any changes may be PCOS in women\(^{12}\), the results in we study showed that increasing significantly in weight of women with PCOS versus normal women, our result agree align Dunaif et.al. result, who revealed that most of patients women with PCOS have obese contrary to normal \(^{13}\). Our results showed increasing significantly in level of blood glucose, insulin concentration and insulin resistance, Furthermore, \(\beta\)-cell dysfunction is one of metabolic abnormalities linked with PCOS and diabetes T2, may heritable factor of families. There are close linked both PCOS and obesity, because similar genes may causes fatness in affected patients with PCOS \(^{14}\). Also the insulin resistance addition to diabetes T2 is a common result of women with PCOS in state without obesity and insulin resistance with obese PCOS\(^{15}\). As many as the insulin resistance about 70% in women with PCOS but it nearly 10% in women with DM \(^{16,17}\), the study revealed that increasing in level of testosterone with elevated of glucose levels, insulin, and insulin resistance which may lack the sensitivity to expect risk of PCOS in women. Our study similar with this study which the women patients with PCOS suffer from hyper-insulinemia also have increasing in testosterone level, the testosterone level may greater than the normal value and middle raised level \(^{18}\), but very high level of testosterone concentration is not usually in PCOS because a virility tumor \(^{19,20}\). The recent study showed that correlation between high testosterone concentration with obesity, exacting with fat in abdominal distribution\(^{21}\), also insulin resistance with a elevated of glucose level rate\(^{22}\). In addition to, hyperandrogenism guide to PCOS as well as ovulatory dysfunction in vivo and vitro\(^{23,24}\). Level of insulin might increase peripheral steroidogenesis, whereas lead to destruction activity of CYP17 \(^{25}\) inducing generally to testosterone overload without androstenedione and DHEAS excess therefore, hyperinsulinemia and insulin resistance raise production of ovarian testosterone in women with PCOS without effect on secretion of androstenedione\(^{26}\). In fact that, no association between adrenal androgen secretion and insulin resistance in PCOS or eumenorrhoic patients \(^{27}\).

Our results revealed that the genotype and allele frequency of TCF4 (rs 290487) gene, allele T was recorded a highly significance (P<0.01) in patients (0.81%) while in control (0.89%), the frequency of allele C allele significant (P<0.01) in patients (0.19%) while in control (0.11%), while this study revealed that there is no contribution of TCF4 gene variation of Tunisian women with PCOS \(^{28}\). The confirmation of relationship with (2) independent loci of TCF4 in a PCOS first1: relationship between insulin level and the diabetes type 2 locus; and second 2: connection through reproductive PCOS phenotype. The study recommends that polymorphism in altered loci of a vulnerability gene donate to divergent phenotypes, also showed no proof for relationship among the rs7903146/rs12255372 polymorphism and PCOS. Though, there are observing first round proof for relationship with PCOS on a loci about (100 kb) downstream in the Caucasian type 2 diabetes locus\(^{29}\). Other findings recorded that relationship among the proinsulin:insulin ratio and glucose tolerance in patients with PCOS and the TCF4 Caucasian type 2 diabetes locus that confirmation for other studies which reveal in variation of TCF4 gene with defects in insulin secretion \(^{30}\), possibly by changing alteration of proinsulin to insulin in pancreatic beta-cells \(^{31}\). Lyssenko et al. recorded that the type 2 diabetes related genotype of rs7903146 besides rs12255372 gene are linked with deficiency in arginine-stimulated insulin production in patients with irregular glucose level but not healthy\(^{32}\).

**Conclusion**

The genetic variation of gene TCF4 was linked with PCOS while contrary in control (healthy women). The genotype and allele frequency of TCF4 (rs 290487) gene, allele T was recorded a highly significance in patients when compare with control. The frequency of allele C allele lower significant in patients than in control. There are relationship between the allele frequency of TCF4 (rs 290487) gene and genetic variation with PCOS.

**Conflict of Interest:** None

**Funding:** Self

**Ethical Clearance:** Not required

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Descriptive Investigation of Government Events and Public Interest Analysis Using Google Trends between Pictorial Health Warnings Policy Implementation and Electronic Nicotine Delivery Systems Ban in India

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Abstract

Background: A sequential descriptive analysis of the government events related to 85% PW implementation and ENDS ban is lacking. There is also a dearth of public interest analysis in such policy making.

Objectives: To descriptively analyse the sequence of government events in both the policies and evaluate the public interest analysing trends from the respective events.

Method: Government events in India on 85% PWs were collected from media articles ranging from October 2014 to April 2016 while on ENDS ban, the information was obtained from Ministry of Health & Family Welfare, Government of India from August 2018 to December 2019. We compared Google Trends relative search volume data for ‘smoking causes cancer’, ‘smoking danger’, ‘pictorial’, ‘ITC limited’ as keywords for Pictorial Health Warnings from April 2014 to April 2016 (Policy A) while keywords such as ‘electronic cigarettes’, ‘Vape’, ‘Juul’ were used as surrogate for ENDS ban from October 2017 to October 2019 (Policy B).

Results: According to the Google trends analysis, ‘pictorial’ was searched significantly more in Policy A time period (4298 vs 2599) while ‘Vape’ had distinctly more searches in Policy B time period (6136 vs 1042). However, the volume of difference between the two policies time period was significantly higher for Vape (5094 vs 1699).

Conclusion: Strategy and experiences from delayed implementation of pictorial health warnings has laid down the path for faster enactment of future anti-tobacco policies.

Keywords: Pictorial Warnings, Electronic Nicotine Delivery Systems (ENDS), Government Actions, Tobacco products.

Introduction

Approximately 1 billion people living on this planet consume tobacco in some form (smoking/smokeless). It is estimated that half a billion human beings would prematurely die due its usage unless they quit1 2. There are various ways in which anti-tobacco health workers have been working hard against mighty tobacco industry...
to save such lives. One of the ways being the Pictorial Warnings showing ill-effects of tobacco on the packaging itself. However, there has been strong resistance from tobacco industry against such mechanism to reduce the usage of tobacco all over the world. India’s long journey of pictorial health warnings (PW) implementation from 40% to 85% on tobacco products was no different than in other countries. The Government of India notified the 85% PWs on October 15, 2014 for the implementation on April 1, 2015 but these were implemented after a delay of over 12 months on April 1, 2016. There was much learning from the implementation of pictorial health warnings for future policies such as recent ban on Electronic Nicotine Delivery Systems (ENDS) in India on 18th September 2019.

Apart from the Government’s will, success of the implementation of any government policy largely depends on the existing public interest. Google is one of the most popular search engines in the world. Google trends give real-time data thus has proven to be a potential tool to gauge public interest. Such data of public interest between the two events can give us potential reason for the difference in the success. This research paper analyses Government actions and public interest on PW and ENDS policies in their respective time periods.

**Method and Material**

We examined the government events on 85% pictorial health warnings and ENDS ban in India, comparing two time periods by means of actions taken by the government in both the policies. Time period for Policy A events was from October 2014 to April 2016 and for Policy B from August 2018 to December 2019. The information on government events on 85% PWs were collected from the media reports provided by a PR agency ‘Comma Communications Management’, which tracked news everyday related to tobacco. For ENDS ban Government events were taken from Ministry of Health & Family Welfare, Government of India. The data was collected for further analysis into an excel sheet. Events were defined as those which were related to policy announced by the Government on (i) Pictorial health warnings, such as notification, delay in implementation of 85% PWs, contempt by Rajasthan High Court, Committee on Subordinate Legislation formed to assess PWs, etc. (ii) In case of ENDS Ban announcements made by the Government such as Advisory issued by the MoHFW, the White Paper by Indian Council of Media Research, the Ordinance, etc. The collected Government events were then manually classified as pro and anti, based on the following criteria: (1) Pro actions included statements in favour of both the policies (2) Negative government events included statements against both the policies. The classifications of the government events were cross-checked by a second researcher to remove any bias or error. We collected the events of both the policies i.e., PWs & ENDS Ban. Events of both policies were then compared in order to observe for government actions. In order to gauge the public interest on both the policies, we compared the Google Trends relative search volume data for terms ‘smoking causes cancer’, ‘smoking danger’, ‘pictorial’, ‘ITC limited’ as keywords for Pictorial health warnings policy from April 2014 to April 2016 (Policy A) while keywords ‘electronic cigarettes’, ‘Vape’, ‘Juul’, ‘ENDS’ were used as surrogate for ENDS ban from October 2017 to October 2019 (Policy B). India was selected as the geography for all the searches on Google Trends.

**Statistical Analysis:** Normal distribution of the scores was tested using the Kolmogorov–Smirnov test and homogeneity of variance was tested using Levene’s test. Categorical data was represented in Frequency form and continuous data was presented as the Mean ± SD or median (IQR). The Spearman correlation coefficient was used to measure the associations, descriptive analysis was performed to identify distribution of variables included in the study. Mann Whitney test was used to compute difference between the two groups. All analysis was tested with two-sided hypothesis testing and significance was considered at a p-value less than 0.05. Statistical analyses were performed using SPSS (Statistical Package for Social Sciences) IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.

**Results**

A total of 19 Government events occurred on Pictorial health warnings from October 2014 to April 2016. Of these 10 (52.63%) were pro policy events and 9 (47.36%) were anti policy events. On ENDS, a total of 6 Government events took place. Of these 100% were pro policy events (Table-1).

In the present study, it was observed that, while the media was reporting real time, each and every move of the Government, all stakeholders as media, lawyers, public health activists, tobacco industry, were also...
playing their roles. It is evident from the table above that even though the Government was in favour of the 85% PWs, there was huge pressure from the tobacco industry, Committee on Subordinate Legislation (CoSL) and public health activists. After many interferences and reports from the CoSL, Public Notice was finally issued. This was taken as affirmation by the public health activists who were monitoring this issue closely. On 16th March 2016, the Ministry issued a statement that there will be no course of change in warnings and it will stick to 85% implementation from April 1, 2016 (Table-1).

The Government was alert in policy on ENDS ban. The MoHFW took proactive actions right from the beginning immediately after there were studies from western world on the multitude of harms of electronic cigarettes. Table 2 represents how the Indian Government then took faster actions for ban on ENDS. An Advisory issued by the MoHFW to all states of India followed by the White Paper on ENDS in India on the World No Tobacco Day 2019 was evidence that the Government was all set to ban ENDS in India and indeed, within three months of this white paper, ENDS was banned in India through an Ordinance. During this time, various stakeholders including public health activists, media, lawyers got involved quickly. Soon after the Ordinance, the Lok Sabha & Rajya Sabha supported the Bill on ENDS and without any anti actions, the ENDS ban came into force on December 5, 2019.

Table 2 shows the intensity of pro actions that took place in the preceding 7-8 months to the Ordinance, despite of attempts by the anti-forces to derail the process (Table-2).

Relative Google search volumes for Policy A, included ‘smoking causes cancer’, ‘smoking danger’, ‘pictorial’, ‘ITC limited’ representing 85% PWs policy. Total volume search for keyword search of ‘smoking causes cancer’ was 873 (0-21 per week), ‘smoking danger’ was 443 (0-15 per week), ‘pictorial’ was 6491 (37-100 per week), ‘ITC limited’ was 3584 (13-58 per week) when searched together (Figure-1). While relative Google search volumes for Policy B, included electronic cigarettes was 1373 (7-100 per week), ‘Vape’ was 807 (5-12 per week), ‘Juul’ was 140 (1-4 per week) for the time period from October 2017 to October 2019 when searched together (Figure-2).

Total volume of searches between the two policies could not be compared as they were from different time periods. Thus, from the above results ‘Pictorial’ and ‘Vape’ were compared for both the time periods Policy A (2014-2016) and Policy B (2017-2019) as these search words were most comparable (Figure-3 and 4). Total volume search for ‘Pictorial’ and ‘Vape’ was 4298 (25-67 per week) and 2599 (4-100 per week) respectively for Policy A time period (Figure 3) while total search volume for ‘Pictorial’ and ‘Vape’ was 1042 (6-18 per week) and 6136 (6-100) respectively for Policy B time period (Figure-4). Thus, in Policy A time period Pictorial was searched significantly higher than Vape while in Policy B time period Vape was searched more than pictorial.

However, Figure-5 represents that volume of difference between the time periods (5094 vs 1699) for Vape was significantly higher than pictorial (p<0.001) (Figure -5).

Table 1: Government Events on 85% Pictorial Health Warnings

<table>
<thead>
<tr>
<th>Date</th>
<th>Government Events on 85% Pictorial Health Warnings (PWs)</th>
<th>Pro/Anti event</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-Oct-14</td>
<td>Government notified 85% PWs</td>
<td>Pro</td>
</tr>
<tr>
<td>25-Feb-15</td>
<td>Favourable statement from the Minister of Health &amp; Family Welfare (MoHFW), Government of India</td>
<td>Pro</td>
</tr>
<tr>
<td>18-Mar-15</td>
<td>Committee on Subordinate Legislation (CoSL) formed and gave report to the Health Ministry to hold 85% GHWs</td>
<td>Anti</td>
</tr>
<tr>
<td>23-Mar-15</td>
<td>PWs were put on hold by the MoHFW</td>
<td>Anti</td>
</tr>
<tr>
<td>25-Mar-15</td>
<td>Favourable statement by the Union Health Minister on 85% PWs</td>
<td>Pro</td>
</tr>
<tr>
<td>03-Apr-15</td>
<td>Favourable statement by the Union Health Minister on 85% PWs</td>
<td>Pro</td>
</tr>
<tr>
<td>05-Apr-15</td>
<td>Prime Minister of India made a favourable statement on PWs</td>
<td>Pro</td>
</tr>
<tr>
<td>01-May-15</td>
<td>Finance Minister of India made a favourable statement that Government fully supports the 85% pictorial health warnings</td>
<td>Pro</td>
</tr>
<tr>
<td>Date</td>
<td>Government Events on 85% Pictorial Health Warnings (PWs)</td>
<td>Pro/Anti event</td>
</tr>
<tr>
<td>------------</td>
<td>------------------------------------------------------------------------------------------------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>16-Jul-15</td>
<td>Civil Societies invited by the Committee on Subordinate Legislation (CoSL) for implementation of 85% PWs discussion (this was a delay strategy)</td>
<td>Anti</td>
</tr>
<tr>
<td>19-Aug-15</td>
<td>Minister of Health, Government of India maintained status quo on 85% PWs</td>
<td>Anti</td>
</tr>
<tr>
<td>27-Aug-15</td>
<td>Affidavit submitted by the MoHFW in Rajasthan High Court seeking for 6-months extension to implement 85% PWs</td>
<td>Anti</td>
</tr>
<tr>
<td>10-Sep-15</td>
<td>Report by the CoSL to the Ministry to hold these large PWs</td>
<td>Anti</td>
</tr>
<tr>
<td>25-Sep-15</td>
<td>Pictorial Health Warnings be implemented on 1st April 2016</td>
<td>Pro</td>
</tr>
<tr>
<td>18-Dec-15</td>
<td>Clarification sought by the CoSL on 85% PWs from the Health Ministry (delay strategy)</td>
<td>Anti</td>
</tr>
<tr>
<td>08-Jan-16</td>
<td>CoSL seeks clarification on 85% PWs from Health Ministry</td>
<td>Anti</td>
</tr>
<tr>
<td>19-Feb-16</td>
<td>Public notice in newspapers to implement 85% PWs effective April 1, 2016</td>
<td>Pro</td>
</tr>
<tr>
<td>11-Mar-16</td>
<td>Members of the CoSL denied 85% PWs stating it is unfair for tobacco industry</td>
<td>Anti</td>
</tr>
<tr>
<td>16-Mar-16</td>
<td>MoHFW issued a favourable statement that no change will be made to course of the warnings and large PWs will be implemented</td>
<td>Pro</td>
</tr>
<tr>
<td>01-Apr-16</td>
<td>Implementation of the 85% PWs from 1st April 2016</td>
<td>Pro</td>
</tr>
</tbody>
</table>

Table 2: Government Events on ENDS Ban

<table>
<thead>
<tr>
<th>Date</th>
<th>Government Events on ENDS Ban</th>
<th>Pro/Anti event</th>
</tr>
</thead>
<tbody>
<tr>
<td>28-Aug-2018</td>
<td>Advisory by Union Health Ministry to ban ENDS</td>
<td>Pro</td>
</tr>
<tr>
<td>31-May-2019</td>
<td>White Paper by ICMR on health hazards of E-Cigarettes</td>
<td>Pro</td>
</tr>
<tr>
<td>18-Sep-19</td>
<td>The Ordinance on ENDS</td>
<td>Pro</td>
</tr>
<tr>
<td>27-Nov-19</td>
<td>Bill on ban of ENDS passed by Lok Sabha</td>
<td>Pro</td>
</tr>
<tr>
<td>2-Dec-19</td>
<td>Bill on ban of ENDS passed by Rajya Sabha</td>
<td>Pro</td>
</tr>
<tr>
<td>5-Dec-19</td>
<td>Law on ENDS ban passed</td>
<td>Pro</td>
</tr>
</tbody>
</table>

Fig. 1: Pictorial Warnings Timeline and Google keyword searches
Fig. 2: ENDS Ban Timeline and Google keyword searches

Fig. 3: Pictorial Warnings timeline and average Google search
Tobacco is a product, if consumed as it is, kills half of its users. As per the World Health Organization, it kills 8 million people every year, globally. Tobacco-related deaths and disease burden are maximum from the low-and middle-income countries. In India, there are 1.3 million deaths every year due to tobacco use. India has a very effective tobacco control policy which focuses on reduction of prevalence. Large Pictorial Health Warnings policy is an important deterrent for smoking initiation amongst non-smokers. It also promotes smoking cessation behaviour in the current smokers. Previously, pictorial health warnings in India covered 40% of the front panel of packets of the tobacco products. Tobacco industry interference was profoundly seen against the implementation of 85% pictorial health warnings in India due its proven efficacy for tobacco control. Similarly, few years later, there was a perceived threat of logarithmic spread of Electronic cigarettes.
amongst the youth demographic of India. The United States had already seen its growing influence on its future generation with its prevalence being as high as 37.7% in their high school students. As a result, there were 2,601 lung injuries requiring hospital admission and 59 deaths in the USA. Thus, Electronic Nicotine Delivery Systems (ENDS) ban in India came right on time. India is a developing country and implementation of policies remains a big challenge. Even so, the Government took immediate actions in the direction of banning ENDS, before it could spread its roots in the country. Western world companies had already planned to set up industries in India and were promoting these as less harmful and an alternative to quit smoking. There was no research on the statements made by the ENDS manufacturing industry and the medical fraternity unanimously stood against it in India. In fact, in one of the instances more than 1000 medical doctors wrote to the Prime Minister to ban ENDS immediately as it contained unregulated levels of nicotine with the potential to cause neural damage. This paper analysed the resistance faced by the government and other tobacco control stakeholders in enlarging the pictorial health warnings from 40% to 85% even after its notification in October 2014. In implementation of 85% pictorial health warnings, India witnessed a delay of 12 months from the scheduled to actual implementation whereas policy on ENDS ban moved much faster right from advisory by the Ministry to research to Ordinance to passing of Bill in the Parliament of India. This study, therefore, shows in conclusion that there was significant uncertainty about policy implementation of 85% PW until it was finally implemented on April 1, 2016 whereas in ENDS the Government events were all in favour of the policy. This study also deduces that there was contrasting difference in the fall of events in making of two policies. On the one hand, there were intense false propaganda by tobacco industry which delayed the process the implementation of the Policy A by more than 12 months while on other hand, the government, and many other jurisdictions, civil society, medical fraternity were equipped enough due to earlier hardships faced during policy A implementation leading to expedite release of the White paper against ENDS. Unlike during policy A, anti-tobacco warriors had local study, i.e., the White Paper as an evidence available against ENDS.

Government does take into account the public opinion, which in turn shapes policies. The Google searches clearly depict the public interest on both the issues in India. Public interest was present for all the keywords representing pictorial health warnings like “smoking causes cancer”, “smoking danger”, “pictorial”, “TC limited”. Similarly, people searched for words related to electronic cigarettes like “Vape”, “Juul”, “e-cig”. As described before, there was a lot of communication from October 2014 to April 2016 till the eventual implementation of enhanced pictorial health warnings. This is truly represented by the google search volumes in those time periods appreciated in the Figure 2. Similarly, there was surge in public interest for policy B events during the month of September (month in which the ordinance was passed). Thus, our results validated our keywords search representing public interest in those periods. We tried to compare the public interest between two policies and found that pictorial was searched more during the policy A time period and Vape was searched more in Policy B time period. However, when the difference of volume of searched keywords was compared, vape representing ENDS was found to be significantly higher. Thus, our google trends analysis suggested that the issue of ENDS was more popular than pictorial health warnings and that the obstacles faced by the Government during the implementation of PWs provided them with much needed insight about the adoption and enforcement of stricter time lines for banning ENDS.

**Limitations:** Though keywords rightly depicted the peak of the events in our study representing public interest but whether the interest was for or against is unknown. In the PWs policy implementation, there were hearings in the Rajasthan High Court but only those involving the MoHFW announcements are considered.

**Novelty of the Study:** This is the first study in the literature to sequentially describe detailed pro and anti-events which led to the delay of the implementation of pictorial health warnings.

This is also the first study to compare the levels of public interest between two health policies in India.

**Implications:** Descriptive analysis of events between two policies with differing results would better equip tobacco control organisations for future policy implementation.

Google trends analysis can be a quick, cost-effective adjunctive tool to assess the public interest thus redefining expensive traditional method.
Conclusion

Intense tobacco control efforts during pictorial health warnings implementation led down a pathway for future policy implementation including ENDS ban. Public interest may also play a pivotal role in hastening policy enactment process as depicted in ENDS ban.

Ethical Clearance: Patients/Subjects were not included in the study.

Source of Funding: Self

Conflict of Interest: (If any then mention it otherwise write it as nil): Nil

References

Study the Possible Levels of Inflammatory Marker TNF-α and Microalbuminuria in Type 2 Diabetic Nephropathy Patients of Babylon Province/Iraq

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Abstract

Background: Diabetic nephropathy is referred to as the kidney damage that occurs in people with diabetes developing it over many years characterized by gradually increasing urinary albumin excretion (>300µg/mg) from microalbuminuria to proteinuria, blood pressure, and declining in glomerular filtration rate (GFR) (thickening in glomerulus) which represents the late event.

Aim: Study the relationship between the levels of urinary TNF-α and the progression of diabetic nephropathy in type 2 diabetic patients.

Objective: Fasting blood and urine samples were collected from seventy type 2 diabetic patients with enrollment the age, duration, blood pressure, and Body Mass Index (BMI) of each patient. The levels of urine TNF-α were established by ELISA.

Results: Forty patients have normal albuminuria (Albumin/Creatinine Ratio <30 µg/mg) and only thirty patients have microalbuminuria (Albumin/Creatinine Ratio>300 µg/mg) with increased urinary TNF-α levels.

Conclusions: A significant positive relationship between urinary TNF-α and severe microalbuminuria.

Keywords: Diabetic nephropathy, Microalbuminuria, TNF-α, Hypertension.

Introduction

Diabetic nephropathy is the chronic kidney disease (CKD) that occurs as a result of diabetes characterized by increased urinary albumin excretion (albuminuria) and decreased glomerular filtration rate (GFR)⁴. Microalbuminuria >300mg/24 hour associated with hypertension is the first marker of this disease occurring in 20-40% of patients with diabetes leading to end stage renal disease (ESRD) or renal failure with glomerular filtration rate GFR<10mg/mintypically in patients with type 2 diabetes after a diabetes duration of about 10 years, with some risk factors like genetic factors, blood pressure, dyslipidemia, metabolic syndrome, inflammation, growth factors, smoking, and others diabetes complications, the presence of these risk factors lead to dramatically increase of cardiovascular disease and eventually progresses of renal failure⁵. Microalbuminuria is considered to be as a marker of both kidney disease and endothelial dysfunction (decreased glomerular filtration) because of diabetes or hypertension or both, is strongly associated with an increased risk for cardiovascular events⁶, increasing microalbuminuria in urine led to the formation of proteinuria which increase overtime to macroalbuminuria (300>µg/mg) are linked with kidney disease and increased risk for progression to end stage renal disease. Impaired glycemic control is related with increasing in urinary microalbumin levels very low levels or absence of microalbuminuria is associated with low CVD, which also increases markedly with increasing albumin amount in urine⁷.

Tumor Necrosis Factor Alfa (TNF-α) is synthesized and produced by stimulated kidney cells
and especially by glomerular, tubular, and active monocytes, causing the elevation of the levels of other inflammatory factors such as cytokines, chemokines, growth factors, and acute phase protein\(^6\). TNF-\(\alpha\) plays an important role in the development of diabetic nephropathy by decreasing glomerular blood flow and a consequence reducing filtration rate, vasoconstriction, and damage of the glomerular filtration barrier leading to macroalbuminuria, in addition the elevated TNF-\(\alpha\) levels leads to the elevation of free radicals increasing the apoptosis of glomerular cells\(^7\). In general, hypertension present in type2 diabetic patients before the development of kidney disease because of the risk factors such as glucose intolerance and obesity. Hypertension causes the progression of kidney disease and contributes to the increased cardiovascular disease in diabetic nephropathy patients because of the destruction of renal function. The distribution of hypertension in diabetic nephropathy were elevated at each step of chronic kidney disease, reaching to about 90% for end stage renal disease patients\(^8\,9\).

**Subjects and Method**

Seventy patients with type2 diabetes The study was conducted between March 2019-June 2019 in Marjan teaching hospital in AL-Hilla City/Babylon province-Iraq. Samples under study were divided according to the duration of disease and age, this study design focus on study some physiological and biochemical parameters.

Blood and urine samples were collected from type2 diabetic patients in the morning between 08:00 and 10:00 O’clock to minimize the effect of diurnal variation\(^10\), after a period of fasting 8-10 hours by vein puncture using 5 ml disposable syringes and it was divided into two parts: one part about 2 ml was put in EDTA containing tube; the blood was mixed gently for 3 minutes and then used for hematological tests and especially for HbA1c assay. The second part included 3 ml of blood was put in the centrifuge tube (glass tube) and allowed to clot for 15 min then it was centrifuged for serum separation at approximately 3000 rpm for 15 minutes\(^11\), the separated sera were used for biochemical tests such as determination of fasting blood glucose.

First emorningurinel samples were collected under sterile conditionse, 10 ml of urine were ecentrifuged at 1500 rpm for 10’ minute’ and the supernatant was stored at -80ºC until’ TNF-\(\alpha\) determination by ELISA assay. This samples also used for measurement of Albumin/Creatinine Ratio ACR (\(\mu g/mg\)), were ACR <30 \(\mu g/mg\) were known as normal albuminurin, 30-300 \(\mu g/mg\) as microalbuminuria, and > 300 \(\mu g/mg\) as proteinuria. Body mass index (BMI) were calculated by dividing the weight in kilograms (kg) by the square of the height (m\(^2\)). Blood pressure were determined by using mercury manometer, the blood pressure with systolic blood pressure SBP ≥ 140 mmHg and diastolic blood pressure DBP ≥ 90 mmHg were referred to as hypertension.

**Statistical Analysis:** The statistical analysis was performed by using the statistical package for social sciences (SPSS version 23.0) and found all of arithmetic mean and standard deviation (M ± S.D.) by using the T-test to know the signification between normal albumin and microalbumin groups at p value (p<0.05). Brivaraite correlations were performed by using the Pearson correlation coefficient at p value (p<0.05) considered to be statistically significant.

**Results**

The results of this study showed that the mean age and duration were 48.70 and 11.20 years, respectively. While, the mean of BMI was 27.70 kg/m\(^2\), with 133.90 and 81.53 mmHg for systolic and diastolic blood pressure. Laboratory results of Fasting blood glucose, HbA\(_1c\), ACR, and urinary TNF-\(\alpha\) were shown in table (1).

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Mean±Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Years)</td>
<td>48.70 ± 9.84</td>
</tr>
<tr>
<td>Duration (Years)</td>
<td>11.20 ± 5.30</td>
</tr>
<tr>
<td>Fasting Blood Glucose FBG (mmol/ml)</td>
<td>13.15 ± 4.25</td>
</tr>
<tr>
<td>HbA(_1c) %</td>
<td>8.56 ± 1.83</td>
</tr>
<tr>
<td>BMI (Kg/m(^2))</td>
<td>27.90 ± 2.02</td>
</tr>
</tbody>
</table>
Forty type 2 diabetic patients with normal albuminuria, and only thirty patients with microalbuminuria. The mean values of age, duration, systolic and diastolic blood pressure were showed significant elevation (P≤0.01 or P≤ 0.05) in microalbumin group compared with normal albumin group, also the mean levels of FBG, ACR, and urinary TNF-α were significantly higher (P≤0.01 or P≤ 0.05) in microalbumin group compared with normal albumin group, as shown in table (2).

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Normal albuminuria (N = 40 (M±SD))</th>
<th>Microalbuminuria (N = 30 (M±SD))</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Years)</td>
<td>40 ± 3.74</td>
<td>57.40 ± 4.95</td>
<td>0.0001**</td>
</tr>
<tr>
<td>Duration (Years)</td>
<td>6.40 ± 1.99</td>
<td>16.00 ± 2.23</td>
<td>0.0001**</td>
</tr>
<tr>
<td>Fasting Blood Glucose FBG (mmol/ml)</td>
<td>9.70 ± 2.32</td>
<td>16.60 ± 2.55</td>
<td>0.0001**</td>
</tr>
<tr>
<td>HbA₁c %</td>
<td>8.08 ± 1.76</td>
<td>9.04 ± 1.83</td>
<td>0.15</td>
</tr>
<tr>
<td>BMI (Kg/m²)</td>
<td>28.40 ± 1.99</td>
<td>27.41 ± 1.89</td>
<td>0.18</td>
</tr>
<tr>
<td>Albumin/Creatinine Ratio (ACR) (µg/mg)</td>
<td>25.92 ± 3.56</td>
<td>54.38 ± 3.97</td>
<td>0.001**</td>
</tr>
<tr>
<td>Urinary TNF-α (pg/mg)</td>
<td>3.32 ± 1.49</td>
<td>10.44 ± 2.24</td>
<td>0.002**</td>
</tr>
<tr>
<td>Systolic Blood Pressure (mmHg)</td>
<td>130.60 ± 4.95</td>
<td>137.20 ± 4.34</td>
<td>0.001**</td>
</tr>
<tr>
<td>Diastolic Blood Pressure (mmHg)</td>
<td>80.80 ± 1.74</td>
<td>82.13 ± 1.55</td>
<td>0.03*</td>
</tr>
</tbody>
</table>

M±SD: Mean ± Standard Deviation, **Signification at P≤0.01, *Signification at P≤0.05.

On the other hand, the correlation study showed significant positive correlation between ACR and urinary TNF-α with (r= 0.48, P= 0.006), as shown in figure (1).
Discussion

Diabetic nephropathy is a chronic disease in which the renal structure and function probably distorted, many pathways that causes the pathological alterations in the kidney of diabetic patients have been suggested and are effectively being inspected. Where, it has been found that hyperglycemia generally lead to elevation the levels of oxidative stress and the stimulation a lot of inflammatory and apoptotic mechanisms in the renal, resulting in abnormal renal cells with excessive predisposition of extracellular matrix in the glomerulus’ and tubulointerstitium(7,8). Also it has been determined that high’ glomerular’ blood’ flow is probably to result in glomerular capillary ‘distention, additionally dysfunction of glomerular and mesangial cell. Moreover, it has been indicated that the loss of regulation of signaling’ pathways comprising a number of inflammatory cytokines and growth factors, like protein kinase C (PKC) and transforming growth factor-β (TGF-β), is also destructive for glomerular hyperperfusion and hyperfiltration(12).

Glomerular injury is represents the early sign of diabetic nephropathy and microalbuminuria, which seem to be a strong predictor of renal damage progression. However, it has been proposed that the increased number of patients with normal albuminuria are probably to promote diabetic nephropathy, whereas not all patients with macroalbuminuria are perhaps to have advanced renal damage(13). This refers that multiple pathways may participate in the pathogenesis of this disorder. Many of structural and pathological changes’ may appear at the same time and proceed at different rates in the diabetic nephropathy causing high heterogeneity’ of the disease. So that, biomarkers with elevated specificity to different abnormalities are needed to determine the onset and progression of nephropathy in different groups of diabetic patients. Lately, a number of possible biomarkers have been reported, comprising markers of glomerular ‘injury, ‘tubular injury, oxidative stress and inflammation(14).

The results of this showed that there were a significant differences between microalbuminuria (nephropathy) and normal albuminuria (without nephropathy) groups in relation to age, duration of diabetes, FBG, ACR, urinary TNF-α, systolic and diastolic blood pressure were showed significant elevation in microalbuminuria than normal albuminuria, this study was in agreement with the study of(15). TNF-α of human is a protein composed of 157 amino acid and is differ from mouse TNF-α in that it is not glycosylated and act through two types of receptors TNF-R1 and TNF-R2, TNF-α mainly produced by inflammatory cells such as activated monocytes and by specific renal cells(16). TNF-α play an important role in nephropathy pathogenesis and progression which stimulate the expression of adhesion molecules on the leukocytes and endothelial cells, increase the production of endothelin-1 leading to narrowing of blood vessels and reduction of blood flow and consequence decreasing glomerular filtration rate (GFR), TNF-α has an ability to stimulate glomerular cell apoptosis by damaging junctions between cells and increasing permeability resulting casing high levels of macroalbuminurea, urinary› TNF-α function as a biomarker of kidney inflammation(17,18).

In this study, urinary TNF-α levels were significantly correlated with microalbuminuria where both levels higher in microalbuminuria than normal albuminuria group making urinary TNF-α as an independent indicator for the degree of microalbuminuria, some studies were showed that TNF-R2 inflammatory pathway is already participated in the progression of macroalbuminurea through the onset of diabetic nephropathy(19,20).

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

Conflict of Interest: The authors declare that they have no conflict of interest.

Funding: Self-funding

References


Maternal Serum Amyloid a Level as a Marker of Primary Unexplained Recurrent Missed Miscarriages

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Abstract

Objective: To assess maternal serum amyloid A (SAA) levels among women with primary unexplained recurrent missed miscarriages.

Patients and Method: A prospective study (case control study) in Al-Zahraa Maternity Hospital, Najaf, Iraq, from first of January to the first of December of 2019 the study was conducted among 91 who were divided into two groups:

1. Group 1: Patient with miscarriage in the early trimester with at least two consecutive primary unexplained REPLs and no previous live births were enrolled.

2. Group 2: A control group was formed of women with miscarriage no history of REPL who had at least one previous uneventful pregnancy with no adverse outcomes.

Serum samples were collected to measure SAA levels. The main outcome was the association between SAA and primary unexplained REPL. A total number of 91 participants. Mean SAA level increased in women with early missed abortion than those women in the control group (p<0.001). The level of SAA was dependent indicator of primary unexplained REPL, (p<0.001). found that serum amyloid A level in women with missed miscarriages represent as biomarker of this complication of pregnancy.

Conclusions: Serum amyloid A theoretically a promising marker that prompts further study for primary unexplained missed miscarriage. in the Studies may be performed, for example, measurement of SAA level in women with history of early recurrent missed abortion during pregnancy and before and also compare SAA levels in women with non-pregnant state Such studies may direct the timing for initiating new therapies the future.

Keywords: Serum amyloid A, maternal, Recurrent early pregnancy loss.

Introduction

Recurrent early pregnancy loss (RPL) is the incidence of minimally two failed-pregnancies before ten week-gestation (confirmed by ultrasound or histological examination). Recurrent early pregnancy loss (REPL) affects 1-2% of all pregnant women¹. Two or more clinical pregnancies documented by ultrasound or confirmed by histopathology end pregnancy loss² in approximately 15% of all known clinical cases while
three or more losses affect almost 1-2%, and two or more losses affect 5% of all clinical cases this indicates that most RPLs are not occur by chance and therefore, require a clinical investigations and assessment. There are many risk factors could contribute to pregnancy loss such as advancing maternal age, paternal age over 40 years, frequent previous miscarriages. RPL could be primary when women experienced RPL without giving any live birth, secondary RPL when woman experienced RPL.

Serum amyloid A (SAA) is an immunoregulation protein involved in the acute phase response. It is known that amyloid is arise from a variety of proteins. SAA has a modulating effect on the immune system, and effect on migration, invasion and differentiation of trophoblasts.

At low concentrations, SAA regulates trophoblastic attack and mineral protease activity in the placental microenvironment, which is important for placental homeostasis. However, it is clear that this chain of events is hampered by the high level of the SAA. Some researchers have found that SAA reduces the secretion of hCG. This indicates a possible impairment of SAA-induced synthesis, which in the trophoblast is stimulated by another inflammatory mediator, TNF-α. The role of SAA may be related to the placenta, regulating the primary trophoblastic attack in early pregnancy and maintaining the balance between pro-inflammatory and anti-inflammatory cytokines. Therefore, the current study tried to investigate the hypothesis that unexplained early RPL may be related to maternal higher levels of serum SAA.

**Patients and Method**

A future study (case control) was Continued at Al-Zahraa teaching Hospital, Najaf, Iraq, from first of January to the first of December of 2019.

A total number of 91 [30 patients (RPL) and 61 controls] were enrolled in the study.

Women were involved missed after diagnosis women have two or more successive unspoken key (MM) and they didn’t have a prior birth.

**Inclusion criteria included:** In the first trimester of current pregnancy (6-12 weeks), patients with miscarriage had at least 2 or more consecutive repeated pregnancy losses and maternal age ranged from (19-35) years.

The control group includes a patient have no history of (MM) and Only one prior non-adverse pregnancy with no side effect in the study.

**Exclusion criteria:** women were excluded if they had one or more of the following: acute or chronic inflammatory condition, poly cysticovariansyndrome, smoking, multiple gestation, diabietic mellitus, hypertension, irregular hysteroscopy, irregular HSG, history of pre-, eclampsia and/or, thyroid disorder or abnormal karyotype.

The protocol was approved and research was carried out at AL-ZAHRAA Maternity Hospital, Najaf, Iraq. The goals and method were clarified to qualified patients, and all participants subsequently received written informed consent in aseptic conditions a participant was given a 5-mL sample of venous blood and used for the Amyloid A serum assay.

The sample size was analyzed by using of SPSS version 24.0 and MedCalc version 12.5 the data was analyzed. for the normal distribution using the Shapiro–Wilk test and kolmogorov-smirnov test. Mean and standard deviation was used for the distributional data. Student t test had been using for comparing between two groups.

Qualitative information was presented as number (percentage); Pearson’s R. compare between two groups, as appropriate... Analysis of the recipient. Service characteristic Curve executed to analyze the serum amyloid A degree needed to differentiate among two groups.

The region under this curve was calculated and serum amyloid A ‘s Optimum value for the cut off was defined according to the highest Youden index (J)... Logistic multi-variable regression (OR and CI 95%) was used to evaluate SSA dependent indicators of recurrent missed abortion All P values were double queued with a value deemed statistically important by less than 0.05.

**Results**

No statistically relevant variations between groups differences regarding the age, duration of miscarriage (days) and gestational age (weeks) table (1) while there was significant difference regarding BMI.
Table (1): The statistical difference between patients and control regarding the age, BMI, duration of miscarriage (days) and gestational age (weeks)

<table>
<thead>
<tr>
<th>Study groups</th>
<th>Demographic</th>
<th>Patients</th>
<th>Control</th>
<th>t-test</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Range Min-Max</td>
<td>Mean</td>
<td>SD.</td>
<td>Range Min-Max</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td>16 19-35</td>
<td>25.13</td>
<td>3.07</td>
<td>16 19-35</td>
</tr>
<tr>
<td>BMI</td>
<td>7 18-25</td>
<td>21.30*</td>
<td>2.23</td>
<td>8 17-25</td>
<td>20.20</td>
</tr>
<tr>
<td>Duration of miscarriage (Day)</td>
<td>9 5-14</td>
<td>7.93</td>
<td>2.52</td>
<td>9 5-14</td>
<td>8.25</td>
</tr>
<tr>
<td>Gestational Age (wk)</td>
<td>2 6-8</td>
<td>6.87</td>
<td>0.68</td>
<td>7 1-8</td>
<td>6.79</td>
</tr>
</tbody>
</table>

Table (2) show a significant difference in the size effects of SAA (ng/ml) (OR=1.378, 95%CI (1.121-1.695, sig. 0.002) in patient’s group comparison with control group, not significant in others parameters Age, BMI, and gestational age between study groups.

Table (2) Estimate size of effects for parameters in patient’s group comparison with control group

<table>
<thead>
<tr>
<th>Patients vs control</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>OR</th>
<th>95% C.I. for OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAA (ng/ml)</td>
<td>0.321</td>
<td>0.106</td>
<td>9.236</td>
<td>1</td>
<td>0.002</td>
<td>1.378*</td>
<td>1.121-1.695</td>
</tr>
<tr>
<td>Age</td>
<td>-0.178-</td>
<td>0.272</td>
<td>0.426</td>
<td>1</td>
<td>0.514</td>
<td>0.837</td>
<td>0.491-1.427</td>
</tr>
<tr>
<td>BMI</td>
<td>0.422</td>
<td>0.442</td>
<td>0.912</td>
<td>1</td>
<td>0.339</td>
<td>1.525</td>
<td>0.641-3.626</td>
</tr>
<tr>
<td>Gestational Age (wk)</td>
<td>-0.294-</td>
<td>0.892</td>
<td>0.109</td>
<td>1</td>
<td>0.741</td>
<td>0.745</td>
<td>0.130-4.281</td>
</tr>
<tr>
<td>Constant</td>
<td>-20.541</td>
<td>12.177</td>
<td>2.846</td>
<td>1</td>
<td>0.092</td>
<td>0.000</td>
<td></td>
</tr>
</tbody>
</table>

The mean of SAA in women with missed abortion was significantly higher than between control group (p<0.001) Table (3).

Table (3): The statistical difference between patients and control regarding the serum amyloid A.

<table>
<thead>
<tr>
<th>Study groups</th>
<th>Biomarker</th>
<th>Patients N=30</th>
<th>Control N=61</th>
<th>t-test</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SAA (ng/ml)</td>
<td>Range Min-Max</td>
<td>Mean</td>
<td>SD.</td>
<td>Range Min-Max</td>
</tr>
<tr>
<td></td>
<td></td>
<td>66.2 33.0-99.2</td>
<td>72.800*</td>
<td>13.59</td>
<td>45.0 11.2-56.2</td>
</tr>
</tbody>
</table>

Table (4) summarizes the sensitivity, precision, positive and negative probability ratio, positive and negative predictive value, and value of that cut off stages. key unknown REPL the SAA level was detected as a missed miscarriage-based indicator.

Table (4): Serum amyloid level A is used to distinguish between women with or without early missed abortion

<table>
<thead>
<tr>
<th>Category</th>
<th>Estimate</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
<td>91</td>
<td></td>
</tr>
<tr>
<td>Patients (Positive group)</td>
<td>30 (32.97%)</td>
<td></td>
</tr>
<tr>
<td>Control (Negative group)</td>
<td>61(67.03%)</td>
<td></td>
</tr>
<tr>
<td>Area under the ROC curve (AUC)</td>
<td>0.978</td>
<td>0.923 - 0.997</td>
</tr>
<tr>
<td></td>
<td>Estimate</td>
<td>95% CI</td>
</tr>
<tr>
<td>---------------------------</td>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td>Youden index J</td>
<td>0.90</td>
<td>NA</td>
</tr>
<tr>
<td>Standard Error *</td>
<td>0.0161</td>
<td></td>
</tr>
<tr>
<td>Optimum cutoff level of SAA (ng/ml)</td>
<td>&gt;45.6</td>
<td>NA</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>93.33</td>
<td>77.9 - 99.2</td>
</tr>
<tr>
<td>Specificity</td>
<td>85.25</td>
<td>73.8 - 93.0</td>
</tr>
<tr>
<td>+LR</td>
<td>6.33</td>
<td>3.4 - 11.7</td>
</tr>
<tr>
<td>-LR</td>
<td>0.078</td>
<td>0.02 - 0.3</td>
</tr>
<tr>
<td>Auc (0.05)</td>
<td>&lt;0.001</td>
<td></td>
</tr>
</tbody>
</table>

Figure (1): Receiver operating characteristic curve to assess amyloid A level capacity to distinguish among women with or without early missed abortion. The area under the curve was 0.978

The Hosmer–Leme show test ($AUC = 95\% (0.923-0.997)$. While there was no correlation (P. value>0.05) between serum amyloid A levels of the patients and the age of the patients as well as BMI and gestational age (wk) of control group. There was linear correlation (P. value< 0.001) between serum amyloid A levels of the patients and the age of the patients as well as between serum amyloid A levels of the patients and the BMI of the patients and linear correlation (P value <0.05) between serum amyloid A levels of the patients and the gestational age(weeks) table (5).
Table (5): The correlation of serum amyloid A levels with age (years), BMI, and gestational age in patients and control groups.

<table>
<thead>
<tr>
<th>Study Groups</th>
<th>Variables</th>
<th>Correlation Coefficient</th>
<th>Age (year)</th>
<th>BMI</th>
<th>Gestational Age (wk)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients N=30</td>
<td>SAA (ng/ml)</td>
<td>r</td>
<td>0.651*</td>
<td>0.678*</td>
<td>0.370*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sig.</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td>0.022</td>
</tr>
<tr>
<td></td>
<td>Age (year)</td>
<td>r</td>
<td>0.729*</td>
<td>0.157</td>
<td>0.204</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sig.</td>
<td>&lt;0.001</td>
<td></td>
<td>0.204</td>
</tr>
<tr>
<td>Control N=61</td>
<td>SAA (ng/ml)</td>
<td>r</td>
<td>0.019</td>
<td>0.149</td>
<td>0.170</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sig.</td>
<td>0.441</td>
<td></td>
<td>-0.044</td>
</tr>
<tr>
<td></td>
<td>Age (year)</td>
<td>r</td>
<td>0.312*</td>
<td></td>
<td>0.369</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sig.</td>
<td>0.007</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Discussion**

Early recurrent pregnancy loss is a challenging and frustrating condition for both patient and clinicians, so that its prediction and prevention and adequate management is significantly reduce the complications or unnecessary intervention. There are a lot of studies concluded that infection and inflammations whether in the gestational tissue or elsewhere in the body, are an important cause of early recurrent miscarriage. We study the serum amyloid A as biochemical predictor of subclinical infection as several studies conclude that SAA is a significant acute phase reactant and an important inflammatory marker.

The decidual cells and synsiotrophoplast cells and extra villous cytotrophoblasts released amyloid A serum amyloid a have important role in placentation when present at low concentrations of amyloid A. In our study, the difference was significantly high in serum amyloid A level between studied group (p<0.001), it was higher in women with missed miscarriage with REPL followed by group of missed miscarriage with no history of any miscarriage previously. The mean serum amyloid A 72.800mg/L, 32.918mg/L respectively. Moustafa I, Ibrahim et al., (2017), mentioned that Patient with recurrent missed abortion demonstrated SAA significantly higher than in women in control group after adjustment with maternal age and gestational age as an in-dependency predictor of this pregnancy complication. This analysis agrees with our outcome.

Sandri S et al., (2015), serum amyloid A facilitate Invasión trofoblástico into the decidua (a critical phase during the early stages of pregnancy) through receptors modulator activation. In comparison, SAA level are increase this is associated with disturbed trophoblastic tolerance this agree with our result.

Knebel FH, Ruano R, et al., (2014), High levels of SAA observed in the potential represent an inverted physiological role for this protein in early recurrent missed abortion, leading to disturbed invasion trophoblast and syncytialisation. SAA levels were measured in early pregnancy (6–10 weeks), indicating a significant early fetal development role.

Sharma S, et al., (2010), Such SAA-induced syncytialization impairment could be facilitated by another mediator and tumor necrosis factor. These results may support this study by association of high SAA levels with the incidence of consecutive miscarriage in women with recurrent early missed abortion through impairing syncytialization.

Engin-Ustun et al., (2007), recorded that increase in SAAN patient with pre eclampsia leading to recurrent early missed miscarriages agree with our research.

Leisser C et al., (2006), SAA stimulated trophoblastic invasion and effect on both metalloprotease gene and enzymatic activity therefore, SAA had no affect trophoblast syncytialisation and decreased human chorionic gonadotropin β isoform secretion. The researchers have find the biochemical syncytialisation signal (β-HCG) in a concentration-dependent manner, this is disagree with our result.

Urieli-Shoval et al., (2000), Trophoblast invasion is impairment when level of SAA IS HIGH, suggesting
a ADVERSE effect of THAT protein that may be activated during an acute-inflammatory response where serum SAA level can rise over 1000 times. 16

Trophoblastic invasion failure can also occur through rise levels of inflammatory mediators like TNF, this leads to early pregnancy loss. In equilibrium development of PROINFLAMMATORY mediator and failure of trophoblastic invasion show in preeclampsia and restriction of intra uterine growth 17,18. The stressful condition that associated with these disorders courses release of SAA. 19 this study agrees with our findings.

Conclusions

Serum amyloid A theoretically a promising marker that prompts further study for primary unexplained missed miscarriage. in the Studies may be performed, for example, measurement of SAA level in women with history of early recurrent missed abortion during pregnancy and before and also compare SAA levels in women with non-pregnant state Such studies may direct the timing for initiating new therapies the future.

Conflicts of Interest: No

Source of Funding: Self

Ethical Clearance: Was taken from the scientific committee of the Iraqi Ministry of health

References


Factors Related to Stunted in East Java Province in 2019: An Ecological Analysis

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Abstract

East Java Province has a high prevalence of stunted. The study aimed to analyze the factors associated with stunted in East Java Province. The study was conducted using secondary data sourced from the 2019 East Java Province Health Profile report. The study was designed with an ecological analysis approach. All 38 regencies/cities in East Java Province were analyzed. Apart from the prevalence of stunted toddlers as the dependent variable, 4 other variables were analyzed as independent variables, namely the coverage of toddler health services, Universal Child Immunization (UCI) village coverage, coverage of families accessing healthy latrines, and percentage of samples of drinking water facilities that meet the requirements. The results showed that the trend of regencies/cities with low coverage of toddler health services has a high prevalence of stunted toddlers. There was a tendency for regencies/cities that have a higher level of immunization coverage which tends to have a lower percentage of stunted toddlers. Meanwhile, the trend of regencies/cities that have better coverage of families accessing healthy latrines has a lower prevalence of stunted toddlers. Finally, regencies/cities with a high percentage of babies receiving exclusive breastfeeding have the lowest prevalence of babies receiving exclusive breastfeeding. It could be concluded that there is a tendency for a negative relationship between the independent variables analyzed and the prevalence of stunted toddlers. The higher the coverage on the independent variable, the lower the tendency for the coverage percentage to be stunted in East Java Province.

Keywords: Ecological analysis, secondary data, stunted, community nutrition.

Introduction

Stunted in toddlers is a nutritional problem that is a world issue, including in Indonesia. Stunted is a condition in which toddlers have less length or height compared to age. This condition is measured by a length or height that is more than minus two standard deviations from the WHO median growth standard for children¹.

Based on the 2019 Health Profile of East Java Province report, East Java Province still has a fairly high prevalence of stunted. In 2016 the prevalence of stunted was 26.10%, while in 2017 it increased to 26.70%, and in 2018 it decreased to 22%². Meanwhile, based on the 2018 Basic Health Survey, the record of the prevalence of stuntedness in East Java Province is even higher, higher than the national average. The prevalence of stunted toddler in East Java Province is 19.9%, while the national one is 19.3%. The prevalence of severely stunted in East Java Province is 12.9%, while the national one is 11.5%³.

Stunted is known to be one of the main causes of morbidity in children under five years of age⁴,⁵. Children who are stunted can have a higher risk for chronic diseases such as obesity and hypertension⁶. The final impact, stunted can reduce the quality of human resources which can result in decreased welfare of

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society. Stunted can lead to long-term effects including cognitive impairment and physical development, lower performance, lower per capita income, increased risk of poverty, increased risk of pregnancy disorders and asphyxia during childbirth, as well as increased risk of degenerative diseases such as obesity, diabetes mellitus, heart disease, stroke, hypertension, and cancer.\(^7,8\)

HL Blum stated that the factors that affect health are divided into four elements, including environment, heredity, lifestyle, and health services\(^5\). Stunted as one of the national health problems that are now a concern requires an in-depth analysis of the causative factors in prevention and overcoming efforts. When viewed using the Blum theory, several variables that can be analyzed include the coverage of under-five health services and the Universal Child Immunization (UCI) village coverage which is one of the elements of activity of the determinants of health services. Besides, there is a variable percentage of babies who are exclusively breastfed as one of the variables of parenting/behavior that can be analyzed. The coverage of households that have access to healthy latrines is the chosen variable to analyze environmental factors against stunted. Based on the background description, this study aims to analyze the factors related to stunted in East Java Province in 2019.

### Materials and Method

The study was designed using an ecological analysis approach. Ecological studies focus on comparisons between groups, not individuals. The data analyzed is aggregate data at a certain group or level, which in this study is the regency/city level. The variables in an ecological analysis can be aggregate measurements, environmental measurements, or global measurements\(^9,10\).

The study was conducted using secondary data from the 2019 East Java Provincial Health Profile report. A total of 38 regencies/cities in East Java were involved in this analysis. The dependent variable in this study was the prevalence of stunted toddlers. There are 4 independent variables analyzed, namely the coverage of under-five health services, the coverage of UCI villages, the coverage of households that access healthy latrines, the percentage of infants receiving exclusive breastfeeding. All variables are categorized into 3 parts of the same size. Data were analyzed by univariate and bivariate. Bivariate analysis was performed using cross-tabulations. The entire analysis process utilizes SPSS 21 software.

### Results and Discussion

Table 1 shows the descriptive statistics of the variables in the ecological analysis of stunted toddlers in East Java. Table 1 shows the distribution of stunted as the dependent variable with positive values in the low category and negative in the high category. In general, the target of stunted performance is to reduce its prevalence in the community. The 5 independent variables include the percentage of infants receiving exclusive breastfeeding, the coverage of under-five health services, UCI village coverage, the percentage of families accessing healthy latrines. The sample was 38 regencies/cities in East Java Province. Based on the table, it is found that the figure is more than 100% due to regencies/cities reporting coverage that exceeds the target set at the beginning of the evaluation year. The lowest prevalence of stunted toddler was in Tulungagung Regency at 5.3% and the highest was in Batu City at 25.4%. The average prevalence of stunted toddlers from 38 regencies/cities was 13.72%.

### Table 1. Descriptive Statistics of Stunted Toddlers in East Java Province in 2019

<table>
<thead>
<tr>
<th></th>
<th>Prevalence of Stunted Toddler</th>
<th>Toddler Health Service Coverage</th>
<th>UCI Village Coverage</th>
<th>Percentage of Households that Have Access to Healthy Latrines</th>
<th>Exclusive Breastfeeding Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N</strong></td>
<td>38</td>
<td>38</td>
<td>38</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>13.7211</td>
<td>89.9079</td>
<td>90.4395</td>
<td>92.8474</td>
<td>78.0316</td>
</tr>
<tr>
<td><strong>Median</strong></td>
<td>13.0000</td>
<td>91.2000</td>
<td>92.0500</td>
<td>96.2000</td>
<td>78.8000</td>
</tr>
<tr>
<td><strong>Mode</strong></td>
<td>15.30(^a)</td>
<td>90.90(^a)</td>
<td>100.00</td>
<td>100.00</td>
<td>78.70(^a)</td>
</tr>
<tr>
<td><strong>Variance</strong></td>
<td>24.949</td>
<td>54.818</td>
<td>96.287</td>
<td>83.573</td>
<td>91.194</td>
</tr>
</tbody>
</table>
Table 2 shows the cross-tabulation between the prevalence of stunted toddlers and the coverage of toddler health services. The analysis showed that the trend of regencies/cities with a high prevalence of stunted toddler had low coverage of health services for children under five. The trend shows that the coverage of toddler health services contributes to reducing the percentage of stunted toddlers. Information in Table 2 shows that regencies/cities with low coverage of health services for children under five tend to have higher rates of stuntedness. This is in line with previous research which states that there is a relationship between the higher the quality of health services the better impact on child growth and stunted\textsuperscript{11}. The inability of families to reach health services due to lack of knowledge, financial capacity, or other causes can affect the nutritional status of children. Health services for children can be associated with changes in nutritional status that lead to stunted\textsuperscript{1,6}.

Table 3 is the result of cross-tabulation between stunted toddler prevalence and UCI village coverage in East Java Province. Table 3 shows the tendency for regencies/cities with the highest percentage of stunted toddlers to regencies/cities with high UCI Village coverage, namely 53.8%. It can be seen that there is a
tendency that regencies/cities that have higher levels of immunization coverage tend to have a lower percentage of stunted. Previous studies reported that cases of stunted toddler and wasting were found to be more in children with incomplete immunization status\textsuperscript{12,13} i.e., BCG; measles; polio 3; and Diphtheria, Tetanus toxoids, and Pertussis, i.e., DTP3. Apart from having an impact on the nutritional status of children under five, immunization is needed because it is an effort to reduce child morbidity and mortality\textsuperscript{14}.

Table 4. Cross-tabulation between Stunted Toddler Prevalence and Coverage of Household Accessing Healthy Latrines in East Java Province, 2019

<table>
<thead>
<tr>
<th>Household Coverage that Accesses Healthy Latrines</th>
<th>Stunted Toddler</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low (5.30-11.00%)</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Low (66.20%-92.80%)</td>
<td>1</td>
</tr>
<tr>
<td>Middle (92.81%-98.20%)</td>
<td>3</td>
</tr>
<tr>
<td>High (98.20%-100.30%)</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>13</td>
</tr>
</tbody>
</table>

Source: The 2019 Health Profile of East Java Province

Table 4 shows the cross-tabulation between stunted toddler prevalence and coverage of households accessing healthy latrines in East Java Province. The apparent trend is that regencies/cities with a low percentage of stunted toddlers are found in regencies/cities with high coverage of households accessing healthy latrines. The information presented in Table 4 shows the trend of regencies/cities with better coverage of families accessing healthy latrines having a lower percentage of stunted. This shows that access to sanitation has an impact on the percentage of stunted in the community. This tendency is in line with the results of previous studies which state that there is a relationship between latrine use and being stunted in children\textsuperscript{7}. In previous studies, hygiene and sanitation have been shown to have a linear relationship with growth in children\textsuperscript{15}. Poor sanitation increases the risk of infectious diseases and impaired absorption of nutrients. Research states that health problems due to poor sanitation are associated with growth problems that can result in stuntedness\textsuperscript{16,17}. Broader efforts are needed that reach beyond the nutrition sector to tackle the underlying determinants of undernutrition. There is growing interest in how water, sanitation and hygiene (WASH).

Table 5. Cross-tabulation between Stunted Toddler Prevalence and Percentage of Babies Receiving Exclusive Breastfeeding in East Java Province, 2019

<table>
<thead>
<tr>
<th>Percentage of Babies Receiving Exclusive Breastfeeding</th>
<th>Stunted Toddler</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low (5.30-11.00%)</td>
</tr>
<tr>
<td></td>
<td>n</td>
</tr>
<tr>
<td>Low (46.90%-75.90%)</td>
<td>5</td>
</tr>
<tr>
<td>Middle (75.91%-81.40%)</td>
<td>3</td>
</tr>
<tr>
<td>High (81.41%-96.40%)</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>13</td>
</tr>
</tbody>
</table>

Source: The 2019 Health Profile of East Java Province
Table 5 is a cross-tabulation between stunted toddler prevalence and coverage of babies receiving exclusive breastfeeding in East Java Province. The cross-tabulation results show that the prevalence of high-category stunted toddlers is most dominant in city districts that have coverage of middle-category ASI, while regencies/cities with a high percentage of babies receiving exclusive breastfeeding have the lowest stunted toddler prevalence. In line with this trend, several previous studies have also informed that one of the factors that influence the incidence of stunted is exclusive breastfeeding. Stunted toddlers are more common in babies who are not exclusively breastfed. Thus, exclusive breastfeeding is highly recommended.

This research, which was conducted using the ecological analysis approach, has limitations in its use as a policy basis because the data used is aggregate data at the provincial level. Further study is needed at the individual level to obtain more accurate information in choosing intervention policy.

Conclusions

Based on the results of the study, it could be concluded that the coverage of toddler health services, UCI village coverage, coverage of households accessing healthy latrines, and coverage of infants receiving exclusive breastfeeding were factors related to the prevalence of stunted toddlers in East Java Province in 2019.

Acknowledgments: The author would like to thank the East Java Provincial Health Office for providing the report which was the source of the data in this study.

Source of Funding: Self-funding

Ethical Clearance: The study was conducted by utilizing secondary data from published reports. For this reason, ethical clearance is not required in the implementation of this study.

Conflicting Interests: Nil

References

12. Solis-Soto T, Paudel D, Nicoli F. Relationship between vaccination and nutritional status in children: Analysis of recent demographic and health


Effect of Organic Cation Transporter 1 (OCT1) Polymorphism on Metabolic Response of Metformin in Iraqi Women with Polycystic Ovary Syndrome

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Abstract

Background: Insulin-sensitizer treatment with metformin is widely used in polycystic ovary syndrome (PCOS). However, the treatment effectiveness shows individual differences in PCOS patients. Organic cation transporter (OCT1) have been reported to mediate metformin transport in the liver. Polymorphisms of OCT1 genes may affect the activity of metformin transport and further influence the treatment response of metformin in PCOS patients.

Materials and Method: In this study, we investigated the association between the polymorphism of OCT1 and the treatment effectiveness of metformin in PCOS patients. The single nucleotide polymorphism (SNPs) of OCT1 – R61C analyzed in 222 PCOS and 106 control women. Fasting serum glucose (FSG), fasting serum insulin and HbA1c which represented metformin treatment response, were conducted at the start of treatment and after three-month treatment.

Results: The results demonstrated that the polymorphisms of OCT1 was associated with the variability of metformin response, most patients with reference allele (wild type) and heterozygous alleles of OCT1 (R61C) showed statistically significant metabolic response to metformin, while patients with mutant alleles showed less or statistically not significant response.

Conclusion: Genetic polymorphisms of OCT1 contributed to different metformin treatment responses, and further study is needed to establish personalized treatment programs using a pharmacogenomic algorithm approach in PCOS patients.

Keywords: Polymorphisms, Polycystic Ovary Syndrome, Metformin, Organic cation transporter.

Introduction

Polycystic ovary syndrome (PCOS) is one of the most common endocrine disorders in women of reproductive age. The main features include menstrual irregularity, oligoanovulation, infertility, as well as hirsutism, acne and polycystic ovarian morphology on ultrasonographic imaging. The aetiogical causation behind PCOS is yet to be precisely defined, but it is evident that familiar genetic predisposing factors interact with environmental stimuli both in utero and in pre-pubertal life.

Metformin is an off-label medication used in PCOS patients as an insulin sensitizer. Metformin can not only lower elevated parameters such as insulin, androgens, and circulating free T levels, but can also...
increase levels of sex hormone-binding globulin (SHBG) and insulin-like growth factor-binding protein (IGFBP) (4). The well-known action of metformin is to suppress the production of hepatic glucose. Moreover, metformin has been demonstrated to increase the synthesis of SHBG and to improve menstrual frequency, ovulation, conception, and live birth rates (5,6).

Organic cation transporter (OCT) proteins mediate the transport of organic cations across the cell membrane. Metformin has been demonstrated to be a substrate of liver-specific OCT1 and kidney-abundant OCT2 (7,8). Recent studies indicated that the pharmacokinetic and pharmacodynamics profiles of metformin are mediated by the activity of OCT1 and OCT2 (9,10). In Oct1-deficient mice, the hepatic metformin concentration in the liver was found to be significantly lower than that in control mice, and the glucose-lowering effects of metformin were completely abolished (11). This indicates that OCT1 expression and activity is essential for the hepatic uptake of metformin (12-15). However, the polymorphisms of OCT1 gene may affect the activity of metformin transport and further influence the treatment response of metformin in individuals. Therefore, in this study, we investigated the association between the polymorphisms of OCT1 and the treatment effectiveness of metformin in patients with PCOS.

### Materials and Method

**Subjects and Study Design:** In this prospective study, 222 PCOS Iraqi female patients and 106 healthy control participants were included. All patients diagnosed by consultant gynecologist according to Rotterdam criteria and treated according to practice guidelines. This study was conducted at Kerbala Teaching Hospital, Iraq, from June 2019 until April 2020 and the study protocol approved by the committee of local ethics in the college of pharmacy, University of Kerbala, Iraq with written informed consent signed by all patients. A blood sample was collected from each overnight fasted subject in day two of the menstrual cycle and any day in case of amenorrhea in some patients for genetic, and biochemical tests fasting serum glucose, fasting serum insulin and HbA1c before the study for all participants and after three months of treatment with metformin 500 mg twice daily for patients.

**Polymerase Chain Reaction:** Genomic DNA was isolated from EDTA whole-blood tubes with a G-DEX Ib DNA Blood Kit (Intron, Korea). Polymorphism of R61C was genotyped using Allele Specific-PCR method and specific primers were designed through Primer-BLAST, (Table 1). Optimization of PCR was recorded, (Table 2). The PCR product was run and sized by electrophoresis in the 1.5% concentration of agarose gel at 70 V for 60 min and visualized under Ultraviolet transmillator, the gel was photographed using a digital camera.

<table>
<thead>
<tr>
<th>Primers</th>
<th>Sequence</th>
<th>Product size (bp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primers sequences of OCT 1 (R61C) Alleles C&gt;T</td>
<td>CAGATGGCCACGTGCATTCTTC</td>
<td>-</td>
</tr>
<tr>
<td>Allele C R1</td>
<td>AGGCTCCAGCCACAGCG</td>
<td>407</td>
</tr>
<tr>
<td>Allele R2</td>
<td>CAGGGTCCAGCCACAGCA</td>
<td>407</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Steps</th>
<th>Temperatures/°c</th>
<th>Time/second</th>
<th>Cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denature template</td>
<td>94</td>
<td>3 minutes</td>
<td>1</td>
</tr>
<tr>
<td>Initial denaturation</td>
<td>94</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Annealing</td>
<td>63</td>
<td>40</td>
<td>30</td>
</tr>
<tr>
<td>Extension</td>
<td>72</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>Final extension</td>
<td>72</td>
<td>5 minutes</td>
<td>1</td>
</tr>
</tbody>
</table>
Data Analysis: Statistical analysis were used by software SPSS program version 20, P–value less than 0.05 was considered a statistically significant in all groups, Continuous and Discrete variables were presented using number and percentages. Chi-square test used for comparisons of discrete variables between each study group. To compare the studied parameters within PCOS group, before and after treatment, Wilcoxon Signed Ranks Test was applied.

Results and Discussion

Metformin was the first insulin-sensitizing drug to be used in PCOS to investigate the role of insulin resistance in the pathogenesis of the syndrome. Velazquez and colleagues reported a significant improvement in menstrual regularity and reduction in circulating androgen levels in PCOS patients treated with metformin(15). Considerable inter-individual variability exists in response to metformin, up to one-third of patients do not respond adequately, both non-genetic and genetic factors are determinants of the metformin effect.(16) The majority of pharmacogenetic studies performed with metformin have been focusing on the identification of gene variants related to metformin pharmacokinetics. Organic cation transporter (OCT) proteins mediate the transport of organic cations across the cell membrane. Metformin has been demonstrated to be a substrate of liver-specific OCT1, several studies indicate that the pharmacokinetic and pharmacodynamics profiles of metformin are mediated by the activity of OCT1 (17).

Table 3 demonstrates that 222 PCOS patients and 106 healthy control enrolled in this study were at the reproductive age. Both groups in this study were overweight, BMI for PCOS patients was 31.4 ±4.9 and for healthy control 27.8 ±4.7. Barber et al. confirmed that weight gain and obesity occur in approximately (76%) of women with PCOS(18). Alopecia and hirsutism were (92%) and (83%) in PCOS patients, PCOS can cause both alopecia and hirsutism as one of the most reliable results of hyperandrogenism associated with this syndrome(19).

Genetic Analysis: Analyses were conducted to assess the association between the OCT1 polymorphism R61C (rs12208357) [CC (Reference allele), CT (heterozygous type), and TT (mutant type)] and metabolic response of metformin.

Fasting serum glucose, insulin level, HbA1C, and HOMA-IR were significantly reduced in patients with reference alleles and heterozygous alleles but they did not in mutated alleles for R61C. Metformin exerts pleiotropic actions in several tissues, primarily the liver, where it inhibits hepatic gluconeogenesis and glycogenolysis, through which the drug contributes to improving insulin sensitivity. The potential mechanisms for inhibiting the hepatic gluconeogenesis including direct inhibition of gluconeogenic enzymes (e.g. phosphoenolpyruvate carboxykinase, fructose-1,6-bisphosphatase, and glucose-6-phosphatase), reduced hepatic uptake of substrates for gluconeogenesis, and increased phosphorylation of insulin receptor and insulin receptor substrates (IRS)-1 and -2 (20,21). Other investigators have also demonstrated the inhibition of mitochondrial respiration by metformin, may reduce the energy supply required for gluconeogenesis.

Patients with mutated alleles didn’t have a significant response and this may be due to reduce or loss of OCT1 function and diminished hepatic uptake of metformin due to gene polymorphisms. Our study was compatible with Yan Shu et al. who showed that the effects of metformin on glucose tolerance tests were significantly lower in individuals carrying reduced function polymorphisms of OCT1(22). Sundelin et al in their study showed that hepatic distribution of metformin was significantly reduced after oral intake in carriers of 420del and R61C variants in OCT1 (23).

Table 3. Assessment of socio-demographic data between PCOS group and healthy control group

<table>
<thead>
<tr>
<th>Variables</th>
<th>Control</th>
<th>PCOS</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>106</td>
<td>222</td>
<td>-</td>
</tr>
<tr>
<td>Age (y)</td>
<td>28.1 ± 6.4</td>
<td>27.6 ± 5.1</td>
<td>0.451 [NS]</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>27.8 ± 4.7</td>
<td>31.4 ± 4.9</td>
<td>&lt;0.001 [S]</td>
</tr>
<tr>
<td>Hirsutism, n (%)</td>
<td>0 (0.0%)</td>
<td>206 (92.8%)</td>
<td>&lt;0.001 [S]</td>
</tr>
<tr>
<td>Alopecia, n (%)</td>
<td>0 (0.0%)</td>
<td>186 (83.8%)</td>
<td>&lt;0.001 [S]</td>
</tr>
</tbody>
</table>

Results are presented as mean±SD, n= number of subjects, (p< 0.05) considered significantly different, [S] significant, [NS] not significant.
Table 4. Glycemic parameters in the polycystic ovary syndrome women before and after treatment with metformin according to R61C

<table>
<thead>
<tr>
<th>Variables</th>
<th>Allele</th>
<th>Before</th>
<th>After</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>FSG (mg/dL)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CC</td>
<td>97.1±13.0</td>
<td>93.2±14.7</td>
<td>0.001 [S]</td>
</tr>
<tr>
<td></td>
<td>CT</td>
<td>98.8±12.6</td>
<td>94.6±11.7</td>
<td>&lt;0.001 [S]</td>
</tr>
<tr>
<td></td>
<td>TT</td>
<td>100.3±12.4</td>
<td>99.7±12.7</td>
<td>0.576 [NS]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Insulin (µIU/ml)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CC</td>
<td>22.6±14.5</td>
<td>20.2±11.3</td>
<td>&lt;0.001 [S]</td>
</tr>
<tr>
<td></td>
<td>CT</td>
<td>23.9±15.1</td>
<td>20.9±11.5</td>
<td>&lt;0.001 [S]</td>
</tr>
<tr>
<td></td>
<td>TT</td>
<td>22.8±10.6</td>
<td>23.3±10.4</td>
<td>0.332 [NS]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HOMA-IR</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CC</td>
<td>5.4±3.5</td>
<td>4.7±2.8</td>
<td>&lt;0.001 [S]</td>
</tr>
<tr>
<td></td>
<td>CT</td>
<td>5.9±4.0</td>
<td>5.0±2.9</td>
<td>&lt;0.001 [S]</td>
</tr>
<tr>
<td></td>
<td>TT</td>
<td>5.7±2.7</td>
<td>5.8±2.7</td>
<td>0.446 [NS]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HbA1c (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CC</td>
<td>4.9±0.7</td>
<td>4.5±0.7</td>
<td>&lt;0.001 [S]</td>
</tr>
<tr>
<td></td>
<td>CT</td>
<td>4.9±0.7</td>
<td>4.5±0.6</td>
<td>&lt;0.001 [S]</td>
</tr>
<tr>
<td></td>
<td>TT</td>
<td>5.6±5.4</td>
<td>5.5±0.6</td>
<td>0.894 [NS]</td>
</tr>
</tbody>
</table>

Results are presented as mean±SD, (p< 0.05) considered significantly different, [S] significant, [NS]: not significant

**Conclusion**

OCT1 polymorphism can be considered as one of the genetic factors responsible for heterogeneity in the metabolic response to metformin in Iraqi female suffering from PCOS. For future studies we recommend further OCT1 SNPs can be studied in order to determine the effect of multiple SNPs on response to metformin. Studying polymorphisms of genes encoding other metformin transporters such as OCT2 and OCT3. All that can lead to prescribe the right medication in precise dose for accurate duration and minimize the chance of side effects to reach the goal of therapy for polycystic ovary syndrome.

**Ethical Clearance:** Informed consent was obtained from all participants. Data were collected in accordance with declaration of Helsinki of the World Medical Association, 2013, all other ethical issues were approved by the authors from the University of Kerbala

**Conflict of Interest:** Authors Declared none.

**Funding:** None, self-funded by corresponding author

**References**


Evaluation of Aflatoxin B1 and Patulin in Blood of Iraqi Renal Failure patients

Basaad Abdzaid AL-Fatlawi

*Department of Biology, Faculty of Science, University of Kufa, Najaf, Iraq*

**Abstract**

**Objectives:** The current study aimed to investigate and evaluate Aflatoxin B1 and Patulin in blood samples of patients with Renal Failure.

**Method:** Hundred fifty blood samples collected from patients with Renal Failure were included in this study. The age range of patients was 1-61 years. Toxin extraction from the samples was done by Thin Layer Chromatography technique (TLC).

**Results:** There were 100 from 150 samples of blood contained Aflatoxin B1 and Patulin. The highest percentage blood samples contamination with Aflatoxin B1 was (18.181 %) at age group (11-30) years and Patulin was (20 %) that collected from persons at age group (11-20) years, the percentage of blood samples that contamination with Aflatoxin B1 and Patulin that collected from the female was (52.727 % and 53.33%).

**Conclusion:** Persons in Najaf province high exposure to mycotoxins from foods (apples, pear and peach) that present in local markets, that are contaminated with mycotoxins. This suggests that these mycotoxins may be a risk factor of renal failure.

**Keyword:** Mycotoxin, Aflatoxin, Patulin, Thin Layer Chromatography.

**Introduction**

In human and animals, Mycotoxins are secondary metabolites of moulds. The toxic effect of mycotoxins in human is called mycotoxicosis. Mycotoxicosis severity depends on the toxicity of mycotoxin, the duration of exposure, the characteristic feature of individual. In general, the mycotoxins are organic molecules with low molecular weight\(^1\). *Aspergillus* molds produce mycotoxin known as Aflatoxin. It is predominant mycotoxin in addition to trichothecene, due to their highly toxicity and their carcinogenic effects\(^2\). In high humidity and temperature conditions, Aflatoxins present predominantly in rice, nuts, and cereals. Both of A. flavus, and A. parasiticus, are the *Aspergillus* species producing B and G aflatoxins\(^3\). In the southern USA, in 1952, because of the consumption of mouldy corn by swine caused an outbreak of ‘moldy corn toxicosis. Also, in Turkey in 1960 there was another outbreak, Turkey ‘X’ disease. Actually, Aflatoxins are powerful hepatocarcinogens produced by A. nomius, *Aspergillus* flavus, and A. parasiticus. Anorexia, lethargy, muscle weakness, liver haemorrhages and necrosis, engorged kidneys and liver cancer are their symptoms\(^4\).

During the 1940, Patulin was first isolated via antimicrobial active principle from *Penicillium patulum* later called *P. urticae*, now *P. griseofulvum*\(^5\). In previous studies, the blue mold *P. expansum*, that causes softrot of fruits, was recognized as one of the most common offenders in patulin contamination. It is commonly present in unfermented fruit juice, although it does not survive the fermentation into cider products. Remarkably, Patulin is toxic at high concentration\(^6\). Chemically, Patulin is a polyketide lactone. Fungal species of *Penicillium*, *Aspergillus* and *Byssochlamys* growing on fruit and vegetables, cereal grains and silage produce Patulin\(^7\). Throughout the world, Chronic Kidney Disease is the third most common disease\(^8\). It is affecting ten percent of the world’s population; it is related with poor quality of life\(^9\). Prevention and determination the risk factor of renal Failure become the major goal for many studies\(^10\). Therefore, the aim of this study was to evaluate the Aflatoxin B1 and Patulin Iraqi renal Failure patients.
Materials and Method

The study protocol was approved by University of Kufa, College of Science. One hundred fifty blood samples collected from Iraqi renal failure patients visited Dialysis unit at Al-Sadder Medical City, in Iraq. The entire participant or their parents approved performing the study. The range of age of the patients was 1-61 years. Blood samples were collected in gel tube and transported to laboratory.

Extraction of Aflatoxin B1 and Patulin were carried by placing the tubes containing the blood into the centrifuge 6000 RPM to spread the serum. Sera were separated. To each sample one drop of proteinase K (BioBasic, Canada) were added. After the addition of the enzyme, the tubes were placed in water bath 35°C for 10 min. The mixture was the exposed to centrifugation in 8000 RPM for 3 mints, the supernatant were taken and the deposit were leaved. The filter double volume from chloroform and well mixed as it formed two layers. Were used to extract Aflatoxin B1 and Patulin, chloroform layer and serum layer then The chloroform layer was withdraw and Put in a small, clean and sterile tube.

Detection of Aflatoxin B1 and Patulin; Thin Layer Chromatography (TLC) technique were used in detection of patulin serum. Thin Layer Chromatography plates were putted in oven at 120°C for one hour to activate it. Straight line was made on TLC plate in distance of about 1.5 cm from the base plate. Patulin stander (15 µl) was putted as spot on TLC plate by capillary tube and putted 15µl on plate from each extracted samples with a distance 2 cm between sample and another then let the spots to dry in laboratory condition. Separation tank was used that containing 100ml from mixture chloroform: acetone in a ratio 8:2. The plate exited from the tank and leaved it to dry under the laboratory condition. Then plate examined under UV light (360 nm) and compared the color and RF (Relative Flow) of extracted samples with the standard toxin.

Qualitative investigation of Aflatoxin B1 and patulin in blood UV visible spectrophotometer were depended it to qualitative investigation of Aflatoxin B1 and patulin. A standard curve was drawn to absorption for different concentrations of standard Aflatoxin and patulin, the standard concentrations were 1, 2, 3, 4, 5, 6, 7, and 8µg/L. The unknown concentrations of toxin in the blood were determined from the standard curve11.

Result

The result showed 66.666% of renal failure patients infected (36.666% Aflatoxin, and 30% patulin toxin), also, 33.333% not contaminated with Aflatoxin and patulin as in Table 1.

Also this study clarified that highest percentage of patients with Aflatoxin at age 11-30 years, While, 18.181% of patients with Aflatoxin at age 41-50% years. As shown in Table 2.

The result in Table 3 high light the fact that the infected female patients percent were (52.727%, 53.333%), while the infected male patients percent were (47.272%, 46.666%) infected with Aflatoxin and patulin respectively.

Table 1: Number and percentage of samples blood of persons borne Renal failure contamination and non-contemned with Aflatoxin and patulin toxin.

<table>
<thead>
<tr>
<th>Case</th>
<th>Number of Patients</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of persons non bore toxin</td>
<td>50</td>
<td>33.333</td>
</tr>
<tr>
<td>Number of persons bore Aflatoxin</td>
<td>55</td>
<td>36.666</td>
</tr>
<tr>
<td>Number of persons non bore patulin</td>
<td>45</td>
<td>30</td>
</tr>
</tbody>
</table>

Table 2: Effect of age on contaminated patients with renal failure with Aflatoxin and patulin toxin.

<table>
<thead>
<tr>
<th>Range of age (years)</th>
<th>No. of patients borne Aflatoxin</th>
<th>Percentage (%)</th>
<th>No. of patients borne Patulin</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-10</td>
<td>8</td>
<td>14.545</td>
<td>7</td>
<td>15.555</td>
</tr>
<tr>
<td>11-20</td>
<td>10</td>
<td>18.181</td>
<td>8</td>
<td>17.777</td>
</tr>
<tr>
<td>21-30</td>
<td>10</td>
<td>18.181</td>
<td>7</td>
<td>15.555</td>
</tr>
</tbody>
</table>
### Table 3: Gender of patients effects on Aflatoxin and patulin toxin.

<table>
<thead>
<tr>
<th>Gender</th>
<th>No. of patients borne Aflatoxin</th>
<th>Percentage (%)</th>
<th>No. of persons borne Patulin</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>26</td>
<td>47.272</td>
<td>21</td>
<td>46.66</td>
</tr>
<tr>
<td>Female</td>
<td>29</td>
<td>52.727</td>
<td>24</td>
<td>53.33</td>
</tr>
</tbody>
</table>

**Discussion**

Worldwide, chronic consumption foods contaminated with aflatoxin is the major problem for human and animals, especially in developing countries\(^{12}\).

Previous studies reported that Aflatoxins disturb numerous body organs, such as heart, skeletal muscles, endocrine organs, lung, brain, liver and kidneys. Because more than 20% of blood in circulation reaching to the kidneys they are susceptible to high concentration of toxic agent in the blood\(^{13-15}\).

Also, the kidneys require high nutrients and oxygen, since their load of work\(^{16}\). Various segments of nephrons are attached by aflatoxins in addition to its metabolites. The possible reason, the aflatoxin prompts protein reduction so increases the kidney cells necrosis\(^{17}\). Previous studies reported that exposor to aflatoxins induced kidney syndromes\(^{18}\), deteriorating variations in renal tubular cells in addition to unusual change of glomerular epithelial cells\(^{19}\). Other studies, on animals predicted that there was decreasing in the GFR, reabsorption of glucose and organic anions in animal’s exposer to the aflatoxins\(^{20}\).

Numerous hostile health special effects causing from exposure to patulin have been labelled previously. Actually, patulin is stated to be very cytotoxic, genotoxic, neurotoxic, and immunosuppressive. Because, Patulin has a high affinity for sulphydryl groups in the proteins\(^{21}\). The major Kidneys function are maintain of total body salt, acid base balance and blood volume regulation, in addition to excretion metabolic waste products\(^{19}\). Accordingly, the levels of the toxic substance in the lumen and surrounding renal cells are fairly high making it a possible target for patulin induced toxicity\(^{22}\).

The data of the present study indicate that there are high percent of patient with renal failure contaminated with aflatoxin and Patulin in Iraq. This suggests that these mycotoxins may be a risk factor of renal failure.

**Conclusion**

Persons in Najaf province high exposure to mycotoxins from foods (apples, pear and peach) that present in the local markets, that are contaminated with mycotoxins. This suggests that these mycotoxins may be a risk factor of renal failure.

**Funding Sources:** Self.

**Conflicts of Interest:** Declared none.

**Ethics Statement:** This experiment was approved by the Central Committee for Bioethics in college of Sciences, University of Kufa, Iraq.

**References**

3. Smith, J. E.; Solomons, G.; Lewis, G. and


The Effect of Radiotherapy and Chemotherapy on Some Kidney and Liver Functions in Colorectal Cancer Patients

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1Research, University of Al-Qadisiyah/College of Science/Department of Biology, Iraq

Abstract

The current study was conducted in Al-Diwania Teaching Hospital/Oncology Division and Middle Furat Center for Cancerous Tumors in Al-Najaf, Babil Health Department/Marjan Hospital, Babil Health Department/Imam Al-Sadiq Hospital and Medical City Department/Al-Amal Hospital for the treatment of tumors and continued for the period from 2/10/2019 to 6/5/2020. 60 samples were taken from patients diagnosed with colorectal cancer and 30 samples from non-infected people as a control group, with ages ranging from 33 years to 80 years for both groups. The results showed an increase in the level of Creatinine in the patient group compared to the control group and it was the highest in the radiotherapy group, followed by the chemotherapy group and then the control group. The results showed high significant differences between the three groups (p <0.001), and there were significant differences between the radiotherapy group and the chemotherapy group. Through the results, it was found that the average level of Creatinine increased in the radiotherapy and chemotherapy groups compared to the control group. The results showed that the mean of AST was highest in the radiotherapy group, followed by the chemotherapy group and then the control group. The results showed high significant differences between the three groups (p <0.001). Through the results, it was found that there were no significant differences between the radiotherapy group and the chemotherapy group in the average level of the AST enzyme. It was also found that the average level of AST enzyme was higher for the radiotherapy and chemotherapy groups compared to the control group. The results of the current study showed the highest mean ALT enzyme in the radiotherapy group, followed by the chemotherapy group compared to the control group. The results showed high significant differences between the three groups (p<0.001) and significant differences between the radiotherapy group and the chemotherapy group. ALT for the radiotherapy and chemotherapy groups compared to the control group.

Keywords: Colorectal cancer, ALT, AST, chemotherapy, radiotherapy.

Introduction

The kidneys are important vital organs and have many functions, including the production of erythropoietin to stimulate the production of red blood cells, filter metabolites and electrolytes from the blood, and adjust blood pressure through fluid balance. Studies have shown the negative effect of chemotherapy agents and their role in the emergence of nephrotoxicity (Nephrotoxicity) and the damage is determined clinically through changes in the rate of glomerular filtration, creatinine clearance, urea nitrogen in the blood and urine excretion, as well as the negative effects of chemotherapy agents that can be radiographed, such as change Cystic, interstitial nephritis, urethral changes, and colitis, etc. Also, radiation therapy causes total body irradiation (TBI) to injure the kidneys with some damage, the most important of which is radiation nephropathy (RN). The incidence of clinical RN increases with the use of TBI and nephropathy usually develops very slowly over several years as proteinuria, hypertension, and impaired urine concentration. Studies have indicated that a dose within the range of 5 to 10 Gy, doses less than 5 Gy will not effectively affect the kidneys, while doses in excess of 10 Gy may cause rapid gastrointestinal death. However, given the threshold dose, adequate ionizing radiation affects most or all of the kidney components. The injury to the glomerulus is first with the development of glomerular scars due to thrombotic angiopathy. Chemotherapy is one of the main treatments used in treating cancer. Systemic cancer treatment has evolved from traditional toxic
agents to newer classes of partially targeted therapy. Although these treatments aim to prevent the growth of cancerous tissues, they have harmful effects on normal tissues where many negative effects of chemotherapy can be detected on various organs, including the liver.\(^7\) Among the most important of these effects is the fatty leaching of the liver tissue and the accumulation of fat cells in the liver cells, which is known as hepatic steatosis or what is known as hepatic steatosis, and steatohepatitis, which is a more severe form of fatty liver disease and is often asymptomatic and can be detected by elevated ALT and AST.\(^8\) These changes have been linked to chemotherapy agents, Methotrexate 5-fu, Irinotecan, Oxaliplatin\(^9\) as the steatohepatitis (steatohepatitis) associated with chemotherapy can be diffuse or focal and can be seen with an ultrasound scan (US).\(^10\) Hepatic steatosis can also be visualized through computed tomography (CT)\(^11\), as well as magnetic resonance imaging (MR)\(^12\). The detection of lipid changes in a chemotherapy patient is useful because it may prompt changes in treatment, especially in patients with metastatic colorectal cancer, as steatosis may increase the risk of postoperative complications.\(^13\)

Several studies have revealed the relationship between acute hepatitis and several chemotherapy treatments.\(^14\) Acute hepatitis ranges from asymptomatic inflammation to highly symptomatic inflammation such as nausea, vomiting, poor appetite and jaundice, with an increase in AST and ALT in the majority of patients. Hepatitis improves upon temporary discontinuation of cancer treatment.\(^15\) As for the effect of radiation therapy, the liver is exposed indirectly during radiotherapy (RT) to tumors located in the upper abdomen, lower lung, esophagus, entire abdomen or the entire body.\(^16\) Despite exposure to a limited area during radiotherapy, normal tissues in that area can receive a high dose of radiation and thus the liver can withstand severe damage such as fibrosis.\(^17\) The radiation effects resulting from radiation treatments for cancer patients depend on age and gender.\(^18\) It has been observed that radiation damage in cells is like breaking the double strand of DNA and this is at the molecular level and this damage leads to many biochemical reactions, which It subsequently leads to various pathologies such as cirrhosis as a form of acute radiological damage after exposure to high-dose radiation.\(^19\) Clinical symptoms known as «classic» radiation induced liver disease (RILD) usually occur. These symptoms occur within four months after exposure to radiation of the liver as the patient suffers from fatigue, weight gain, enlarged liver, and high alkaline phosphatase. Which is not compatible with other liver enzymes.\(^20\) In contrast to this «classic» RILD, a cancer patient may present with underlying chronic liver disease such as cirrhosis and viral hepatitis with liver function abnormalities such as jaundice within three months of completion of radiotherapy.\(^21\)

**Materials and Method**

**Collecting and testing blood serum:** Samples were collected from Al-Diwaniyah Teaching Hospital/Oncology Department and the Central Euphrates Center for Cancerous Tumors in Najaf, Babil Health Department/Morgan Hospital, Babil Health Department/Imam Al-Sadiq Hospital and Medical City Department/Al-Amal Hospital. For the treatment of tumors after the approval of the above-mentioned hospital departments and after taking the verbal consent of the patients and healthy people who were included in the study after clarifying the idea of the research and its purpose, and their data should be used only for the purposes of research and to maintain privacy. 2 ml of the patient’s blood was withdrawn and it was placed in a centrifuge at 3000 rpm for ten minutes, then the separated serum was taken and transferred to the Eppendorf tube. These samples were kept in continuous freezing temperature (-20 °C). As for the control samples, 30 samples were taken from healthy people in the same way as patient samples for the purpose of examining some liver and kidney functions.

**Examination of Biochemical parameters**

i. **Determination of serum creatine levels:** Serum creatinine levels were measured using a spinreact Kit.

ii. **Determination of serum ALT and AST activity (U/L):** I used a ready-made test kit, a kit manufactured by the Chinese company CUSABIO, using the color method used by Reitman & Frankel.\(^22\)
Results

Table: Biochemical characteristics of colorectal cancer patients and control group

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Control $n = 30$</th>
<th>Radiotherapy $n = 30$</th>
<th>Chemotherapy $n = 30$</th>
<th>P- Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creatinine</td>
<td>0.60±0.05</td>
<td>1.56±0.08</td>
<td>1.28±0.06</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>A</td>
<td>B</td>
<td>HS</td>
</tr>
<tr>
<td>AST</td>
<td>26.04±0.50</td>
<td>43.75±0.63</td>
<td>41.14±1.09</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>A</td>
<td>A</td>
<td>HS</td>
</tr>
<tr>
<td>ALT</td>
<td>31.46±0.29</td>
<td>56.11±0.54</td>
<td>51.78±0.32</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>A</td>
<td>B</td>
<td>HS</td>
</tr>
</tbody>
</table>

The results showed an increase in the level of Creatinine in the patient group compared to the control group and it was highest in the radiotherapy group (1.56 ± 0.08), followed by the chemotherapy group (1.28 ± 0.06) and then the control group (0.60 ± 0.05). The results showed high significant differences between groups. The three were (p <0.001). There were also significant differences between the radiotherapy group and the chemotherapy group. Through the results, it was found that the average level of Creatinine increased in the radiotherapy and chemotherapy groups compared to the control group.

The results showed that the mean of the highest AST was in the radiotherapy group (43.75 ± 0.63), followed by the chemotherapy group (41.14 ± 1.09) and then the control group (26.04 ± 0.50). The results showed high significant differences between the three groups (p <0.001). Through the results, it was found that there were no significant differences between the radiotherapy group and the chemotherapy group in the average level of the AST enzyme. It was also found that the average level of the AST enzyme was higher for the radiotherapy and chemotherapy groups compared to the control group.

The results of the current study showed the mean of the higher ALT enzyme in the radiotherapy group (56.11 ± 0.54), followed by the chemotherapy group (51.78 ± 0.32) compared to the control group (31.46 ± 0.29). The results showed high significant differences between the three groups (p <0.001). Significant levels were found between the radiotherapy group and the chemotherapy group. The mean level of ALT was found to be higher in the radiotherapy and chemotherapy groups compared to the control group.

Discussion

The percentage of creatinine is high in the serum of cancer patients, and the reason for this increase may be due to kidney injury, as there is a reciprocal relationship between cancer and the kidneys, as chronic kidney disease can increase the risk of cancer, and cancer patients often suffer from renal impairment resulting from associated factors. With disease or toxicity of the treatments used by cancer patients, the effect of radiation therapy is more concentrated on cells, being specific to the organ affected by the carcinoid tumor. Therefore, cell lysis in radiotherapy is stronger and faster than chemotherapy (23). Doses of less than 18 Gy of the whole kidney appear to rarely cause severe or long-term renal injury while doses of more than 20 Gy of disease lead to significant nephropathy (24).

(25) found a mean reduction of 8% in glomerular filtration rate (GFR) for each 100 mg/m2 dose received from cisplatin treatment. In serum or urine and cisplatin infusion rates. Decreases in glomerular filtration rate and hypomagnesaemia are rare after carboplatin use. Ironically, it is possible that the risk of renal insufficiency and tubopathy is higher with carboplatin/ifosfamide compared to the cisplatin/ifosfamide combination therapy (26). Radiation nephritis or radiation nephropathy develops after a latent period of 3 to 12 months and is manifested in varying degrees of hypertension, renal insufficiency and anemia (27). An elevated liver enzyme level is frequently present in cancer patients but is mostly due to the fact that chemotherapy and radiotherapy damage liver cells (28).

The administration of chemotherapy presents a challenge to the strict regulation and balance of these processes since most drugs tend to be lipophilic, so
the liver takes them easily. Under the influence of chemotherapy, about 85% of patients develop liver steatosis and steatohepatitis is the most serious event, especially if it is associated with an increase in bilirubin levels(29). Radiation therapy affects the liver and has negative effects. Treatments cause cirrhosis and venous obstructive liver disease, a feature of patients with radiation-induced liver disease (RILD). Radiation therapy also causes oxidative stress and the production of reactive oxygen species, which lead to the apoptosis of liver cells and acute inflammatory responses and increases the susceptibility of central hepatocytes («centrilobular» hepatocytes «HCs») to the apoptosis of the treatment and ultimately leads to the death and degeneration of hepatocytes. Chemotherapy also causes various tissue changes to the liver, including this fatty degeneration, and steatohepatitis associated with chemotherapy and sinus obstructive syndrome for sinus infection, as well as the treatment regimens and the quality of chemotherapy have a direct and important effect on the severity of the liver injury and this is in accordance with studies (30).

Ethical Clearance: Nil
Source of Funding: Self
Conflict of Interest: Nil

References


Pathological and Immunohistochemical Assessment of \textit{Salmonellatyphimurium} Pathogenicity During Oral Experimental Infection in Mice

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Abstract

\textit{Salmonella typhimurium} is a Gram-negative zoonotic bacterium which causes a wide range of illnesses to both humans and animals. The aim of this research is to study the pathogenicity of \textit{S. typhimurium} in vivo. A total of 40 adult white BALB/c mice were divided into 5 groups (8 animals each). Four groups were orally dosed by viable \textit{S. typhimurium} (1 X 10\textsuperscript{9} cfu/ml) suspended in phosphate buffer saline (PBS) by a stomach tube, while the fifth group was given PBS orally only (control group). Four mice were killed at 7, 12, 24, 48 hours after giving the infective dose plus one mouse from the control group. In addition, sera were collected after 2 weeks from animals of each group to detect the titer of antibodies. The viability of \textit{S. typhimurium} was checked by culturing on SS agar after mice death. Slides were prepared for histopathological examination (to assess the lesions) and immuno-histochemistry (to detect cytotoxic T cells in the affected organs). The results included bacterial isolation from duodenum, jejunum, ileum and liver which were positive from the infected groups. Histopathological examination showed hepatic granulomatous lesions with severe infiltration of mononuclear cells (MNCs) in the liver parenchyma and within small intestine. Finally, to detect cytotoxic T cells in the slides, immunohistochemistry showed presence of CD8 T cells in the hepatic cells. Titers of antibodies were measured by ELISA where IgG antibodies were detected. The conclusion of this study could be summarized by addressing the severity of infection after 12 hours of oral dosing in the stomach while severe lesions were seen in the liver after 48 hours of oral administration.

Keywords: Pathology; Immunohistochemistry, Pathogenicity; \textit{S. typhimurium}, IgG, CD-8 T cells.

Introduction

\textit{Salmonella enterica} serovar \textit{Typhimurium} (hereafter \textit{S. typhimurium}) is a Gram negative motile non spore forming encapsulated bacteria belongs to Enterobacteriaceae family that could cause a long list of infections (mainly diarrhea due to enteritis) to both humans and animals as a zoonotic virulent foodborne pathogen\textsuperscript{1,2,3}. Therefore, \textit{S. typhimurium} is responsible for being a major threat pathogen to public health globally as well as it causes huge economic losses in the field of veterinary medicine worldwide because of the biological damage to the intestine of infected animals which leads to poor absorption of digested food and weight loss\textsuperscript{4,5}. Recent publications referred to the capability of \textit{S. typhimurium} to develop a multidrug resistance to many antibiotics which worsen much more the economic losses in animals due to the added value of the cost of treatment\textsuperscript{6,7,8,9}.

In mice, \textit{S. typhimurium} is responsible for bacterial diarrhea and considered as an animal model for human
Infection of mice with *S. typhimurium* is mainly initiated due to oral-fecal route of transmission. After ingestion of *S. typhimurium* with the contaminated food, the bacteria survive and colonize in the small intestine. Settling of bacteria in the small intestine leads to expansion in numbers through multiplication of these bacteria. The clinical symptoms mainly characterized by anorexia, loss of appetite, and the most important clinical symptom is diarrhea (ranged from mild to bloody depending on the virulence of the *S. typhimurium* strain).

After propagation of *S. typhimurium* in the intestine and establishing clear clinical symptoms, it is essential to interfere this microbial attack by giving antibiotics. However, *S. typhimurium* is sensitive to most antibiotics except a few emerged strains which gained resistance properties against antibiotics.

The immune response against *S. typhimurium* differs according to the level of virulence of the strain. Innate immunity against *S. typhimurium* represents by phagocytic activity of neutrophils and macrophages in the early stages of infection which almost always not biologically effective, thus adaptive immunity is required. Adaptive immunity against *S. typhimurium* could be considered as the key role in the clearance of this bacterium through establishing production of more specific CD4+ and CD8+ T cells.

The pathogenicity of *S. typhimurium* in mice was studied before more than 2 decades, but this study did not focus on the liver as an important organ involved in *S. typhimurium* infection. Therefore, and due to lack of studies in Iraq, this study is designated to spot the light on infection which is evaluated by bacterial spread in intestine and liver through investigation of experimental studies.

**Materials and Method**

A total of 40 adult white BALB/c mice were divided into 5 groups (8 animals each). Four groups were given an oral dose of viable *S. typhimurium* (1 X 10⁹ cfu/ml) suspended in phosphate buffer saline (PBS) by a stomach tube, while the fifth group was given PBS orally only (control group). The bacteria were isolated from local Iraqi lambs. Four mice were killed at 7, 12, 24 and 48 hours after giving the infective dose plus one mouse from the control group. The viability of *S. typhimurium* was checked by culturing on SS agar after mice death. Slides were prepared for histopathological examination (to assess the lesions) and immunohistochemistry (to mainly detect cytotoxic T cells in the affected organs). Three mice were chosen from both infected and control groups and subjected to Widal test which was used to determine the presence of O and H antigens of *S. typhimurium* and the positive samples of Widal were further subjected to ELISA to confirm measuring the titer of the IgG antibodies in the serum against protein and LPS antigen of *S. typhimurium*.

**Histopathological examination:** The tissue specimens collected from liver, duodenum, jejunum and ileum were fixed in 10% formalin for 72 hour and processed for slide preparation and staining with Hematoxylin and Eosin (H and E) stain was done according to. Histopathological changes were observed under light microscope.

**Immunohistochemistry:** The kit used for this technique was purchased from “US Biological, USA” and the procedure was done according to. The stain used in this technique was 3, 3’ Diaminobenzidin (DAB) stain which is a stable liquid substrate. DAB is the most common reagent employed for the immunohistochemical detection of horse radish peroxidase (HRP) probes. In the presence of HRP and hydrogen peroxide, DAB is oxidized to a brown polymer easily recognized by light microscope.

**Preparation of protein and lipopolysaccharide (LPS) antigens:** *S. typhimurium* isolated from infected mice (biochemically and serologically proven by), were grown overnight on Trypticase soy agar (TSA) (Difco, USA) at 37°C. After that, the bacteria were harvested in normal saline solution and mixed with three volumes of acetone for inactivation. Inactivated bacteria were centrifuged, and the pellet further washed from acetone. The LPS antigen of *S. typhimurium* was extracted from acetone-dried cells by the following hot phenol-water method. The resultant protein antigen was obtained from the acetone dried cells by Veronal buffer extraction and purified by repeated precipitation with trichloroacetic acid. The carbohydrate and protein content of the prepared mixture was determined by Lowry and Anthrone method.

**Preparation of O and H antigens for Widal test:**

**Preparation of O-antigen:** Bacteria were grown on TSA agar at 37°C overnight, then harvested by adding...
normal saline solution to each petri dish. Bacterial cells were brushed off from the agar surface by cotton swab. The bacterial suspension was centrifuged at 6000 rpm for 30 minutes and the supernatant was discarded. The bacterial cell pellet was washed three times and resuspended in normal saline. Bacterial cells were killed by heating at 100°C for 30 minutes, diluted with normal saline at appropriate dilution and kept at 4°C until later use.

**Preparation of H antigen:** Trypticase Soya (TS) broth (Difco, USA) was heavily inoculated with *S. typhimurium* and incubated at 37°C overnight. Bacterial cells were killed with formalin at a final concentration of 0.5% and harvested by centrifugation at 6000 rpm for 30 minutes. The bacterial cell pellet was washed three times before being resuspended in PBS. It was kept at 4°C until later use. Optimal concentrations was determined in carbonate-bicarbonate buffer (pH = 9.6).

**Enzyme-linked immunosorbent assay (ELISA):** the kit (Biosource, USA) was purchased to measure IgG in the serum. Sandwich ELISA method was applied according to manufacturer instructions. Protein and LPS antigens were added into u-shape microtiter plates, then incubated at 37°C for 3 hours. After that, plates were washed three times by PBS containing (0.05% Tween20). Then a biotinylated detection antibody specific for IgG was loaded into the plates and Avidin-Horseradish Peroxidase (HRP) as a conjugate is added to each microplate well and incubated for 1 hour at 37°C. A blue color was developed as a result of positive IgG titer. The colorimetric reaction was stopped by adding enzyme-substrate (sulphuric acid solution) and the color turned into yellow. The optical density (OD) was measured by ELISA reader (Varioskan™ LUX multimode microplate reader, ThermoFisher Scientific, USA) machine (spectrophotometer) at a wavelength of 450 nm.

The samples used for ELISA were incubated for one hour with optimal dilutions of serum samples (1:40) for protein antigen, and (1:20) for LPS antigen.

**Statistical Method:** T test was used to compare statistically between the titer of antibodies in infected and controls at a level of significance (P<0.05).

**Results**

The histopathological data obtained in this research showed hepatic granulomatous lesions scattered through its parenchyma consist of central foci of necrosis, associated with severe infiltration of mononuclear cells (MNCs), mainly macrophages and lymphocytes (Figure 1). In addition, sections illustrated dilated congested central veins and sinusoids, also inflammatory cells particularly neutrophils and macrophages were seen in lumen with large areas of necrotized hepatocytes replaced by RBCs (Figure 2). The results of immunohistochemical examination manifested by deposited brownish color in the intracellular area of hepatocytes within the cytoplasm of infected cell when stained by (3,3’-Diaminobenzidine) which were recognized in the liver tissues (Figure 3).

The histopathological lesion in the intestine of mice after orally administered by (0.2 ml containing 1 X 10^7 cfu/ml of *S. typhimurium*), showed severe necrosis associated with massive infiltration of inflammatory cells particularly MNCs in the lamina propria and in mucosal glands, as well as severe congested blood vessels and edematous spaces appeared in the serosa layer of infected organ.

**Figure 1:** Histopathological section in liver of infected mouse after orally administered via (0.2 ml contain 1x10^7cfu/ml of *S. typhimurium*), shows granulomatous lesions characterized by, central of necrosis (yellow arrows) with severe infiltration MNCs mainly macrophages and lymphocyte in the liver parenchyma (green arrow) (H & E stain, 40X).
Figure 2: Histopathological section in liver of infected mouse after orally administered via (0.2 ml contain 1x10^7 cfu/ml of *S. typhimurium*), shows dilation of sinusoids (yellow arrow), neutrophils and macrophages infiltration (turquoise arrow) necrotic hepatocytes that replaced by RBCs (green arrow) (H & E stain, 40X).

Figure 3: Immunohistochemistry section in liver of infected mouse after orally administered via (0.2 ml contain 1x10^7 cfu/ml of *S. typhimurium*), show infiltration of immunohistochemical staining positive cells of CD8, that appear as deposited brownish color in the intracellular within cytoplasm of infected cell (Diaminobenzidine staining, 40X).
Figure 4: Histopathological section in intestine of infected mouse after orally administered via (0.2 ml contain 1x10⁷ cfu/ml of *S. typhimurium*), shows severe infiltration of inflammatory cells within and between the mucosa intestinal gland (green arrow) as well as severe congestion that appear in the serosa layer (yellow arrow)(H & E stain, 40X).

Figure 5: Immunohistochemistry section in intestine of infected mouse after orally administered via (0.2 ml contain 1x10⁷ cfu/ml of *S. typhimurium*), shows infiltration of immunohistochemical staining positive cells of CD8, that appear as deposited brownish intracellular color within and between the mucosa gland and intestinal villi (Diaminobenzidine staining, 40X).
Mean quantities of CD8+ T lymphocytes marked (table 1) with specific antibody by immunohistochemistry in tissue section of the Liver and Intestine (duodenum, jejunum, and ileum) of infected mice after orally administered via (0.2 ml contain 1x10^7 cfu/ml of S. typhimurium).

**Table 1: Quantities of CD8+ T cells in detected in liver and small intestine**

<table>
<thead>
<tr>
<th>Organ</th>
<th>Control group Mean±SE</th>
<th>Infected group Mean±SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liver</td>
<td>9.74 ± 0.69</td>
<td>24.25 ± 0.83*</td>
</tr>
<tr>
<td>Duodenum</td>
<td>8.70 ± 0.55</td>
<td>26.39 ± 0.86*</td>
</tr>
<tr>
<td>Jejunum</td>
<td>8.45 ±0.44</td>
<td>24.97 ±0.55*</td>
</tr>
<tr>
<td>Ileum</td>
<td>8.25 ± 0.60</td>
<td>22.95 ± 0.71*</td>
</tr>
</tbody>
</table>

*=Presence of significant differences between groups (P ≤ 0.05).

The results of bacterial isolation from internal organs revealed positive isolation from duodenum and jejunum after 12 hours of giving the infective dose of S. typhimurium orally, while the bacterium was seen after 24 hours post infection. However, invasion of S. typhimurium to the liver was detected after 48 hours (table 2).

**Table 2: Bacterial isolation from internal organs at different time points.**

<table>
<thead>
<tr>
<th>Time</th>
<th>Organ</th>
<th>Duodenum</th>
<th>Jejunum</th>
<th>Ileum</th>
<th>Liver</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 hours</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>12 hours</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>24 hours</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>48 hours</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Control</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

The serological results revealed detection of fair levels of antibodies against oral dosing of pathogenic S. typhimurium measured by Widal test after 2 weeks post infection (table 3). The antibody titer was 71.11 pg/ml against S. typhimurium O-antigen whereas, it was 94.22 pg/ml against S. typhimurium H-antigen. The antibody titers measured by Widal test were re-tested by ELISA and they were 150.83 pg/ml and 95.44 pg/ml for S. typhimurium protein and LPS antigens respectively (table 4).

**Table 3: Mean quantities of antibodies measured by Widal test for (O and H) antigens (pg/ml).**

<table>
<thead>
<tr>
<th>Time</th>
<th>Mean quantity of antibodies against O-antigen (pg/ml)</th>
<th>Mean quantity of antibodies against H-antigen (pg/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infected</td>
<td>94.22</td>
<td>71.11</td>
</tr>
<tr>
<td>Control</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

No significant differences between groups (P>0.05)

**Table 4: Mean quantities of IgG antibodies measured by ELISA test for both protein and LPS antigens (pg/ml).**

<table>
<thead>
<tr>
<th>Time</th>
<th>Mean quantity of IgG against protein antigen (pg/ml)</th>
<th>Mean quantity of IgG against LPS antigen (pg/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infected</td>
<td>150.83*</td>
<td>95.44</td>
</tr>
<tr>
<td>Control</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

* Presence of significant differences between groups (P<0.05)

**Discussion**

The genus Salmonella in general was extensively studied in Iraq in both animals and humans 28, 29, 30, 31, 32. However, there was no research done with regards to immunopathological studies on S. typhimurium in Iraq. There was one study in Iraq33 who isolated this bacterium from chicken meet.

The histopathological lesions caused by oral dosing of S. typhimurium in mice in this study revealed massive destruction to the epithelium of intestine accompanied by mononuclear cells (MNCs) infiltration as well as invasion of these bacteria into liver which caused inflammatory reactions represented by infiltration of MNCs into the hepatic tissue which developed into a hepatic necrosis to wide areas of liver in addition to scattered hemorrhages in the hepatic tissue. These findings are in line with previous studies 34, 35, 36 who reported microbial invasion and colonization of S. typhimurium to the enteric canal (GIT) of mice causing diarrhea (ranged from mild to severe bloody type). However, further research similar to we have found with regards to spreading of S. typhimurium into hepatic tissue was investigated by 37, 38 who described the penetrative ability of S. typhimurium to infect liver.
The immune response against *S. typhimurium* was measured in this study by three methods (Immunohistochemistry “IHC”, Widal test and ELISA). The cellular immune response was determined by IHC method to search for cytotoxic T cells (CD8+ T cells) in the liver which were prevalent in the slide sections. This finding is in line with previous studies who demonstrated that CD8+ T cells (T cytotoxic cells) are the predominant cell type in the immune response to *S. typhimurium* and explained how these lymphocytes killed the bacterium through production of bactericidal cytokines such as interferon gamma (IFN-γ) and interleukins (IL-17 and IL-23).

Humoral immune response was also assayed to measure the levels of antibodies in the sera against *S. typhimurium*. Initial attempts were made to measure the titer of antibodies through Widal test and then confirmed by ELISA (more specific and sensitive). IgG titers were relatively low in this study against *S. typhimurium* which was (150.83 pg/ml) against protein antigen and (95.44 pg/ml) against LPS. The titers of IgG were much higher in a study who measured IgG in the blood of mice orally dosed with bovine lactoferrin and infected (challenged by) pathogenic *S. typhimurium*. The titer of IgG measured by ELISA ranged from about 300 to 3400 pg/ml measured at multiple time points (7 days, 14 days and 21 days) post challenge.

Another study in Iran was performed to study the effect of alum as an adjuvant while vaccination against endotoxin-removed lysates of *S. typhimurium* in mice. They used ELISA to measure the titer of IgG which was significantly higher in the vaccinated groups by comparison with controls (given PBS only) at a level (P<0.05) plus a significant increase in the leucocytes count (mainly T helper 1 cells) compared with controls which is approximately in line to what we found.

Further research done by was applied to study antibodies’ titers (IgA, IgM and IgG) against African O antigen of *S. typhimurium* and found that IgG was increased 4 logs in the vaccinated mice by comparison with controls after two weeks of immunization. This finding is much higher than our results.

A contemporary study to found that *Rag1−/−* mice has the ability to eliminate *S. typhimurium* from the gut through the antibacterial activity of IgG in the mucus of GIT that immobilize bacteria which explains the beneficial role of humoral immunity against this bacteria and this is in agreement to the findings of our study.

Further serological research to compare between pIlgR knockout mice and wildtype mice was done to detect both IgA and IgG in the sera samples and stool specimens in response to oral dosing and intravenous injection of pathogenic *S. typhimurium*. The concentration of IgA and IgG measured by ELISA demonstrated significant increase of IgA and IgG (P<0.05) in the sera of pIgR knockout mice by comparison with the wildtype mice which resulted in elevation of survival rates in these mice against *S. typhimurium* infection with which we agree.

Finally, a recent study to discovered an essential role of core fucosylation in the immunological mechanism of Fut8+/+ and Fut8−/− mice against *S. typhimurium* infection. They demonstrated significant lower concentrations of IgA and IgG (P<0.05) in Fut8−/− mice plus remarkable fall (P<0.05) in lymphocytes count (both B and T cells) which is in contrast to what we found.

In conclusion, pathogenesis of oral dosing with *S. typhimurium* was studied in mice which spread into intestine and liver within 48 hours and this was examined by bacterial isolation from the infected organs and histopathological pictures. IgG antibodies against *S. typhimurium* were also detected.

**Declaration of Interest:** This research article is self funded by the authors. The authors did not receive any fund or financial support to accomplish this work.

**Conflict of Interest:** The authors declare no conflict of interest.

**Ethical Approval:** Ethical Clearance was taken from the Committee of College of Veterinary Medicine, University of Baghdad.

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Estimation of Stature from Foot Dimensions

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²Professor, Department of Forensic Medicine, Saveetha Medical College, Thandalam, Chennai-602105

Abstract

The purpose of this study is to establish reliability of estimating stature from the foot dimensions in South Indian population. Volunteers aged above 18 years were recruited for the study and measured using standard measuring using standardized measuring equipment. Anthropometric measurements taken include stature, foot length, foot breadth, navicular height and malleolar heights. Correlations, regression formula and linear regression equations derived for both male and female showed positive correlation coefficient between stature and foot dimensions. To conclude foot dimensions were correlated with stature and can be a better predictor of stature.

Keywords: Stature estimation, foot length, foot breadth, navicular height, malleolar height.

Introduction

Identification of an individual is the mainstay in forensic investigations. This becomes more essential when dismembered body parts are found. Forensic examinations to identify individuals depend on aspects that solely define them such as fingerprints. One of such investigations is stature estimation. Stature is the height of the person in erect posture and this can determine the physical identity of a person. It has a significant aspect in establishing identity of an unknown[1]. Stature of an individual belonging to a given combination of age, race, and sex have measurements of different body parts that are proportionate to it[2]. Measurements of long bones are usually used to estimate stature[3]. Different parts of the body can also be used for estimation[4][5].

As foot dimensions enable determine stature, they also determine age and sex of an individual[6]. This forensic assessment of stature helps identify individuals, thereby helping medico-legal and forensic investigations.

Materials and Method

It is a cross-sectional study consisting of South Indian population. Residents of Chennai irrespective of sex with age above 18 years and those who had given their informed consent were measured for stature, foot length (the maximum distance between the most posteriorly projecting point of the heel (pteron) to the most anteriorly projecting point (acropodion) of the first or second toe, whichever is bigger when the foot is fully stretched), foot breadth (the distance between the lateral and the medial sides at the metatarsal region or at the heel region, whichever is the broadest), navicular height (the distance between the prominent part on the medial side of dorsal foot (navicular bone being situated on the medial side) to the base of foot on the plantar aspect) and malleolar heights (the most superficial prominent point on the malleolus to the base of foot at the heel) using vernier calipers and measuring tape to the nearest centimeter. Since stature is variable among population and sex, regression formulas have been derived for the population and the data will be tabulated, analyzed and subjected to statistical calculations using SPSS software.

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Results

Estimation of stature using foot measurements

Table No: 1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Number</td>
<td>23</td>
<td>38</td>
</tr>
<tr>
<td>Mean of Height</td>
<td>167.0261</td>
<td>155.9184</td>
</tr>
<tr>
<td>S.D of Height</td>
<td>2.98621</td>
<td>5.53846</td>
</tr>
<tr>
<td>Mean of FLRT</td>
<td>24.9261</td>
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</tr>
<tr>
<td>S.D of FLRT</td>
<td>1.08302</td>
<td>1.02823</td>
</tr>
<tr>
<td>Mean of FLLT</td>
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<td>22.7711</td>
</tr>
<tr>
<td>S.D of FLLT</td>
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<td>1.00079</td>
</tr>
<tr>
<td>Mean of FBRT</td>
<td>9.1652</td>
<td>8.0421</td>
</tr>
<tr>
<td>S.D of FBRT</td>
<td>0.53395</td>
<td>0.46361</td>
</tr>
<tr>
<td>Mean of FBLT</td>
<td>9.1174</td>
<td>8.0316</td>
</tr>
<tr>
<td>S.D of FBLT</td>
<td>0.51580</td>
<td>0.46155</td>
</tr>
<tr>
<td>Mean of NHRT</td>
<td>5.0870</td>
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</tr>
<tr>
<td>S.D of NHRT</td>
<td>0.42885</td>
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<td>Mean of NHLT</td>
<td>5.0913</td>
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<tr>
<td>S.D of NHLT</td>
<td>0.46993</td>
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</tr>
<tr>
<td>Mean of LMHRT</td>
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Table No: 2: Correlation of stature with foot dimensions

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</tr>
<tr>
<td>FBRT</td>
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<tr>
<td>FBLT</td>
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Table No: 3: Linear Regression equation for Male

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Regression equation SEE

S=154.107+0.518FLRT3.00200
S=156.498+0.423FLLT3.01653
S=141.278+2.809FBRT2.64288
S=141.856+2.761FBLT2.68656
S=138.627+5.583NHRT1.82685
S=139.857+5.336NHLT1.65959
S=166.149+0.153LMHRT3.05431
S=166.418+0.106LMHLT3.05547
S=168.206-0.194MMHRT3.05284
S=168.441-0.233MMHLT3.05070

Linear Regression equation for Female

Regression equation SEE

S=76.262+3.498FLRT4.26964
S=76.105+3.505FLLT4.34513
S=158.921-0.373FBRT5.61211
S=160.353-0.552FBLT5.60891
S=118.633+8.489NHRT4.11560
S=119.102+8.382NHLT4.13615
S=136.135+4.038LMHRT4.14284
S=136.128+4.045LMHLT4.16737
S=140.616+2.838MMHRT4.89023
S=140.021+2.927MMHLT4.84001
Correlations

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<th>FBLT</th>
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</table>

*Correlation is significant at the 0.05 level (2-tailed), **Correlation is significant at the 0.01 level (2-tailed).

Regression equation:


Discussion

In forensic investigations difficulties are being experienced in identification of bodies dismembered in mass destruction. So as to minimize these difficulties many methods are developed and are being developed. One such investigation is stature estimation which helps in identifying individuals. Stature estimation can be done with different parts of the body. This assessment is of great importance in medico-legal and forensic examinations. The present study is to estimate stature from foot measurements and to analyze the relationship between foot dimensions and stature.

It is a cross-sectional study in South Indian population. Residents of Chennai irrespective of sex with age above 18 years and informed consent given are measured for stature, foot length, foot breadth, navicular height and malleolar heights. Those with deformities and below 18 years of age were excluded from the study.

Table 1 shows the mean and standard deviation of various measurements of both right and left feet in males and females, along with height. In the present study 62.30% are of females and 37.70% are males. The mean height of males is 167.0261 and females is 155.9184.

The mean height is more in males than females though female to male ratio is low. The mean of other foot dimensions also show more for males than females.

Table 2 shows correlation of stature with foot dimensions of both right and left. Also shows correlation of various parameters in males and females.

Almost all correlation coefficients show positive values indicating a relation between various parameters and stature. Foot breadth in females and malleolar height in males show negative correlation indicates less relation between stature and these two parameters.

Correlation coefficient of foot length in females is 0.649 and males is 0.188 says that foot length is more correlated to stature in females than males.

Correlation coefficient foot breadth in males is 0.502 and -0.046 in females indicates that foot breadth is more correlated to stature in males than females. Foot breadth in females have negative correlation with stature.

Correlation coefficient of navicular height in males is 0.840 and 0.680 in females says that navicular height is more correlated to stature in males than females.

Correlation coefficient lateral malleolar height in females is 0.675 in females and 0.038 in males indicates that lateral malleolar height is more correlated to stature in females than males.

Correlation coefficient of medial malleolar height in females is 0.507 and -0.061 in males says medial malleolar height is more correlated to stature in females than males.
Foot breath in females and medial malleolar height in males are negatively correlated to stature that is increase in one variable is associated with a decrease in the other variable.

Correlation of the parameters with stature show positive values in total indicating a relation between stature and foot dimensions.

Table 3 shows linear regression equations for males and females.

The SEE help predict the deviation of estimated stature from the actual stature. A low value indicates a greater reliability in the estimated stature.

The SEE ranges from 1.65959 to 3.05547 in males. Navicular height exhibits a lower value and gives better reliability in prediction of stature.

The SEE ranges from 4.11560 to 5.61211 in females. Navicular height exhibits a lower value and gives better reliability in prediction of stature.

In this study navicular height in both males and females presented a strong relationship with stature and more reliable in estimation of stature.

The results of the present study show that dimensions of foot show statistically significant positive correlation with stature of an individual. In this study males showed higher mean values in all the parameters studied than among females with statistically significant difference. Sexual dimorphism was noted for the foot dimensions recorded. The foot dimensions are relatively smaller in females than males. No significant difference was found in either right or left side measurements.

**Conclusion**

The present study established a definite relationship between stature and foot dimensions. The above findings suggest that foot dimensions can be predictors of stature. However, the results of this study is different from the studies previously conducted. Thus cannot be used to make any firm conclusions. It is important to note that results differ with races and geographical distribution.

**Ethical Clearance:** Taken from Institutional ethical committee.

**Source of Funding:** Self

**Conflict of Interest:** Nil

**References**


Derivation of Regression Equation for Estimation of Height from the Length of Clavicles

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Abstract

Background: The various features of clavicle help to decide the gender and height of the individual. Stature is an important biological parameter in medico-legal forensic examination. The length of clavicle is considered as an important anthropological parameter. The present study was undertaken with the aim of deriving of regression equation for estimation of height from the lengths of clavicle.

Methodology: This cross sectional, observational study was conducted from October 2019 to February 2020 after getting approval from IEC. 489 healthy subjects (290 males and 199 females) were included in the study after getting the informed consent. Length of clavicle and height of individual were measured and mean was calculated. Regression equations were derived after statistical analysis.

Results: The values obtained by statistical analysis were found statistically significant. Equation were derived for estimation of height from right and left clavicles in males as well as females. The mean lengths of right sided clavicles are more than that of left sided clavicles in both the genders.

Discussion: Stature estimation is key parameter in the identification process of unknown individuals in which human remains are found in mutilated form or as skeletal remains. In the present study, we attempted to correlate the lengths of clavicle with stature of individual. The present study also proved that lengths of clavicles are more in males than in females which can be attributed to heavy built in males.

Keywords: Stature; correlation; mutilated; anthropological; decomposing.

Introduction

The clavicle is a modified long bone. It is the only long bone that lies horizontally, and shows variations in its morphometry. The locomotor behavior of superior extremity relies mostly on clavicle morphometry. The various features of clavicle help to decide the gender and height of the individual.

The length of clavicle is considered as an important anthropological parameter which is described as the distance between the lateral-most point of the clavicle in the acromio-clavicular joint and the medial-most point of the clavicle in the sterno-clavicular joint¹. Black S and Scheuer L¹ have mentioned that most of the adult morphological features of clavicle in humans are developed very early in fetal life well before birth³. Clavicle attains 80% of its total length by 12 years in males and 9 years in females⁴.
Stature is an important biological parameter in medico-legal forensic examination. The linear measurement of individual body parts plays a very important role in the field of forensic, anatomical and anthropological sciences. Out of various criteria for personal identification, stature carries the significant value. Anthropological database can be prepared from four basic parameters- age, race, stature and gender.

Establishment of an identity is very much important in both civil and criminal cases. Sometimes mutilated or decomposed bodies or the fragmentary remains of skeleton are brought for medico-legal examination. This is common in Indian setup where victims are attacked by wild animals in forests. This leads to difficulty in identification of the deceased. Literature shows many studies on stature estimation from percutaneous body measurements. But stature estimation from clavicle length is very rarely done especially in central India region. So, we have attempted to estimate the stature of individual from the clavicle length.

**Material and Method**

The present cross sectional, observational study was conducted in the department of Anatomy from October 2019 to February 2020 over a period of five months. The protocol was approved by the Institutional Ethics Committee. All the participants were informed about the procedure of the study and informed consent was taken before taking the measurements.

Total of 489 apparently healthy subjects of both the sexes were involved in the study. The age group of the participants was 18 to 30 years. Lower age limit of 18 years was considered because stature at this age is considered as adult height and multiplication factor remains mostly constant. Apparently healthy subjects without any noticeable deformities (congenital or acquired) of the spine or upper extremities were included in the study.

The length of clavicle was measured with the vernier caliper using palpable landmarks- most medial most point of the clavicle on the sterno-clavicular joint and the lateral most point of the clavicle on the acromio-clavicular joint.

Height of the individual was measured using stadiometer in standing position where he/she was asked to stand barefoot.

All the measurements were taken thrice and mean of it was used for documentation.

Statistical Analysis: All the values were analyzed statistically using SPSS software Version 22. Mean and standard deviations were calculated for both genders. Linear regression and correlation coefficients were calculated separately for males and females. Equations were derived in both genders individually for right and left sided clavicles.

![Figure 1: Measurements of height](image)
Results

Out of 489 participants, 290 were male and 199 were females. Demographic distribution of the involved subjects in mentioned in table I for males and table II for females.

Table I: Demographic parameters in males

<table>
<thead>
<tr>
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</thead>
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</tbody>
</table>

MH= Height in male (cm) MRTC= length of right clavicle in male (cm) MLTC= length of left clavicle in male (cm)

Table II: Demographic parameters in females

<table>
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</tbody>
</table>

FH= Height in female (cm) FRTC= length of right clavicle in female (cm) FLTC= length of left clavicle in female (cm)
Table III: Correlations for height in males (MH) with length of right clavicle in males (MRTC) and length of left clavicle in males (MLTC)

<table>
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<tr>
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<th>Correlations of MH with MRTC</th>
<th>Correlations of MH with MLTC</th>
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</thead>
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<tr>
<td>MH</td>
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<td>Sig. (2-tailed)</td>
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<tr>
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<tr>
<td>MRTC</td>
<td>Pearson Correlation</td>
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<tr>
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<td>N</td>
<td>100</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).

Equation for height and right clavicle in males (MRTC): Height = 5.160 x MRTC + 90.908

Equation for height and left clavicle in males (MLTC): Height = 5.302 x MLTC + 89.453

Table IV: Correlations for height in females (FH) with length of right clavicle in females (FRTC) and length of left clavicle in females (FLTC)

<table>
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</table>

Equation for height and right clavicle in females (FRTC): Height = 4.456 x FRTC + 98.178

Equation for height and left clavicle in females (FLTC): Height = 4.549 x FLTC + 97.445

Discussion

Stature estimation is key parameter in the identification process of unknown individuals in which human remains are found in mutilated form or as skeletal remains. Stature calculation from decomposing and incomplete skeletal remains is gold standard in establishing the identity of individual in anthropological studies and forensic examinations. Literature shows various studies undertaken on the stature determination from dry clavicle bones but very few studies are available where height is determined from the clavicle when the soft tissues are intact around it. It is easier to measure the length of dry clavicle as compared when it’s covered with soft tissues i.e. percutaneous measurements. In the present study, we attempted to correlate the lengths of clavicle with stature of individual.

The major conclusion in the present study is that the mean lengths of right sided clavicles are more than that of left sided clavicles in both the genders. Sehrawat JS and Pathak RK (2016) also observed bilateral asymmetry in all parameters like length, weight, mid-clavicular circumference etc. They further advocated that right clavicle is more robust due to its greater sagittal diameter and higher development of most of the ligaments and muscles than the left clavicles. Another differentiating factor might be physical activity pattern of right and side. King PR et al (2014) found longer left clavicle than the right clavicle in 65% male (4.55 mm) and 67% female (3.14 mm) cases. Cunningham et al (2013), found 28% clavicles were length-wise asymmetric (with up to 5 mm side differences). The different effects of genetic changes, mechanical loadings
and the muscular attachments might be responsible for such asymmetries of the clavicle. The various factors that may affect the lengths of clavicles are genetic, nutrition, geographical location, physical activity, and different races. The study carried out by Yashoda et al. (2011) in New Delhi population postulated that mean length of the left clavicle was higher than the mean length of the right clavicle for both sexes. Similar results were observed by Ukoha UU et al. (2019) in North Eastern Nigerian population.

The present study also proved that lengths of clavicles are more in males than in females which can be attributed to heavy built in males. Other possible factors might be higher skeletal size and body mass. The study conducted by Pande V et al. (2020) for correlation between stature and length of clavicle in female population in central India concluded with positive correlation and the linear relationship between the living stature and length of clavicle of either side. But the sample size was just 50.

**Conclusion**

We derived regression equations for height calculation from length of right and left clavicles in both males and females. These regression equations will be very helpful for calculating height of an individual from the length of clavicle.

**Funding:** This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

**Conflicts of Interest:** The Authors declares that there is no conflict of interest

**Reference**

Assessment of Diabetes Health Promotion Behaviors for Clients with Type 2 Diabetes Mellitus at Diabetic Center in Al-Diwaniya City

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¹MScN(c), Research Scholar, University of Baghdad, College of Nursing,
²Professor (PhD), University of Baghdad, College of Nursing, Community Health Nursing Department

Abstract

Background: Diabetes mellitus (DM) is a significant worldwide medical issue that causes high human, social, and financial expenses on nations at all pay levels. The constant hyperglycemia of diabetes is related to long-term damage, brokenness, and disappointment of different organs, particularly of the eyes, kidneys, nerves, heart, and blood vessels.

Method: A descriptive correlational design is used in this study which aims to measure health-related experiences and lifestyle behaviors for clients with type 2 diabetes for the period from (1st October 2019 to 27th August 2020). The study included a convenience sample of 358 clients with type 2 diabetes mellitus who were recruited from Al-Diwaniya Teaching Hospital at Diabetes and Endocrine Center.

Data were collected using a self-report study instrument that includes the socio-demographic sheet, the health profile, and the Type 2 Diabetes and Health Promotion Scale. The data were analyzed using Statistical Package for Social Sciences (SPSS) version 26 using the frequency, percent, arithmetic mean, standard deviation, Pearson correlation, Independent-sample t-test, and one-way analysis of variance (ANOVA).

The study results displayed that most of participants reported poor Physical Activity level (n = 266; 74.3%), more than two-fifth reported good Risk Reduction level (n = 148; 41.3%), less than two-fifth reported good Stress Management level (n = 134; 37.4%), less than two-fifth reported fair Healthy Diet level (n = 135; 37.7%), more than two-fifth reported good overall behavior (n = 193; 53.9%). Furthermore, there are statistically significant inverse correlations between participants’ age and their Physical Activity, Risk Reduction, Stress Management, Enjoying Life, and overall behavior.

Conclusion: The researcher concluded that the younger the clients, the poorer the Physical Activity, Risk Reduction, Stress Management, Enjoying Life, and overall behavior; the older the client, the better the Health Responsibility; the better socioeconomic status, the better the Physical Activity, Risk Reduction, Stress Management, Enjoying Life, and overall behavior.

Keywords: Diabetes, Health Promotion Behaviors, Clients, Type 2 Diabetes Mellitus, Diabetic Center.

Introduction

Diabetes mellitus (DM) is a significant worldwide medical issue that causes high human, social, and financial expenses on nations at all pay levels. The constant hyperglycemia of diabetes is related to long-term damage, brokenness, and disappointment of different organs, particularly of the eyes, kidneys, nerves, heart, and blood vessels(1).

Type 2 diabetes mellitus (T2DM) is an interminable illness which frequently creates for quite a long time with no clinical indications. It is the most widely recognized sort of diabetes around the world, the other two regular sorts being type 1 diabetes and gestational diabetes. T2DM represents 85%–95% of analyzed cases. Diabetes just as different ailments of abundance which incorporate heftiness and cardiovascular ailments are a significant wellbeing worry in the 21st century(2).
Health promotion behavior is the art and study of helping individuals find the cooperative energies between their core interests and ideal wellbeing, improving their inspiration to make progress toward ideal wellbeing, and supporting them in changing their way of life to push toward a condition of ideal wellbeing. Ideal wellbeing is a unique parity of physical, passionate, social, spiritual, and scholarly wellbeing\(^3\). Additionally, health promotion is more relevant today than ever in addressing general health problems. The health situation is situated at unique crossroads as the world is confronting a ‘triple weight of maladies’ established by the incomplete plan of transferable illnesses, recently rising and reappearing ailments just as the phenomenal ascent of non-communicable diseases (NCDs)\(^4\). Behaviors applicable to diabetes include self-checking of blood glucose levels, eating healthily, regular physical activity, taking medications as ordered, and the utilize of healthcare services, such as healthcare professional visits, and eye and foot assessments\(^5\).

**Method**

A descriptive correlational design is used in this study which aims to measure health-related experiences and lifestyle behaviors for clients with type 2 diabetes for the period from (1\(^{st}\) October 2019 to 27\(^{th}\) August 2020). The study included a convenience sample of 358 clients with type 2 diabetes mellitus who were recruited from Al-Diwaniya Teaching Hospital at Diabetes and Endocrine Center. Data were collected using a self-report study instrument that includes the socio-demographic sheet, the health profile, and the Type 2 Diabetes and Health Promotion Scale. The data were analyzed using Statistical Package for Social Sciences (SPSS) version 26 using the frequency, percent, arithmetic mean, standard deviation, Pearson correlation, Independent-sample t-test, and one-way analysis of variance (ANOVA).

**Results**

Figure 1. Participants’ distribution according to their BMI
Less than a half are overweight (n = 176; 49.2%), followed by those who are within normal BMI (n = 138; 38.5%), those who have class I obesity (n = 39; 10.9%), and those who have class II obesity (n = 5; 1.4%).

**Table 1. Levels of Health-Promoting Lifestyle**

<table>
<thead>
<tr>
<th></th>
<th>Poor</th>
<th></th>
<th>Fair</th>
<th></th>
<th>Good</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percent</td>
<td>Frequency</td>
<td>Percent</td>
<td>Frequency</td>
<td>Percent</td>
</tr>
<tr>
<td>Physical Activity</td>
<td>266</td>
<td>74.3</td>
<td>48</td>
<td>13.4</td>
<td>44</td>
<td>12.3</td>
</tr>
<tr>
<td>Risk Reduction</td>
<td>73</td>
<td>20.4</td>
<td>137</td>
<td>38.3</td>
<td>148</td>
<td>41.3</td>
</tr>
<tr>
<td>Stress Management</td>
<td>98</td>
<td>27.4</td>
<td>126</td>
<td>35.2</td>
<td>134</td>
<td>37.4</td>
</tr>
<tr>
<td>Healthy Diet</td>
<td>134</td>
<td>37.4</td>
<td>135</td>
<td>37.7</td>
<td>89</td>
<td>24.9</td>
</tr>
<tr>
<td>Overall</td>
<td>105</td>
<td>29.3</td>
<td>60</td>
<td>16.8</td>
<td>193</td>
<td>53.9</td>
</tr>
</tbody>
</table>

Most of participants reported poor Physical Activity level (n = 266; 74.3%), followed by those who reported fair level (n = 48; 13.4%), and those who reported good level (n = 44; 12.3%).

More than two-fifth reported good Risk Reduction level (n = 148; 41.3%), followed by those who reported fair level (n = 137; 38.3%), and those who reported poor level (n = 73; 20.4%).

Less than two-fifth reported good Stress Management level (n = 134; 37.4%), followed by those who reported fair level (n = 126; 35.2%), and those who reported poor level (n = 98; 27.4%).

Less than two-fifth reported fair Healthy Diet level (n = 135; 37.7%), followed by those who reported fair level (n = 134; 37.4%), and those who reported good level (n = 89; 24.9%).

Ultimately, more than two-fifth reported good overall behaviour (n = 193; 53.9%), followed by those who reported poor level (n = 105; 29.3%), and those who reported fair level (n = 60; 16.8%).

**Table 2. Correlations among Study Variables**

<table>
<thead>
<tr>
<th></th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
<th>7.</th>
<th>8.</th>
<th>9.</th>
<th>10.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age</td>
<td>-</td>
<td>-.184**</td>
<td>-</td>
<td>-.264**</td>
<td>-.140**</td>
<td>-</td>
<td>4. Physical Activity</td>
<td>-.429**</td>
<td>-.461**</td>
<td>-.199**</td>
</tr>
<tr>
<td>2. SE status</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-.262**</td>
<td>.499**</td>
<td>-.037</td>
<td>6. Stress Management</td>
<td>-.269**</td>
<td>.451**</td>
<td>-.021</td>
</tr>
<tr>
<td>3. BMI</td>
<td>-.255**</td>
<td>-.008</td>
<td>.371**</td>
<td>.012</td>
<td>.211**</td>
<td>.273**</td>
<td>8. Health Responsibility</td>
<td>-.035</td>
<td>.482**</td>
<td>.126**</td>
</tr>
<tr>
<td>4. Physical Activity</td>
<td>-.262**</td>
<td>.499**</td>
<td>-.037</td>
<td>.558**</td>
<td>.815**</td>
<td>-</td>
<td>9. Healthy Diet</td>
<td>-.035</td>
<td>.482**</td>
<td>.126**</td>
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<tr>
<td>5. Risk Reduction</td>
<td>-.269**</td>
<td>.451**</td>
<td>-.021</td>
<td>.474**</td>
<td>.791**</td>
<td>.833**</td>
<td>10. Overall</td>
<td>-.310**</td>
<td>.570**</td>
<td>-.038</td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.05 level (2-tailed)., **Correlation is significant at the 0.01 level (2-tailed).

There are statistically significant inverse correlations between participants’ age and their Physical Activity, Risk Reduction, Stress Management, Enjoying Life, and overall behavior ($r = -.429$, at $p < 0.01$; $r = -.321$, at $p < 0.01$; $r = -.262$, at $p < 0.01$; $r = -.269$, at $p < 0.01$; $r = -.310$, at $p < 0.01$) respectively. On the other hand, there is a statistically significant positive correlation between participants’ age and their Health Responsibility ($r = .255$, at $p < 0.01$).
There are statistically significant positive correlations between participants’ socioeconomic status and their Physical Activity, Risk Reduction, Stress Management, Enjoying Life, and overall behavior ($r = -.461$, at $p < 0.01$; $r = -.579$, at $p < 0.01$; $r = -.499$, at $p < 0.01$; $r = -.451$, at $p < 0.01$; $r = -.482$, at $p < 0.01$; $r = -.750$, at $p < 0.01$) respectively. There is statistically significant inverse correlation between participants’ BMI and their Physical Activity ($r = -.199$, at $p < 0.01$). On the other hand, there are statistically significant positive correlations between participants’ BMI and their Health Responsibility and Healthy Diet ($r=.371$, at $p<0.01$; $r=.126$, at $p<0.05$) respectively.

### Table 3. Difference in Health-Promoting Lifestyle Between BMI Groups

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical Activity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>1797.537</td>
<td>3</td>
<td>599.179</td>
<td>9.188</td>
<td>.000</td>
</tr>
<tr>
<td>Within Groups</td>
<td>23086.656</td>
<td>354</td>
<td>65.217</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>24884.193</td>
<td>357</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Risk Reduction</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>184.698</td>
<td>3</td>
<td>61.566</td>
<td>1.188</td>
<td>.314</td>
</tr>
<tr>
<td>Within Groups</td>
<td>18348.701</td>
<td>354</td>
<td>51.832</td>
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<tr>
<td>Total</td>
<td>18533.399</td>
<td>357</td>
<td></td>
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<tr>
<td><strong>Stress Management</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>222.532</td>
<td>3</td>
<td>74.177</td>
<td>2.533</td>
<td>.057</td>
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<tr>
<td>Within Groups</td>
<td>10366.988</td>
<td>354</td>
<td>29.285</td>
<td></td>
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<tr>
<td>Total</td>
<td>10589.520</td>
<td>357</td>
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<tr>
<td><strong>Enjoy Life</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>55.551</td>
<td>3</td>
<td>18.517</td>
<td>1.512</td>
<td>.211</td>
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<tr>
<td>Within Groups</td>
<td>4336.348</td>
<td>354</td>
<td>12.250</td>
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<tr>
<td>Total</td>
<td>4391.899</td>
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<td></td>
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<tr>
<td><strong>Health Responsibility</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>463.989</td>
<td>3</td>
<td>154.663</td>
<td>16.169</td>
<td>.000</td>
</tr>
<tr>
<td>Within Groups</td>
<td>3386.212</td>
<td>354</td>
<td>9.566</td>
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</tr>
<tr>
<td>Total</td>
<td>3850.201</td>
<td>357</td>
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</tr>
<tr>
<td><strong>Healthy Diet</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>65.531</td>
<td>3</td>
<td>21.844</td>
<td>2.076</td>
<td>.103</td>
</tr>
<tr>
<td>Within Groups</td>
<td>3725.332</td>
<td>354</td>
<td>10.524</td>
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<tr>
<td>Total</td>
<td>3790.863</td>
<td>357</td>
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<td></td>
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<tr>
<td><strong>Overall</strong></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>4005.947</td>
<td>3</td>
<td>1335.316</td>
<td>2.283</td>
<td>.079</td>
</tr>
<tr>
<td>Within Groups</td>
<td>207054.816</td>
<td>354</td>
<td>584.901</td>
<td></td>
<td></td>
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<tr>
<td>Total</td>
<td>211060.763</td>
<td>357</td>
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<td></td>
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</tbody>
</table>

There are statistically significant differences in Physical Activity Health Responsibility among the BMI groups (P-value = .000, .000) respectively.

### Table 4. Difference in Health-Promoting Lifestyle between SE Class Groups

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical Activity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>4577.878</td>
<td>4</td>
<td>1144.470</td>
<td>19.895</td>
<td>.000</td>
</tr>
<tr>
<td>Within Groups</td>
<td>20306.315</td>
<td>353</td>
<td>57.525</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>24884.193</td>
<td>357</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
There are statistically significant differences in Physical Activity, Risk Reduction, Stress Management, Enjoying Life, Healthy Diet, and overall behavior among the socioeconomic class groups (P-value = .000, .000, .000, .000, .000, .000) respectively.

**Discussion**

Physical activity is one of the most important modifiable determinants of disease. The study findings that most of participants reported poor Physical Activity level, followed by those who reported fair level, and those who reported good level. This finding is consistent with(6) who concluded that most of study participants have low level of physical activity. More than two-fifth reported good Risk Reduction level (n = 148; 41.3%), followed by those who reported fair level (n = 137; 38.3%), and those who reported poor level (n = 73; 20.4%). This finding could be explained as that clients may sensitizes the seriousness of DM. This finding is consistent with(7) who stated that the scores of Risk Reduction for more than a half of the study participants were high. Less than two-fifth reported good Stress Management level, followed by those who reported fair level, and those who reported poor level. This finding is lower than that reported by(8) who reported that most of study participants have good response to stress management. Less than two-fifth reported fair Healthy Diet level (n = 135; 37.7%), followed by those who reported poor level (n = 134; 37.4%), and those who reported good level (n = 89; 24.9%). This finding reflects participants’ poor health literacy; particularly about the healthy diet and its vital role in management of DM. This finding is lower than that reported by(7) who reported that most of the study displayed good commitment to healthy diet. Ultimately, more than two-fifth reported good overall behaviour, followed by those who reported poor level, and those who reported fair level. This finding goes in line with(7) who reported that more than a half of the study participants have good response to the domains of Physical Activity, Risk Reduction, Healthy Diet, and Stress Management. There were statistically significant inverse correlations between participants’ age and their Physical Activity, Risk Reduction, Stress Management, Enjoying Life, and overall behavior. On the other hand, there is a statistically significant positive correlation between participants’ age and their Health...
Responsibility. This finding could be explained as that the younger the client, the more the physical activity level they enjoy which enable them to adopt healthier health-promoting behaviors. Further cross-tabulation demonstrates that younger clients have higher educational levels. As such, clients who have higher educational levels could have better health awareness which provoke them to adopt health promotive behaviors. This finding is congruent with\(^9\),\(^10\) who concluded that there was a statistically significant correlation between participants’ age and the Physical Activity, Risk Reduction, Stress Management, Enjoying Life, and their overall behavior. There were statistically significant positive correlations between participants’ socioeconomic status and their Physical Activity, Risk Reduction, Stress Management, Enjoying Life, and overall behavior. This finding could be explained as that the better the socioeconomic status the family has, the greater the opportunity to engage in physically active lifestyle, healthier diet, and seeking mental health counseling. This finding is consistent with\(^11\),\(^12\) who stated that there was a significant effect of socioeconomic status and each of Physical Activity, Risk Reduction, Stress Management, Enjoying Life, and overall behavior. There was a statistically significant inverse correlation between participants’ BMI and their Physical Activity. This finding could be explained as that the higher the body mass index, the poorer the ability of the individual to practice physical activity. On the other hand, there were statistically significant positive correlations between participants’ BMI and their Health Responsibility and Healthy Diet. This finding be explained as that as the individuals has high BMI, they may sensitise a greater health threat which render them be more responsible in terms of their health and try to adopt a healthy diet. There were statistically significant differences in Physical Activity Health Responsibility among the BMI groups. Further post hoc analysis demonstrates that clients whose BMI is within normal have better Physical Activity levels. This finding could be explained as that the physical movement for individuals whose BMI is within normal would be easier than those whose BMI is higher. There was statistically significant difference in Physical Activity, and overall behavior among the socioeconomic class groups. Further post hoc analysis displays that the better the socioeconomic class, the better the Physical Activity level. This finding could be explained as that individuals with better socioeconomic status have better capabilities to have physical activity devices and/or seeking sport clubs or gyms than those with poorer socioeconomic status. There was statistically significant difference in Risk Reduction among the socioeconomic class groups. Further post hoc analysis displays that the better the socioeconomic class, the better the Risk Reduction abilities. This finding could be explained as that individuals with better socioeconomic status have higher educational levels which in turn enable them to have better capabilities of Risk Reduction. There was statistically significant difference in Stress Management among the socioeconomic class groups. Further post hoc analysis exhibits that the better the socioeconomic class, the better the Stress Management abilities. This finding could be explained as that individuals with better socioeconomic status could not be occupied with earn living. In other words, poor socioeconomic status could occupy individuals with earn living and hinder them from seeking mental health counseling. There was statistically significant difference in Enjoying Life among the socioeconomic class groups. Further post hoc analysis exhibits that the Enjoying Life scores were higher among individuals with better socioeconomic class. This finding could be explained as that individuals with better socioeconomic status could have better opportunities for recreation and leisure than those with poorer socioeconomic status. There was statistically significant difference in Health Diet among the socioeconomic class groups. Further post hoc analysis displays that the better the socioeconomic class, the better the Health Responsibility abilities. There was statistically significant difference in Healthy Diet among the socioeconomic class groups. Further post hoc analysis displays that the better the socioeconomic class, the better the Healthy Diet level. This finding could be explained as that individuals with better socioeconomic status have better capabilities to buy healthy foods than those with poorer socioeconomic status. There was statistically significant difference in overall Health Promotion Behaviors among the socioeconomic class groups. Further post hoc analysis displays that the better the socioeconomic class, the better the Health Promotion Behaviors. This finding could be explained as that individuals with better socioeconomic status have better Physical Activity, Risk Reduction, Stress Management, Enjoying Life than those with poorer socioeconomic status.

**Conclusions**

1. Most of study subjects are physically inactive and have poor stress management abilities.
2. Most of study subjects have been used to unhealthy diet.
3. The younger the clients, the poorer the Physical Activity, Risk Reduction, Stress Management, Enjoying Life, and overall behavior.

**Recommendations:**
1. There is a need to establish health education activities that aim to improve the physical activity level for individuals with DM type 2.
2. There is a need to establish health education activities to younger clients with DM type 2 that serve to raise their health awareness about the Health Responsibility.
3. There is a need to initiate health promotion activities that target older clients with DM type 2 that seek to improve their Physical Activity, Risk Reduction, Stress Management, and Enjoying Life.

**Conflict of Interest:** The researchers confirm that there is no any conflict of interest.

**Source of Funding:** This study is self-funded.

**Ethical Clearance:** The researchers obtained the ethical approval from the University of Baghdad, College of Nursing.

**References**
The Outcome of Endoscopic Assisted Underlay Tragal Cartilage Myringoplasty

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Abstract

Background: The use of Endoscope is increasing for otologic surgery because it is providing anew perspective on the intricate anatomy of the middle ear.

Study Design: Cross sectional study.

Objective Evaluation of outcomes of endoscopic aided transcanal underlay tragal cartilage Myringoplasty.

Patients and Method: This were a prospective clinical study included Fifteen patients who were operated on for chronic otitis media (COM) and their data and findings. All operations and surgical procedures were performed only with the use of a tragal cartilage graft, lining, and total transcanal endoscopic access. We assessed the postoperative graft up-taking rate and assessed hearing at 6-8 weeks.

Results and Discussion: Out of the 15 patients (9 female and 6 male) the graft take rate was 86% and the comparison of pre and postoperative mean AB gap revealed that the mean AB gap was 31 dB preoperatively while it changed (improved) to 16 dB at 6 to 8 weeks postoperatively, with a statistically significant difference (P<0.05).

Conclusions: Endoscopic Myringoplasty is minimally invasive, effective and safe procedure with good success rate and short duration.

Keywords: Endoscope, cartilage, Myringoplasty.

Introductions

Myringoplasty: Myringoplasty can be described as the surgical repair of tympanic membrane.1(1) Ear surgeries have traditionally been performed using a surgical microscope. Endoscopes have improved the field of otorhinolaryngology. Nowadays, various surgical procedures are easily performed using endoscopes, which reduces the morbidity of cases. Endoscopes are rapidly substitute the microscopic procedures in the otology practice, as first choice for assisting various operations.2(2)

Indication of Myringoplasty:

1. Infection, the presence of a perforation exposes the middle ear to the risk of recurrent infection from external sources.
2. Hearing loss, the repeated insult of infections is not only unpleasant for the patient but can affect hearing through both the presence of mucopus and the potential destruction of the ossicular chain.
3. Social to enable swimming without the need to protect the ear from water, particularly in children, is a relative indication for myringoplasty.

**Contra Indication:**

1. Cholesteatoma
2. Contralateral hearing
3. Bilateral perforation
4. Eustachian tube dysfunction

**Approaches and Incisions:**

1. The transcanal method is generally used for minor posterior perforations or can be used to doperforations in medium sized, when the anatomy of the ear canal is adequate and when complete perforation and the anterior edge of the tympanic membrane are visible.
2. Endaural access can be used for any perforation. A self-retaining retractor can be used with this approach.
3. Postauricular approaches. These can be applied in all sizes of and can provides the best viewing angle for anterior TM even without canaloplasty.\(^{(3)}\)

**Techniques:**

**Lateral graft technique (overlay):** In tympanoplasty using the lateral technique, also known as the overlay procedure (technique) in which the graft is laterally rested to the fibrous layer of the TM ruminants but medially to the malleus handle. Such procedures need to completely remove the squamous epithelium from the TM remnant lateral surface to prohibit the iatrogenic cholesteatomas. Bone canaloplasty is also required for preview and correct placement of the graft.\(^{(3)}\)

**Medial graft technique (underlay):** medial to the entire tympanic membrane, with an elevation of the skin flap of the auditory canal, together with the tympanic membrane, the most used for access, stabilization of the graft below the fibrous annulus.\(^{(1)}\)

**Graft Selection:**

1. Cartilage Myringoplasty
   
   **Indications**
   
   High risk perforation includes-1
   
   **Surgical Revisions**

   **Anteriorly to malleus**
   
   **Perforation Drainage during surgery**
   
   **Perforation exceeding 50%**

   When traditional techniques used in bilateral perforations they are usually associated with higher failure rate

2. Atelectatic ear: one of the most important indications for cartilage tissue tympanoplasty

3. Cholesteatoma: use of the surrounding cartilage in this operation, the shield and the posterior half of the tympanic membrane (cholesteatoma) were aimed at reducing the frequency of recurrent atrophy, as well as retracting the sac in these problem cases.

4. Pediatric Patients: A universal method for reconstruction of a ruptured TM should be avoided in pediatric patients in years of predisposition to otitis media (<3 years). It’s boring if the opposite ear is normal Tympanoplasty is performed on a child under 4 years old. Abnormal contralateral ear measurements are currently being performed, and adenoidectomy and tympanoplasty are usually delayed up to 7 years. If at this stage the disease is still contralateral, the ear can be considered at high risk of failure.\(^{(4)}\)

   The main advantages of cartilage are its stiffness and extremely low metabolic requirements, making it particularly suitable for adverse conditions such as partial perforations, adhesive otitis media, and reoperations.\(^{(5)}\)

   Cartilage may be harvested with its attached perichondrium from the tragus or the concha. Tragal cartilage is thicker and flatter than conchal cartilage, and it may be more suitable for larger perforations.\(^{(6)}\)

**II. Temporals fascia graft:** The anterior or posterior sectors perforations were restricted to one sector with normal tubaric function tests, with or without retractions of the pars tensa.\(^{(5)}\)

**III. Other grafting materials have also been used, including loose areolar tissue, vein, and fat. Perichondrium is frequently used in tympanoplasty.**

**Complication:**

1. Retraction of the drumhead following grafting can occur in up to 10%, with some suggesting the use of cartilage to try to prevent this.
2. Elevation of the anteroinferior aspect of the tympanic membrane runs the risk of anterior blunting, a risk with both overlay and underlay techniques.

3. The incidence of iatrogenic cholesteatoma, particularly with the overlay technique which runs a higher risk of leaving some squamous epithelium medial to the graft, can be as high as 4.4%.

4. Myringitis can occur, influenced by the presence of infection or choice of material, though most cases resolve within 3 months with short-term topical medication and observation. 

Endoscopic Middle EAR Surgery (historical view): The endoscopy of the middle ear firstly presented in 1967 by Mer. Et al. for diagnosis and for surgical procedures (El-Guindy, 1992). Finally, surgery has traditionally been performed on the middle ear. Under the microscope, this is now gradually achieved endoscopically.

Many producers of rigid Hopkins rod lens endoscopes with different diameters, but those for endoscopic ear surgery were come with diameters (2.7, 3 and 4 mm). larger size endoscopy was giving more better picture scope and quality, accordingly the best one to use in this operation is the largest one which can fit into canal of the ear.

Advantage of ENDOSCOIC EAR Surgery:

1. Ability to see outside the axis of large surgical instruments. When using a microscope, the field of view is most affected by the use of instruments and possibly the hands of the surgeon. In endoscopic surgery, the surgeon has a panoramic view of the area outside the stem of the instrument.

2. When using a microscope, it is important to position the structure almost at right angles to the axis of the microscope so that the endoscope can see structures in the same plane as the endoscope. Consequently, structures such as the ear canal, facial recoil and tegmen are much better visualized with an endoscope.

3. Operative time is shorter.

Disadvantage of Endoscopic Ear Surgery: Endoscopic surgery also has disadvantages. One-handed surgery is possible with the endoscopic technique, but restricting one-handed access can be an obstacle in certain situations, such as severe bleeding, where endoscopic vision may be blocked by blood and the operation is difficult. In addition, the autoendoscope itself can cause injury, including thermal injury, due to the light emitted from the endoscope tip. Mist can often accumulate over the endoscope.

Unfavorable anatomy of the ear canal or anterior perforation creates technically complex microscopic transcanal procedures and ultimately results in a high failure rate.

The endoscope offers a wide and comprehensive transcanal view of all elements of this procedure: the ear canal, tympanic membrane and eardrum, without the need to constantly move the microscope, even with an anterior ridge.

Objectives: To clinically assess the postoperative outcomes of endoscopic assisted Trans canal underlay tragal cartilage myringoplasty.

Patients and Method:

Study Design: This was prospective single group clinical trial been conducted at Al-Sadr medical city in Najaf province, Iraq in the department of otolaryngology-Head and Neck surgery during the period from (January 2019 to march 2020).

All participants were informed about the study: We have analyzed (15) patients (10 female and 5 male) their age ranged between 18 to 35 years. All of them complained of chronic suppurative otitis media of mucosal type and decrease hearing.

Hearing assessment done one week before the operation by PTA.

The surgeries were done entirely under total endoscopic transcanal method by means of tragal cartilage as an implant, motivated method.

We have assessed the postoperative implant uptake and done a hearing assessment post operatively after 6-8 weeks.

Inclusion Criteria: Patients with inactive mucosal CSOM with conductive hearing loss.

Statistical Analysis: Data of all patients were checked for any errors or inconsistency and then analyzed using the statistical package for social sciences (SPSS) version 24). Appropriate statistical tests and procedures were applied according the type of variables and requested outcome. Level of significance set at 0.05.
Results

Fifteen patients who met the inclusion criteria, fit for operation and consented to participate were selected and recruited in the study; their average age was 25.1±5.4 years. Additionally, 60% of the patients aged 18-25 years. Females were dominant gender, represented 66.7% of the studied group and the remaining 5 patients were males. Subtotal perforation of tympanic membrane was the more frequent type of perforation, contributed for 46.7%, followed by anterior perforation (40%) and the least frequent type was posterior perforation, (Table 1).

<table>
<thead>
<tr>
<th>Site of perforation</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subtotal</td>
<td>7</td>
<td>46.7</td>
</tr>
<tr>
<td>Anterior</td>
<td>6</td>
<td>40.0</td>
</tr>
<tr>
<td>Posterior</td>
<td>2</td>
<td>13.3</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The success was considered when there is a good graft uptake, while those who failed and those with small residual perforation considered as unsuccessful, therefore, 13 out of the 15 patients had successful endoscopic myringoplasty giving a success rate of 86.7%, (Figure 1).

According to the air bone gap (AB gap) values at 6-8 weeks postoperatively, 5 patients reached an ABG of 10 dB, 6 patients with 15 dB, 2 patients with 20 dB, one patient with 25 dB and one patient with 35 dB ABG. Moreover, at 6-8 weeks postoperatively, the mean ABG reduced from 31.0 ± 3.4 at preoperative to reach 16.0 ± 6.8 dB with high-significant difference, (P. value<0.001), as shown in (Fig. 2).
Further analysis was performed to assess the relationship between success rate and other variables including age, sex, site of perforation and time of surgery, none of these variables showed a significant effect on or correlation with the outcome of endoscopic myringoplasty, in all comparisons, P. value non-significant > 0.05, (Tables 3 and 4).

Table 3: Relation of success outcome with site of perforation (n=15)

<table>
<thead>
<tr>
<th>Site of perforation</th>
<th>Successful (n=13)</th>
<th>Unsuccessful (n=2)</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Subtotal</td>
<td>5</td>
<td>71.4</td>
<td>2</td>
</tr>
<tr>
<td>Anterior</td>
<td>6</td>
<td>100.0</td>
<td>0</td>
</tr>
<tr>
<td>Posterior</td>
<td>2</td>
<td>100.0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 4: Relationship of success outcome with Time of Surgery (N=15)

<table>
<thead>
<tr>
<th>Time of surgery</th>
<th>Successful (n=13)</th>
<th>Unsuccessful (n=2)</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of patients</td>
<td>%</td>
<td>Number of patients</td>
</tr>
<tr>
<td>&lt; 60 min</td>
<td>4</td>
<td>100.0</td>
<td>0</td>
</tr>
<tr>
<td>60 - 75 min</td>
<td>5</td>
<td>83.3</td>
<td>1</td>
</tr>
<tr>
<td>90 min</td>
<td>4</td>
<td>80.0</td>
<td>1</td>
</tr>
</tbody>
</table>
Discussion

Endoscopes have been used for middle ear inspection for decades. However, recent improvement of camera and optical technologies have yielded endoscopes that provide extremely high-definition video with a wide-angle field of view, surgeons are increasingly using endoscopes not only for visual inspection, but also for dissection. The increased resolution and field of view of current endoscopes have provided surgeons with a fresh look at middle ear anatomy. (13)

In the present study we assessed the surgical outcomes in addition to the feasibility of procedures in 15 patients who were operated on with Endoscopic-Transcanal-Myringoplasty with the use of tragus-cartilage. In our study, the graft take rate was 86.7% (13 out of 15), and the other 13.3% (2 out of 15) with subtotal perforation, one failed due to infection and the other one residual small perforation present that healed by cauterization after 3 months of surgery. Comparable to Amit Saini et al study of 42 patients (19 were male and 23 female) in 2018 was 90.9 % is consistent with our study. (8)

In Muaaz Tarabichi study in 2010 the closure of perforation was evident in 59 ears, a success rate of 92%. (14) Gokgoz MC et al study at 2018 the take rate was 94% of fifty patient and 6 months postop. (15) Another study conducted by Leandro De Borborema Garcia et al, study in 2015, included 22 patients found that after 3 months of surgery, closure of TM perforation reported in 86.4% of cases. (16) Raj et al at 2001 found graft take rate 90% this result is consistent with our study. (17) A significant improvement in the hearing outcome was reported where the average ABG was 31 dB preoperatively and it changed (improved) to 16 dB at 6 to 8 weeks postoperatively, with significant difference (P<0.05).

ABG improved to 11.91+-8.41 db in Dipesh Shakya et al study comparable to our study. (17) The mean ABG was 22.40 db and improved to 9.1 db by Amit Saini et al study. (8) In the study of Dawood MR, in 2017 of 26 cases of successful myringoplasty, the mean ABG reduction was 20.73 db (18), and this is consistent with our study. Average air bone gap closure achieved was 10.1 db the study of 30 patient by Munish Kambatattishekharappa et al (19), this result compatible with our study. Mokbel et al at 2015 reported improved hearing outcome in patients undergoing myringoplasty and is consistent with present study. (20)

In present study, the operative time ranges between 50-90 min, with the mean of 67 min and this is consistent with Ghaffar et al 2006 they reported that the mean operative time 62-85 min (21) Huang et al (2016) reported the mean operative time 80.4 in patient underwent endoscopic myringoplasty. (22), the present study better than this study. In the study of Patel et al 2015 mean time was found to be 75 min and this is comparable to our study. (23) Furthermore, Raj et al. evaluated the value of rigid-endoscope in management of of dry central perforation of TM, their findings when compare endoscopic Myringoplasty versus conventional microscope indicated 90% uptake rate in endoscopic versus 85% in the microscopic, these findings supported ours. (17)

Guer RS et al. in their research showed that changes in the external auditory canal, such as stenosis, tortuosity and protrusions of bones, interfere with the view of TM under a microscope. Therefore, it is necessary to manipulate the patient’s head or microscope several times to see all parts of the TM. Sometimes, despite manipulation, TM cannot be fully visualized; hence canaloplasty must be performed. This can increase up the operation time. Conversely, endoscope brings the eyes of surgeons close to the scope end. The wide zero degree viewing angle allows visualization of the entire TM. Saves surgery time without the need to regularly adjust the patient’s head or doing a canaloplasty. (24)

Sekaattin Gulsen and others stated that transcanal endoscopic tympanoplasty is reliable alternate to Microscopy tympanoplastyin management of COM, with comparable success rate of graft uptake and outcomes of hearing (25) Similarly, Amit et al. in their study concluded that even novices and junior surgeons can used this procedures as it is safe reliable and with good outcomes, hence surgeons, can apply endoscopic procedure in this way without fear of serious complication or adverse outcomes. (17)

Conclusion

Endoscopic myringoplasty is minimally invasive, effective and safe procedure with good success rate and short duration.

Conflicts of Interests: Authors declared none

Source of Funding: Self-funded by the authors
Ethical Clearance: All approved by the authors

References

Women's Readiness to Conduct Pap Smear Test at Primary Health Care Centers in Baghdad City: The Health Belief Model as A Theoretical Framework

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²Professor (PhD), University of Baghdad, College of Nursing, Community Health Nursing Department

Abstract

Background: Cervical cancer is the second leading cause of cancer deaths in low and middle-income countries. The International Agency for Research on Cancer (IARC) gauges that the frequency of cervical disease will increment by 75% worldwide by 2030.

Method: This descriptive correlational study was carried out to examine women’s readiness to perform Pap smear test. to (1) assess women’s readiness to perform Pap Smear test, (2) identify the association between woman’s age, family’s socioeconomic status, gravidity, parity, abortion, and their Stages of Change for conducting Pap Smear test, the Perceived Susceptibility to contract cervical cancer, the Perceived Seriousness of cervical cancer, the Perceived Barriers to conduct Pap Smear test, the Perceived Benefits of conducting Pap Smear Test, and the Health Motivation to conducting Pap Smear Test, and (3) investigate the differences in the Perceived Susceptibility to contract cervical cancer, the Perceived Seriousness of cervical cancer, the Perceived Barriers to conduct Pap Smear test, the Perceived Benefits of conducting Pap Smear Test, and the Health Motivation to conducting Pap Smear Test between the groups of the Stages of Change for conducting Pap Smear test woman’s level of education, family’s socioeconomic class, and family type.

Results: The target population of this study was selected from adult, married women on social media. The SR used a self-reported online survey for data collection. The SR prepared the online survey and published its link on the social media pages and groups, where the study objectives were demonstrated to study subjects

Conclusion: Most of the women are precontemplators. The older the age, the greater the Susceptibility to contracting cervical cancer and the better the family’s socioeconomic status, the greater the greater Susceptibility to contracting cervical cancer.

Keywords: Theoretical Framework, Health Belief Model, Women’s Readiness, Pap Smear.

Introduction

Cervical cancer is the second leading cause of cancer deaths in low and middle-income countries(¹). In Iraq, cervical disease is the twelfth malignant growth among ladies and the tenth among ladies somewhere in the range of 15 and 44 years old. The annual incidence is 1.2 per 100,000 and mortality rate of cervical cancer is estimated at 1.4 per 100,000 and there is rising threat to 0.3% for women in all her life. In Asia, the region which Iraq belongs, about 2.5% of female in the country are exposure to cervical HPV-16/18 infections during aperiod of time and 72% of invasive cervical cancers are documented to HPVs 16 or 18. Nononcogenic subtypes of HPV, e.g., 6 and 11, lead to low-grade cervical lesions and genital warts(²). These lesions if left long period without treatment, patients contact to high risk to HPV, so these cases must follow up and testing for HPV DNA, colposcopic evaluation and biopsy which preventcervical disease. gauges demonstrate that consistently 311 ladies are determined to have cervical malignancy and 212 pass on from the sickness (USAID, 2013). In view of the public program, Pap smear is offered to all ladies after marriage in medical services places gratis. This was accomplished for three back to back years, and if three ordinary Pap smear tests were gotten, after that this test ought to be rehashed like clockwork(⁴).
Fitting that programming may expect organizers to consider different models or speculations when they create projects and intercessions to help way of life conduct changes. A blend of approaches assists with offering the best help and direction to people, gatherings and networks as they work to create sound way of life practices(5).

Method

The study design for this study is descriptive predictive design. The descriptive design can be used to predict the value of one variable based on the values obtained for another variable or variables. Prediction is one approach for examining causal relationships between variables. The study was conducted at across Iraq by an online survey. The study included a non-probability, convenience sample of adult women. The SR prepared the online survey and published its link on the social media pages and groups, where the study objectives were demonstrated to study subjects. The target population of this study was selected from adult, married women on social media. The SR used a self-reported online survey for data collection. Data were collected for the period from February 20th, 2020 to March 31st, 2020.

Data were collected through a self-report instrument that includes First part: The study instrument includes the socio-demographic sheet, the body mass index (BMI), and Second part: the Mental Health Belief Model AssessmentThe Perceived Susceptibility Scale, The Perceived Benefits Scale, Self-Efficacy Scale, Health Motivation, The Perceived Severity Scale, and The Perceived Barriers Scale. Participants indicate how much they agree or disagree with each statement on a scale of 1 to 5 (1 = strongly disagree, 2 = Disagree, 3 = neutral, 4 = agree, 5 = strongly agree). Higher scores indicate stronger feelings regarding that construct. This scale originally demonstrated fair to very good internal consistency reliability. The Health Belief Model Scale for Cervical Cancer and the Pap Smear also demonstrated excellent discriminant validity(6). Data were analyzed using the Statistical Package for the Social Sciences (SPSS) for Windows, version 26, Chicago, IL. The statistical measures of frequency, percent, mean, standard deviation were used. The inferential statistical measures of Chi-square, and one-way analysis of variance (ANOVA) were used.

Results

Table 1. Participants’ socio-demographic characteristics (N = 380)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (Years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16-24</td>
<td>145</td>
<td>37.4%</td>
</tr>
<tr>
<td>25-33</td>
<td>192</td>
<td>49.5%</td>
</tr>
<tr>
<td>34-42</td>
<td>39</td>
<td>10.1%</td>
</tr>
<tr>
<td>43-52</td>
<td>12</td>
<td>3.0%</td>
</tr>
<tr>
<td><strong>Mean (SD)</strong></td>
<td>27.13</td>
<td>6.27</td>
</tr>
<tr>
<td><strong>Number of children in the family</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>56</td>
<td>14.4%</td>
</tr>
<tr>
<td>1</td>
<td>82</td>
<td>21.1%</td>
</tr>
<tr>
<td>2</td>
<td>91</td>
<td>23.5%</td>
</tr>
<tr>
<td>3</td>
<td>57</td>
<td>14.7%</td>
</tr>
<tr>
<td>4</td>
<td>36</td>
<td>9.3%</td>
</tr>
<tr>
<td>5</td>
<td>33</td>
<td>8.5%</td>
</tr>
<tr>
<td>6</td>
<td>15</td>
<td>3.9%</td>
</tr>
<tr>
<td>7</td>
<td>10</td>
<td>2.6%</td>
</tr>
<tr>
<td>≥ 8</td>
<td>8</td>
<td>2.0%</td>
</tr>
<tr>
<td><strong>SE Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper lower class</td>
<td>97</td>
<td>25.0%</td>
</tr>
<tr>
<td>Lower middle class</td>
<td>129</td>
<td>33.3%</td>
</tr>
<tr>
<td>Upper middle class</td>
<td>151</td>
<td>38.9%</td>
</tr>
<tr>
<td>Upper class</td>
<td>11</td>
<td>2.8%</td>
</tr>
</tbody>
</table>

The age mean is 27.13 ± 6.27; around a half age 25-33-years (n = 192; 49.5%), followed by those who age 16-24-years (n = 145; 37.4%), those who age 34-42-years (n = 39; 10.1%), and those who age 43-52-years (n = 12; 3.0%).

Regarding the number of children in the family, less than a quarter reported that they have two children (n = 91; 23.5%), followed by those who have one child (n = 82; 21.1%), those who have three children (n = 57; 14.7%), those who do not have a child (n = 56; 14.4%), those who have four children (n = 36; 9.3%), those who have five children (n = 33; 8.5%), those who have six children (n = 15; 3.9%), those who have seven children (n = 10; 2.6%), and those who have eight or more children (n = 8; 2.0%).

Regarding the family’s socioeconomic class, less than two-fifth are classified in the upper middle class (n = 151; 38.9%), followed by those who are classified in the lower middle class (n = 129; 33.3%), those who are classified in the upper lower class (n = 97; 25.0%), and those who are classified in the upper class (n = 11; 2.8%).
Table 2. Women’s distribution according to readiness to perform Pap smear test

<table>
<thead>
<tr>
<th>Readiness to perform Pap smear test</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precontemplation</td>
<td>263</td>
<td>67.8</td>
</tr>
<tr>
<td>Contemplation</td>
<td>78</td>
<td>20.1</td>
</tr>
<tr>
<td>Preparation</td>
<td>12</td>
<td>3.1</td>
</tr>
<tr>
<td>Action</td>
<td>13</td>
<td>3.4</td>
</tr>
<tr>
<td>Maintenance</td>
<td>8</td>
<td>2.1</td>
</tr>
<tr>
<td>Termination</td>
<td>14</td>
<td>3.6</td>
</tr>
</tbody>
</table>

Around two-fifth are within normal weight-to-height ratio (n = 153; 39.4%), followed by those who are overweight (n = 142; 36.6%), those who have obesity class I (n = 55; 14.2%), those who have obesity class II (n = 17; 4.4%), those who have obesity class III (n = 11; 2.8%), and those who are underweight (n = 10; 2.6%).

Table 3. Correlations among study variables

<table>
<thead>
<tr>
<th></th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
<th>7.</th>
<th>8.</th>
<th>9.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Number of children in the family</td>
<td>.111*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Socioeconomic Status</td>
<td>.016</td>
<td>-.028</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. BMI</td>
<td>.271**</td>
<td>.027</td>
<td>-.019</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Benefits of Pap Smear Test and Health Motivation</td>
<td>.035</td>
<td>.061</td>
<td>.043</td>
<td>.024</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Barriers to Pap Smear Test</td>
<td>.035</td>
<td>.029</td>
<td>-.043</td>
<td>-.032</td>
<td>.167**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Perceived Seriousness of Cervical Cancer</td>
<td>.071</td>
<td>-.006</td>
<td>-.040</td>
<td>.045</td>
<td>.051</td>
<td>.004</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Susceptibility to Cervical Cancer</td>
<td>.106*</td>
<td>-.051</td>
<td>.110*</td>
<td>.048</td>
<td>.042</td>
<td>-.098</td>
<td>.264**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Health Motivation</td>
<td>-.012</td>
<td>.016</td>
<td>-.009</td>
<td>.050</td>
<td>.373**</td>
<td>.060</td>
<td>.108*</td>
<td>.006</td>
<td>=</td>
</tr>
</tbody>
</table>

There is a statistically significant positive correlation between women’s age and their Susceptibility to contracting cervical cancer (r = .106; at p < 0.05). There is a statistically significant positive correlation between family’s socioeconomic status and their Susceptibility to contracting cervical cancer (r = .110; at p < 0.05).

Table 4. Difference in Health Belief Model constructs among readiness to Pap smear test groups

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits of Pap Smear Test and Health Motivation</td>
<td>Between Groups</td>
<td>197.092</td>
<td>5</td>
<td>39.418</td>
<td>1.768</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>8518.916</td>
<td>382</td>
<td>22.301</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>8716.008</td>
<td>387</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barriers to Pap Smear Test</td>
<td>Between Groups</td>
<td>90.608</td>
<td>5</td>
<td>18.122</td>
<td>.258</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>26806.101</td>
<td>382</td>
<td>70.173</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>26996.709</td>
<td>387</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Seriousness of Cervical Cancer</td>
<td>Between Groups</td>
<td>245.537</td>
<td>5</td>
<td>49.107</td>
<td>1.067</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>17578.906</td>
<td>382</td>
<td>46.018</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>17824.443</td>
<td>387</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Susceptibility to Cervical Cancer</td>
<td>Between Groups</td>
<td>32.491</td>
<td>5</td>
<td>6.498</td>
<td>.932</td>
</tr>
<tr>
<td></td>
<td>Within Groups</td>
<td>2663.870</td>
<td>382</td>
<td>6.973</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>2696.361</td>
<td>387</td>
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</table>
Table 5. Difference in Health Belief Model constructs among SE Status groups

<table>
<thead>
<tr>
<th>Constructs</th>
<th>ANOVA Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
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<tr>
<td>Health Motivation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>52.475</td>
<td>5</td>
<td>10.495</td>
<td>1.441</td>
<td>.209</td>
</tr>
<tr>
<td>Within Groups</td>
<td>2782.185</td>
<td>382</td>
<td>7.283</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2834.660</td>
<td>387</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

There is no statistically significant difference in the Health Belief Model constructs among readiness to Pap smear test groups.

**Discussion**

Most are in the Precontemplation Stage of Change (n = 263; 67.8%), followed by those who are in the Contemplation Stage of Change (n = 78; 20.1%), those who are in the Termination Stage of Change (n = 14; 3.6%), those who are in the Action Stage of Change (n = 13; 3.4%), those who are in the Preparation Stage of Change (n = 12; 3.1%), and those who are in the Maintenance Stage of Change (n = 8; 2.1%). These findings reflect that study subjects do not realize how severe the cervical cancer is and how important performing the Pap smear is in detecting the potential cervical cancer in early time. These findings are consistent with that obtained by Krok(7) who stated that women (84.4%) at Visit 1 were categorized in the Contemplation or Preparation Stages of Change, and (15.6%) women were in the Precontemplation Stage of Change and Kwak, (8) who concluded that 15.5% of women were in the Precontemplation SOC, 21.3% in the Contemplation, 31.3% in the Action, 15.4% in Maintenance, 10.4% in the Relapse risk, and 6.1% in the Relapse SOC; Abdullah and Su (2013) who concluded that more than two-fifth were in the Contemplation Stage of Change (43.8%), followed by those who were in the Precontemplation Stage of Change (35.8%), and those who were in the Preparation Stage of Change (20.4%).

On the other hand, these findings are incongruent with; Tung(9), who concluded that more than a half of the subjects were classified into the Maintenance Stage of Change (55.9%), followed by those who were in the
Contemplation Stage (17.6%), Relapse Stage of Change (14.7%), Precontemplation Stage of Change (9.8%), or Action Stage of Change (2%); Tung\(^{(10)}\) who concluded that more than a half of subjects were in the Maintenance SOC, followed by those who are in Precontemplation SOC (17%), those who are in the Relapse SOC, those who were in the Contemplation SOC (10%), the Action SOC (3%). None of subjects were in the Preparation and Relapse risk SOC; Tung\(^{(11)}\) who concluded that most of the participants were in the maintenance stage (60.3%) and in the Contemplation Stage of Change (25.6%), with smaller portions in the Action Stage of Change (1.7%), the Preparation Stage (5.8%), the Precontemplation Stage (4.1%), or the Relapse Stage (2.5%). None of the participants were classified in the relapse risk stage\(^{(12)}\) who concluded less than a half (46.3%) of the subjects were in the Maintenance Stage, followed by those who were in the Precontemplation Stage (18.8%), those who were in in the Relapse Stage of Change (16.3%), those who were in the Contemplation Stage of Change (10%), and Action Stage of Change (8.8%); Tung\(^{(11)}\) who concluded that most of subjects were in Maintenance Stage of Change (60%), followed by those who were in the Contemplation Stage of Change (26%), Preparation (6%), Precontemplation (4%), Relapse (2%), and Action Stage of Change (2%); Tung\(^{(12)}\) who concluded that less than a half (46.3%) of the subjects were in the Maintenance Stage, followed by those who were in the Precontemplation Stage (18.8%), those who were in in the Relapse Stage of Change (16.3%), those who were in the Contemplation Stage of Change (10%), and Action Stage of Change (8.8%); Tung\(^{(10)}\) who concluded that less than a half (46.3%) of the subjects were in the Maintenance Stage, followed by those who were in the Precontemplation Stage (18.8%), those who were in in the Relapse Stage of Change (16.3%), those who were in the Contemplation Stage of Change (10%), and Action Stage of Change (8.8%).

There was a statistically significant positive correlation between women’s age and their Susceptibility to contracting cervical cancer. This finding could be explained as that the better the socioeconomic status the family is, the greater the opportunity to use to unhealthy life style including physical inactivity and unhealthy diet which increase the chance of developing different types of cancer including cervical cancer. There was no statistically significant difference in the Health Belief Model constructs among readiness to Pap smear test groups. This finding reflects that study subjects lack health awareness that can motivate them to adopt health preventive behaviors including Pap smear testing. There was no statistically significant difference in the Health Belief Model constructs among SE status groups. This finding indicates that women; irrespective of their family’s socioeconomic status, have invariant, unsound health beliefs which do not motivate them or hinder them from adopting health preventive behaviors. There was no statistically significant difference in the Health Belief Model constructs between access to healthcare services groups. This finding reflects people’s dissatisfaction with the quality of healthcare delivery system in Iraq. That is, whether the access to healthcare services was easy or difficult, this doesn’t matter for women in terms of seeking the required healthcare services including Pap smear testing. There was a statistically significant difference in women’s Perceived Seriousness of cervical cancer among self-rated health status groups. The post hoc analysis using Scheffe test demonstrates that the Perceived Seriousness of cervical cancer scores were higher among women who described their general health as poor.

**Conclusion**

1. Most of the women are precontemplators.
2. The older the age, the greater the Susceptibility to contracting cervical cancer.
3. The better the family’s socioeconomic status, the greater the greater Susceptibility to contracting cervical cancer.
4. Women’s health beliefs do not predict their readiness to Pap smear test.
5. The Perceived Seriousness of cervical cancer scores were higher among women who self-rated health status as poor and vice versa.
Recommendations:

1. Education activities to raise awareness need to have cervical screening early.

2. It needs educational activities to increase women’s awareness of the risks of cervical cancer.

3. Health education needs to follow a healthy diet and know its impact on cervical cancer, from fitness and a healthy diet.

4. Improving the quality of health care services and facilitating access to them.

Conflict of Interest: The researchers confirm that there is no any conflict of interest.

Source of Funding: This study is self-funded.

Ethical Clearance: The researchers obtained the ethical approval from the University of Baghdad, College of Nursing.

References:


5. Abd Ali M BH. Psychometric properties of the Arabic version of The Health Belief Model Scale for Cervical Cancer and the Pap Smear. Unpublished manuscript


Factors Related to Problem Drinking in Korean Elderly

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Abstract

Background/Objectives: The purpose of this study is to evaluate the prevalence and related risk factors of problem drinking in the Korean elderly population.

Method/Statistical Analysis: Participants (n=817) aged 65 years or older were selected from the Korea National Health and Nutrition Examination Survey [KNHANES] of 2018. Sociodemographic characteristics and AUDIT-C score were obtained from the KNHANES dataset. AUDIT-C scores were categorized into two groups, including low risk, high-risk alcohol drinking according to WHO guidelines. Data analysis was performed using SPSS WIN 25.0 program.

Findings: In this study, the prevalence of high-risk alcohol drinking was 31.9%, respectively. Adjusted mean AUDIT score was higher in men, younger elderly individuals, as well as those with lower education levels and those that smoked. Results revealed that demographic variables, including sex, age, education level, and smoking, were important factors affected high-risk drinking. In particular, since family number and smoking were the most significant risk factor, the odds ratio for high-risk drinking among participants that smoked was 2.49 [(95% confidence interval (CI)=1.31-4.71)].

Improvements/Applications: This study suggests that men, younger age, low educational level, and smoking are the risk factors for a high-risk alcohol drinking

Keywords: Elderly, AUDIT score, Demographic factor, High risk alcohol drinking, Problem drinking.

Introduction

Problem drinking in Korea has become a serious social issue. Reportedly, 158 of 2,657 elderly men and 48 of 2,080 elderly women in Korea have demonstrated problem drinking in a study¹. Considering that the elderly do not live with their children or engage in social activities after retirement, the reported number might be lower than the actual number. Furthermore, as they show a characteristic tendency to lie about their drinking because of the negative stigma attached to this problem²³, the actual magnitude of problem drinking among the elderly could be more serious than what studies have indicated. In fact, a study examining 5,102 Korean adults showed that the percentage of the elderly diagnosed with alcoholism was lower than that of young or middle-aged adults with problem drinking⁴. Moreover, the pattern of drinking among the elderly was such that while the overall drinking quantity was low, the frequency was high as they favored aperitifs or relied on alcohol as a sleep aid. They also habitually drank stashed alcohol, a fact often neglected as a problem by the elderly and family members, which poses a challenge in improving the condition³⁵⁶.

As drinking leads to serious social consequences, there is an urgent need to develop response measures against it. Drinking causes physical⁷ and psychological⁸ problems, and may lead to impulsive crime or accidents⁹. The problems related to drinking often cause a tremendous social loss. The blood alcohol concentration of the elderly rises more rapidly than in young individuals because of reduced metabolic functions and body fluids. In addition, if they have a chronic disease,
the interaction between the currently administered drug and even a small quantity of alcohol may change the drug efficacy or induce side effects \[^{10,11}\].

Therefore, a social need to find solutions to problem drinking among the elderly has been highlighted. Thus far, many studies have investigated diverse factors related to problem drinking among the elderly. Problem drinking is associated with biological factors such as age and gender \[^{12}\], psychological problems such as stress and depression \[^{4}\], and family type such as living with a family member or not \[^{13}\]. Previous studies in Korea and overseas have described the relationship between problem drinking and various factors; however, identifying the correlation between problem drinking and socio-demographic and health-related factors has remained a challenge based on the latest dataset.

Thus, this study set out to determine the factors related to problem drinking among the Korean elderly to provide basic data for advancing practical measures to improve health among the elderly. To this end, the status of problem drinking in the Korean elderly population is analyzed, and related factors are identified based on socio-demographic and health-related data. Specifically, this study set out to:

- Examine the differences between low-risk and high-risk groups regarding problem drinking according to the socio-demographic and health-related characteristics of the Korean elderly population, and
- Analyze the factors related to high-risk problem drinking among the elderly in Korea.

**Method**

1. **Research Method:** This is a secondary data analysis study that identifies factors related to High-Risk Drinking in Korean Elderly by employing the 7th Korea National Health and Nutrition Examination Survey (KNHAES) conducted nationwide in 2018.

2. **Data Collection:** The KNHAES was conducted under approval by the Institutional Review Board (IRB) of KCDC (No. 2018-01-03-P-A). On April 5, 2020, the present study’s researcher received approval for data use and downloaded them via the link on the KCDC’s website (https://knhanes.cdc.go.kr), which releases and provides the KNHAES’s raw data. In addition, this study underwent a review for an examination exemption (IRB No. SMU-EX-2020-02-001) at the IRB of the organization to which the research belongs. The 2018 KNHAES involved 7,992 respondents in total. In the present study, 817 individuals without missing values were selected as final subjects from elderly people aged 65 or above.

**Research Tools:**

**Sociodemographic Characteristics:** As the subjects’ general characteristics, gender, age, areas of residence, education levels, marital status, income levels, and occupations were used. Of these variables, areas of residence were divided into “urban” and “rural”. The current marital status was reclassified into “having a spouse” and “living together”, and occupations were also reclassified into “having” and “not having.”

**Health Behavior:** Health behaviors include smoking, drinking, engaging in exercise or not, subjective health conditions, suicidal thoughts, and perceived stress. The number of comorbidities means the number of diseases from which one suffers after doctors’ confirmation. For smoking, those who had smoked at least five packs in their lifetime and were currently smoking were classified as answering “yes”. For drinking, those who had drunk at least one glass of alcohol over the past one year were classified as answering “yes.” In addition, those who performed at least one of 1) strenuous physical activities that cause severe shortness of breath, 2) moderate physical activities that cause moderate shortness of breath, and 3) walking were classified as engaging in regular exercise. Subjective health conditions were reclassified into “good”, “average”, and “poor.” For suicidal thoughts, the original survey’s answers were used without change. In addition, perceived stress was reclassified into “high” and “low.”

**Problem Drinking:** For problem drinking, the AUDIT-C (Alcohol Use Disorders Identification Test-Consumption) score of three questions on drinking frequency, typical drinking quantity, and binge drinking frequency was used. Each question was categorized as follows: (i) Drinking frequency: None, less than once a month, two to four times a month, two to three times a week, four times a week or more; (ii) Typical drinking quantity per week: ≤ 1–2 glasses, 3–4 glasses, 5–6 glasses, 7–9 glasses, ≥ 10 glasses; and (iii) Binge drinking frequency: None, less than once a month, once a month, once a week, almost every day. The total score for AUDIT-C is 12, and items are scored on a 4-point Likert scale. In addition, in this research, the criteria for problem drinking were based on the control point...
reported in a study examining Korean adults regarding the trimmed mean of the assessment tool on high-risk drinking. Thus, an AUDIT-C score of ≥ 6 for men and ≥ 5 for women was considered to indicate problem drinking.

**Data Analysis:** The study’s data were analyzed using SPSS 25.0, and differences in general characteristics and health related characteristics between low risk alcohol drinking and high risk alcohol drinking were identified using descriptive statistics and \( \chi^2 \)-test. To identify the factors that influence high risk alcohol drinking, a logistic regression analysis was conducted using a concurrent input method by applying the significant variables resulting from an univariable analysis as independent variables.

**Result**

**Differences in problem drinking according to socio-demographic and health-related characteristics in the Korean elderly population:** The differences in problem drinking according to socio-demographic and health-related characteristics were analyzed after subjects were categorized into the low-risk (n=556) and high-risk (n=261) problem drinking groups based on their AUDIT-C score [Table 1]. The high-risk group comprised a higher percentage of men \( (\chi^2=147.295, \ p<.001) \), higher number of elderly aged 65–70 years than those aged > 70 years \( (\chi^2=32.67, \ p=.017) \), more subjects with a low level of education \( (\chi^2=4.684, \ p=.030) \), more subjects with ≤ elementary school graduation than those with ≥ high school or college/university graduation \( (\chi^2=29.32, \ p<.001) \), more people living in urban rather than rural areas, more married individuals \( (\chi^2=16.882, \ p<.001) \), more unemployed individuals, and a higher number of individuals living with two family members \( (\chi^2=5.931, \ p=.029) \). For health-related characteristics, statistically significant differences between the low-risk and high-risk groups were found for subjective health status \( (\chi^2=18.379, \ p<.001) \), smoking status \( (\chi^2=119.272, \ p<.001) \), physical discomfort for ≥ two weeks \( (\chi^2=10.242, \ p<.001) \), rheumatoid arthritis \( (\chi^2=28.735, \ p<.001) \), osteoporosis \( (\chi^2=49.958, \ p<.001) \), cataracts \( (\chi^2=10.518, \ p<.001) \), limited activity \( (\chi^2=5.090, \ p=.024) \), exercise ability \( (\chi^2=12.584, \ p<.001) \), self-discipline \( (\chi^2=1.309, \ p=.253) \), daily activity \( (\chi^2=6.559, \ p=.010) \), pain \( (\chi^2=15.651, \ p<.001) \), anxiety/depression \( (\chi^2=4.001, \ p<.001) \), and fatigue \( (\chi^2=10.766, \ p<.001) \).

**Table 1. Comparison of General and Health-related Characteristics of Low risk alcohol drinking and High risk alcohol drinking (N=817)**

<table>
<thead>
<tr>
<th>Problem drinking</th>
<th>Low risk alcohol drinking N (%) N=556</th>
<th>High risk alcohol drinking N (%) N=261</th>
<th>( \chi^2 ) (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>230 (41.4)</td>
<td>226 (86.6)</td>
<td>147.295</td>
</tr>
<tr>
<td>Female</td>
<td>326 (58.6)</td>
<td>35 (13.4)</td>
<td>(&lt;0.001)</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>65-70</td>
<td>239 (43.0)</td>
<td>139 (53.3)</td>
<td>8.167</td>
</tr>
<tr>
<td>70-75</td>
<td>142 (25.5)</td>
<td>60 (23.0)</td>
<td>(0.017)</td>
</tr>
<tr>
<td>75-80</td>
<td>175 (31.5)</td>
<td>62 (23.8)</td>
<td></td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>256 (46.2)</td>
<td>99 (37.9)</td>
<td>17.182</td>
</tr>
<tr>
<td>Middle low</td>
<td>156 (28.2)</td>
<td>67 (25.7)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Middle high</td>
<td>92 (16.6)</td>
<td>46 (17.6)</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>50 (9.0)</td>
<td>49 (18.8)</td>
<td></td>
</tr>
<tr>
<td><strong>Living Area</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>411 (73.9)</td>
<td>211 (80.8)</td>
<td>4.684</td>
</tr>
<tr>
<td>Rural</td>
<td>145 (26.1)</td>
<td>50 (19.2)</td>
<td>(0.030)</td>
</tr>
<tr>
<td>Education</td>
<td>Low risk alcohol drinking N (%)</td>
<td>High risk alcohol drinking N (%)</td>
<td>(\chi^2 (p))</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>---------------------------------</td>
<td>----------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Elementary school</td>
<td>297 (55.2)</td>
<td>101 (40.1)</td>
<td>21.138</td>
</tr>
<tr>
<td>Middle school</td>
<td>93 (17.3)</td>
<td>43 (17.1)</td>
<td>(&lt;0.001)</td>
</tr>
<tr>
<td>High school</td>
<td>93 (17.3)</td>
<td>62 (24.6)</td>
<td></td>
</tr>
<tr>
<td>College/university</td>
<td>55 (10.2)</td>
<td>46 (18.3)</td>
<td></td>
</tr>
</tbody>
</table>

| Marital Status                   |                                 |                                 |                |
|----------------------------------|                                 |                                 |                |
| Never married                    | 2 (0.4)                         | 4 (1.5)                          | 16.882         |
| Spouse(have)                     | 382 (68.7)                      | 209 (80.1)                       | (<0.001)       |
| Others                           | 172 (30.9)                      | 48 (18.4)                        |                |

| Occupational status              |                                 |                                 |                |
|----------------------------------|                                 |                                 |                |
| No                               | 329 (61.2)                      | 131 (52.0)                       | 5.931          |
| Yes                              | 209 (38.8)                      | 121 (48.0)                       | (0.015)        |

| Family number                    |                                 |                                 |                |
|----------------------------------|                                 |                                 |                |
| 1                                | 129 (23.2)                      | 37 (14.2)                        | 9.036          |
| 2                                | 286 (51.4)                      | 150 (57.5)                       | (0.029)        |
| 3                                | 75 (13.5)                       | 41 (15.7)                        |                |
| 4 or over                        | 66 (11.9)                       | 33 (12.6)                        |                |

| Health related status            |                                 |                                 |                |
|----------------------------------|                                 |                                 |                |
| Subjective health status         |                                 |                                 |                |
| Good                             | 162 (30.0)                      | 48 (18.8)                        | 18.379         |
| Average                          | 267 (49.4)                      | 125 (48.8)                       | (<0.001)       |
| Poor                             | 111 (20.6)                      | 83 (32.4)                        |                |

| Sleeping (Day)                   |                                 |                                 |                |
|----------------------------------|                                 |                                 |                |
| <7 hours                         | 201 (36.2)                      | 100 (38.3)                       | 1.773          |
| 7~8 hours                        | 237 (42.6)                      | 116 (44.4)                       | (0.412)        |
| >8 hours                         | 118 (21.2)                      | 45 (17.2)                        |                |

| Suicidal ideation                |                                 |                                 |                |
|----------------------------------|                                 |                                 |                |
| No                               | 548 (98.6)                      | 254 (97.3)                       | 1.523          |
| Yes                              | 8 (1.4)                         | 7 (2.7)                          | (0.217)        |

| Perceived Stress                 |                                 |                                 |                |
|----------------------------------|                                 |                                 |                |
| No                               | 455 (81.8)                      | 226 (86.6)                       | 2.895          |
| Yes                              | 101 (18.2)                      | 35 (13.4)                        | (0.089)        |

| Depressive mood                  |                                 |                                 |                |
|----------------------------------|                                 |                                 |                |
| No                               | 543 (97.7)                      | 255 (97.7)                       | 0.001          |
| Yes                              | 13 (2.3)                        | 6 (2.3)                          | (0.972)        |

| BMI (kg/m²)                      |                                 |                                 |                |
|----------------------------------|                                 |                                 |                |
| <18.5                            | 8 (1.5)                         | 3 (1.2)                          | 3.304          |
| 18.5–22.9                        | 183 (33.4)                      | 70 (27.2)                        | (0.347)        |
| 23.0–24.9                        | 152 (27.7)                      | 78 (30.4)                        |                |
| ≥25.0                            | 205 (37.4)                      | 106 (41.2)                       |                |

| Smoking status                   |                                 |                                 |                |
|----------------------------------|                                 |                                 |                |
| Non-smoker*                      | 358 (64.4)                      | 62 (23.8)                        | 119.272(<0.001)|
| Ex-smoker†                       | 157 (28.2)                      | 147 (56.3)                       |                |
| Current smoker‡                  | 41 (7.4)                        | 52 (19.9)                        |                |
### Problem drinking

<table>
<thead>
<tr>
<th></th>
<th>Low risk alcohol drinking N (%) N=556</th>
<th>High risk alcohol drinking N (%) N=261</th>
<th>$\chi^2$ (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical activity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>235 (42.3)</td>
<td>96 (36.8)</td>
<td>2.217 (0.137)</td>
</tr>
<tr>
<td>Yes</td>
<td>321 (57.5)</td>
<td>165(63.2)</td>
<td></td>
</tr>
<tr>
<td><strong>Physical discomfort for ≥ two weeks</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>381(68.5)</td>
<td>207(79.3)</td>
<td>10.242 (&lt;0.001)</td>
</tr>
<tr>
<td>Yes</td>
<td>175(31.5)</td>
<td>54(20.4)</td>
<td></td>
</tr>
<tr>
<td><strong>Rheumatoid arthritis</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>336(62.3)</td>
<td>208(81.3)</td>
<td>28.735 (&lt;0.001)</td>
</tr>
<tr>
<td>Yes</td>
<td>203(37.7)</td>
<td>48(18.8)</td>
<td></td>
</tr>
<tr>
<td><strong>Osteoporosis</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>419(75.4)</td>
<td>250(95.8)</td>
<td>49.958 (&lt;0.001)</td>
</tr>
<tr>
<td>Yes</td>
<td>137(24.6)</td>
<td>11(4.2)</td>
<td></td>
</tr>
<tr>
<td><strong>Cataracts</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>282(50.7)</td>
<td>164(62.8)</td>
<td>10.518 (0.001)</td>
</tr>
<tr>
<td>Yes</td>
<td>274(49.3)</td>
<td>97(37.2)</td>
<td></td>
</tr>
<tr>
<td><strong>Limited activity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>468(84.2)</td>
<td>235(90.0)</td>
<td>5.090 (0.024)</td>
</tr>
<tr>
<td>Yes</td>
<td>88(15.8)</td>
<td>26(10.0)</td>
<td></td>
</tr>
<tr>
<td><strong>Exercise ability</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>345(63.5)</td>
<td>194(76.1)</td>
<td>12.584 (&lt;0.001)</td>
</tr>
<tr>
<td>Yes</td>
<td>197(36.5)</td>
<td>61(23.9)</td>
<td></td>
</tr>
<tr>
<td><strong>Daily activity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>439(81.4)</td>
<td>226(88.6)</td>
<td>6.559 (0.010)</td>
</tr>
<tr>
<td>Yes</td>
<td>100(18.6)</td>
<td>29(11.4)</td>
<td></td>
</tr>
<tr>
<td><strong>Pain</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>343(63.6)</td>
<td>198(77.6)</td>
<td>15.651 (&lt;0.001)</td>
</tr>
<tr>
<td>Yes</td>
<td>196(36.4)</td>
<td>57(22.4)</td>
<td></td>
</tr>
<tr>
<td><strong>Anxiety/depression</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>471(87.4)</td>
<td>235(92.2)</td>
<td>4.001 (0.045)</td>
</tr>
<tr>
<td>Yes</td>
<td>68(12.6)</td>
<td>20(7.8)</td>
<td></td>
</tr>
<tr>
<td><strong>Fatigue</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>369(69.0)</td>
<td>202(80.2)</td>
<td>10.766 (0.001)</td>
</tr>
<tr>
<td>Yes</td>
<td>166(31.0)</td>
<td>50(19.8)</td>
<td></td>
</tr>
</tbody>
</table>

**Factors related to problem drinking in the Korean elderly population examined in this study:**

To determine the influence of socio-demographic and health-related characteristics on the high-risk problem drinking group, a logistic regression analysis was performed. Table 2 presents the results. For socio-demographic characteristics, a significant influence was found for gender, age, income level, residential area, education level, marital status, occupation, and number of family members. For health-related characteristics, subjective health status, smoking status, rheumatoid arthritis, osteoporosis, cataracts, exercise ability, daily activity, pain/discomfort, fatigue, and anxiety/depression were found to significantly influence the high-risk group. Among the socio-demographic factors, the odds ratio of high-risk problem drinking was 0.144 times lower for women (95% CI: 0.07–0.27) than men; 0.639 times lower for subjects aged 70–75 years (95% CI: 0.40–1.00) than those aged 65–70 years, and 0.499 times lower for subjects aged 75–80 years (95% CI: 0.30–0.81); 0.968 times lower for subjects with a middle-low income level (95% CI: 0.60–1.56) than those with a low level, 0.769 times lower for subjects with a middle-high level (95% CI: 0.44–1.34), and 1.586 times lower for those with a
high level of income (95% CI: 0.84–3.00); 0.78 times lower for subjects living in a rural area (95% CI: 0.49–1.24) than those living in an urban area; and 0.650 times lower for subjects who graduated from middle school (95% CI: 0.38–1.09) than those who graduated with ≤ elementary school, and 0.831 times lower for subjects who graduated with ≥ high school or from college/university (95% CI: 0.46–1.49). In addition, the odds ratio of high-risk problem drinking was 1.037 times higher for employed individuals (95% CI: 0.71–1.51) than for unemployed individuals and 2.542 times higher for individuals living with two family members than those living alone (95% CI: 1.24–5.21).

Of the health-related factors, the odds ratio of high-risk problem drinking was 1.438 times higher for subjects with poor subjective health status (95% CI: 0.79–2.61) than for those with good subjective health status, and 1.325 times higher for ex-smokers (95% CI: 0.79–2.22) than non-smokers and 2.492 times higher for current-smokers (95% CI: 1.31–4.71). In addition, the odds ratio of high-risk problem drinking was 1.306 times higher for subjects with rheumatoid arthritis (95% CI: 0.35–4.75), 1.114 times higher for subjects with cataracts (95% CI: 0.76–1.62), 1.688 times higher for subjects experiencing pain or discomfort (95% CI: 0.35–4.75), 1.267 times higher for subjects with anxiety or depression (95% CI: 0.63–2.56), and 1.783 times higher for subjects with fatigue (95% CI: 0.50–1.22).

Table 2. Odds ratios(ORs) for high risk drinking, stratified by demographic characteristics (N=817)

<table>
<thead>
<tr>
<th>Living Area</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>0.780</td>
<td>0.491–1.241</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary school</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Middle school</td>
<td>0.650</td>
<td>0.386–1.093</td>
</tr>
<tr>
<td>High school</td>
<td>0.704</td>
<td>0.427–1.161</td>
</tr>
<tr>
<td>College/university</td>
<td>0.831</td>
<td>0.461–1.497</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never married</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Spouse(have)</td>
<td>0.048</td>
<td>0.005–0.438</td>
</tr>
<tr>
<td>Others</td>
<td>0.118</td>
<td>0.013–1.044</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Occupational Status</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.037</td>
<td>0.711–1.511</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Family Number</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2.542</td>
<td>1.240–5.211</td>
</tr>
<tr>
<td>3</td>
<td>2.061</td>
<td>0.907–4.683</td>
</tr>
<tr>
<td>4 or over</td>
<td>2.352</td>
<td>1.044–5.301</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Health related status</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>1.100</td>
<td>0.657–1.840</td>
</tr>
<tr>
<td>Poor</td>
<td>1.438</td>
<td>0.791–2.612</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Smoking Status</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-smoker</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Ex-smoker</td>
<td>1.325</td>
<td>0.790–2.221</td>
</tr>
<tr>
<td>Current smoker</td>
<td>2.492</td>
<td>1.318–4.710</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Rheumatoid Arthritis</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.306</td>
<td>0.358–4.756</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Arthritis</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.642</td>
<td>0.170–2.421</td>
</tr>
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<table>
<thead>
<tr>
<th>Osteoporosis</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.393</td>
<td>0.185–0.834</td>
</tr>
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<table>
<thead>
<tr>
<th>Cataracts</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.114</td>
<td>0.765–1.622</td>
</tr>
<tr>
<td>Exercise Ability</td>
<td>OR</td>
<td>95% CI</td>
</tr>
<tr>
<td>------------------</td>
<td>----</td>
<td>--------</td>
</tr>
<tr>
<td>No</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0.048</td>
<td>0.638–1.722</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Daily Activity</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0.148</td>
<td>0.580–2.275</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pain</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.688</td>
<td>0.420–1.128</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Anxiety/Depression</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.267</td>
<td>0.630–2.564</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fatigue</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.783</td>
<td>0.500–1.226</td>
</tr>
</tbody>
</table>

Discussion

This study examined the elderly aged ≥ 65 years to determine the influence of socio-demographic and health-related factors on problem drinking. The following discussion is based on the results of the study.

First, among the socio-demographic characteristics that influence problem drinking, the risk of problem drinking was higher for men than women. This gender difference is consistent with the results of a previous study on problem drinking in Korea [1]. In addition, an overseas study has also found a higher level of problem drinking among men than women in terms of both drinking quantity and frequency [14]. This implies that problem drinking is more serious among the male elderly in Korea and overseas. The finding may be attributed to the traditional gender norms that seem to favor drinking among men [15]. Regarding age, the risk of problem drinking increased as age decreased. This supports previous studies reporting a decrease in the drinking quantity and number of drinkers due to the early death of individuals who had been drinking excessively since their youth or middle-aged adulthood, or decreased alcohol consumption caused by aging-related physical disability or reduced metabolic ability [16,17]. For income, the highest risk of problem drinking was evident for individuals with the lowest income level. In addition, individuals living with two family members showed a higher risk of problem drinking than other cases. These findings imply the need to consider the quality or satisfaction of family relationships as an influencing factor. The results support those of previous studies reporting a high risk of problem drinking among the elderly with a low-income level who have unsatisfactory family relationships [12].

Second, among the health-related characteristics that influence problem drinking, the risk was high for individuals diagnosed with rheumatoid arthritis or cataracts, and for those experiencing pain/discomfort, anxiety/depression, or fatigue. These results contrast those of a previous study reporting that a physical or psychological condition had no influence on problem drinking, thus indicating a need for replication studies. In addition, the risk was high for individuals with poor subjective health status, contradicting a previous study that found a higher subjective health status among individuals with problem drinking as they viewed themselves as healthy and thus drank more [21]. Therefore, replication studies are needed. The risk of problem drinking was also higher for employed individuals, contradicting a previous study conducted in Korea reporting a higher risk for unemployed individuals [16].

The risk of problem drinking was higher for individuals living in urban areas than those in rural areas. Noteworthy is that a previous study found that problem drinking deteriorated the quality of life of the elderly regardless of residential area [18]. This means that future research should focus on problem drinking among the elderly in both urban and rural areas. Regarding education level, a high risk of problem drinking was found for those who graduated ≤ elementary school, which supports the results of a previous study that showed the influence of education level on problem drinking among the elderly [19]. However, this result contrasts that of a previous study that showed the influence of education level on problem drinking among young and middle-aged adults, but not among the elderly [20], thus indicating a need for replication studies. The risk of problem drinking was also higher for ex- or current-smokers than for non-smokers, and smoking was the most influential factor related to drinking. This is aligned with a previous study on Korean adults that identified smoking as the most significant risk factor as it increased the risk of problem drinking 4.78 times [22].

Conclusion

This study is significant as it analyzed data collected through a nationwide survey to determine the general
factors related to problem drinking among the entire Korean elderly population. The research was conducted at a time when relevant studies are lacking despite the growing social concerns regarding problem drinking among the elderly and the increase in the elderly population. For the interpretation and application of the findings of this study, which re-analyzed the KNHANES dataset, the limitations and recommendations are presented as follows.

First, this study used a previously collected dataset; thus, potential errors in the process of subject interviews and data collection could not be identified. Second, the data used in this study was secondary data, which led to the limited use of the completed survey questionnaires. Furthermore, the variables used in evaluating the factors that influence problem drinking among the elderly could not be diversified. Third, this study found no significant correlations with problem drinking among the elderly for the variables reported in previous studies. This is likely because of the limitation of using secondary data, as mentioned, which prevented evaluating relevant variables such as the family function, social support, satisfaction with family relationships, and friendship. Further studies should use a larger set of samples that contain more diverse variables for reinvestigation. Finally, note that as a cross-sectional study, only the correlations among relevant variables were analyzed in this research, while cause-effect relationships could not be described. In future, a longitudinal study should analyze cause-effect relationships among the factors related to problem drinking among the Korean elderly in a more systematic way.

Ethical Clearance: For ethical consideration of the study subjects, data was collected after approval through the deliberation(IRB No. SMU-EX-2020-02-001) of Institutional Review Board (IRB) of S university. The informed consent was obtained from the subjects before data collection. Confidentiality of data collected was ensured.

Source of Funding: This paper was supported by the Semyung University Research Grant of 2020

Conflict of Interest: Nothing specific-can use the study findings with proper citation of authors name.

References


Patent Granting on Marine DNA Discovery

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Abstract

In recent years, the world has experienced various medical treatments originates from the ocean, such as cytarabine, vidarabine, and ziconotide. Marine represents a great source of species with potential medical treatments due to these species’ unique properties; however, the research and discovery of this industry demand high financial resources and time management. Hence, the international government has employed intellectual property rights and patent granting as a mechanism to promote innovative research. This paper explores the benefits and disadvantages of patent granting on marine DNA discovery and application.

Keywords: Biomimicry, DNA, Intellectual Property Rights, Marine, Medicine.

Introduction

Nature is a complex but miracle system with various shapes, functions, and structures that are highly applicable in our modern lives and far more sustainable and efficient than human most cutting-edge technology. Therefore, over the last ten years, biomimicry has become a trend of bio-engineering and innovation across disciplines, ranging from robotic to business management. Many real-world applications are already available for human usages, such as the bullet train in Japan, superhydrophobic raincoat, temperature regulating systems in the commercial building, and lean business strategies. Applying biomimicry in innovation is highly recommended for a sustainable world, but it also comes with a legal question: can a company patent and own a product or a discovery from nature? To create a comprehensive picture of this legal issue, firstly, the essay will introduce the context of Marine pharmacology and the impacts of marine discovery on medical research. Moreover, it is essential to understand the nature of intellectual property rights and patent rights. Finally, this essay will explore the benefits and drawbacks of granting patent rights for a person, business, or research entities within the context of sea life.

Marine Research and Contribution to Medical and Pharmaceutical Studies: Marine represents a great source of species with potential medical solutions due to these species’ unique properties. For example, according to research from Arizona State University, the Whale can defy cancer due to their excellent genes. If the researchers can decode the Whale’s gene and manufacturing drugs based on the Whale’s gene properties, a human would find a cure to combat the cancer problems. The application of marine research in pharmacies can be categorized into three sections:

1. Genetically engineered marine organisms
2. Manufacture of pharmaceuticals and nutraceuticals of marine origin
3. Chemicals produced by or found in marine organisms shown to have a wide variety of applications as pharmaceuticals

Currently, there are many drugs application with the marine origin, such as

1. Cytarabine (Cytosar-UW, DepocytW) to treat leukemia,
2. Vidarabine (Vira-AW) to combat against herpes viruses, rhabdoviruses, hepadnaviruses, and RNA tumor viruses,
3. Ziconotide (PrialtW) as a pain reliever.

As marine research has provided breakthrough research on medical and pharmaceutical studies, the international government must develop a mechanism that promotes such research globally. One solution is granting patent and intellectual property rights.
Intellectual Property and Patent Granting:

According to the World Intellectual Property Organization (WIPO), “intellectual property (IP) refers to creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names, and images used in commerce.” A patent is “an exclusive right granted for an invention, which is a product or a process that provides, in general, a new way of doing something, or offers a new technical solution to a problem.” The IP rights and patent specifically aim to balance the inventors’ interests and public interests; thus, they nourish the fair-use, innovative environment, and credit creativity. When an inventor patents an invention, he must share the technical information with the public, and he will get back the rights to prevent others from using his invention without permission. Based on WIPO’s definition, one can only fill a patent for “a new way of doing something” or “a new technical solution to a problem”; hence, one cannot patent a discovery of nature, such as the genetics of sea life creatures.

Intellectual Property in Biomimicry Research from Sea Life Creatures: Patent granting in biomimicry research from sea life creatures is the importance of its motivation and compensation for the research team’s time, expertise, and financial contribution. Creating a novel solution from a natural discovery is a challenging and lengthy process. A case of the underwater forest is a practical example. The sea creates, and the forest ecosystem guides innovation across disciplines, such as medical treatment, climate solution, and industrial food production. However, “a single specimen can generate dozens of strains of bacteria. Screenings are difficult and take months. If a compound passes all the tests, presuming funding continues, they might reach the clinic in 15 to 20 years.” In short, available research on sea creatures’ DNA only involves 13000 of the DNA of sea life from the American Association for the Advancement of Science, the problem is also at the inequality allocation of technology between the developed and developing countries. Although there is no direct causal relation between intellectual property rights and global inequality, patents’ unequal distribution would create an imbalance between multinational and local companies. Because the patent holders have exclusive rights on their invention for commercial, research, and non-commercial activities, companies from the highly developed nations can exclude other developing nations to access the ocean’s economic benefits. These technological and commercial exclusives would not benefit the global society and the sustainable usage of international water. Experts believe that the ocean is beyond any country’s
jurisdiction and the United Nations Convention on the Law of the Sea (UNCLOS) commits to inclusive and transferable marine technology. As countries share the ocean, a patent without commercial binding could benefit the global society and uphold the international marine treaty.

**Discussion on Patent Granting for Marine Discovery and Application on a Legal Perspective:**

However, having the majority share of global patents on sea creatures is not equivalent to owning the sea. From a legal perspective, the ocean is a library filled with books and knowledge rather than land for occupation. The act of one filling a new patent learned from the library’s books does not prevent other people from accessing the library. The United States granted patents for the first person who identified the new gene sequences and entitled him exclusive rights on commercial, clinical, and non-commercial uses for 20 years. However, this rule was over-rulled in the United States in 2013. It created a precedent for many other nations. Today for most countries, one cannot patent discovery from nature or the product of nature. In the context of genetics, Mr. Blasiak from Stockholm Resilience Center mentions one can only patent “synthesis organism; a little bit of DNA from a lot of different things.” The process of creating a synthesis organism is genuinely an innovative idea, equivalent to building a new car model from various raw materials from nature. A researcher can patent the collective synthesis organism, but he has no exclusive rights to each little bit of DNA from a natural sea creature. For example, genetic sequences from a purple sea urchin have been used by three companies across Germany, the United States, and Japan without any litigation occurring. This is the evidence for the inclusive usage of global sea creatures and other related discoveries about them.

Before the birth of IP rights and patents, companies usually keep their technical research as a trade secret, limiting the knowledge sharing between people to people. The patent also encourages knowledge sharing between business and academics. Technical information disclosure is a mandatory part of patenting an invention. This information will be presented at the marine genetic resources (MGR) for global researchers to learn. In the sea creature context, this can be researched from “species associated with deep-sea hydrothermal vent systems,” underwater microbes,....., which might not be accessible without advanced technology, technical experts, and extensive research time the individual researcher. The technical disclosure also prevents duplication of research effort and encourages building on existing solutions. Hence, the cumulative nature of science would benefit from this treatment.

Moreover, the majority of patents only last for 20 years. After this period, it is free and accessible for the majority of citizens. If there is a technical monopoly, it is just a temporal situation. In the long run, the patents of corporations will become a shared resource for all. Therefore, entities, such as BASF, “could play a very important and valuable role in supporting efforts to ensure that areas beyond national jurisdiction can be accessed by all and benefit all.” After analyzing the arguments above, it is more reasonable to grant companies patent rights for their innovative usage and new bio-synthesis inspired by nature. The suggested problems of patent rights could be solved with other solutions rather than eliminating the patent granting system. Firstly, to promote the inclusive usage of international water and its biodiversity, developed countries should support developing countries with cutting-edge facilities to research sea creatures. The support should encompass human capital, financial support, technological transfer, and machinery. With this collaboration, developed countries would also benefit from the unique natural system in developing countries and local expertise. Moreover, if there is sufficient evidence proving that BASF hinders innovation from other marine researchers, UNCLOS and WIPO could reduce the patent periods or redefine the scope of patent owners’ exclusive rights. These policies would ensure that patent owners’ creativity, works, and commercial rights are respected without compromising future research on sea creatures and biomimicry.

**Conclusion**

In conclusion, life underwater is an essential source of future technology and knowledge, such as medical treatment, pain reliever, and many drug inventions. Hence, governments should optimize the legal environment for promoting innovation in this industry. A single company should be allowed to patent an invention related to sea life because the benefits of patent granting overshadow the drawbacks in promoting innovation and research on sea life. To combat the domination of patent-holding, such as in the BASF case, the international government could modify the current patent laws to best fit society’s needs.
**Ethical Clearance:** Taken from institutional ethics committee.

**Source of Funding:** Self.

**Conflict of Interest:** Nil

**References**


Risk of Violence among Nurses in Emergency Departments at Baghdad City Hospitals: The Mediating Role of the Work Environment

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¹MScN(c), Research Scholar, University of Baghdad, College of Nursing, ²Assistant Professor (A PhD), University of Baghdad, College of Nursing, Community Health Nursing Department

Abstract

Background: Workplace violence is a problem of international healthcare among the workers in all departments of the healthcare systems, but more severe at the emergency departments. Nurses in the emergency departments are working on the front lines of violence. This study aims to examine risk of violence among nurses in the emergency departments and to find out the association between nurses’ age, years of working in nursing, years of working in emergency departments, work hours, violent events by patients, violent events by coworkers, likelihood of exposure to violence in the future, work environment, intention to leave the job, and risk of violence.

Method: A descriptive predictive study design has been carried out. A non-probability (convenience) sample of (380) nurses from the emergency departments of (12) hospitals in Baghdad city center were selected to participate in the study.

Data were collected through a self-report instrument that includes nurses socio-demographic data, the employment data, general information about the violent events, Intention to Leave the Job Scale, Risk of Violence Scale, Violent Events by Patient Scale, Violent Events by co-workers Scale, Likelihood of Exposure to Violence in the Future Scale and the Nursing Work Environment Scale. The data were analyzed using the Statistical Package for Social Sciences (SPSS) version 26.

The study results revealed that a half of the nurses described the risk of violence they can expose to in the workplace as average. There is a statistically significant inverse correlation between nurses’ age, years of experience in nursing, years of experience in EDs and their exposure to violent event by the coworkers, and risk of violence. The researcher concluded that the younger the nurses, the less the experience they have in nursing, the less the experience they have in the EDs, the greater the exposure to violence by coworkers, and risk of violence.

Keywords: Workplace Violence, Work Environment, Emergency Department, Turnover Intention.

Introduction

More than 5 million United States (US) hospital workers from many occupations are exposed to many safety and health hazards, including violence. Healthcare workers are more likely to be attacked at work than police officers or prison guards(1). Now days, hospital violence against health care providers, especially nurses, is a significant concern in every health care setting in the world(2). World Health Organization (WHO) defines violence as the intentional use of threatened or actual force against a person or a group which may cause physical or psychological trauma(3). There are three forms of violence, emotional violence, physical violence, and sexual harassment(4). Emotional violence comprises verbal abuse, in the practice of punitive words, swearing, talking in a hostile style, or an upraised voice bullying, mobbing, and written or verbal intimidations that do not cause physical harm(5). Physical violence can be defined as every type of assault that has a physical element(6). And involves the use of physical strength against another
individual (7). Sexual harassment as any unwanted, unwelcome and unreciprocated act of a sexual nature that is offensive to the person (8). In the Middle East, workplace violence (WPV) reported variedly according to the type of violence, the verbal threat was the most common forms, with a frequency range between 19.6% and 98.6%, which was three to six times higher than physical violence (9). Additionally, violence is knowingly under reported in a hospital setting, particularly relative to the nonphysical type of violence (10). Many reasons for the under reporting of violence, including an absence of time and refusal to fill in forms (15). The emergency departments (EDs) are typically a stressful environment across the 24-hours of the day and involves a great turnover of nurses (11). Emergency departments nurses’ presence in stressful situations exposes them to more abuse or harsh behavior from patients or their colleagues than other hospital staff (12). Additionally, the risk of violence between nurses in the EDs distribution is not consistent, significant variances are found in relation to age, marital status, kind of service, hospital characteristics, work shift, and position in the profession (13-14). There are many factors making the nursing staff at risk of workplace violence in EDs. These factors are related to the emergency department work environment, nursing staff characteristics, and patient’s condition (16).

Method

A descriptive predictive study design was used in this study from period of December 24th, 2019 to February 23th, 2020. During the study, the total population of interest include (853) nurses who work in the emergency departments of (18) hospitals in the Baghdad City center. Of those, only (380) nurses were selected from the emergency departments of (12) hospitals to participate in the study. The response rate for the study is (76%). A non-probability (convenience) sample was used to recruit study subjects. Data were collected through a self-report instrument that include the socio-demographic data, the employment data, general information about the violent events, the Intention to Leave the Job Scale, Risk of Violence Scale, and Likelihood of Exposure to Violence in the Future Scale, Violent Events by Patient Scale, Violent Events by Coworkers Scale and Nursing Work Environment Scale. The validity of the questionnaire were verified by presenting it to (15) experts. Descriptive and inferential statistics were used to analyze the results of the study using the Statistical Package of Social Sciences (SPSS) version 26.

Results

Table 1. Participants’ Socio-demographic Characteristic

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19-29</td>
<td>190</td>
<td>50.0</td>
</tr>
<tr>
<td>30-39</td>
<td>119</td>
<td>31.3</td>
</tr>
<tr>
<td>40-49</td>
<td>50</td>
<td>13.2</td>
</tr>
<tr>
<td>50-60</td>
<td>21</td>
<td>5.5</td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>31.73</td>
<td>8.73</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>205</td>
<td>53.9</td>
</tr>
<tr>
<td>Female</td>
<td>175</td>
<td>46.1</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not married</td>
<td>137</td>
<td>36.1</td>
</tr>
<tr>
<td>Married</td>
<td>194</td>
<td>51.1</td>
</tr>
<tr>
<td>Divorced</td>
<td>18</td>
<td>4.7</td>
</tr>
<tr>
<td>Separated</td>
<td>25</td>
<td>6.6</td>
</tr>
<tr>
<td>Widower</td>
<td>6</td>
<td>1.6</td>
</tr>
<tr>
<td>Educational Qualification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nursing High School</td>
<td>116</td>
<td>30.5</td>
</tr>
<tr>
<td>Diploma</td>
<td>157</td>
<td>41.3</td>
</tr>
<tr>
<td>Bachelor’s Degree</td>
<td>107</td>
<td>28.2</td>
</tr>
</tbody>
</table>

The age mean is 31.73 ± 8.73; a half age 19-29-years (n = 190; 50.0%), followed by those who age 30-39-years (n = 119; 31.3%), those who age 40-49-years (n = 50; 13.2%), and those who age 50-60-years (n = 21; 5.5%). Concerning the gender, more than a half are males (n = 205; 53.9%) compared to females (n = 175; 46.1%). Regarding the marital status, more than a half are married (n = 194; 51.1%), followed by those who are Not married (n = 137; 36.1%), those who are separated (n = 25; 6.6%), those who are divorced (n = 18; 4.7%), and those who are widowers (n = 6; 1.6%). With respect to educational qualification, more than two-fifth hold a diploma degree (n = 157; 41.3%), followed by those who are nursing high school graduates (n = 116; 30.5%), and those who hold a bachelor of nursing (n = 107; 28.2%).
### Table 2. Nurses’ Employment Profile

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Years of experience in nursing</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-5</td>
<td>171</td>
<td>45.0</td>
</tr>
<tr>
<td>6-10</td>
<td>88</td>
<td>23.2</td>
</tr>
<tr>
<td>11-15</td>
<td>45</td>
<td>11.8</td>
</tr>
<tr>
<td>≥ 16</td>
<td>76</td>
<td>20.0</td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>9.32</td>
<td>8.57</td>
</tr>
<tr>
<td><strong>Years of experience in emergency department</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-5</td>
<td>235</td>
<td>61.8</td>
</tr>
<tr>
<td>6-10</td>
<td>67</td>
<td>17.6</td>
</tr>
<tr>
<td>11-15</td>
<td>38</td>
<td>10.0</td>
</tr>
<tr>
<td>≥ 16</td>
<td>40</td>
<td>10.5</td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>6.05</td>
<td>5.38</td>
</tr>
<tr>
<td><strong>Work hours</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>174</td>
<td>45.8</td>
</tr>
<tr>
<td>18</td>
<td>204</td>
<td>53.7</td>
</tr>
<tr>
<td>24</td>
<td>2</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>Role in emergency department</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical nurse</td>
<td>350</td>
<td>92.1</td>
</tr>
<tr>
<td>Supervisor</td>
<td>30</td>
<td>7.9</td>
</tr>
</tbody>
</table>

The years of experience in nursing mean is 9.32 ± 8.57; less than a half have 1-5-years (n = 171; 45.0%), followed by those who have 6-10-years (n = 88; 23.2%), those who have 16-years or longer (n = 76; 20.0%), and those who have 11-15-years (n = 45; 11.8%). The years of experience in ED mean is 6.05 ± 5.38; most have 1-5-years (n = 235; 61.8%), followed by those who have 6-10-years (n = 67; 17.6%), those who have 16-years or longer (n = 40; 10.5%), and those who have 11-15-years (n = 38; 10.0%). Concerning the work hours, more than a half work for 18-hours (n = 204; 53.7%), followed by those who work for seven hours (n = 174; 45.8%), and those who work for 24-hours (n = 2; 0.5%). Lastly, the role of the majority of nurses in the ED is clinical nurse (n = 350; 92.1%) compared to supervisor (n = 30; 7.9%).

### Table 3. Correlation among Study Variables

<table>
<thead>
<tr>
<th>1. Age</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
<th>7.</th>
<th>8.</th>
<th>9.</th>
<th>10.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Years of experience in nursing</td>
<td></td>
<td>.907**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Years of experience in ED</td>
<td></td>
<td>.786**</td>
<td>.871**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Work hours</td>
<td></td>
<td>.078</td>
<td>.079</td>
<td>.061</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Violent Events by the Patient</td>
<td></td>
<td>.009</td>
<td>.024</td>
<td>.016</td>
<td>.134**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Violent Events by Coworkers</td>
<td></td>
<td>-.185**</td>
<td>-.137**</td>
<td>-.174**</td>
<td>-.001</td>
<td>.505**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Likelihood of Exposure to Violence in the Future</td>
<td></td>
<td>.170**</td>
<td>.193**</td>
<td>.238**</td>
<td>.055</td>
<td>.396**</td>
<td>.035</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Work Environment</td>
<td></td>
<td>-.070</td>
<td>-.058</td>
<td>-.049</td>
<td>.168**</td>
<td>.210**</td>
<td>.046</td>
<td>.414**</td>
<td></td>
</tr>
<tr>
<td>9. Intention to Leave the Job</td>
<td></td>
<td>-.145**</td>
<td>-.093</td>
<td>-.124*</td>
<td>-.069</td>
<td>.225**</td>
<td>.062</td>
<td>.195**</td>
<td>.185**</td>
</tr>
<tr>
<td>10. Risk of Violence</td>
<td></td>
<td>-.200**</td>
<td>-.202**</td>
<td>-.204**</td>
<td>.179**</td>
<td>.401**</td>
<td>.341**</td>
<td>.202**</td>
<td>.251**</td>
</tr>
</tbody>
</table>
There are statistically significant inverse correlations between nurses’ age and their exposure to violent event by the coworkers, intention to leave the job, and risk of violence \((r = -.185; \text{at } p < 0.01; r = -.145; \text{at } p < 0.01; r = -.200; \text{at } p < 0.01)\) respectively. On the other hand, there is a statistically significant positive correlation between nurses’ age and their likelihood of exposure to violence in the future \((r = .170; \text{at } p < 0.01)\). There are statistically significant inverse correlations between nurses’ years of experience in nursing and their exposure to violent event by the coworkers and risk of violence \((r = -.137; \text{at } p < 0.01; r = -.202; \text{at } p < 0.01)\) respectively. On the other hand, there is a statistically significant positive correlation between nurses’ years of experience in nursing and their exposure to violent event by the patient work environment, and risk of violence \((r = .193; \text{at } p < 0.01)\). There are statistically significant inverse correlations between nurses’ years of experience in ED and exposure to violent event by the coworkers, intention to leave the job, and risk of violence \((r = -.174; \text{at } p < 0.01; r = -.124; \text{at } p < 0.05; r = -.204; \text{at } p < 0.01)\) respectively. On the other hand, there is a statistically significant positive correlation between nurses’ work hours and their exposure to violent event by the patient work environment, and risk of violence \((r = .134; \text{at } p < 0.01; r = .168; \text{at } p < 0.01; r = .179; \text{at } p < 0.01)\) respectively.

**Discussion**

Concerning the age, the study results revealed that the highest percentage of the study subjects within the age group (19-29) years, this finding consistent with \((17)\) who reported that the highest percentage of the nurses in the emergency departments within age groups (19-29) years. Concerning the gender, the study results revealed that the majority of the study subjects are males. This finding is consistent with that of \((18)\) who reported that the majority of the nurses were males. Regarding the marital status, the study results revealed that the majority of the study subjects are married. This finding consistent with \((6)\) who reported that the majority of the study participants are married. With respect to educational qualifications, the study results revealed that more than two-fifth hold a diploma degree of nursing. This finding is consistent with that \((19)\) who reported that the majority of the study subjects have a diploma degree in nursing. Relating to the years of experience in nursing, the study results revealed that less than a half of the study subjects have 1-5 years. This finding consistent with \((20)\) who reported that less than half of the study subjects have 1-5 years of experience in nursing. Regarding the years of experience in the emergency department, the study results revealed that the majority of the study subjects have 1-5 years of experience in the emergency department. This finding consistent with that of \((17)\) who reported that the majority of the study subjects have 1-5 years of experience in the emergency department. Relating to the work hours in the workplace, the study results revealed that more than a half of the study subjects work for 18-hours. This finding consistent with that of \((21)\) who reported that more than half of the study subjects working for 18-hour. Regarding the work shift in the workplace, the study results revealed that more than a half of the study participants work on the evening shift from 3:00 p.m. -8:00 a.m. This finding supported by that \((20)\) who found that more than half of the nurses work in the evening shift between 3:00 p.m. -8:00 a.m. Regarding the role in emergency department, the study results revealed that the majority of nurses in the ED are clinical nurse. This finding supported by that of \((17)\) who reported that the majority of the study subjects was clinical nurses. The study results revealed that there were statistically significant inverse correlations between nurses’ age and their exposure to violent event by the coworkers. This finding is consistent with \((22)\) who reported that there was a significant inverse relationship between the nurses’ age and the occurrence of workplace violence by coworkers. The study findings indicated that there were statistically significant inverse correlations between nurses’ age and intention to leave the job. This finding is supported by \((23)\) who reported that there was a significant negative correlation between nurses’ age and intention to leave the job. The study findings revealed that there was a statistically significant inverse correlation between nurses’ age and risk of violence. This finding is supported by \((24)\) who reported that there was a significant inverse correlation between nurses’ age and risk of violence. The study findings revealed that there was a statistically significant positive correlation between nurses’ age and their likelihood of exposure to violence in the future. This finding supported by that of \((24)\) reported that there was a statistically significant positive relationship between nurses’ age and their likelihood of exposure to violence in the future. The study findings revealed that there was a statistically significant inverse correlation between nurses’ years of experience in nursing and risk of violence. This finding supported by that of \((26)\) who reported that there was a statistically significant
inverse correlation between nurses’ years of experience in nursing and risk of violence. The study results revealed that there were statistically significant inverse correlations between nurses’ years of experience in the EDs and exposure to violent events by the coworkers. This finding is supported by that of (27) who concluded that there was a significant negative correlation between nurses’ years of experience in the EDs and exposure to violent events by the coworkers. There was a statistically significant inverse correlation between nurses’ years of experience in the ED and intention to leave the job. This finding is supported by (28) who concluded that there was a negative correlation between the years of experience in the ED and the turnover intention of nurses. The study findings revealed that there was a statistically significant inverse correlation between nurses’ years of experience in the ED and risk of violence. This finding is supported by that of (29) who concluded that there was a significant negative correlation between nurses’ years of experience in the ED and risk of violence. There was a statistically significant positive correlation between nurses’ years of experience in the ED and risk of violence. This finding could be explained as that the longer the duration of work the nurses have in the ED, the greater the burnout they may experience. This finding is congruent with that obtained by (30) who concluded that the majority of nurses had reported decreased job satisfaction which was mainly contributed by verbal violence (73%) of participants. There was a statistically significant positive correlation between nurses’ work hours and their exposure to violent event by the patient. This finding is supported by that of (31) who concluded that there was a positive correlation between the work hours and exposure to violence by patients. There was a statistically significant positive correlation between nurses’ work hours and risk of violence. This finding is supported by (32) who concluded that there was a significant positive correlation between nurses’ work hours and risk of violence.

Conclusions

1. The younger the nurses, the less the experience they have in nursing, the less the experience they have in the EDs, the greater the exposure to violence by coworkers and the risk of violence.
2. The younger the nurses age, the less the experience they have in the ED, and the greater the intention to leave the job.
3. The longer the work hours, the greater the exposure to violent events by the patients, and the risk of violence.

Recommendations:

1. It is necessary for the top management in the hospitals to provide as optimal nursing staffing as possible in the emergency departments.
2. Offer training to nurses about predicting, recognizing, and managing assaults, resolving conflicts to increase their ability to deal and manage the workplace violence.
3. Working to improve the security precautions in the hospital; particularly in the EDs to minimize the violent events.

Conflict of Interest: The researchers confirm that there is no any conflict of interest.

Source of Funding: This study is self-funded.

Ethical Clearance: The researchers obtained the ethical approval from the University of Baghdad, College of Nursing.

References


Assessment of Asthmas’ Quality Life Style among Children Aged 1-12 Years in Al Noor Pediatric Hospital in Hilla City

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2Lecture, M.Sc, Health Community/Nursing Department, Al-Furat AL-Awsat Technical University,  
Babel Technical Institute, Iraq

Abstract

Objective: To assess the quality of lifestyle among asthmatic children.

Population and Method: A descriptive study carried out in Al Noor pediatric hospital in Hilla City, during the period 1/5/2020-30/5/2020, the population was (100) children aged 1-12 years; data were collected by questionnaire through direct interview with the mother or caregiver and the child.

Data analysis by using SPSS, Pearson’s correlation and chi-square were used to find associations between variables.

Results: The highest percentage (34%) of the study samples their age group (4-6, 10-12) years respectively and the age at onset asthma (60%) at (1-3) years. School grade: (68%) of study sample was elementary schools. Family history: (48%) they had history from grand mothers and fathers. Severity of asthma: (46%) of study sample have moderate attacks, the highest mean score for the Asthma attack triggers was (2.45); Change in daily life was (2.14); Family support was (2.71); Satisfaction with daily life was (2.32) and restriction in participating in physical education class was (2.33). significant correlation and severity of asthma with having cough because of sudden change in temperature, disturbance of sleep, unpleasant feeling to be told about asthma and Emergency visit to hospital.

Conclusion: The study concludes asthma has negative Impact on the quality of life style on children at home and school in various ways.

Keywords: Asthma, quality of life, QOLv.3.items.

Introduction

Asthma is a common chronic illness worldwide which increase reaction of the airways to numerous stimuli including allergens and irritants that cause obstructions of the airways. Contracting of muscles around the airway and infection result in swelling of the coating layers and increased secretion of mucous, so, there were difficulty in breathing and coughing. The most common causes of asthma are infection, exercise, allergens, and irritant air pollution. Children with asthma may have wheezing, coughing, shortness of breath, and chest tightness [1].

Asthma cannot be cured, but could be controlled. Asthmatic children have negatively impact of Health-related quality of life (HRQL) they are required to modify their mode of living to avoid its complications, and have negative impact on their psychological and social well-being.

The strongest risk factors for developing asthma are exposure, especially in infancy, to indoor allergens as domestic mites in bedding, carpets and stuffed furniture, cats and cockroaches; a family history of asthma [2]. Children have smaller airways than adults, which makes asthma especially serious for them. Children with asthma may experience wheezing, coughing, chest tightness, and trouble breathing, especially early in the morning or at night. In the United States, about 9 million children have asthma, which triggers by cold weather,
pet dander, and being around smoke. Pollutants can also make children more likely to have respiratory infections as like colds; pollutants can make the lungs even more sensitive to them \cite{3}. Also, triggers asthma are allergens- mold, pollen, animals, irritants-cigarette smoke, air pollution, weather-cold air, changes in weather, exercise, infections - flu, common cold \cite{2,4}.

**Method**

**Study design, setting, and population:** A descriptive study carried out in Al Noor pediatric hospital in Hilla City, during the period 1/5/2020-30/5/2020, the population was (100) children aged 1-12 years; data were collected by questionnaire through direct interview with the mother or caregiver and the child.

Data analysis by using SPSS (Statistical Package For Social Sciences)

**Study Tool:** By using modified the Quality of Life Questionnaire for Japanese School-aged Children with Asthma Version 3 (JSCA-QOL v.3)items scale.

**Data Analysis:** Descriptive statistics was done. Pearson’scorrelation and P value of ≤ 0.05 was considered statistically significant.

**Results**

The study assess of asthmas’ quality Life style among children aged 1-12 years, the highest percentage (34%) of study sample at age group (4-6,10-12) years respectively, and the age at onset asthma(60%) at (1-3) years. (68%) of study sample was elementary schools,(58%, 44%) of mothers and fathers had primary school and College and above graduate respectively. (48%) they had history from grand mothers and fathers. And Severity of asthma (46%) of study sample was moderate attacks,(Table (1)Table 2: shows the highest mean score for the Asthma attack triggers was (2.45); Change in daily life was (2.14); Family support was (2.71); Satisfaction with daily life was (2.32) and Restriction in participating in physical education class was (2.33).Table 3: shows significant correlation between age at onset asthma with age and Disturbance of sleep; Mother education with being absent from school; Father education with Having cough because of sudden change in temperature; and Severity of asthma with Having cough because of sudden change in temperature, Disturbance of sleep, Unpleasant feeling to be told about asthma and Emergency visit to hospital.

**Table (1): Distribution of study sample according to demographic data and the severity of asthmatic attack. (n=100)**

<table>
<thead>
<tr>
<th>Age/year</th>
<th>f.</th>
<th>%</th>
<th>Age at onset asthma/year</th>
<th>f.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3</td>
<td>4</td>
<td>4</td>
<td>1-3</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>4-6</td>
<td>34</td>
<td>34</td>
<td>4-6</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td>7-9</td>
<td>28</td>
<td>28</td>
<td>7-9</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>10-12</td>
<td>34</td>
<td>34</td>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School grade</td>
<td>f.</td>
<td>%</td>
<td>Family history</td>
<td>f.</td>
<td>%</td>
</tr>
<tr>
<td>Kindergarten</td>
<td>32</td>
<td>32</td>
<td>father</td>
<td>34</td>
<td>34</td>
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<tr>
<td>Elementary</td>
<td>68</td>
<td>68</td>
<td>mother</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>others</td>
<td>48</td>
<td>48</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational level for</td>
<td>Mother</td>
<td></td>
<td>Father</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f.</td>
<td>%</td>
<td>f.</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>58</td>
<td>58</td>
<td>44</td>
<td>44</td>
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</tr>
<tr>
<td>Secondary</td>
<td>14</td>
<td>14</td>
<td>16</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>College &amp; above</td>
<td>28</td>
<td>28</td>
<td>40</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Severity of asthma</td>
<td>Mild</td>
<td>%</td>
<td>Moderate</td>
<td>%</td>
<td>Sever</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
<td>46</td>
<td>46</td>
<td>44</td>
<td>44</td>
</tr>
</tbody>
</table>
Table (1) shows that the Age group (years): highest percentage (34%) of study sample their age group (4-6,10-12) years respectively, and the mean with SD. was 12.5 ± 7.14 and the age at onset asthma (60%) at (1-3) years.

School grade: (68%) of study sample was elementary schools;(58%, 44%) of mothers and fathers had primary school and College and above graduate respectively.

Family history: (48%) they had history from grand mothers and fathers.

Severity of asthma: (46%) of study sample was moderate attacks,

Table (2) : Distribution of study sample according to JSCA-QOL v.3. (N=100)

<table>
<thead>
<tr>
<th>JSCA-QOL v.3 items</th>
<th>Never</th>
<th>%</th>
<th>Some time</th>
<th>%</th>
<th>Always</th>
<th>%</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Asthma attack triggers.</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Having cough because of cigarette smoke.</td>
<td>2</td>
<td>4</td>
<td>11</td>
<td>22</td>
<td>37</td>
<td>74</td>
<td>2.7</td>
</tr>
<tr>
<td>2 Having cough in crowd.</td>
<td>2</td>
<td>4</td>
<td>25</td>
<td>50</td>
<td>23</td>
<td>46</td>
<td>2.42</td>
</tr>
<tr>
<td>3 Having cough because of sudden change in temperature.</td>
<td>9</td>
<td>18</td>
<td>21</td>
<td>42</td>
<td>20</td>
<td>40</td>
<td>2.2</td>
</tr>
<tr>
<td><strong>Total mean of score</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.45</td>
</tr>
<tr>
<td><strong>Change in daily life</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Being absent from school.</td>
<td>13</td>
<td>26</td>
<td>26</td>
<td>52</td>
<td>11</td>
<td>22</td>
<td>1.96</td>
</tr>
<tr>
<td>2 Unpleasant feeling to be told about asthma.</td>
<td>7</td>
<td>14</td>
<td>19</td>
<td>38</td>
<td>24</td>
<td>48</td>
<td>2.34</td>
</tr>
<tr>
<td>3 Disturbance of sleep.</td>
<td>21</td>
<td>42</td>
<td>0</td>
<td>0</td>
<td>29</td>
<td>58</td>
<td>2.58</td>
</tr>
<tr>
<td>4 Emergency visit to hospital.</td>
<td>3 6</td>
<td>16</td>
<td>32</td>
<td>31</td>
<td>62</td>
<td>58</td>
<td>2.56</td>
</tr>
<tr>
<td>5 Leaving school earlier.</td>
<td>30</td>
<td>60</td>
<td>14</td>
<td>28</td>
<td>6</td>
<td>12</td>
<td>1.52</td>
</tr>
<tr>
<td>6 Giving family trouble.</td>
<td>16</td>
<td>32</td>
<td>25</td>
<td>50</td>
<td>9</td>
<td>18</td>
<td>1.86</td>
</tr>
<tr>
<td><strong>Total mean of score</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.14</td>
</tr>
<tr>
<td><strong>Family support</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Family support when having an asthma attack.</td>
<td>3 6</td>
<td>1</td>
<td>2</td>
<td>46</td>
<td>92</td>
<td>2.86</td>
<td></td>
</tr>
<tr>
<td>2 Family’s careful consideration to prevent asthma attacks.</td>
<td>11</td>
<td>22</td>
<td>0</td>
<td>0</td>
<td>39</td>
<td>78</td>
<td>2.78</td>
</tr>
<tr>
<td>3 Being praised for making efforts toward asthma treatment.</td>
<td>3 6</td>
<td>18</td>
<td>36</td>
<td>29</td>
<td>58</td>
<td>2.52</td>
<td></td>
</tr>
<tr>
<td>4 Family support in daily life.</td>
<td>1 2</td>
<td>13</td>
<td>26</td>
<td>36</td>
<td>72</td>
<td>2.7</td>
<td></td>
</tr>
<tr>
<td><strong>Total mean of score</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.71</td>
</tr>
<tr>
<td><strong>Satisfaction with daily life</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Being as healthy as friends.</td>
<td>10</td>
<td>20</td>
<td>22</td>
<td>44</td>
<td>18</td>
<td>36</td>
<td>2.16</td>
</tr>
<tr>
<td>2 Enjoying daily life.</td>
<td>6</td>
<td>12</td>
<td>20</td>
<td>40</td>
<td>24</td>
<td>48</td>
<td>2.36</td>
</tr>
<tr>
<td>3 Enjoying at play.</td>
<td>9</td>
<td>18</td>
<td>17</td>
<td>34</td>
<td>24</td>
<td>48</td>
<td>2.3</td>
</tr>
<tr>
<td>4 Enjoying school life.</td>
<td>8</td>
<td>16</td>
<td>18</td>
<td>36</td>
<td>24</td>
<td>48</td>
<td>2.32</td>
</tr>
<tr>
<td>5 Enjoying what I want to do.</td>
<td>10</td>
<td>20</td>
<td>15</td>
<td>30</td>
<td>25</td>
<td>50</td>
<td>2.3</td>
</tr>
<tr>
<td>6 Spending daily life with satisfaction.</td>
<td>6</td>
<td>12</td>
<td>27</td>
<td>54</td>
<td>17</td>
<td>34</td>
<td>2.22</td>
</tr>
<tr>
<td>7 Having dreams or hopes for the future.</td>
<td>4</td>
<td>8</td>
<td>17</td>
<td>34</td>
<td>29</td>
<td>58</td>
<td>2.5</td>
</tr>
<tr>
<td>8 Spending daily life as well as friends does.</td>
<td>4</td>
<td>8</td>
<td>21</td>
<td>42</td>
<td>25</td>
<td>50</td>
<td>2.42</td>
</tr>
<tr>
<td><strong>Total mean of score</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.32</td>
</tr>
</tbody>
</table>
Table 2: shows the highest mean score for the Asthma attack triggers was (2.45); Change in daily life was (2.14); Family support was (2.71); Satisfaction with daily life was (2.32) and Restriction in participating in physical education class was (2.33).

Table 3: the correlation between some demographic data and JSCA-QOL v.3 items. (N=100)

<table>
<thead>
<tr>
<th>Correlation</th>
<th>Pearson correlation</th>
<th>Sig.(2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age*age at onset asthma</td>
<td>.290*</td>
<td>.041</td>
</tr>
<tr>
<td>Mother education*being absent from school</td>
<td>-.382**</td>
<td>.006</td>
</tr>
<tr>
<td>Father education*Having cough because of sudden change in temperature.</td>
<td>-.286*</td>
<td>.044</td>
</tr>
<tr>
<td>Severity of asthma*Father education</td>
<td>-.413**</td>
<td>.003</td>
</tr>
<tr>
<td>Severity of asthma*Having cough because of sudden change in temperature.</td>
<td>.306*</td>
<td>.031</td>
</tr>
<tr>
<td>Severity of asthma*Disturbance of sleep</td>
<td>.382**</td>
<td>.006</td>
</tr>
<tr>
<td>Severity of asthma*Unpleasant feeling to be told about asthma.</td>
<td>.485**</td>
<td>.000</td>
</tr>
<tr>
<td>Severity of asthma*Emergency visit to hospital.</td>
<td>0.329*</td>
<td>.020</td>
</tr>
<tr>
<td>Age at onset asthma*Disturbance of sleep</td>
<td>-.479**</td>
<td>.000</td>
</tr>
</tbody>
</table>

*significant at ≤0.05, **significant at ≤0.01

Table 3: shows significant correlation between age at onset asthma with age and Disturbance of sleep; Mother education with being absent from school; Father education with Having cough because of sudden change in temperature; and Severity of asthma with Having cough because of sudden change in temperature, Disturbance of sleep, Unpleasant feeling to be told about asthma and Emergency visit to hospital.

Discussion

Demographics of the Sample: The Age group (years): highest percentage (34%) of study sample their age group (4-6, 10-12) years respectively.

That agree with Iraqi Family Health Survey stated that the prevalence rates increase progressively with age and the age at onset asthma (60%) at (1-3) years. School grade: (68%) of study sample was elementary schools;(58%, 44%) of mothers and fathers had primary school and College and above graduate respectively. Family history: (48%) they had history from grand mothers and fathers and the Severity of asthma: (46%) of study sample was moderate attacks[5]. Also a study mentioned that parents’ educational level and family income were positively related to asthma control status[6].

A study found that parents with low educational levels are associated with medication underuse. Also, studies in the United Kingdom and Germany have revealed that severe asthma is correlated with decreasing socioeconomic status. Also, 61.7% of the patients had history of smoking exposure in their home having poor control asthma[1]. Go to:

Although little is known about the scope to which the age at asthma first began is associated with the presence, frequency, or severity of subsequent respiratory health outcomes [7].
Quality of Life as Assessed by JSCA-QOL v.3: The result of this study revealed that there were high negative impact among quality of life for asthmatic children that agree with study conducted by The American Lung Association, states about the secondhand smoke which estimated 400,000 to 1 million children with asthma and their condition worsened and The Centers for Disease Control and Prevention (CDC) state that children with asthma are more likely to have repetitive visit to hospital, emergency, and urgent care visits than adults with asthma[8].

The study shows significant correlation between age at onset asthma with age and Disturbance of sleep; Mother education with being absent from school; Father education with Having cough because of sudden change in temperature; and Severity of asthma with Having cough because of sudden change in temperature, Disturbance of sleep, Unpleasant feeling to be told about asthma and Emergency visit to hospital.

That result agree with study stated that Asthma influenced the life of the children physically, emotionally and socially and consequences of asthma on peer relationships, the dependence on medication, shortness of breath, cough, limitations in activities and limitations due to the response on cigarette smoke exposure[9].

Also, study mentioned that there were association between severity of asthma and child’s quality of life and between routine burden and quality of life in children with asthma[10].

A study showed that while parents of children with intermittent asthma and parents of younger children presented higher levels of caregiving burden,

Significant negative and positive associations were found between burden measurements and quality of life[11].

Also, study stated that Significantly poorer quality of life was observed in children with uncontrolled asthma (p = <0.001). Children with controlled and uncontrolled asthma were equally affected psychosocially with no relation between asthma control and their psychosocial well-being (p = 0.58)[12].

Children are underestimating the level of disease severity. The accurateness of symptom perception depends on cognitive and emotional state, previous life experiences, attributions, related information, attention and learning processes, and prior asthma attacks, the sensation of unpleasantness related to dyspnea, rather than its sensory strength, all that linked to affecting stimuli[13]. The cohorts study revealed that the average increasing incidence of 19.1%, but it keep on steady among children aged 3 years or older, and increased very quickly only among children over 3 years, from 1.3% (95% CI, 1.2-1.3) to 13.7% (95% CI, 13.5-13.9) (P < .0001)[14].

Conclusion

The findings shows significant correlation between age at onset asthma with age and Disturbance of sleep; Mother education with being absent from school; Father education with Having cough because of sudden change in temperature; and Severity of asthma with Having cough because of sudden change in temperature, Disturbance of sleep, Unpleasant feeling to be told about asthma and Emergency visit to hospital.

Recommendations: This study recommends further researches are needed to study the psychological effect of asthma, study the risk factors leading to poor asthma control.

Availability of data and materials

Available on reasonable request.

Author’s Contributions: All the authors are equally contributed to complete this research.

Acknowledgements: We wish to express our sincere appreciation to all study participants for their help and patience. We also thank and appreciate the nurses staff of Al Noor Pediatric Hospital in Hilla City, for assistant during data collection.

Funding: The authors did not receive any external funding for this work.

Conflicts of Interest: The authors declare no conflicts of interest regarding the publication of this paper.

Acknowledgment: The authors would like to thank all mothers and child who involve in this study.

Ethical Consideration: The researchers obtained an approval from Al Noor Pediatric Hospital in Hilla City. And the verbal approval of the mother’s participants in the research project.
Consent for Publication: Not applicable.

Competing Interests: The authors declare that they have no competing interests.

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The Biunik of Isotonic Safety with the Addition of Arabic Gum

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Abstract

Background: Endurance sports greatly affect fluid requirements. The exercise that is too heavy will cause a lot of body fluids to come out. Providing sports drinks with carbohydrate and electrolyte content has more benefits for athletes. One of them is an isotonic drink formula with the addition of gum Arabic. The food safety factor in isotonic drink formulas is very important to prevent side effects due to the contamination of food or beverages that can endanger health.

Objectives to determine the food safety of the isotonic drink formula with the addition of gum Arabic.

Method: This study is the pre-experimental. Food safety, which includes microbial and metal contaminants, was analyzed at the Makassar Health Laboratory Center. The results showed that the isotonic beverage formula with the addition of gum Arabic was safe from metal contamination.

Results of the microbial contamination test shows that Biunik (F1) is an isotonic drink formula with the addition of safe Arabic gum, while other formulas still exceed the quality requirements of isotonic drinks in Indonesia based on ISN 01-4452-1998.

Keywords: Gum Arabic, Food Safety, Isotonic Beverage Formula.

Introduction

Performance in sports is the main objective of a competition. Maximum achievement can be obtained if the athlete is in good nutrition. Exercise requires energy that is obtained from nutrients in the food or drinks consumed. So achievement and energy are inseparable. Nutritional needs for adolescent athletes are relatively greater in nutritional needs, because adolescents still experience a period of physical growth and development of very fast behaviors such as lifestyle, eating habits, eating behavior disorders, physical activity, and the frequency and duration of exercise¹,²

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DOI Number: 10.37506/mlu.v21i2.2698
that is entered. Dehydration can result in hyponatremia, hypoglycemia, hypokalemia so that athletes feel nauseous, dizzy, tired, and reduce the concentration (performance) of athletes during training or competitions. Sports drinks containing carbohydrates and electrolytes have even more benefits. In addition to providing a sweet taste, carbohydrates such as glucose, sucrose, and fructose are also useful for increasing energy, preventing hypoglycemia (decreased blood glucose), preventing weakness, and reducing stress hormone levels in the body. While the electrolyte content in it such as sodium, potassium, and chloride can prevent muscle cramps.\(^6\)

Food safety is a condition and an effort needed to prevent the possibility of contamination of biological, chemical, and other objects that can disturb, harm, and endanger human health. One aspect of food safety is carried out through food sanitation as an effort to create and maintain food conditions that are healthy, hygienic, and free from the danger of contamination. The food safety factor is very important for a food product, both food and beverage to prevent side effects due to food contamination that can endanger health.\(^7\)

Security dap is defined as a state free from the danger of injury or damage to the wearer. If the security aspect is not considered, then food or drink can turn into a source of disaster, a source of disease and death. There are three important things that can cause contamination in food and beverages. The first is handling food ingredients that do not comply with hygiene requirements. Second, in the processing process and the use of processing equipment and unclean presentation. Finally, when the food or drink is left idle or stored for too long at an inappropriate temperature.\(^8\)

The number of isotonic beverage products on the market has attracted researchers to determine the safety of isotonic drink formulas that use local food ingredients, namely purple sweet potatoes. This isotonic drink formula is a development of Justin’s research results (2019), to produce a sports drink formula based on purple sweet potato, there is still starch deposits in the resulting drink, so the addition of a stabilizer is required in the manufacturing process. One of the stabilizers that meet these requirements is gum Arabic. This study aims to determine the food safety of the isotonic drink formula with the addition of gum Arabic. Food safety in question is metal contamination and microbial contamination.\(^9\)

### Material and Method

This research is pre-experiment with a completely randomized design (CRD) that there are three treatment addition of gum Arabic, which is 0.1%, 0.2%, and 0.3% in the isotonic drink made from 75 grams of purple sweet potato. This research was conducted at the Food Technology Laboratory the Health Polytechnic of Makassar in February-September 2020. The materials used to make samples of isotonic drink formulas are purple sweet potato, sweet orange juice, sugar, table salt (NaCl), water, and gum Arabic. The tools used are a blender, cutting board, knife, sieve, scale, basin, gas stove, pan, squeezer, hand gloves, measuring cup, spoon, covered container, sample glass. Prepare all the ingredients and tools needed in the manufacture of an isotonic drink formula. The purple sweet potato is cleaned, then steamed for \(\pm 30\) minutes, skinned, and weighed as much as 75 grams for each formula. After the blend by adding m strangers each 250 ml mineral water. Sweet potato filtrate was filtered to obtain purple sweet potato juice. The purple sweet potato juice is heated for 1 minute, then cooled. After that, add 25 ml of sweet orange juice, sugar, table salt, and gum arabic. Stir until smooth, using a boxed bottle of plastic and glass bottles.

**Findings:** The safety of isotonic drink formulas is tested from metal contaminants and microbial contaminants to comply with SNI 01-4452-1998 regarding the quality of isotonic drinks. The metal contamination of the isotonic drink formula with the addition of gum Arabic which is done twice for each formula.

**Metal Contamination:** The result of metal contamination analysis using the atomization method in the isotonic drink formula with the addition of gum Arabic showed that the average results were below the ISN for isotonic drinks, namely for arsenic metal a maximum of 0.1 mg/kg, maximum mercury 0.03 mg/kg, maximum zinc 5.0 mg/kg, stannum maximum 40 mg/kg, maximum copper 2.0 mg/kg and maximum lead 0.3 mg/kg.

**Microbial Contamination:** The results of the Total Plate Count (TPC) of bacteria in the isotonic drink formula with the addition of gum Arabic showed that the TPC of bacteria for all formulas decreased from the results of the I test. The results of the TPC analysis for mold/yeast showed that the second TPC of mold/yeast
in the isotonic drink formula decreased the TPC of mold/yeast for the formula. F1 and F3. The increase in mold/yeast TPC was seen in the F0 and F2 formulas in examination II. While the results of the Salmonella Sp examination showed that no Salmonella Sp content was found in the isotonic drink formula with the addition of gum Arabic.

Table 01. Results of Metal Contamination and Microbial Contamination Analysis are appropriate SNI 01-4452-1998 Isotonic Drinks

<table>
<thead>
<tr>
<th>No.</th>
<th>Type of Test</th>
<th>F0</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>Unit</th>
<th>Requirements*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Metal contamination</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lead (Pb)</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
<td>0.05</td>
<td>&lt;0.01</td>
<td>mg/kg</td>
<td>max. 0.3</td>
</tr>
<tr>
<td></td>
<td>Copper (Cu)</td>
<td>0.34</td>
<td>0.24</td>
<td>0.21</td>
<td>0.23</td>
<td>mg/kg</td>
<td>max. 2.0</td>
</tr>
<tr>
<td></td>
<td>Zinc (Zn)</td>
<td>0.35</td>
<td>1.11</td>
<td>0.20</td>
<td>0.22</td>
<td>mg/kg</td>
<td>max. 5.0</td>
</tr>
<tr>
<td></td>
<td>Mercury (Hg)</td>
<td>&lt;0.0005</td>
<td>&lt;0.0005</td>
<td>&lt;0.0005</td>
<td>&lt;0.0005</td>
<td>mg/kg</td>
<td>max. 0.03</td>
</tr>
<tr>
<td></td>
<td>Tin (Sn)</td>
<td>&lt;0.36</td>
<td>&lt;0.01</td>
<td>6.60</td>
<td>&lt;0.59</td>
<td>mg/kg</td>
<td>max. 40 (20 *)</td>
</tr>
<tr>
<td>2</td>
<td>Arsenic</td>
<td>&lt;0.08</td>
<td>0.015</td>
<td>&lt;0.01</td>
<td>0.015</td>
<td>mg/kg</td>
<td>max. 0.1</td>
</tr>
<tr>
<td></td>
<td>Microbial contamination</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Plate Figures (TPL)</td>
<td>1.35 x 10^2</td>
<td>&lt;3.5</td>
<td>1.15 x 10^2</td>
<td>3.65 x 10^2</td>
<td>colony/ml</td>
<td>max. 2 x 10^2</td>
</tr>
<tr>
<td></td>
<td>Salmonella</td>
<td>negative</td>
<td>negative</td>
<td>negative</td>
<td>negative</td>
<td>/25g</td>
<td>negative</td>
</tr>
<tr>
<td></td>
<td>Mold/Yeast</td>
<td>6.1 x 10^4</td>
<td>&lt;1</td>
<td>1.3 x 10^5</td>
<td>&lt;1</td>
<td></td>
<td>max. 50</td>
</tr>
</tbody>
</table>

*National Standardization Agency of Indonesia

Discussion

Metal Contamination: The metal content of arsenic (As) in the isotonic drink formula with the addition of gum arabic (biunik). The result of the analysis is still within the recommended threshold in SNI 01-4452-1998, namely Max. 0.1 mg/kg. The concentration of As heavy metal contamination is still accepted in the four isotonic drink formulas with the addition of Arabic gum, making it safe for consumption. The mercury content in the four isotonic drink formulas with the addition of gum Arabic was still within the permissible threshold of <0.0005 µg/g on examinations I and II. The maximum allowable limit of mercury/mercury (Hg) contamination is Max. 0.03 mg/kg. The requirements for isotonic drinks according to the Indonesian National Standard (INS) 01-4452-1998, the maximum limit of Zn metal contamination is Max. 5.0 mg/kg. The results of the analysis show that the average levels of Zn in the four isotonic drink formulas with the addition of Arabic gum are between 0.20 mg/kg to 1.11 mg/kg (< 5.0 mg/kg), meaning that the isotonic drink formula is safe for consumption. The maximum B of Sn metal contamination is max. 40 (25.0 *) mg/kg in isotonic drinks according to INS 01-4452-1998. The analysis showed that the average Sn content in the four isotonic drink formulas with the addition of gum Arabic was <40 mg/kg, meaning that the isotonic drink formula was safe for consumption.

The requirement for isotonic drinks in SNI 01-4452-1998, the maximum limit of Cu metal contamination is max. 2.0 mg/kg. The results of the analysis showed that the average levels of Cu in the four isotonic drink formulas with the addition of Arabic gum were between 0.21 mg/kg to 0.34 mg/kg (< 2.0 mg/kg), which means that the isotonic drink formula is safe for consumption.

Lead (Pb) is a metal that has received major attention in terms of health, because of its impact on a large number of people due to poisoning of food or air contaminated with Pb and has dangerous toxic properties. Naturally, lead can be found in the soil, odorless, and tasteless. The INS 01-4452-1998 set of heavy metal contamination limits for lead in isotonic drinks are consumed by humans is a maximum of 0.3 mg/kg. The average value of lead-heavy metal content in the four isotonic formulas with the addition of gum
Arabic which has been analyzed is within the threshold so that it is safe for consumption.(8)

**Microbial Contamination:** The results of the analysis showed that the total average value of bacteria in the four isotonic drink formulas at examination I ($300 \times 10^5$ Colonies/g) was much greater than the maximum value of TPC for bacteria (Total Plate Numbers) required in SNI ($2 \times 10^2$ Colonies/g).(10) This means that this product is not safe for consumption. This data is the reason for the re-creation of the isotonic drink formula. Unlike the previous one, the formula is made and packaged using glass bottles. Before use, the bottles were sterilized at a temperature of $>100^\circ$ C for 15 minutes. Then, a microbiological analysis (examination II) was carried out at the Makassar Health Laboratory Center. Microbiology laboratory results showed that there was a drastic decrease in Bacterial TPC in all isotonic drink formulas. It is known that Bacterial TPC in F0, F1, and F2 is smaller than the maximum value of TPC for bacteria required in SNI for Indonesian isotonic drinks. This means that the formula is safe for consumption based on microbiological aspects. Bacteria TPC F3 ($3.65 \times 10^2$ colonies/g) has experienced a drastic decline but still exceeded the quality standard isotonic drinks ($2 \times 10^2$ colonies/g) if the review of aspects of microbiology.

This research is in line with the research of Rianti A, et al (2018) which showed that the results of TPC testing in green bean drink (GBD) samples showed that the contamination exceeds the maximum limit of microbial contamination. Meanwhile, the sample of soybean drink (SSD) and red bean drink (RBD) did not exceed the maximum limit of microbial contamination. The difference in the process of making SSD, RBD, and GBD samples lies in the type of material used. GBD samples were made with the addition of *pandanus*, while the SSD and RBD samples did not use these materials.(8)

Research on isotonic drink formulas with the addition of gum arabic in their packaging process is not good, so it can cause the risk of bacterial contamination. In making the first formula, drinks are packaged using plastic bottles that have been washed using soap and clean running water, then dried using dry *tissue*. No sterilization process is carried out on the bottles used. Unlike the second formula, the drinks are packaged using glass bottles that have been washed using soap and clean running water, then sterilized at a temperature $>100^\circ$ C for 15 minutes. The results of the microbiological quality analysis showed that the total fungi/yeast F1 and F3 had met the standards set in INS for Indonesian isotonic drinks. Microbiologically, the formula is safe for consumption. In contrast to F0 and F2, the amount of mold and yeast in the formula exceeds the set standard (maximum 50 Colonies/g). The quality requirements contained in INS 01-4452-1998 require negative isotonic drinks *Salmonella* Sp. The results showed that the isotonic drink formula with the addition of gum Arabic was not contaminated with *Salmonella* sp.(1,11)

**Ethic:** This study has been approved by the Makassar Health Polytechnic Ethics Committee with the reference number:: 0087/KEPK-PTKMS/III/2020

**Conflict of Interest:** The researcher states there is no conflict of interest

**Source of Funding:** Self or other source

Funding from The Health Polytechnic of Makassar,

**Conclusion**

The results of the research show that theBiunik with the addition of gum arabic is safe from metal contamination in accordance with the SNI requirements for isotonic drinks. If assessed based on microbial contamination, F1 is an isotonic beverage formula with the addition of Arabic gum which is safe from microbial contamination.

**References**

5. Vogel RM, Joy JM, Falcone PH, Mosman MM,


Association of Genetic Polymorphism of Insulin Receptor Substrate 1 (IRS-1) with Polycystic Ovary Syndrome Pathogenicity in Iraqi Women

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Abstract

Background: Insulin receptor substrate 1 (IRS-1) is an intracellular signaling adapter protein that integrates and coordinates multiple biologically key extracellular signals within the cell, is also a key central receptor in insulin signaling, and plays a focal role in maintaining essential cellular capabilities, e.g., survival, development and digestion system. IRS1 is essentially found in the cytoplasm but localization in nucleus may occur in some cell types and under certain stimuli.

Materials and Method: A total of 104 healthy control and 215 Iraqi women have Polycystic ovary syndrome (PCOS) aged 20–40 years who was admitted to conducted a prospective clinical study at kerbala gynecology teaching hospital, it was measured the genotype distribution of the rs2943641 T to C substitution of IRS1 and the effects of genotypes on Polycystic Ovary syndrome Pathogenicity in Iraqi women,

Results: Analyses were conducted to assess the association between the SNP rs2943641 [TT (Wild type), TC (heterozygous type), and CC (mutated type)], with the pathogenesis of PCOS according to logistic regression results. This survey demonstrated that there was no significant association between different alleles for this SNP with the pathogenesis of PCOS

Conclusion: Genetic polymorphism with IRS-1 may be associated with metabolic disturbance but not Polycystic Ovary syndrome in Iraqi women.

Keywords: Polycystic Ovary Syndrome, Pathogenicity, Genetic Polymorphism, Insulin Receptor Substrate 1.

Introduction

Polycystic ovary syndrome (PCOS) is highly prevalent hormonal disorder among reproductive-aged women. Its clinical manifestations are heterogeneous(1).

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susceptibility to insulin resistance and PCOS, Molecular scanning of the IRS1 gene has showed substitutions of several amino acid\(^3\). Insulin Receptor Substrate 1 (IRS1) polymorphism significantly decrease insulin-dependent receptor tyrosine autophosphorylation and increase Insulin-independent receptor serine phosphorylation markedly\(^3\). These serine phosphorylation inhibit normal receptor signaling and make the primary defects in insulin-stimulated glucose transporters (GLUT4) production\(^4\). Decreased glucose uptake may result from suppressed insulin signaling or impaired glucose transporter (GLUT) 4 trafficking. In adipocytes of women with PCOS that decrease insulin responsiveness\(^5\).

**Materials and Method**

**Sample Collection:** A total of 104 healthy control and 215 Iraqi women with PCOS, aged 20–40 years old have been recorded the PCOS subjects had at least two of the following signs: 1) chronic oligoanovulation 2) hirsutism or increased serum total testosterone levels; and 3) polycystic ovarian morphology at ultrasound, according to the Rotterdam consensus. Conference criteria (6). The protocol was approved by the local Ethics Committee, and all women gave written informed consent.

**Polymerase chain reaction:** The human genomic DNA extracted from whole blood by using genomic DNA extraction kit (G-DEX llb Introne, korea), according to the manufacture company, the purity and concentration of DNA obtaining was determinate by nanodrop apparatus (biobase, china). Polymorphism of IRS1 gene was detected by amplification refractory mutation system (ARMS) polymerase chain reaction (PCR). Nucleotides primers were designed through Primer-BLAST allows users to design new target-specific primers according to the websites (https://www.ncbi.nlm.nih.gov/tools/primer-blast/index.cgi) it is also prepared by (Bioneercom.Korea) company as the following (Table 1)

Optimization of PCR reaction was recorded as initial denaturation for 3 min at 94 °C, followed by 35 cycles consist of second denaturation for at 94 °C 30 seconds, 45 second at 56 °C, first extension 55 seconds at 72 °C, then last extension at 72 °C for five minutes. The amplification of insulin receptor substrate 1 was run electrophoresis in the 1.5% concentration of agarose gel at 70 V for 60 min after stained with 2 μL ethidium bromide, the product size was visualized under Ultraviolet.

**Statistical Analysis:** Statistical analysis were used by software SPSS program version 20, Test for Hardy-Weinberg equilibrium in controls and allelic or genotypic association in cases versus control were evaluated by Chi – square (\(x^2\)) test. This analysis was performed for all genotypes in this study using Hardy-Weinberg equilibrium online calculator. To assess the predictability of PCOS, logistic analysis of SNP was applied, this yielded odds ratio (OR) also the 95% confidence interval of the OR was calculated which is good estimator for the significance of the OR; when the value of “one” included within interval, this is an indicator that the OR is not significant. All statistical procedures and tests were applied under a level of significance (P-value) of less than 0.05 to be considered as significant difference or correlation.

<table>
<thead>
<tr>
<th>Primers sequences of IRS1 rs2943641 Alleles T &gt; C</th>
<th>Sequence</th>
<th>Product size (bp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>O-F</td>
<td>TGGTTCTGTAACTGGGTG</td>
<td>537</td>
</tr>
<tr>
<td>O-R</td>
<td>AGTTGAAGTAGCCATCTTC</td>
<td>537</td>
</tr>
<tr>
<td>Allele T</td>
<td>ATCAGGCCCTAATAGTTAGAGA</td>
<td>387</td>
</tr>
<tr>
<td>Allele C</td>
<td>GTTGGAAATGAGAGGAACC</td>
<td>190</td>
</tr>
</tbody>
</table>

O-F: Outer forward; O-R: Outer Reverse

**Results and Discussion**

PCOS is a polygenic endocrine and metabolic disorder. The prevalence of PCOS has grown rapidly. Several genetic polymorphisms have already been enrolled in the pathogenesis of PCOS\(^7\). The IRS-1 gene has been considered to be a candidate gene for the etiology of metabolic diseases such as type 2 DM,
PCOS, and obesity. The presence of polymorphisms of the IRS-1 gene has been documented to be associated with the development of IR. The IRS-1 gene located on chromosome 2q36 is the substrate for the insulin tyrosine kinase receptor, responsible for insulin signaling. The protein is expressed in multiple cells and tissues sensitive to insulin. Binding of insulin to its receptor activates phosphorylation of cytosolic substrates of IRS-1\(^8\). IRS-1 activation is a first step in the insulin signaling pathway, and functional studies of polymorphism in the IRS-1 gene showed weak insulin signals through the PI3-kinase pathway\(^9\).

Analyses were conducted to assess the association between the SNP rs2943641 with the pathogenesis of PCOS according to logistic regression and (Figure 1). This survey demonstrated that there was no significant association between different alleles for this SNP with the pathogenesis of PCOS, (Tables 2 and 3).

The exact cause of PCOS is unknown, but several studies suggest a strong genetic component that is affected by gestational environment and lifestyle factors, or both\(^10\). Thus, numerous genetic variations have been related to the presence of PCOS in different populations\(^11\). In the present study, we investigated the possible association between the single nucleotide polymorphisms (SNPs) (rs2943641) of the IRS1 gene and susceptibility to PCOS in Iraqi women, (TT wild type, TC heterozygotes, and CC mutated form for the two SNPs). The frequencies of SNP rs2943641 variant observed in our study were not significantly different between PCOS and healthy control women (11.5% vs. 12.1%, \(P= 0.368\)) as shown in table (2). Our data revealed that the IRS-1 polymorphism (rs2943641) is not associated with increased susceptibility to PCOS in Iraqi populations. However, we cannot exclude the possibility that other genetic polymorphisms of the IRS1 family are associated with PCOS and might be clinically useful as markers to assess the disease risk, as polymorphism of Gly972Arg that could play a contributory role in the pathophysiology and risk of PCOS \(^12\). But C allele of rs2943641 is associated with increased hyperinsulinemia and impaired insulin sensitivity\(^13\).

### Table 2. Distribution of SNP rs2943641 in the healthy control group and polycystic ovary syndrome group.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Control</th>
<th>PCOS</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>104</td>
<td>215</td>
<td>-</td>
</tr>
<tr>
<td>SNP1 (rs2943641)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TT (Wild type)</td>
<td>24 (23.1%)</td>
<td>65 (30.2%)</td>
<td>0.368</td>
</tr>
<tr>
<td>TC (Heterozygotes)</td>
<td>68 (65.4%)</td>
<td>124 (57.7%)</td>
<td></td>
</tr>
<tr>
<td>CC (Mutant)</td>
<td>12 (11.5%)</td>
<td>26 (12.1%)</td>
<td></td>
</tr>
</tbody>
</table>

### Table 3. Logistic analysis of SNP rs2943641 to predict polycystic ovary syndrome pathogenesis.

<table>
<thead>
<tr>
<th>SNP1 (rs2943641)</th>
<th>OR (95% CI)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TT (Wild type)</td>
<td>1.0 (reference value)</td>
<td>-</td>
</tr>
<tr>
<td>TC</td>
<td>0.67 (0.39 – 1.17)</td>
<td>0.161</td>
</tr>
<tr>
<td>CC</td>
<td>0.80 (0.35 – 1.83)</td>
<td>0.598</td>
</tr>
</tbody>
</table>

Figure 1. ARMS-PCR amplification of IRS1 gene T> C showing the outer primer 537 bp in size, T allele is 387 bp in size while C allele is 190 bp in size.
Conclusion

Polycystic ovary syndrome is associated with hyperinsulinemia and insulin resistance that affected by insulin receptor substrate 1 (IRS1) protein, this protein is an important intermediate in insulin signaling and plays a key role in maintaining the basic function of the cell, so any polymorphism in IRS1 genes acts as a competitive inhibitor of the insulin receptor. IRS1 rs2943641 polymorphism may associated with susceptibility to insulin resistance but not poly cystic ovary syndrome in Iraqi women.

Ethical Clearance: Informed consent was obtained from all participants, Data were collected in accordance with declaration of Helsinki of the World Medical Association, 2013, all other ethical issues were approved by the authors from the University of Kerbala

Conflict of Interest: Authors Declared none.

Funding: None

Self-funded by corresponding author.

Reference

Assessment the Content of Methanil Yellow and Boraks at Traded Food Market in Makassar

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Abstract

The market is one of the public places frequented by the public, thus allowing transmission of the disease both directly and indirectly through vectors such as flies. Market cleanliness must be kept clean so that food contamination is less likely to occur so that the food to be consumed remains good, clean and safe to eat. This research to identify boraks and methanil yellow. The sample is a portion taken from the whole object under study and is considered to represent the population. Sampling in this study was conducted by total sampling for interviews with hawker food vendors. Food samples to see the content of Borax and 3 food and beverage samples to see the content of Rhodamin B. The content of Borax and Rhodamin in street food vendors in the Eggplant Market shows that 6 traders who tested the content of Borax on meatballs obtained negative results, while for 3 traders tested the content of Rhodamin B in food sold obtained positive results or did not meet the requirements for consumption. Hygiene in serving food obtained that 20 (64.5%) hawker food vendors in the Eggplant Market did not meet the requirements. Hygiene and sanitation of sales locations shows that 20 (64.5%) of traders are in sales locations that are not good or have not met the requirements.

Keywords: Boraks, methanil Yellow, Personal hygiene.

Introduction

Food snacks as one of the community services in the field of food, which is often still far from meeting health requirements that cause disease to the community¹. By seeing the potential for such large food and high levels of vulnerability, efforts to monitor the quality of snacks are managed by taking into account hygiene and sanitation rules and health requirements. About 80% of food-borne diseases are caused by pathogenic bacteria. Some types of bacteria that often cause disease include: Salmonella, Staphylococcus, Escherichia coli, Vibrio, Clostridium, Shigella and Pseudomonas Cocovenenous¹²³.

Food outlets and food handlers available in public places should receive special attention from the government in order to present good and safe snacks for consumption. One of the public places where there are traders who provide various snacks is traditional markets such as the Makassar Terong Market Snacks sold in markets are needed considering the activity in the market occurs from morning and even usually happens in the afternoon. Snack food that is often sold in the market is cheap enough so that it is in demand by many people. Noteworthy is not only snacks at low prices but we also need to consider the cleanliness of these foods. Of course we want snacks that are cheap, tasty, also have good nutrition and hygiene and can support the health of the human body⁴⁵⁶.

Snack food is very risky for health such as infection by microorganisms, pathogens, poisoning, cancer risk and others that are not yet known by researchers. This risk can occur because of the lack of knowledge about the safety of snacks. These risks can be minimized if in the presentation, as well as at the time of distribution or sale are considered things that can cause health risks. Noteworthy is not only snacks at low prices but we
also need to consider the cleanliness of these foods\textsuperscript{7,8,9}. Of course we want snacks that are cheap, tasty, also have good nutrition and hygiene and can support the health of the human body. Snack food is very risky for health such as infection by microorganisms, pathogens, poisoning, cancer risk and others that are not yet known by researchers. This risk can occur because of the lack of knowledge about the safety of snacks. These risks can be minimized if in the presentation, as well as at the time of distribution or sale are considered things that can cause health risks\textsuperscript{10,11,12}.

There are quite a number of hawker food vendors in the Eggplant Market considering that the Eggplant Market is a fairly large traditional market and the activity of traders in the market sometimes takes place from morning to evening, it is possible that snacks sold can be contaminated with pollutants, bacteria or germs that can disturb health when consumed by humans\textsuperscript{13,14}. In addition, there are some hawker food traders who trade in places that are not good food at Pasar Terong quite a lot considering that Pasar Terong is a fairly large traditional market and the activities of traders in the market sometimes take place from morning to evening, do not rule out food snacks that are sold can be contaminated with pollutants, bacteria or germs that can interfere with health if consumed by humans. In addition, there are some hawker food traders who trade in places that are not good.

**Method**

The population is Snack food is very risky for health such as infection by microorganisms, pathogens, poisoning, cancer risk and others that are not yet known by researchers. This risk can occur because of the lack of knowledge about the safety of snacks. These risks can be minimized if in the presentation, as well as at the time of distribution or sale are considered things that can cause health risks.

**Result**

### Table 1: Distribution of Respondents Based on Hygiene and Sanitation Food Handler in Pasar Terong Bontoala District

<table>
<thead>
<tr>
<th>Food Handlers Hygiene</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Use of food tongs</td>
<td>12</td>
<td>38,7</td>
<td>19</td>
</tr>
<tr>
<td>The use of plastic gloves</td>
<td>3</td>
<td>9,7</td>
<td>28</td>
</tr>
<tr>
<td>Maintain cleanliness of nail</td>
<td>31</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Use of aprons</td>
<td>12</td>
<td>38,7</td>
<td>19</td>
</tr>
<tr>
<td>Wash hands before serving</td>
<td>2</td>
<td>6,5</td>
<td>29</td>
</tr>
<tr>
<td>Speak when serving</td>
<td>30</td>
<td>96,8</td>
<td>1</td>
</tr>
<tr>
<td>Use jewelry/accessories</td>
<td>15</td>
<td>48,4</td>
<td>16</td>
</tr>
</tbody>
</table>

### Table 2: Distribution of Respondents Based on Borax Content in Meatballs in Pasar Terong Bontoala District

<table>
<thead>
<tr>
<th>Code Sample</th>
<th>The Contant of Boraks</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>B 1</td>
<td>Negatif</td>
<td>Eligible</td>
</tr>
<tr>
<td>B 2</td>
<td>Negatif</td>
<td>Eligible</td>
</tr>
<tr>
<td>B 3</td>
<td>Negatif</td>
<td>Eligible</td>
</tr>
<tr>
<td>B 4</td>
<td>Negatif</td>
<td>Eligible</td>
</tr>
<tr>
<td>B 5</td>
<td>Negatif</td>
<td>Eligible</td>
</tr>
<tr>
<td>B 6</td>
<td>Negatif</td>
<td>Eligible</td>
</tr>
</tbody>
</table>
Based on Table 2 shows that the results of laboratory tests on the content of Borax on meatballs sold in the eggplant market are negative and do not contain Borax. Based on the results of laboratory tests obtained the results that the meatballs used as samples are free from borax content so that it is safe for consumption by the buyer (consumer).

Table 3: Rhodamin B content in cakes and ice in Pasar Terong Bontoala District Makassar

<table>
<thead>
<tr>
<th>Code sample</th>
<th>Information</th>
<th>Keterangan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Es “X”</td>
<td>Positif</td>
<td>Not eligible</td>
</tr>
<tr>
<td>K 1</td>
<td>Positif</td>
<td>Not eligible</td>
</tr>
<tr>
<td>K 2</td>
<td>Positif</td>
<td>Not eligible</td>
</tr>
</tbody>
</table>

Table 4: Shows that the results of laboratory tests on Rhodamin B content in cakes and ice sold Positive (+) containing Rodamin B Dyes

<table>
<thead>
<tr>
<th>Chemical Test</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not inspected</td>
<td>23</td>
<td>71.8</td>
</tr>
<tr>
<td>Not eligible</td>
<td>3</td>
<td>9.4</td>
</tr>
<tr>
<td>Eligible</td>
<td>6</td>
<td>18.8</td>
</tr>
<tr>
<td>Total</td>
<td>32</td>
<td>100</td>
</tr>
</tbody>
</table>

Discussion

Snack food ingredients are materials used in processing snacks. In terms of quality, in addition to containing all the substances needed by the body food must also meet safety requirements. Based on the results of research conducted on 31 respondents in the Terong Market Bontoala District of Makassar City, the results obtained are that most traders use natural ingredients/materials in accordance with the requirements of the Minister of Health Decree No. 942 of 2003. Laboratory test results regarding the content of borax in meatballs traders in the Terong Market, Bontoala District, Makassar, showed that 6 traders whose meat samples were taken as samples and had been examined in the laboratory showed negative results or no borax content in the meatballs.

The results of this study are not in line with research on the identification of snacks containing borax in traders in Semarang City markets. From the research results, it was found that there are 3 types of snacks that positively contain Borax, namely: gendar (100%) positively containing Borax, lopis (50%) containing Borax, and cenil (25%) containing Borax. Other types of snacks, namely: rice cake, sentiling, and putu mayang do not contain Borax. From the overall snacks sample studied, 29% contained Borax.

Laboratory test results regarding the content of Rhodamin B in 2 cake traders and one ice trader in the Terong Market in the Bontoala District of Makassar were obtained that all traders whose food samples were taken and examined in the laboratory showed positive results or contained Rhodamin B. The results of this study are in line with research conducted on the identification of snack foods containing Forbidden Dyes at traders in Semarang City Markets. From the results of the study it was found that 50% of the food samples studied contained dyes that could not be used in snacks, snacks containing prohibited dyes, namely: cenil, centiling, and putu mayang.

Rhodamin B synthetic dyes are found in food products that should be used for textile dyes. Although it has a low toxicity, consumption of large amounts or repeatedly causes cumulative properties of respiratory tract irritation, skin irritation, eye irritation, irritation of the digestive tract, poisoning, and liver disorders. From these results it was found that 24 (77.4%) traders were not tested for their food ingredients, because the tested foods were suspected of containing Borax and Rhodamin B. For testing Borax was taken from 6 meatball traders, while for Rhodamin B was taken from food are red and are thought to contain Rhodamin B. Based on the results of field observations made at the Terong Market in Bontoala District, Makassar City by researchers regarding hygiene in serving snacks, it was found that the majority of traders who served their food openly were 20 (64.5%), this meant that hygiene in serving snacks was served not eligible.

The Terong Market area is located in the middle of the city, where vehicles often pass by which can cause pollution or contamination of snacks sold by traders. Food outlets and food handlers available in public places should receive special attention from the government so that merchants serve good, safe food for consumption. Food contamination can occur due to poor sales locations, close to pollution sources such as high frequency traffic. Based on the results of research that has been done for the variable location of sales obtained that most of the traders maintain the cleanliness of their sales location, while traders who have a sales location are close to polluting sources as many as 20 (64.5%). This data is based on the results of direct observations and interviews, the location of the sales of hawker food...
vendors in Pasar Terong partly located beside the roads that are often traversed by vehicles, those that trade beside used clothing sellers (claws), and are right in front of the garbage dump.

The data illustrates that hygiene and sanitation of merchant sales locations in Terong Market, Bontoala District, Makassar City, the majority (64.5%) are not good or have not met the requirements for good, clean and safe street food sales. The results of this study are in line with the results of research conducted by Pratiwi (2012) on traders in the traditional market area of Kaliyoso Village. From the results of the study obtained a description that all traders (100%) in the Kaliyoso Traditional Market. Food hygiene sanitation in terms of sales location does not meet the requirements.

**Conclution**

1. The content of Borax and Rhodamin in street food traders that 6 traders tested the content of Borax on meatballs obtained negative results, while for 3 traders tested the content of Rhodamin B in food sold obtained positive results or did not meet the requirements for consumption.

2. Hygiene in serving food obtained that 20 (64.5%) hawker food vendors in the Eggplant Market did not meet the requirements.

3. Hygiene and sanitation of sales locations shows that 20 (64.5%) of traders are in sales locations that are not good or have not met the requirements.

**Source of Funding:** Self-funding

**Conflict of Interest:** None of the authors has competing interests.

**Ethical Clearance:** taken from Comitee ethical Clearence Universitas Muslim of Indonesia Makassar

**References**


Mapping Analysis Distribution of Microplastics at the Tallo River in Makassar

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Abstract

This aims of the study to identify spatial microplastic pollution sediments in the Tallo River Makassar City. This type of research is descriptive observational. This research design uses a Geographical Information System (GIS) Statistical analysis using the average abundance of microplastics is presented in tables and graphs, then analyzed descriptively quantitatively at each station. Data showing the mean ± standard deviation were analyzed using SPSS software. Based on the results of research that has been done, the number of microplastics found in the sediments in the Tallo River is 289. The highest micoplastic size found in the Tallo River sediments is 1.00-4.75 mm as much as 167 MP (58%) with an average abundance of 18, 56 ± 30,875 MP/kg. Followed by a size of <1 mm as much as 112 MP (39%) with an average abundance of microplastics 12.44 ± 17.686 MP/kg and sizes> 4.75 mm as much as 10 MP (3%) with an average abundance of microplastics 1.11 ± 2,315 MP/kg.

Keyword: Mapping, Microplastic, sediment, river.

Introduction

One of the results of environmental pollution is the accumulation of garbage. Waste production in Makassar City in 2018 was 1,261 tonnes/day (World Bank Group, 2018). This results in garbage entering the river body and ending up in the marine environment. The type of waste that dominates in the waters is plastic waste¹. In 2019, plastic contributed 60% - 80% of waste in the sea and is a threat to the ecosystem. Plastics that are degraded to MP <5 mm in size known as microplastics can accumulate in sediments and are consumed by marine organisms²,³,⁴.

The highest concentration of microplastics is found in the estuaries of many rivers. Population density, domestic discharge, industrial disposal and urban activities can be a contributor to microplastic pollution in sediments. Wind and currents also act as drivers for the distribution of microplastics. Coastal currents and wind transport can contribute to a higher distribution of microplastics at river mouths and adjacent to shore. Lack of proper plastics management could be a cause of transport and the relatively high abundance of microplastics in river estuaries⁵,⁶,⁷.

Microplastics are susceptible to sedimentation as evidenced by differences in the type and shape of the polymer. Microplastic size decreases with increasing microplastic concentration in water and sediment. Smallmicroplastic particles will take more time to settle than larger ones. Adverse human health impacts from the consumption of micro and nanoplastics in seafood can be caused by the plastic particles themselves or the inherent additives and contaminants such as Persistent, Bioaccumulative, and Toxic Substances (PBTs). Microplastic intake in humans from seafood has been estimated at 1 particle per day to 30 particles per day depending on seafood consumption habits and the organism’s exposure to microplastics⁸,⁹.

Microplastics contain a mixture of chemicals added during the manufacture of plastics which can become contaminated in the environment. These chemical additives include monomers, oligomers, plasticizers, and flame retardants. Meanwhile, contaminants that are
absorbed from the environment include Polychlorinated Biphenyls (PCBs), Polycyclic Aromatic Hydrocarbons (PAHs), Chlorinated Pesticides, and the Persistent Organic Pollutants (POPs) group. Persistent Organic Pollutants (POPs) are classified as Bioaccumulative Toxic Substances (PBTs) which have the ability to accumulate in organisms10,11.

One of the studies conducted stated that domestic discharge, surface runoff, municipal discharge and factory effluent were identified as important contributors to microplastic pollution in sediments. In addition, wind and currents are other drivers in the distribution of microplastics along river flows12,13. This study is consistent with the research that has been found that microplastics are found in the most sediments in the 2.45 and 4.75 size categories because they are influenced by their mass. A similar study was also conducted by Karthik, et.al. (2018), that among all classes, the MP size of microplastics between 1.18 and 2.36 mm shows the highest microplastic abundance in sediments in Indian waters2,4,15.

Effluent without proper treatment from Wastewater Treatment Plants significantly increases the abundance of microplastics in water and sediment. In addition, the activities of the plastics industry directly contribute to the load of microplastics downstream and water bodies. Recreational activities along the river contribute a large amount of plastic waste which is a direct source of microplastic11,14,16.

Tallo River is surrounded by rice fields, fishponds and some residential areas. In addition, along the Tallo River, there are several industries including Steam Power Plant (PLTU). The Tallo River is used as a disposal site for used cooling water, a carrier for industrial waste from households to the sea and as a means of transportation for fishermen, fishpond farmers and industry (Zainal and Awaluddin, 2018). Tallo River is used as a means of transportation and tourism activities, namely mangrove nature tourism, Lakkang tourism village, TirtaBugis Waterpark tourism, M; Tos shopping center, and historical tours of the tombs of the Tallo Kings. Based on this background, the researcher is interested in researching microplastic identification in the sediments in the Telloriver, Makassar city.

**Method**

This type of research is descriptive observational. This research design uses a Geographical Information Systems (GIS) approach. Collecting data using the exploratory method, namely direct sampling. The research was carried out in the Tallo City River in 2020.

The materials used for testing the sediment samples were sediment, NaCl solution, Aquabidest, aluminum foil, 47 mm Whatman Nitrocellulose filter paper, plastic samples, and label paper. Sediment sampling was carried out using a shovel with a depth of 3 cm. The sediment was then put into the plastic sample as much as 1 kg.

**Separation of microplastic particles from sediment is carried out in several steps, namely:**

(a) Drying was carried out in an oven at 75oC until the water content of the sediment ran out.

(b) Reduction of the volume of dry sediment was carried out by sieving (size 5 mm). The sieve sample was put into an Erlenmeyer flask.

(c) Density separation was carried out by mixing a 100 gram dry sediment sample and a saturated NaCl solution (300 gr NaCl + 1 liter Aquabidest) with an estimate of 3 times the sample volume. Then the mixture was stirred using a Shaker Rotator H-SR-200 for 2 minutes. The sample is then left for 12 hours to form a supernatant.

(d) Filtering was done by filtering the supernatant using Whatman Nitrocellulose 47 mm with the aid of a vacuum pump.

(e) Visual sorting. Microplastic particles were sorted visually using a stereo microscope and microplastic observations were made.

**Result**

The proportion of the number of microplastics contained in the sediment samples at each station is as follows.
Figure 1 Proportion of Microplastic Data in the Sediment

Based on Figure 1 shows, the proportion of the number of microplastics in the sediment at station 1 is 0.7%, station 2 is 4.5%, and at station 3 is 94.8%.

The proportion of the amount of microplastic contained in the sediment sample is based on its shape as follows.

Figure 2 Proportion Data of the Amount of Microplastic in the Sediment

Based on Figure 2, the proportion of the amount of microplastics in the sediment in the Tallo River based on its shape is 80% fragment shape, 4% foam, 7% film and 9% line.

Figure 3 Proportion of the Amount of Microplastic in the Sediment
Based on Figure 3 shows that the proportion of the amount of microplastic in the sediment in the Tallo River based on its color is white 14.9%, red 4.5%, transparent 36.0%, green 11.4%, blue 31.1%, black color 1.0%, 0.7% brown color, and 0.3% pigmented color.

Based on Figure 3, it shows the distribution of microplastic pollution in the sediments in the Tallo River, namely at station 1 point 1 as much as 1 MP (0.3%), point 2 as much as 1 MP (0.3%) and point 3 microplastics are not found. As for station 2, point 1 is 4 MP (1.4%), point 2 is 1 MP (0.3%) and point 3 is 8 MP (2.8%). Meanwhile, at station 3, point 1 is 38 MP (13.1%), point 2 is 107 MP (37%) and point 3 is 129 MP (44.6%).

**Discussion**

Based on the research results, the forms of microplastics found in sediments are fragments, foam, film, and line. The shape of the fragments is a form that is found more in the Tallo River compared to other forms, namely as much as 231 MP (80%) with an average abundance of microplastics $25.67 \pm 40.811$ MP/kg.

This study is in accordance with the research microplastics found around Kupang and Rote are dominated by fragments. Fragments are pieces of plastic that have strong synthetic polymers such as drinking bottles and other plastic food packaging. That fragments contribute to the majority of microplastics in sediments and are followed by line shapes both at high tide and at low tide. The distribution of the size and shape of the microplastics in the sediments can be caused by various factors such as the source of the plastic, the quality of the debris, the degradation of macroplastics, the wind currents and the sinking rate of the plastics and the relative susceptibility to microbes $^{2,6,17,18}$.

Fragment microplastics are microplastics that come from anthropogenic activities such as household waste. Fragments can come from bottles, plastic bags and pieces of pipe pipe. Fiber microplastics come from synthetic fabrics, fishing boat waste and fishing gear such as fishing nets and fishing lines. This type of fiber can also be called a line. This type of film comes from food packaging. Meanwhile, fragments came from large plastic fractures. Fragments are microplastics derived from pieces of plastic products with strong synthetic polymers. Fiber or line comes from washing clothes, namely the residue of clothing yarn and plastic rope that is degraded and is also affected by fishing activities that come from fishing rods and nets. Films are microplastics that come from the cut and degrade of plastic bags $^{10,19,20}$.

Although foam forms have a lower number than fragments, lines and films, this shape also needs attention. A special structure with many cavities in it and is often
used for sound insulation, heat insulation and impact avoidance. This foam is widely used in packaging, auto components, clothing, and building equipment. Its brittle nature and low density make it easier to enter and float in water. The results of identification in this study, the color of the microplastics found in the Tallo River sediments are white, red, transparent, green, blue, black, brown and the color of the pigmentation results. The most dominant plastic color in the Ofanto River is transparent (56%), followed by black (35%). Microplastics can inherit color from the parent plastic product, but the color can change due to photodegradation and residence time in water. This shows the degree of fragmentation. Microplastic with a transparent color is the initial identification of the type of Polypropylene (PP) polymer and indicates the length of time the microplastic has been photodegradable by UV light. The black color can indicate the amount of contaminants absorbed in the microplastic and has the ability to absorb high pollutants which can affect the texture of the microplastic.9,14,18.

The high level of microplastics in the sediments illustrates that the microplastics originating from land are also high. In this study, the sediment sampling was carried out at three points per station. Based on the research results, at station 1 point 1 and point 2 it was found that each 1 MP (0.3%). Community activities at points 1 and 2 are still insufficient and far from residential areas. At point 1 is the Nipa-Nipa Regulated Reservoir Gazebo where the existing activities are only fishing activities for the surrounding community. Point 2 is to the east of the Nipa-Nipa Sewage Treatment Plant, which is under the Nipa-Nipa intersection. At this location it is still far from activities and residential areas. Whereas point 3 is a location very far from residential areas and is in the middle of a very large agricultural land. So that no microplastics are found at point 3 because there is no resident activity that produces plastic waste8,22.

At station 2 point 1, 4 MP (1.4%) was found which came from anthropogenic waste. Point 1 is located in a residential area so that the resulting waste is the result of resident activities. At point 2 it is found that 1 MP (0.3%) is lower than point 1. This is because the sampling location in point 2 is a location far from residential areas. The activities around point 2 are fishing activities and river transportation. Meanwhile, at point 3, Lakkang Island, the number of microplastics is higher than points 1 and 2, namely 8 MP (2.8%). This is due to the confluence of the pampang tributaries and tributaries of PT. KIMA so that plastic waste accumulates at point 3. In addition, Lakkang Island is a residential location that does not have a Final Disposal Site (TPA) so that the resulting waste is dumped directly into the river.

**Conclusion**

The number of microplastics found in sediments in the Tallo River was 289 particles. The microplastic forms identified were fragment, foam, film and line. The colors of microplastics identified were white, red, transparent, green, blue, black, brown and pigmented colors. The microplastic sizes identified were <1 mm and 1.00-4.75 mm and> 4.75 mm.

**Source of Funding:** Self-funding

**Conflict of Interest:** None of the authors has competing interests

**Ethical Clearance:** Taken from Comitee ethical Clearences of Universitas Muslim of Indonesia Makassar

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Assessment of Nursing Care Provided to Hospitalized Children Burn Patients at Burn and Plastic Surgery Center at Kirkuk City

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Abstract

Background: Burns are the foremost important causes of a child’s injury that lead to a considerable health problem; social, functional, and psychological weakness. They are the leading reason of hospitalization and are associated with significant morbidity and mortality.

Objectives: This study aimed to assess the quality of nursing management and to find out association between nurses’ sociodemographic data and quality of nursing management provided to admitted children Azadi Teaching Hospital in Kirkuk city-Iraq.

Method: A descriptive design (quantitative approach) was carried out from January 1st to 20th of October 2020. A non-probability (purposive sample) sampling technique utilized to collect data from (48) nurses working in burn and plastic surgery center in Azadi teaching hospital in Kirkuk city. A questionnaire was designed and constructed for the purpose of the study. Statistical analysis was performed using (SPSS) software (V.26). Comparison was carried out using Chi-square (X²) and T test for determination of the P. value.

Results: The study sample revealed that the majority of the sample were in age group (21-30) years old represent (47.9 %), and (60.4 %) of the participants were female. The most striking results emerged from the data is that the majority of the participants have a good level of the practices in relation to nursing management of major burns at admission (54.17%). The results also show a significant association between the nurses’ practices at admission and their age, gender, number of courses training.

Conclusion: Training courses have significant effects on nurses’ practices at admission. Further studies are required to find the effectiveness of intervention that involve nurses’ practices for children with burn injuries.

Keywords: Children, Burn, Nursing Management, Plastic Surgery, Quality.

Introduction

Burns are some of the foremost devastative injuries a child can have. These traumas occur when there’s skin contact with hot liquid: hot surfaces/objects, chemicals, radiation or electricity and skin damage can furthermore results from cold and friction injures. Burn injuries are ranked fourth among acute injuries within the world. The majority of burns are being minor (<10%) total body surface area (TBSA). However a big number of kids sustain burns >15% (TBSA), leading to the initiation of the systemic inflammatory response syndrome. These patients require resuscitation. Delays in resuscitation may result in increased complications and mortality.

World Health Organization definition of quality of management is “the extent to which health care services provided to individuals and patient populations improve desire health outcomes. In order to perform this, health
care must be safe, effective, timely, efficient, equitable and people-centered”.

Pediatric nurses have provocation and responsibility to give assistance to burn children efficaciously. Care of burnt children classified into prehospital care (first aid and transportation to burn unit) and hospital care (wound care, prevention of complication and nutrition support likewise the rehabilitation and psychosocial counseling). Primary assessment of patients with acute burns starts with airway patency and cervical spine protection, assess breathing, circulation, and cardiac status; stabilize any disability, deficit, or gross deformity; and assess the extent of burns and concurrent injuries. The secondary assessment must not begin until the primary assessment is complete. This assessment includes a whole history, instance information about the burn injury, head-to-toe physical examination, accurate calculation of the percentage (TBSA) affected, fluid resuscitation requirements, and wound care. To found the percentage of (TBSA) involved in a burn injury, as this value is use for fluid resuscitation, transfer decisions, further management, prognosis, and research. The useful method of estimation of burned (TBSA) are palm method, rule of nines method, and the Lund and Browder (LB) chart.

Material and Method

A descriptive design (Quantitative approach) was carried out from January 1st to 20th of October 2020 in burn and plastic surgery center. This study aimed to assess the quality of nursing management provided to admitted children Azadi Teaching Hospital in Kirkuk city-Iraq. Burn and plastic surgery center is the only main center for burns that received patients inside and outside of Kirkuk city.

A non-probability (purposive sample) sampling technique utilized to collect data from (48) nurses working in burn and plastic surgery center. (10) Nurses sample for pilot study were included. They were selected according to certain criteria, which include at least one year of experience and worked at burn centers in the hospitals that have such facilities to provide burn nursing.

A questionnaire was designed and constructed for the purpose of study. It is composed of two parts. Overall variables (42) items.

Part I: Socio-demographic Data of Nurses: This part of questionnaire is includes eight variables for the socio-demographic characteristics of nurses who working in burn and plastic surgery center.

Part II: Nursing Management of Child with Major Burn at Admission to Burn and Plastic Surgery Center: This part of questionnaire form is observation checklist which contains information about nursing management for children with burn when admission to burn and plastic surgery center. It is composed of (34) items and this part rated on (2) levels dichotomous scale which are indicated by score (2) for yes and score (1) for no. The total score ranged between (34-68). Therefore, the levels are poor practices when score (≤ 45.33), the levels are fair practices when score between (45.34 - 56.66), and the levels are good practices score (≥ 56.67).

Statistical Analysis: was performed using statistical package of social sciences (SPSS) software (V.26). Comparison was carried out using Chi-square (X²) and T test for determination of the P. value (P< 0.05 significant) and (P< 0.01 highly significant).

Result

The study sample revealed that the majority of the sample were in age group (21-30) years old represent (47.9%), (60.4%) of the participants were female, and (50%) of nurses were graduated professional diploma nursing degree. Plurality of the sample were the monthly income is between (601,000-900,000 ID per month) and (62.5%) of the participants had less than (5) years of experience at burn and plastic surgery center. (70.8%) of the sample were not participated in any courses of special training and (92.9%) of them participated in courses the number of courses is between (1-3) and the located inside of Iraq. Table 1.
### Table 1: Socio-demographic Characteristics of the Sample

<table>
<thead>
<tr>
<th>No</th>
<th>Variables</th>
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<th>%</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>(21-30) years</td>
<td>23</td>
<td>47.9</td>
</tr>
<tr>
<td></td>
<td>(31-40) years</td>
<td>17</td>
<td>35.4</td>
</tr>
<tr>
<td></td>
<td>(41-50) years</td>
<td>6</td>
<td>12.5</td>
</tr>
<tr>
<td></td>
<td>(51-60) years and more</td>
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<td>4.2</td>
</tr>
<tr>
<td></td>
<td>Mean = 33.02 SD ± 8.99</td>
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<td></td>
</tr>
<tr>
<td>2</td>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>19</td>
<td>39.6</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>29</td>
<td>60.4</td>
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<td>3</td>
<td>Education level</td>
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<td></td>
<td>Nursing preparatory school</td>
<td>17</td>
<td>35.4</td>
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<td>Professional diploma of nursing</td>
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<td>50</td>
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<tr>
<td></td>
<td>Bachelor of nursing science</td>
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<td>≤ 600,000 ID/month</td>
<td>17</td>
<td>35.4</td>
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<td>601,000-900,000 ID/month</td>
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<td>58.3</td>
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<tr>
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<td>901,000-1,200,000 ID/month</td>
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<td>4.2</td>
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<td>1,201,000-1,500,000 ID/month</td>
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<td>2.1</td>
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<td>≥1,501,000 ID/month</td>
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<td>5</td>
<td>Years’ of experience in burn center</td>
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<td></td>
<td>(1-5) years</td>
<td>30</td>
<td>62.5</td>
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<td></td>
<td>(6-10) years</td>
<td>15</td>
<td>31.3</td>
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<td></td>
<td>(11-15) years</td>
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<td></td>
<td>(16-20) years and more</td>
<td>2</td>
<td>4.2</td>
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<td>6</td>
<td>Participate in a training courses</td>
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<td></td>
</tr>
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<td></td>
<td>Yes</td>
<td>14</td>
<td>29.2</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>34</td>
<td>70.8</td>
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<td>6.1</td>
<td>Number of training courses</td>
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<td>(1-3) courses</td>
<td>13</td>
<td>92.9</td>
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<td>(4-6) courses</td>
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<td>7.1</td>
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<td>6.2</td>
<td>Location of training courses</td>
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<td>Inside of Iraq</td>
<td>13</td>
<td>92.9</td>
</tr>
<tr>
<td></td>
<td>Outside of Iraq</td>
<td>1</td>
<td>7.1</td>
</tr>
</tbody>
</table>

The study exhibit that (54.17%) were the nurses’ practices about items of nursing management for a child with the major burns at admission to burn and plastic surgery center were a high mean score. Table 2.

### Table 2: Distribution of Nurses’ Practices according to the Level and Mean Scores Nursing Management Provided at Admission to Burn and Plastic Surgery Center to Major Burned Children

<table>
<thead>
<tr>
<th>No</th>
<th>Items</th>
<th>Yes</th>
<th>No</th>
<th>M.S</th>
<th>Eval</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Airway maintenance with cervical spine control</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1</td>
<td>Inspect the airway for foreign material and any abnormal signs</td>
<td>39</td>
<td>9</td>
<td>1.81</td>
<td>High</td>
</tr>
<tr>
<td>1.2</td>
<td>Open the airway with a jaw thrust and chin lift</td>
<td>39</td>
<td>9</td>
<td>1.81</td>
<td>High</td>
</tr>
<tr>
<td>1.3</td>
<td>Stabilizing the neck for suspected cervical spine injury</td>
<td>23</td>
<td>25</td>
<td>1.48</td>
<td>Fair</td>
</tr>
<tr>
<td>2</td>
<td>Breathing and ventilation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 2.1 Administer oxygen
- Possibility: 48, Outcomes: 100, Probable: 0, Least Probable: 0, High
- Evaluation: High

### 2.2 Expose the chest to check expansion is adequate and bilaterally equal
- Possibility: 46, Outcomes: 95.8, Probable: 2, Least Probable: 4.2, High
- Evaluation: High

### 2.3 Elevation of the head and chest by 20-30° to reduce neck and chest wall edema
- Possibility: 37, Outcomes: 77.1, Probable: 11, Least Probable: 22.9, High
- Evaluation: High

### 2.4 Auscultate for breath sounds bilaterally
- Possibility: 13, Outcomes: 27.1, Probable: 35, Least Probable: 72.9, Low
- Evaluation: Low

### 2.5 Monitor respiratory rate
- Possibility: 30, Outcomes: 62.5, Probable: 18, Least Probable: 37.5, High
- Evaluation: Fair

### 2.6 Apply pulse oximeter monitor
- Possibility: 2, Outcomes: 4.2, Probable: 46, Least Probable: 95.8, Low
- Evaluation: Low

### 2.7 Monitor color of non-burnt skin in a non-breathing patient to check carbon monoxide poisoning
- Possibility: 42, Outcomes: 87.5, Probable: 6, Least Probable: 12.5, High
- Evaluation: High

### 3 Circulation with hemorrhage control

#### 3.1 Inspect for any obvious bleeding
- Possibility: 38, Outcomes: 79.2, Probable: 10, Least Probable: 20.8, High
- Evaluation: High

#### 3.2 Apply direct pressure to stop bleeding
- Possibility: 26, Outcomes: 54.2, Probable: 22, Least Probable: 45.8, Fair
- Evaluation: Fair

#### 3.3 Monitor the peripheral pulse for rate, strength and rhythm
- Possibility: 35, Outcomes: 72.9, Probable: 13, Least Probable: 27.1, High
- Evaluation: High

#### 3.4 Apply capillary blanching test
- Possibility: 5, Outcomes: 10.4, Probable: 43, Least Probable: 89.6, Low
- Evaluation: Low

#### 3.5 Elevate the limb to reduce edema and aid blood flow
- Possibility: 47, Outcomes: 97.9, Probable: 1, Least Probable: 2.1, High
- Evaluation: High

### 4 Disability: neurological status

#### 4.1 Monitor level of consciousness use the pediatric Glasgow Coma Scale
- Possibility: 38, Outcomes: 79.2, Probable: 10, Least Probable: 20.8, High
- Evaluation: High

#### 4.2 Examine pupil response to light for reaction and size
- Possibility: 8, Outcomes: 16.7, Probable: 40, Least Probable: 83.3, Low
- Evaluation: Low

### 5 Exposure, environmental control and estimate burn size

#### 5.1 Remove all clothing and jewelry
- Possibility: 48, Outcomes: 100, Probable: 0, Least Probable: 0, High
- Evaluation: High

#### 5.2 Keep patient warm to prevent hypothermia
- Possibility: 45, Outcomes: 93.8, Probable: 3, Least Probable: 6.3, High
- Evaluation: High

#### 5.3 Log roll patient to remove wet sheets
- Possibility: 36, Outcomes: 75, Probable: 12, Least Probable: 25, High
- Evaluation: High

#### 5.4 Examine posterior surfaces for burn and any injury
- Possibility: 30, Outcomes: 62.5, Probable: 18, Least Probable: 37.5, Fair
- Evaluation: Fair

#### 5.5 Estimate total body surface area burn size using Pediatric Rule of Nines or Lund and Browder chart
- Possibility: 35, Outcomes: 72.9, Probable: 13, Least Probable: 27.1, High
- Evaluation: High

### 6 Fluid resuscitation

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>M.S</th>
<th>Eval.</th>
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<tr>
<td>F</td>
<td>%</td>
<td>F</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>6.1 Insert two large bore peripheral IV lines, prefer through unburnt tissue</td>
<td>20</td>
<td>41.7</td>
<td>28</td>
<td>58.3</td>
</tr>
<tr>
<td>6.2 Send collect bloods simultaneously for essential baseline bloods and special for child patient check glucose levels</td>
<td>48</td>
<td>100</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6.3 Check patients body weight in kg</td>
<td>29</td>
<td>60.4</td>
<td>19</td>
<td>39.6</td>
</tr>
<tr>
<td>6.4 Commence resuscitation fluids, IV Hartmann’s solution at an initial rate of the Modified Parkland Formula</td>
<td>48</td>
<td>100</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6.5 Monitor urine output each hour, IV fluids adjusted according to the previous hour’s urine output</td>
<td>44</td>
<td>91.7</td>
<td>4</td>
<td>8.3</td>
</tr>
<tr>
<td>6.6 Give maintenance fluids in addition to resuscitation fluids for children less than 16 years old</td>
<td>27</td>
<td>56.3</td>
<td>21</td>
<td>43.8</td>
</tr>
<tr>
<td>6.7 Give more IV fluids for haemochromogenuria, inhalation injury, electrical injury and after delayed resuscitation</td>
<td>17</td>
<td>35.4</td>
<td>31</td>
<td>64.6</td>
</tr>
<tr>
<td>6.8 Follow up the IV fluids continuously and calculate the flow of fluid by drop/minute</td>
<td>43</td>
<td>89.6</td>
<td>5</td>
<td>10.4</td>
</tr>
<tr>
<td>6.9 Monitor vital sings</td>
<td>41</td>
<td>85.4</td>
<td>7</td>
<td>14.6</td>
</tr>
</tbody>
</table>

### 7 Nutrition
7.1 Monitor nutrition intake through nasogastric tube for larger burns (>10% TBSA in children) 41 85.4 7 14.6 1.85 High

8 Pain relief

8.1 Give morphine (or other appropriate analgesia) slow intravenously according physician prescription 26 54.2 22 45.8 1.54 Fair

8.2 Give analgesia in small increments according to pain score and sedation scale 2 4.2 46 95.8 1.04 Low

Mean score (M.S), Low: M.S = (1.00-1.33), Fair: M.S = (1.34-1.66) High: M.S = (1.67-2.00), Eva: Evaluation

**Figure 1:** The bar chart illustrates (54.17%) of nurses’ practices related nursing management of child with major burn at admission to burn and plastic surgery center were on good level.

Figure 1: Evaluation of Nurses Practices Regarding Nursing Management of Child with Major Burn at Admission to Burn and Plastic Surgery Center

The study showed that there is highly statistical significant association between the nurses’ practices at admission and their participated in courses training. Table 3.

**Table 3:** Associated between Nurses’ Socio-demographic Characteristics and their Level of Nurses Practice Regarding Nursing Management of Child with Major Burn at Admission to Burn and Plastic Surgery Center

<table>
<thead>
<tr>
<th>Nurses demographic characteristics</th>
<th>Nurses Practice Level Admission</th>
<th>P Value</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variables</td>
<td>Good</td>
<td>Fair</td>
<td>Poor</td>
</tr>
<tr>
<td>1- Age</td>
<td>F %</td>
<td>F %</td>
<td>F %</td>
</tr>
<tr>
<td>(20-30) years</td>
<td>7 30.4</td>
<td>16  69.6</td>
<td>0  0</td>
</tr>
<tr>
<td>(31-40) years</td>
<td>12 70.6</td>
<td>5  29.4</td>
<td>0  0</td>
</tr>
<tr>
<td>(41-50) years</td>
<td>5 83.3</td>
<td>1  16.7</td>
<td>0  0</td>
</tr>
<tr>
<td>(51-60) years</td>
<td>2 100</td>
<td>0  0</td>
<td>0  0</td>
</tr>
<tr>
<td>2- Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>14 73.7</td>
<td>5  26.3</td>
<td>0  0</td>
</tr>
<tr>
<td>Female</td>
<td>12 41.4</td>
<td>17  58.6</td>
<td>0  0</td>
</tr>
<tr>
<td>3- Education level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nursing preparatory school</td>
<td>8 47.1</td>
<td>9  52.9</td>
<td>0  0</td>
</tr>
<tr>
<td>Professional diploma of nursing</td>
<td>12 50</td>
<td>12  50</td>
<td>0  0</td>
</tr>
<tr>
<td>Bachelor of nursing science</td>
<td>6 85.7</td>
<td>1  14.3</td>
<td>0  0</td>
</tr>
</tbody>
</table>
In our study, the table 1 shows that the majority of the sample were in age group (21-30) years old represent (47.9%), and (60.4%) of the participants were female. Furthermore (62.5%) of the participants had less than (5) years of experience at burn and plastic surgery center. The present result disagree with Hassan (2015)\textsuperscript{10}, who mention (72%) of his sample are in age more than (30) years old and most of the nurses (80%) are male. Additionally, result of study agree with Hassan (2015)\textsuperscript{10}, accounted of (56%), in nurses’ burnout reports that the majority of the study sample have (2-6) years of experience.

The present study disclose the nurses’ practices regarding items of nursing management for a child with the major burns at admission in burn and plastic surgery center. (54.17%) Items in the table 2 is a high mean score that agrees with results of the study done by Youssef, & et al., (2019)\textsuperscript{11}, which found that (74%) of them had a competent level of practice regarding nurses’ care of pediatric burn. The study done by Lam, & et al., (2018)\textsuperscript{12}, found regarding fluid resuscitation method53.5% of nurses provided the correct answer which agree with current study.

The nurses practice regarding pain management is incommensurate in present study table 2 which agree with a study was done by\textsuperscript{13}, their found the minority of the staff regarded pain management as sufficient during dressing changes and after nursing care\textsuperscript{14} mentions in their study children are often exposed to painful procedures during hospitalization. The study illustrate result of association between nurses’ practices and participate in courses training of burn there was statistics high significant association which account the p value is 0.005. The outcome of the study disagree with previous study done by\textsuperscript{15}, there was no correlation found between total knowledge/practice score and number of seminars (r = 0.033, 0.144) respectively.

Majority of the sample were in age group (21-30) years old represent (47.9 %), and (60.4 %) of the participants were female. Also (70.8%) of the sample were did not participated in any courses of special training and (92.9%) of them participated in courses the number of courses is between (1-3) courses and the located inside of Iraq. Majority of nurses practices regarding nursing management for a child with the

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Discussion

In our study, the table 1 shows that the majority of the sample were in age group (21-30) years old represent (47.9%), and (60.4%) of the participants were female. Furthermore (62.5%) of the participants had less than (5) years of experience at burn and plastic surgery center. The present result disagree with Hassan (2015)\textsuperscript{10}, who mention (72%) of his sample are in age more than (30) years old and most of the nurses (80%) are male. Additionally, result of study agree with Hassan (2015)\textsuperscript{10}, accounted of (56%), in nurses’ burnout reports that the majority of the study sample have (2-6) years of experience.

The present study disclose the nurses’ practices regarding items of nursing management for a child with the major burns at admission in burn and plastic surgery center. (54.17%) Items in the table 2 is a high mean score that agrees with results of the study done by Youssef, & et al., (2019)\textsuperscript{11}, which found that (74%) of them had a competent level of practice regarding nurses’ care of pediatric burn. The study done by Lam, & et al., (2018)\textsuperscript{12}, found regarding fluid resuscitation method53.5% of nurses provided the correct answer which agree with current study.

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Conclusion

Majority of the sample were in age group (21-30) years old represent (47.9 %), and (60.4 %) of the participants were female. Also (70.8%) of the sample were did not participated in any courses of special training and (92.9%) of them participated in courses the number of courses is between (1-3) courses and the located inside of Iraq. Majority of nurses practices regarding nursing management for a child with the
major burns at admission in burn and plastic surgery center were on good level that accounted (54.17%).

There is statistical significant association between the nurses’ practices at admission and their age, gender, number of courses training and location of courses. Training courses have significant effects on nurses’ practices at admission. Further studies are required to find the effectiveness of intervention that involve nurses’ practices for children with burn injuries.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the University of Sulaimani College of Nursing Pediatric Nursing Department, Kurdistan Regional Government, Iraq and all experiments were carried out in accordance with approved guidelines.

References
COVID-19 Infection and its Relation to Preterm Delivery in Pregnant Women

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¹,²,³Lecturer, College of Medicine, University of Al-Fallujah, Iraq

Abstract

The study aims to find the relationship between COVID-19 virus infections and early births in women infected with this virus in Al-Fallujah city. The prospective study was conducted in Al-Fallujah city during the period between February 1, 2020, and September 1, 2020, at Al-Fallujah Teaching Hospital. Through the study, 100 pregnant women were received, complaining of Covid-19 infections, which were diagnosed in Al-Fallujah, and now Real Time PCR was confirmed through nasopharyngeal swabs that were taken from Al-Fallujah Teaching Hospital. The study also included measuring the level of blood pressure, sugar and C-RP in those women during the fifth to eight week, where we were infected, and then in the 12th week of pregnancy took place, where communication was made, and a level was measured, and as a result, these women who completed the period with a pre-term labor, miscarriage before the 24th week of pregnancy or those completed the period with successful pregnancy. In this study, 33% of COVID-19 pregnant women were within the age group 24-30 years followed by 30% in the age group 31-38 year. In this study, 10% of COVID-19 pregnant women suffer from hypertension, 13% were with Diabetes, 35% with UTI while 70% were suffered from fever. When reaching 24th week of pregnancy, and as shown in Table 3. The study showed that 40% COVID-19 pregnant women experienced completed the period with a pre-term labor, 10% was with miscarriage before the 24th week of pregnancy, while 50% of them completed the period continued the pregnancy. In this study, 82.5% of COVID-19 pregnant women with preterm labor were suffered previously from fever comparing with 55% of COVID-19 pregnant women without preterm labor. The study showed the highest mean of C-reactive protein was present COVID-19 pregnant women with preterm labor (22.5±2.14 mg/ml), fan lowest mean was in women who without preterm labor (14.6±2.11 mg/ml) (P<0.01).

Conclusions: The study showed a significant relation of COVID-19 infection with pregnant women who pre-term labor especially who have high body temperature.

Keywords: COVID-19; Preterm delivery; pregnant women; C-reactive protein.

Introduction

New Corona virus infections are considered one of the most deadly diseases in society these days, especially people who kill countries affected by the virus, and recent studies have indicated that there is a strong relationship between the high level of infection with Corona virus 19 failure to respect global health laws and follow the instructions that my son and use sterilizer and wash treatment With among people (¹). It is worth noting that one of the diseases associated with Virus Corona is chest infections and coughing that exacerbate cases of Covid 19 in society(²). As the Covid 19 virus is considered one of the most important diseases that have appeared in society and that do not affect all ages and genders, regardless of their living condition, but the role of immunity has a great role in expelling the virus or keeping it in a state that can multiply and affect a person’s health(³). There is no doubt that Corona injuries may lead to medicine for people, as the study indicated that Corona injuries are major problems, problems of pregnant women, which deal with miscarriage or early childbirth associated with high blood sugar or high blood...
pressure\(^{(4,5)}\). High temperatures in people with Covid virus 19 are tormented by one of the most important causes of respiratory disorder due to the high level of cytokinins like Interleukin 1 and Interleukin 6 and the C-reactive protein, which adversely affects the health condition through the cytokinin A storm in infected people \(^{(6,7)}\). Which may lead to health problems, especially in pregnant women, which may lead to abortion or premature labor in pregnant women\(^{(8)}\). The study aims to find the relationship between Covid 19 virus infections and early births in women infected with this virus in of Al-Fallujah city.

**Materials and Method**

The study was conducted in the city of Al-Fallujah during the period between February 1, 2020, and September 1, 2020, at Al-Fallujah Teaching Hospital. Through the study, 100 pregnant women were received, complaining of Covid-19 infections, which were diagnosed in Al-Fallujah, and now Real Time PCR was confirmed through nasopharyngeal swabs that were taken from Al-Fallujah Teaching Hospital. The study also included measuring the level of blood pressure, sugar and C-RP in those women during the fifth to eight week, where we were infected, and then in the 12th week of pregnancy took place, where communication was made, and a level was measured, and as a result, these women who completed the period with a pre-term labor, miscarriage before the 24th week of pregnancy or those completed the period with successful pregnancy.

**Results**

In this study, 33% of COVID-19 pregnant women were within the age group 24-30 years followed by 30% in the age group 31-38 year(Table 1).

**Table 1: Age characteristics of COVID-19 pregnant women**

<table>
<thead>
<tr>
<th>Age Groups (Years)</th>
<th>No (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>17-23</td>
<td>20</td>
</tr>
<tr>
<td>24-30</td>
<td>33</td>
</tr>
<tr>
<td>31-38</td>
<td>30</td>
</tr>
<tr>
<td>39-45</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

In this study, 10% of COVID-19 pregnant women suffer from hypertension, 13% were with Diabetes, 35% with UTI while 70% were suffered from fever.(Table 2).

**Table 2: Distribution of COVID-19 pregnant women according to different situations.**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Present</th>
<th>Absent</th>
<th>Absent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Hypertension</td>
<td>10</td>
<td>10</td>
<td>90</td>
</tr>
<tr>
<td>Diabetes</td>
<td>13</td>
<td>13</td>
<td>87</td>
</tr>
<tr>
<td>UTI</td>
<td>35</td>
<td>35</td>
<td>65</td>
</tr>
<tr>
<td>Fever</td>
<td>70</td>
<td>70</td>
<td>30</td>
</tr>
</tbody>
</table>

When reaching 24th week of pregnancy, and as shown in Table 3. The study showed that 40% COVID-19 pregnant women experienced completed the period with a pre-term labor, 10% was with miscarriage before the 24th week of pregnancy, while 50% of them completed the period continued the pregnancy.

In this study, 82.5% of COVID-19 pregnant women with preterm labor were suffered previously from fever comparing with 55% of COVID-19 pregnant women without preterm labor, Table 4.

**Table 3: Distribution of COVID-19 pregnant women according to pregnancy outcomes**

<table>
<thead>
<tr>
<th>Pregnancy outcomes</th>
<th>Cases</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miscarriage</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Preterm labor</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Continued pregnancy</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Total</td>
<td>35</td>
<td>100</td>
</tr>
</tbody>
</table>

\(X^2: 7.55\) P. value : 0.01
### Table 4: Relation of Fever with preterm labor among COVID-19 pregnant women

<table>
<thead>
<tr>
<th>Preterm labor</th>
<th>Fever (&gt;38°C) at 5-8th week of pregnancy</th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Present</td>
<td>Absent</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Yes</td>
<td>37</td>
<td>82.5</td>
<td>3</td>
</tr>
<tr>
<td>No</td>
<td>33</td>
<td>55</td>
<td>27</td>
</tr>
</tbody>
</table>

P < 0.001

The study showed the highest mean of C-reactive protein was present COVID-19 pregnant women with preterm labor (22.5±2.14 mg/ml), fan lowest mean was in women who without preterm labor (14.6±2.11mg/ml) (P<0.01), as shown in Table 5.

### Table 5: Relation of CRP level with preterm labor among COVID-19 pregnant women

<table>
<thead>
<tr>
<th>Preterm labor</th>
<th>C-Reactive protein (mg/ml)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Yes (n:40)</td>
<td>22.5</td>
<td>2.41</td>
</tr>
<tr>
<td>No (n:60)</td>
<td>14.6</td>
<td>2.11</td>
</tr>
</tbody>
</table>

P<0.001

### Discussion

In this study, 33% of COVID-19 pregnant women were within the age group 24-30 years followed by 30% in the age group 31-38 year(Table 1). Consistent with what our study has reached, many studies also found that most of the ages affected by the Corona virus here are pregnant women were less than 30 years old[6,7]. This age period is considered the most vulnerable to premature birth, as was proven in previous studies[8,9]. In this study, 10% of COVID-19 pregnant women suffer from hypertension, 13% were with Diabetes, 35% with UTI while 70% were suffered from fever.(Table 2). There is no doubt that among the most important problems that pregnant women face is high blood level, high level of diabetes, and also UTI[10]. Where previously conducted studies mentioned that most women with urinary tract infection are pregnant, and as the study indicated that most pregnant women with Coronavirus suffer from high levels of temperature due to infection with the Corona virus, which leads to high temperatures, coughing, shortness of breath, muscle and bone pain[10,11]. When reaching 24th week of pregnancy, and as shown in Table 3. The study showed that 40% COVID-19 pregnant women experienced completed the period with a pre-term labor, 10% was with miscarriage before the 24th week of pregnancy, while 50% of them completed the period continued the pregnancy. On the level of similarities, recent studies conducted this year indicated that most of the women infected with the Coronavirus, who were there during pregnancy, had suffered from pregnancy specialization disorders, including premature birth and abortion, as well as the problem of premature birth at least 40% of these women[12,13]. A study conducted in Wuhan stated that women infected with Coronavirus are more likely to have early labor due to the worsening of the health condition in pregnant women and due to elevated levels of cytokines that affect the baby health (2). In this study, 82.5 % of COVID-19 pregnant women with preterm labor were suffered previously from fever comparing with 55% of COVID-19 pregnant women without preterm labor, Table 4. From previous studies and from the information accumulated by everyone that repeated infections with the COVID-19 include high temperatures in infected people as well as other respiratory symptoms. They complain of high temperatures compared to women who are not enough in the asymptomatic infections[14,15]. Other scientists have instructed similar studies on high temperatures in patients with Covid 19 virus that may result from an elevated level of interleukin-16, CRP and TNF alpha[16,17]. The study showed the highest mean of C-reactive protein was present COVID-19 pregnant women with preterm labor (22.5±2.14 mg/ml), fan lowest mean was in women who without preterm labor (14.6±2.11 mg/ml) (P<0.01), as shown in Table 5. There is no doubt that the level of the reactive protein, a type that is high in infections and viral on the limit of the reactive protein, the type of disease of people with Covid 19 virus is a sign of the task of secondary bacterial infections in the respiratory, upper and lower system of people, the virus, especially since the infected are pregnant women, and pregnant women are known to suffer Those who have
it and the bacteria that infect them as a result these circumstances (18).

Conclusions

The study showed a significant relation of COVID-19 infection with pregnant women who pre-term labor especially who have high body temperature.

Conflict of Interest: None

Source of Findings: None

Ethical Clearance: None

References

Emergency Traumatic Patients, Study & Analysis in Nineveh Province in Iraq

Mohammed Salih Abdullah Ali¹, Zainab Saud Abdulaziz², Sara Raad Lahoob³, Azzawi M. Hadi³

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Abstract

Trauma is the medical problems associated with physical injury. This was a cross section study involve 250 trauma cases admitted to Alsalam and Aljumhoory teaching hospitals of Nineveh province Iraq, from November 2018 to April 2019. The study was aimed to highlight the epidemiological parameters of these cases, determine most common causes and the management as well outcome for them. Males are more affected than females, and 56% of patients belong to the age groups from 10 to 39 years, we found that Slips and falls (or same level falls) are the most common mechanism of injury specially among elderly people, while bullet and blast injuries form a small percentage of injuries with 4% & 1.6% respectively. Limb injury is the most common type of injury, followed by head injuries. Most of these injuries were treated conservatively but about quarter of them require surgery, while abdominal injuries which represent about 5.6% of all injuries, were treated by surgery with exception of 21.4% treated conservatively.

Keywords: Trauma, Accidents, RTA, Injury.

Introduction

Trauma is the medical problems associated with physical injury. There are many types of physical injuries that can affect the human body including thermal, chemical and ionizing radiation but the most common type is the mechanical injury. Trauma usually affect younger age group. Those their age below 40-year-old, and it is the main cause for their mortality and morbidity all over the world (1). It’s traditionally seen as a disease of the young, with in particular, young males involved in motor vehicle accidents and interpersonal violence. Training of those involved in the management of patients suffering trauma has often concentrated on these aspects of injury (2).

In 2006 more than 42.5million of injured patient was evaluated and treated in emergency department in USA, and it account about 36% of all patient visit emergency department (3). Although the main mechanism of injuries is unintentional falls (20.3%), followed by motor vehicle accident (9.5%) but the death due to motor vehicle crash is more than due to falls. It is 43,000 deaths from 179,000 deaths due to all trauma, while only 21,000 death was due to fall from this number (3).

Injuries sustained are predominantly due to high energy blunt trauma such as a fall from height, road or workplace trauma (4). Abdomen remain the 3rd most commonly injured region, with surgery required in about 25% of civilian cases (5).

Patients and Method

Two hundred fifty of traumatic patients admitted to the emergency department of Al-Salam and Al-Jumhoory teaching hospital in Nineveh province/Iraq, during the period extended from November/2018 to April/2019 were involved in this study, the data were collected from the patient’s relatives the questioner included the gender, age, mechanism of injury, type of injury, investigation done for the patient and the provisional diagnosis according to the clinical examination and investigation’s results. These data have been analyzed to represent the trauma in Nineveh province.

The mechanism of injury, the patients are classified into bullet injury, blast injury, road traffic accident (RTA), fall from height (FFH), slips and falls, fall of heavy objects on the patient like wall, blocks, or other heavy objects, and injury by sharp objects like knives,
glass or others. The injured patients classified according to the part of the body affected into head injury, chest injury, abdominal injury, limb injury and those who have combined injuries. Conservative treatment included pain management, cleaning, suturing and dressing in case of wounds, closed reduction of fractures and follow up of patients for possible complications. Patients who required surgical intervention, have been followed, but we focused on the surgeries performed for patients with abdominal injuries to know what is the most frequently injured organs and how they are treated.

Results

During the study period we collected 250 cases of trauma patients affected mainly by mechanical trauma from the emergency department of Nineveh province/ Iraq. Table 1 shows age and sex distribution of trauma patients in Nineveh province, it shows that the highest age group affected was those below 10 years, followed by those in the third decade. The least affected age group was those over 70 years.

Table 1: Age and sex distribution of trauma patients in Nineveh province.

<table>
<thead>
<tr>
<th>Age (Years)</th>
<th>Male</th>
<th>Female</th>
<th>No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-9</td>
<td>46</td>
<td>23</td>
<td>69 (27.6)</td>
</tr>
<tr>
<td>10-19</td>
<td>34</td>
<td>13</td>
<td>47 (18.8)</td>
</tr>
<tr>
<td>20-29</td>
<td>34</td>
<td>17</td>
<td>51 (20.4)</td>
</tr>
<tr>
<td>30-39</td>
<td>33</td>
<td>9</td>
<td>42 (16.8)</td>
</tr>
<tr>
<td>40-49</td>
<td>10</td>
<td>5</td>
<td>15 (6)</td>
</tr>
<tr>
<td>50-59</td>
<td>12</td>
<td>5</td>
<td>17 (6.8)</td>
</tr>
<tr>
<td>60-69</td>
<td>6</td>
<td>1</td>
<td>7 (2.8)</td>
</tr>
<tr>
<td>&gt; 70</td>
<td>2</td>
<td>0</td>
<td>2 (0.8)</td>
</tr>
<tr>
<td>Total</td>
<td>177 (70.8%)</td>
<td>73 (29.2%)</td>
<td>250 (100)</td>
</tr>
</tbody>
</table>

Mechanism and Type of injury (according to the part of the body involved) of trauma patients in Nineveh province was demonstrated in table 2, it shows that the highest insult was road traffic accident followed by fall from height, while the least cause of injury was blast injuries. The most insulted part was the limbs, followed by head, while the least was the chest.

Table 2: Mechanism and Type of injury (according to the part of the body involved) of trauma patients in Nineveh province.

<table>
<thead>
<tr>
<th>Mechanism</th>
<th>Limb (%)</th>
<th>Head (%)</th>
<th>Abd. (%)</th>
<th>Chest (%)</th>
<th>Comb. (%)</th>
<th>No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bullet</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>10 (4)</td>
</tr>
<tr>
<td>Blast</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>4 (1.6)</td>
</tr>
<tr>
<td>RTA</td>
<td>40</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>6</td>
<td>56 (22.4)</td>
</tr>
<tr>
<td>FFH</td>
<td>29</td>
<td>15</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>49 (19.6)</td>
</tr>
<tr>
<td>Slips &amp; falls</td>
<td>53</td>
<td>13</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>70 (28)</td>
</tr>
<tr>
<td>Sharp object</td>
<td>24</td>
<td>12</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>43 (17.2)</td>
</tr>
<tr>
<td>FHO</td>
<td>9</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>18 (7.2)</td>
</tr>
<tr>
<td>Total</td>
<td>159 (63.6)</td>
<td>52 (20.8)</td>
<td>14 (14)</td>
<td>4 (1.6)</td>
<td>21 (8.4)</td>
<td>250</td>
</tr>
</tbody>
</table>

Table 3 tells the investigations done for trauma patient in Nineveh province. CT was the least sent, while x-ray of limbs was the dominated.

Table 3: Investigations done for trauma patient in Nineveh province.

<table>
<thead>
<tr>
<th>Investigation</th>
<th>Negative</th>
<th>Positive</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAST</td>
<td>20</td>
<td>3</td>
<td>23</td>
</tr>
<tr>
<td>CXR</td>
<td>37</td>
<td>4</td>
<td>41</td>
</tr>
<tr>
<td>CT abd</td>
<td>10</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>Skull x-ray</td>
<td>39</td>
<td>13</td>
<td>52</td>
</tr>
<tr>
<td>CT of head</td>
<td>18</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>X ray of limb</td>
<td>72</td>
<td>152</td>
<td>224</td>
</tr>
</tbody>
</table>
Treatment and outcome of trauma patients in Nineveh province presented in table 4 that shows that most of cases were treated conservatively (75%). In contrast most of abdominal injuries (78%) were treated operatively.

**Table 4: Treatment and outcome of trauma patients in Nineveh province.**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>No.(%)</th>
<th>Recovered</th>
<th>Died</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conservative treatment</td>
<td>189(75.6)</td>
<td>189</td>
<td>0</td>
</tr>
<tr>
<td>Surgical operation</td>
<td>61(24.4)</td>
<td>54</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>250</td>
<td>243</td>
<td>7</td>
</tr>
</tbody>
</table>

There was little discrepancy between Provisional and operative diagnosis of injured abdominal organs in trauma patients in Nineveh province, this was shown in table 5.

**Table 5: Provisional and operative diagnosis of injured abdominal organs in trauma patients in Nineveh province.**

<table>
<thead>
<tr>
<th>Organ</th>
<th>Provisional</th>
<th>Operative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bowel</td>
<td>7 (63.6)</td>
<td>5 (45.4)</td>
</tr>
<tr>
<td>Liver</td>
<td>2 (18.2)</td>
<td>2 (18.2)</td>
</tr>
<tr>
<td>Combined</td>
<td>0</td>
<td>2 (18.2)</td>
</tr>
<tr>
<td>Spleen</td>
<td>1 (9.1)</td>
<td>1 (9.1)</td>
</tr>
<tr>
<td>Stomach injury</td>
<td>1 (9.1)</td>
<td>0</td>
</tr>
<tr>
<td>Negative laparotomy</td>
<td>0</td>
<td>1 (9.1)</td>
</tr>
</tbody>
</table>

Table 6 represents the post-operative Complications (for abdominal injury), it shows that wound infection was the most common complication faced.

**Table 6: Post-operative Complications (for abdominal injury)**

<table>
<thead>
<tr>
<th>Complications</th>
<th>No. of cases</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wound infection</td>
<td>2</td>
<td>22.2</td>
</tr>
<tr>
<td>Bleeding</td>
<td>1</td>
<td>11.1</td>
</tr>
<tr>
<td>Paralytic ileus</td>
<td>1</td>
<td>11.1</td>
</tr>
<tr>
<td>Re exploration</td>
<td>1</td>
<td>11.1</td>
</tr>
<tr>
<td>sepsis</td>
<td>1</td>
<td>11.1</td>
</tr>
<tr>
<td>Burst abdomen</td>
<td>1</td>
<td>11.1</td>
</tr>
<tr>
<td>death</td>
<td>2</td>
<td>22.2</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>100%</td>
</tr>
</tbody>
</table>

Discussion

Although trauma is very common in all societies, this is the 1st study in our city to highlight the prevalence of traumatic injuries, their causes and treatment. Male preponderance in our study is corresponding to similar studies in Pakistan (6), Ghana (7) and Tanzania (8), in all injury types, there were more males injured than females (9), this could be related to traditions that obligate many females to stay home unless it is very important to go out.

About the age 56% of patients belong to the age groups from 10 to 39 years which means that young people are mostly affected by trauma among population, this result is also seen in similar studies in Iran (10, 11, 12, 13). Injured men were significantly younger than women in general. (14)

Slips and falls (or same level falls) are the most common mechanism of injury specially among elderly people, it’s commonly occur during daily activities. Older adults are five times more likely to be hospitalized due to falls than to injuries from other causes (15). Road Traffic Accidents (including car accidents, motor cycle accidents and pedestrians) are the most common mechanism of injury in young people, this is mostly due to reckless and speedy driving of the vehicles, not obeying or following traffic rules (16).

Fall from heights is a common cause of injury in children, it’s mostly from terraces, tables, windows and ladders and most frequently have a tendency to occur in homes followed by playgrounds and schoolyards (17).

Injury by sharp objects is also a common mechanism of injury according to this study, it’s mostly caused by glass pieces and other sharp objects specially occur during work time. Injuries caused by a fall of heavy object on the patient form about 7.2% of injuries, it’s caused by fall of blocks during building jobs, wall or even TV or other heavy devices on the patients specially children.

Bullet and blast injuries form a small percentage of injuries with 4% & 1.6% respectively. Limb injury is the most common type of injury, it mostly results from slips and same level falls, it includes injuries to all components of limb architectures such as bone, nerve, blood vessel, soft tissue and skin which makes for prompt and precise evaluation and management for optimizing functional outcome (18). The 2nd most common type of injury, result
from road traffic accidents and fall from heightis head injury, traumatic brain injuries presents in various forms from mild head injury that cause alterations of consciousness to sever head injury that cause comatose state and death (19). CT scan though it is very valuable in trauma, it was the least performed test, because it is not always available in our hospitals, same thing is for FAST.

Most of the injuries in this study treated conservatively with 24.4% require surgery. Abdominal injuries form about 5.6% of all injuries, most of these injuries treated by surgery with only 21.4% treated conservatively. The pre-operative and postoperative diagnosis are nearly compatible specially in suspected liver & splenic injuries and most of the bowel injuries. Nine percent of the abdominal injuries cases that require exploratory laparotomy the result was negative. Most of the patients who underwent abdominal operations didn’t develop complications with approximately third of the patients developed complications of wound infection, bleeding and paralytic ileus.

Wound infection occur more commonly than other complication, higher risk of infection was found in the older age group, patient having colostomy due left colonic injury, taking blood transfusion and having multi organ injury (20). The outcomes of this study show that the majority of patients recovered while 2.8 % died. Head injury specifically intracranial hemorrhage is the most common cause of death.

Conclusion

Young males are the most common group of people exposed to trauma. Limb injury is the most common type of injury while head injury is the commonest cause of death. Most of the patients treated conservatively with pain management, wound’s cleaning, dressing and suturing. Bowel is the most common intra-abdominal organ affected.

**Conflict of Interest:** None

**Source of Findings:** None

**Ethical Clearance:** None

**References**

13. Roudsari BS, Sharzei K, Zargar M. Sex and age


Screening for Cervical Polyp among Women Attending Salah-Aldin General Hospital

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¹M.B.Ch. B., Gynecologist, Salah-Aldin General Hospital; ²Prof. Department of Obstetrics and Gynecology, Medical College, University of Tikrit, Iraq

Abstract

Background: Cervical polyps are the commonest cervical lesions, affecting up to 10% of women, with a reported recurrence rate of 6.2%, they arise from the endocervical canal or, less frequently, from the ectocervix, and vary in size from 5 mm to 50 mm. Symptomatic polyps are significantly more frequent in the premenopausal women, while asymptomatic polyps are significantly more common in post-menopausal women.

Aim of the Study: Screening for cervical polyps among women attending Salah-Aldin general hospital.

Patients and Method: A cross sectional study conducted in outpatients clinic and obstetrical ward in Salah El-Din general hospital at the period from the 1st of March 2018 to the end of August 2018. Simple random sample of (200) women in different ages were included.

Results: 200 women were enrolled in this study with the mean age of them were (27.30±6.8 years), the BMI mean of the patients with polyp was (30.2±2.1),4(40%) in age group between 26-35 years. Patients with polyps have ≥ 1 parity 9(9%) and 1(10%) in nulliparous.

Conclusion: The frequency of cervical polyp was 5% with no relation to the age, and 60% of the patients were healed.

Keywords: Cervical polyp; women; Salah-Aldin general hospital.

Introduction

Cervical polyps, affecting up to 10% of women(1), with a reported recurrence rate of 6.2%(2). They arise from the endocervical canal or, less frequently, from the ectocervix(3), and vary in size from 5 mm to 50 mm(4). They are commonly cherry red to purplish red in color, soft, pliable, fleshy, pedunculated, friable and readily bleed when touched(5).

It is hypothesized that they result from chronic inflammation causing focal hyperplasia, reaction to foreign bodies, a localized congestion of cervical vasculature and/or an abnormal local response to estrogen stimulation.

Cervical polyps may present with intermenstrual bleeding, postcoital bleeding, postmenopausal bleeding bleeding after trauma (e.g. gynaecological examination or coitus), vaginal discharge(5) which may be white or yellow mucus, dyspareunia which may be deep or superficial, symptomatic polyps are significantly more frequent in the premenopausal women, while asymptomatic polyps are significantly more common in postmenopausal women(6).

There is still a widely held view that all cervical polyps should be removed and subjected to histological examination to identify an unsuspected malignancy, and that further investigation (ultrasound scan and/or hysteroscopy) should be performed to identify endometrial polyps or other pathology(7), so only about 2.5% of polyps develop neoplastic changes and about 0.4% become frankly malignant. Malignancies include adenocarcinomas, squamous cell carcinomas, and Mullerian adenosarcomas. Malignancy cannot be distinguished by polyp size or appearance; hence, all cervical polyps should be removed completely and submitted for histologic evaluation. Most patients who
have malignant cervical polyps also have an associated cervical malignancy. It is unclear whether the malignancy arises first in the polyp or in the cervix. Patients with a malignant polyp should be examined carefully with colposcopy (8).

Patients with cervical polyps may have one of several types of associated endometrial lesions. These include endometrial polyps, hyperplasia (simple, complex, or atypical), adenocarcinoma, and adenosquamous carcinoma. Endometrial polyps are also common in women who are on tamoxifen therapy. Most women who have endometrial carcinoma associated with cervical polyps have symptoms that include bleeding or leucorrhea (white, thin, sticky vaginal discharge). Patients with both cervical polyps and associated symptoms have a much higher incidence of premalignant or malignant endometrial lesions than those who are asymptomatic. Up to 25% of symptomatic postmenopausal women also have associated endometrial pathology (9).

**Aim of the Study:** Screening for cervical polyps among women attending Salah-Aldin general hospital.

**Patients:** Across sectional study conducted in Salah Al-Din general hospital from first of march 2018 to end of August 2018, which included 200 married women attending obstetrical ward and gynecology and obstetrics outpatients clinic during study period sample selected simple random sampling method. The study included 200 married women in their reproductive age and their parity between 1-6, while Exclusion criteria as adolescent, menopause, unmarried and pregnant women were not included in this study.

**Data analysis:** By using manual statistical analytic method.

**Results**

The current study included 200 women and found 10 patients had cervical polyp.

**Table 1: Frequency of cervical polyp in the studied group.**

<table>
<thead>
<tr>
<th>Cervical Polyp</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Negative</td>
<td>190</td>
<td>95</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>

The mean age of them was (27.30±6.8 years), and the most dominant age group was between 16-25 years 99(49.5%).

**Table 2: Age of the studied group**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number. (negative)</th>
<th>%</th>
<th>Number. (positive)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age mean±SD (27.30±6.8 years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16-25 years</td>
<td>96</td>
<td>50.5</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>26-35 years</td>
<td>70</td>
<td>36.8</td>
<td>4</td>
<td>40</td>
</tr>
<tr>
<td>≥36 years</td>
<td>24</td>
<td>12.6</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td>190</td>
<td>100</td>
<td>10</td>
<td>100</td>
</tr>
</tbody>
</table>

Regarding to the occupation it was found that the majority of the women were housewife 191(95.5%).

**Table 3: Body Mass Index of the studied group**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number. (negative)</th>
<th>%</th>
<th>Number. (positive)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean±SD (29.3±3.6 Kg/m²), while for patients only=(30.2±2.1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>17</td>
<td>8.9</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Overweight</td>
<td>100</td>
<td>52.6</td>
<td>7</td>
<td>70</td>
</tr>
<tr>
<td>Obese</td>
<td>73</td>
<td>38.4</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td>190</td>
<td>100</td>
<td>10</td>
<td>100</td>
</tr>
</tbody>
</table>
The distribution of polyp according to the parity, it was found that majority of patients with polyps have ≥1 parity 9(9%) and 1(10%) in nulliparous.

So, the mean BMI of them were (29.3±3.6 Kg/m²) while for patients only (30.2±2.1) while the overweight represents more than half (53.5%) of the respondents while for patients only (30.2±2.1).

Table 5 shows that 57% of the patients had 1-3 parity, 27% in patients have 4-6 parity. 77.5% of them delivered with vaginal delivery, and with no one of the respondents have previous history of polyp as in table 5.

Table 4: Parity of the studied group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Null parity</td>
<td>10</td>
<td>5.0</td>
</tr>
<tr>
<td>1—3</td>
<td>114</td>
<td>57</td>
</tr>
<tr>
<td>4—6</td>
<td>54</td>
<td>27</td>
</tr>
<tr>
<td>&gt;6</td>
<td>22</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 5: Mode of delivery of the studied group.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode of delivery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>10</td>
<td>5.0</td>
</tr>
<tr>
<td>VD</td>
<td>155</td>
<td>77.5</td>
</tr>
<tr>
<td>C/S</td>
<td>18</td>
<td>9.0</td>
</tr>
<tr>
<td>VD+C/S</td>
<td>17</td>
<td>8.5</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>

Postcoital bleeding is present in 8(4%) of the studied group, Dyspareunia were found in 4(2.0%), infertility in 1(0.5%), 10(5%) of the patients have vaginal discharge, and backpain is found in 9(4.5%) of the studied group. Color of vaginal discharge either white (2.5%), Bloody in (2 only), Green, yellow and brown were found in 1 patients for each color (Table 6).

Table 6: Sign and symptoms of cervical polyp with Color of vaginal discharge.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post coital bleeding</td>
<td>8</td>
<td>4.0</td>
</tr>
<tr>
<td>Dyspareunia</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>Infertility</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>Vaginal discharge</td>
<td>10</td>
<td>5.0</td>
</tr>
<tr>
<td>Back pain</td>
<td>9</td>
<td>4.5</td>
</tr>
<tr>
<td>Color</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.Bloody</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>2. White</td>
<td>5</td>
<td>50.0</td>
</tr>
<tr>
<td>3. Yellow</td>
<td>1</td>
<td>10.0</td>
</tr>
<tr>
<td>4. Green</td>
<td>1</td>
<td>10.0</td>
</tr>
<tr>
<td>5. Brown</td>
<td>1</td>
<td>10.0</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>100</td>
</tr>
</tbody>
</table>

Discussion

Cervical polyps arise from the endocervical canal or less frequently from the ectocervix (10). Polyps are predominantly gland-like structures with a fibrous core and can be composed of columnar or squamous epithelium similar to the cervical tissues depending on the location of origin. The etiology of these lesions are largely unknown however, it is hypothesized that they result from chronic inflammation, from a localized collection/congestion of cervical vasculature or from an abnormal local response to hormonal stimulation(10,11,12). Cervical polyps have been shown to have a significant association with endometrial hyperplasia and endometrial polyps suggesting that high levels of estrogen may be an etiologic factor(13).

Cervical polyps are a common, and usually benign, finding of the cervix. Prior data suggest that 2%–5% of women develop cervical polyps, and in one analysis of benign tumors of the cervix, (76% were found to be cervical polyps)(14). This is in agreement with the current study when the prevalence of polyp was found in 10 (5%) of the studied group.
In this study the polyps were present in different age group, which means that it happened without age bearing. This is in accord with (15) who mentioned that patients’ age and polyp size did not have any bearing on the results.

In current study the BMI of the patients with polyp were 30.2±2.1 which means it is obese, which is same that found in Mustafa G et al., (16) 2016 who revealed that women with cervical polyp had higher body mass index than the controls, but the difference was not statistically significant.

Symptoms attributable to polyps include intermenstrual bleeding, post coital bleeding, heavy menses, postmenopausal bleeding and vaginal discharge (5). In this study the main symptoms were vaginal discharge, then post coital bleeding.

According to Neri et al., (17) while symptomatic or asymptomatic cervical polyps in premenopausal years do not indicate the need for subsequent D & C, symptomatic cervical polyps in postmenopausal years must be excised with mandatory subsequent D & C since they are associated with a statistically significant incidence of severe pathological conditions. Asymptomatic simple polyps in postmenopausal women on the other hand do not indicate the need for subsequent D & C since they are not associated with malignant changes of endometrium. Other hands do not indicate the need for subsequent D & C since they are not associated with malignant changes of endometrium. In the current study, it was found that (60.0%) of the patients were healed and (40.0%) were relapse (not healed).

Conclusions

The frequency of cervical polyp was 5% with higher frequency at 26-35 years old. So vaginal discharge and postcoital bleeding is the most common sign and symptoms of cervical polyp.

Conflict of Interest: None

Source of Findings: None

Ethical Clearance: The study was approved by the ethical committee of the Ministry of health scientific council and Tikrit Medical College. The purpose and procedures explain to all participants and were give the right to participate or not, verbal consent was taken with reassurance that interpret gained will be kept confidentially and not to be used for other research object.

References

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11. “Cervical Polyps” Doncaster and Bassetlaw
Microdebrider Assisted Inferior Turbinoplasty: The Evaluation According to the Pathological Causes of Hypertrophied Turbinates

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Abstract

Background: Hypertrophied inferior turbinates are the frequent cause of nasal obstructions. Microdebrider is one of recent advances in technology used for reduction of hypertrophiied turbinate to improve nasal breathing.

Objective: To evaluate and compare the effectiveness of microdebrider assisted inferior turbinoplasty on nasal breathing, turbinate size and complications according to the pathological causes.

Patients and Method: Aprospective case study of 45 patients with chronic nasal obstruction and hypertrophied inferior turbinates underwent microdebrider assisted tubinoplasty. At Salah-elddeen General Hospital and private practice in salah-elddeen governorate, Iraq. During the peroid from June 2016-June 2018. The patients were classified according to the cause of turbinate hypertophy and follow up at 1,3, and 12 months post operatively for nasal bereathing and turbinate size.

Results: The preoperative turbinate size was grade III (48.5%) and grade IV (51.5%). At 1,3,and 12 months post operatively, the grade I and II was (87%). (90%), and (84%) respectively better in compensatory hypertrophy. The subjective patient’s satisfaction grade I(relieved) and II(improved)) at 1,3, and 12 month after surgery was (100%) (97%) and (89%) respectively more satisfaction with compensatory hypertrophy.

Conclusion: The therapeutic success of microdebrider turbinoplasty for improvement of nasal obstruction and turbinate size, according to the causes . In early postoperative period was almost equal, but long-term follow-up (one year) found it was greater in compensatory hypertrophy and chronic rhinosinusitis and less in allergic and nonallergic rhinitis. There is no significant association between the cause of turbinate hypertrophy and type of complications.

Keywords: Nasal obstruction, Inferior turbinate hypertrophy, Inferior turbinoplasty, Microdebrider turbinoplasty.

Introduction

The turbinates are the portion of nose that warm and moisten the inspired air. The most common turbinates that affect airflow are the inferior turbinates, where enlargement can obstruct nasal breathing, especially the anterior tip of the inferior turbinate is located in the nasal valve region and hypertrophy leads to impingement on the nasal valve, and increase nasal resistance. The enlarged turbinates are the second most frequent cause of nasal obstructions after nasal septal deviation that compromise quality of life. Turbinate hypertrophy can be treated medically or surgically depending on the size and response to medical management, and correction of the causes is important. There were at least 13 basic
surgical techniques described to shrink the size of the inferior turbinates, but the ideal treatment method is currently undetermined. Microdebrider which is one of more recent advances in technology for reduction of inferior turbinate volume and was first reported by Davis and Nishioka in 1996. The significant advantage of this method is removal of submucosal vascular stromal tissue, while preserving overlying respiratory mucosa.

The aim: To evaluate and compare the effectiveness of microdebrider assisted inferior turbinoplasty on nasal breathing, turbinate size and complications according to the pathological causes.

Patients and Method

A prospective case study of 45 patients presented with chronic nasal obstruction and hypertrophied of inferior turbinates underwent Microdebrider assisted inferior turbinoplasty under general anesthesia during the period from June 2016-June 2018 at Salah eldeen General Hospital and private practice in salah-elden governorate, Iraq. Male were 24 patient (53%) and 21 (47%) were female. age ranging between 18-55 years, and the average 29 years.

A detailed history was taken regarding nasal obstruction, discharge, sneezing, itching, smell, and headache. Full ENT examination, nasal endoscopy, and CT-scan of the nose and paranasal sinuses when indicated. All patients did not respond to medical treatment. Mulberry posterior end of inferior turbinate was reduced by extraturbinate microderbrider was excluded from this study.

The patients were classified according to the cause of inferior turbinate hypertrophy in to the following:

1. Patients with allergic rhinitis.
2. Patients with non-allergic rhinitis includes vasomotor rhinitis, hormonal, irritant.
3. Patients with compensatory hypertrophy due septal deviation.
4. Patients with chronic infective rhino sinusitis.

The size of inferior turbinate was graded according to inferior turbinate classification system, by measuring the horizontal percentage of total airway space from the anterior aspect of the inferior turbinate (lateral) to the nasal septum (medial) in to four grads. Grade 1 (0%–25% of total airway space), Grade 2 (26%–50%), Grade 3 (51%–75%), Grade 4 (76%–100%).

The subjective sensation of patient about his or her postoperative nasal breathing was assessed by using the questionnaire applied and divided patients in to four grades. Grade I=Relieved (cured) of nasal obstruction, Grade II=Improved nasal breathing, Grade III=Same as before surgery, IV=Worse.

For assessment of peroperative bleeding (during surgery), the patients were classified in to:

1. Patients with accustomed bleeding (means that the bleeding stopped spontaneously with sugicel).
2. Patients with prolonged bleeding (means that the bleeding continued and stopped using cautereization or suturing the incision or the accidental mucosal tear.).

The patients were followed about the size of inferior turbinate and nasal breathing at one, three, and twelve months postoperatively.

Surgical Procedure: Microdebrider inferior turbinoplasty was performed under general anesthesia.

It was carried out after completing the septoplasty, septorhinoplasty or FESS, when the operation has been accompany with it. The patient is prepared for a standard endonasal procedure using an 0° endoscope 4-mm diameter, injection of 1% Lidocaine with 1:100,000 Epinephrine into the anterior aspect of the inferior turbinate with xylometazoline 0.1% nasal spray. An incision made along the anterior tip of the turbinate at its lateral insertion. Create a submucosal tunnel with a Freer elevator along the medial conchal bone. The turbinate microdebrider blade is inserted into the pocket created and excise submucosa with or with bone excision out a of the inferior turbinate. The incision site can be cauterized or sutured if significant bleeding occurs from the mucosal edge or accidental mucosal tear. Silastic splint, and surgicel placed.

Results

Forty-five patients with inferior turbinate hypertrophy underwent microdebrider turbinoplasty. The compensatory hypertrophy and hypertrophy due to chronic rhinosinusitis was common in male (72%) and (71%) respectively, but turbinate hypertrophy in allergic and non allergic rhinitis was common in female (72%) and (80%) respectively (Table 1). Microdebrider turbinoplasty was performed in combination with septoplasty with or without FESS for 33 patients (73%) and microdebrider turbinoplasty alone for 12 patients (27%).
Table 1: The causes and sex distribution of inferior turbinate hypertrophy.

<table>
<thead>
<tr>
<th>Total (%)</th>
<th>Female (%)</th>
<th>Male (%)</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 (40%)</td>
<td>5(28%)</td>
<td>13(72%)</td>
<td>Septal deviation (Compensatory HT)</td>
</tr>
<tr>
<td>15 (33%)</td>
<td>10(67%)</td>
<td>5(33%)</td>
<td>Allergic rhinitis</td>
</tr>
<tr>
<td>7 (16%)</td>
<td>2(29%)</td>
<td>5(71%)</td>
<td>Chronic rhinosinusitis</td>
</tr>
<tr>
<td>5 (11%)</td>
<td>4(80%)</td>
<td>1(20%)</td>
<td>Non-allergic rhinitis</td>
</tr>
<tr>
<td>45 (100%)</td>
<td>21(47%)</td>
<td>24(53%)</td>
<td>Total</td>
</tr>
</tbody>
</table>

$\chi^2 = 22.6.$, d.f. = 3, P-value = <0.05, Correlation = 0.5. *Significant association between cause and sex.

The total number of inferior turbinates that underwent turbinoplasty in 45 patients with nasal obstruction was 68 turbinate, in patients with allergic rhinitis were 29 turbinate, compensatory hypertrophy were 20 turbinate, chronic rhinosinusitis were 11 turbinate, and in non-allergic rhinitis were 8 turbinate (Table 2).

Table 2. The causes and side of inferior turbinate hypertrophy.

<table>
<thead>
<tr>
<th>Total Turbinate</th>
<th>Bilateral TH</th>
<th>Unilateral TH</th>
<th>Patient No.</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>29</td>
<td>14(93%)</td>
<td>1(7%)</td>
<td>15(33%)</td>
<td>Allergic rhinitis</td>
</tr>
<tr>
<td>20</td>
<td>2(11%)</td>
<td>16(89%)</td>
<td>18(40%)</td>
<td>Compensatory HT</td>
</tr>
<tr>
<td>11</td>
<td>4(57%)</td>
<td>3(43%)</td>
<td>7(16%)</td>
<td>Chronic rhinosinusitis</td>
</tr>
<tr>
<td>8</td>
<td>3(60%)</td>
<td>2(40%)</td>
<td>5(11%)</td>
<td>Non-allergic rhinitis</td>
</tr>
<tr>
<td>68</td>
<td>23(51%)</td>
<td>22(49%)</td>
<td>45(100%)</td>
<td>Total</td>
</tr>
</tbody>
</table>

*$\chi^2 = 22.4,$ d.f. = 3, P-value = <0.05, correlation = 0.057., Strong (significant) association between causes and side of inferior turbinate hypertrophy.

The preoperative turbinate size was as follows grade III 33/68 turbinate (48.5%) and grade IV was 35/68 turbinate (51.5%). At month after surgery the turbinate size was grade I (28%), grade II (59%) then and grade III(13%). At 3 months post operatively grade I was (46%), grade II was (44%) then grade III(10%). In compensatory hypertrophy grade I and II were 20/20 (100%)and in allergic rhinitis were 25/29 (85%).

After one year, grade I was 22/68 (32%), grade II 35 (52%),and grade III 8 (12%). In compensatory hypertrophy Grade I and II were 18/20 (90%) and grade III was 2/20 (10%),which is better than In allergic rhinitis where Grade I and II were22/29 (76%), Grade III was (17%) and grade IV was(7%).(Figure 1).

Table 3: The complications of microdebrider turbinoplasty according to the causes.

<table>
<thead>
<tr>
<th>Nasal dryness</th>
<th>Crustation</th>
<th>Secondary bleeding</th>
<th>Mucosal tear</th>
<th>Prolonged Bleeding</th>
<th>Total (N=68)</th>
<th>Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post operative*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>3(10%)</td>
<td>0</td>
<td>2(7%)</td>
<td>2(7%)</td>
<td>29</td>
<td>Allergic rhinitis</td>
</tr>
<tr>
<td>3(15%)</td>
<td>1(5%)</td>
<td>0</td>
<td>1(5%)</td>
<td>2(10%)</td>
<td>20</td>
<td>Severe septal deviation</td>
</tr>
<tr>
<td>0</td>
<td>2(18%)</td>
<td>1(9%)</td>
<td>2(18%)</td>
<td>2(1%)</td>
<td>11</td>
<td>Chronic rhinosinusitis</td>
</tr>
<tr>
<td>1(12.5%)</td>
<td>1(12.5%)</td>
<td>1(12.5%)</td>
<td>1(12.5%)</td>
<td>1(12.5%)</td>
<td>8</td>
<td>Non-allergic rhinitis</td>
</tr>
<tr>
<td>4(6%)</td>
<td>7(10%)</td>
<td>2(3%)</td>
<td>6(9%)</td>
<td>7(10%)</td>
<td>68</td>
<td>Total</td>
</tr>
</tbody>
</table>

*Synchia and Atrophic change had not been observed;* $\chi^2 = 0.8,$ d.f. =3,P-value =<0.05, correlation =0.2., No significant association between causes and type of complications.
Subjective improvement of nasal patency after the surgery was as follows: After one month grade I (relieved) was 29/45 patients (64%) and grade II (improved) was 16/45 (36%). No (grade III) nor (grade IV) were reported. After 3 months relieved was 30 (67%), improved was 13 (29%), and same was 2 (4%). After 12 months (49%) were relieved, (40%) were improved and (11%) were same. In compensatory hypertrophy the grade I and II at one month, 3 months, 12 months postoperatively were (100%), (100%), and (94.5%) respectively, more than allergic rhinitis that was (100%), (93%), and (80%) respectively. (Figure 2).
Regarding the complications, the peroperative prolonged bleeding was 6/68(10%) common in patients with chronic rhino-sinusitis were 2/11(18%), then with non-allergic rhinitis 1/8(12.5%). Accidental mucosal tear in 6/68(9%) more in chronic rhinosinusitis was 2/11(18%). Postoperative complications includes secondary bleeding was 2/68(3%) more in non-allergic rhinitis 1/8(12.5%), nasal crustation 7/68(10%), nasal dryness was 4/68 (6%), no synechia or atrophic rhinitis reported (Table 3). No case of synechia and Atrophic change had been reported.

Discussion

The inferior turbinate hypertrophy is a common cause for nasal obstruction. It is prevalence in patients with severe nasal obstruction is (77%)\(^7\). Compensatory hypertrophy of inferior turbinate due to nasal septal deviation is a common cause of nasal obstruction\(^8\). Patients who had compensatory hypertrophy correction of nasal septum deviation (septoplasty) has been performed for all patients accompanied with microdebrider turbinoplasty. Septoplasty has an effect on reduction of turbinate size. There are several studies was found that septoplasty reduce the size of hypertrophied inferior turbinates even without turbinate surgery for size reduction\(^9,10\). (Chieh-Feng Lee, et al.2004) Found that there is excellent out comes in improving nasal patency when microdebrider turbinoplasty is adjunct to septoplasty and endoscopic sinus surgery which lasts for a long time\(^4\), although in rhinomanometric assessment had been found that improvement was greater in turbinoplasty only than combined surgery, but the authors attributed this to undercorrection or residual deviation might exist\(^4\). In the current study found that patients with compensatory hypertrophy of the inferior turbinate had a good therapeutic success rate after 12 months period, regarding turbinate size Grade I and II was (90%) (Figure 1), and for nasal breathing the Grade I and II was (94.5%) (Figure 2).

Allergic and non-allergic rhinitis are the most common causes of inferior turbinate hypertrophy\(^11\). The study found that nasal breathing and turbinate size reduction in allergic and non allergic rhinitis after one year was (80%) which less than that for compensatory hypertrophy was (94.5%)\(^4\). The reasons for this may be that the allergic and vasomotor rhinitis regarded as the most frequent causes of mucosal dysregulation that affect outcomes of turbinate reduction\(^12\). In addition, the method used in this research is intra-turbinate microdebrider inferior turbinoplasty where the submucosal vascular stromal tissue is removed with preservation of turbinate respiratory mucosa\(^13,4\) these will affect the long-term relief of allergic symptoms. Several studies found that extra-turbinate microdebrider is more effective than intraturbinate microdebrider turbinoplasty in allergic rhinitis\(^14,8\).

Previous studies have been conducted that majority of patients (90% -100%) gets subjective improvement of nasal obstruction after reduction of turbinate, but effectiveness often reduced over time\(^15\). A study found that the failure in turbinate surgery is due to persisting pathology for mucosal membrane dysregulation and less due to operating technique\(^12\). For long term follow-up of patients with allergic rhinitis who underwent inferior turbinate reduction, one study found that the improvement of nasal obstruction after one year was (80%)\(^16\). Other study found that improvement after 5 years was (70%)\(^17\).

The turbinate is very vascular structure as it composed of the an extensive plexus of venous capacity vessel (sinusoid) and respiratory mucosa\(^1\). Current study found that peroperative bleeding (during surgery) was accustomed bleeding that it stopped spontaneously with sugicel, because the author used local infiltration of epinephrin with careful handling the shaver results in avoidance damage and protection the turbinate mucosa, all reduce the occurrence of accidental mucosal tear, bleeding and crustation. In this current study excessive primary bleeding was (9%) common in non-allergic rhinitis and infective rhinosinusitis due to hyperemic engorged turbinate that occurrence of accidental mucosal tear increased bleeding. Secondary bleeding was two patients (3%) one on the fifth and the second on seventh day after the operation, they are mostly as a result of infection, that leads to hyperemia and increased friability of the turbinate mucosa. Postoperative bleeding has been reported with a frequency of(3.4%- 10%) in various studies\(^3,18\) one study has been reported postoperative bleeding was (27%)\(^13\). Mucosal tear usually due to aggressive resection, it occurs in (9%) more in chronic rhinosinusitis was (18%) and in non allergic rhinitis (12.5%). Study by another author was found that occurrence of mucosal tear was 7.5%\(^19\). Crustation occur in (10%) with accidental mucosal tear all was resolved with use a saline nasal spray within 3 weeks postoperatively. Atrophic rhinitis were not observed because the mucosa and its neurovascular supply were preserved. Despite the differences in the incidence rate...
of complications with the cause of turbinate hypertrophy (Table 3), but statistically there are no significant association.

Limitations that in this study the turbinate reduction was accompanied by septoplasty, septorhinoplasty or FESS in (73%) of the patients, this makes difficult to accurately evaluate the effect of microdebrider turbinoplasty as an isolated procedure on nasal breathing and to accurately calculate the amount of blood loss from the procedure.

**Conclusion**

The study found that microdebrider assisted inferior turbinoplasty procedure is a safe and effective method for turbinate reduction. The therapeutic success rate for improvement of nasal breathing and turbinate size according to the cause was almost equal in early postoperative period (one and three months), but long-term follow-up (after one year) found that success rate was greater in compensatory hypertrophy and chronic rhinosinusitis and less in allergic and non-allergic rhinitis. There is no significant association between the cause of turbinate hypertrophy and type of complications.

**Ethical Clearance:** From research ethic committee in Tikrit university/college of medicine.

**Source of Funding:** Self

**Conflict of Interest:** None

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Effect of General Anesthesia on Levels of Blood Sugar Values in Different Times of Operation

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Abstract

The present study was carried out on a period between December 2019 to February 2020 on 50 healthy patients, their ages ranged from eighteen to fifty years. They were 26 males and 24 females. These healthy patients were attending Baghdad Educational Hospital, Al-Harriri Hospital, and Al-Diwaniyah General Hospital in order to perform various surgeries. And after all tests are done. Then they were admitted to the operating theater. In this study used the general anesthesia method. And they were given drugs of anesthesia, during each step; the values of blood sugar levels (Mg/dl) were measured. Such as pre induction, post induction, after incision, after fluid, and recovery. To know the effect of general anesthesia method on blood sugar levels in different times of operation on gender and age groups.

This study showed that total numbers of patients were 50 including males about 26 (52.0%) and females about 24(48.0%), their age of all individuals ranged from less than 20 years old (<20-29) which number and percentage 22,44.0% to 50 years old 7 (14.0%). Also there are no significant difference was observed in the blood sugar levels changes (Mg/dl) in both males and females (gender) before and after the operation or surgery, also no found any differences between blood sugar levels changes (Mg/dl) at the age groups and the general anesthesia method, after and before the operation in different times of surgery. So in this study summarized the mean and stander deviation values according to the levels of blood sugar (Mg/dl) among different times of surgery, and then show the mean of pre induction period about 83.84, While mean of values of blood sugar at post induction time at general anesthesia method about 104.94.

Aims and Objectives: This study was investigated the influence of general anesthetic drugs that effect on the blood sugar level changes of patients with surgery. This was done with the following objectives:

- To administer general anesthesia by using a different combination of drugs.
- To assess and compare the blood sugar level changes of the patients at different time intervals.
- Complications, if any were observed and noted on patients at different time intervals.

Keywords: General Anesthesia; Blood Sugar; Times of Operation.

Introduction

Anesthesia was not known prior to 1846 although the anaesthetic properties of ether already described by Faraday in 1818 .the use of ether in 1846 by W.T.G mortan opened up anew era of painless surgery with the help of drugs.Presently there are various anaesthetic agents ether still stand out as the most commonly used anesthetic agent in our country[1]: the primary goal of anesthesia is to provide patient comfortt and safety during surgery or to facilitate the surgical procedure itself. Anesthesia can be general, regional, and local, depending on the needs of the patient and surgeon. General anesthesia is a reversible drug induced state of unconsciousness with hypnosis, amnesia,analgesia and elimination of the patient response to the painful stimuli sometimes accompanied by paralysis[2].

Glucose the main conversion product of carbohydrate food enters the blood from the intestine. Glucose is distributed fairly uniformly throughout the body fluid both extracellular and intracellular. Maintenance of
blood sugar at a constant level is a balance between production and loss[1]. Blood glucose concentrations in normal healthy individuals are normally maintained at ~90 mg/dl. Abnormal concentrations of glucose in plasma result in deleterious effects at the whole organism level. Glucose is the main energy source for the brain and decreased plasma glucose levels (hypoglycemia) can lead to impaired brain function and death. Conversely, increased plasma glucose levels (hyperglycemia), a major clinical symptom of diabetes[3]. The key hormones which regulate glucose homoeostasis include insulin, glucagon, epinephrine, norepinephrine, cortisol and growth hormone (GH)[4]. Surgeries are considered to be the combination of multiple factors including tissue damage, fasting, blood-loss, effect of medication and temperature changes from a metabolic point of view. Combinations of all these factors give rise to stress response. The stress response to surgery is characterized by increased secretion of pituitary hormones and activation of the sympathetic nervous system. The ultimate effect of these various endocrine changes is increased catabolic activity by increased secretion of catabolic hormones like cortisol and glucagon. The effect of these endocrine and metabolic changes ultimately leads to increased neoglucogenesis and hyperglycemia. So this stress response may be quantified by the incidence of hyperglycemia.

The metabolic changes appear to be proportional to the severity of the surgical trauma with plasma cortisol and blood glucose concentration rising slightly during minor surgical procedures but significantly during major operations[5]. Regulation blood sugar levels in the use of general anesthesia needs to be considered carefully. Some induction agents for general anesthesia have the side effects of increasing blood sugar level[6]. Anesthetic drugs will basically have a sympathomimetic effect and affect the endocrine system in the human body, especially the regulation of blood glucose levels. The mechanism for increasing blood glucose levels is very complex. One opinion held is that anesthetic drugs directly suppress pancreatic beta cells through the release of catecholamines and result in decreased insulin production[7]. All the intravenous agents and volatile anesthetics in normal doses have minor influence on the endocrine and metabolic function. Severity of surgery and the type of anesthesia influence the magnitude of the counter regulatory response which is evidenced by increase in circulating catecholamines, cortisol and glucagon concentration and blood glucose as well[5].

Materials and Method

The current study was done in Baghdad Educational Hospital, Al-Harriri Hospital and Al-Diwaniyah General Hospital during the year 2019-2020, with the aim to study the effect of general anesthesia on blood sugar level in patients undergoing surgery. The study recruited 50 adult patients, all the patients were of physically fit belonging to A.S.A. grade I or II, between the age of 18 to 50 years who were ASA I and ASA II patients of both sexes presenting for elective surgeries.

Anesthetic Technique: In the operating room, the standard anesthetic machine check was done prior to commencement of any procedure every morning. All patients had baseline blood glucose measurement performed immediately prior to the start of any things. The patients were cannulated using 18 or 20 or 22G cannula and an infusion of normal saline or normal saline with glucose was initiated. Non-invasive blood pressure cuff, ECG and pulse oximeter probe were then connected to the patient and initial blood pressure and heart rate readings were then obtained. All patients were premedicated with 1 mg midazolam I.V, ranitidine 50 mg I.V, fentanyl 2 mcg/kg I.V, metoclopramide 10 mg I.V and dexamethasone 8 mg I.V, 3 minutes prior to induction. Pre-oxygenation was done during these three minutes after which, induction of anaesthesia using I.V. propofol 2-3 mg/kg, I.V. ketamine 1-2 mg/kg was done. For the ETT, muscle relaxation for intubation was facilitated by the use of injection rocuronium 0.6 mg/kg or atracurium 0.5 mg/kg.

Patients were then ventilated with 100 percent oxygen for a period of 1 minute prior to intubation with the aid of Macintosh laryngoscope. Endotracheal tubes of size 7/7.5 for female and 8/8.5 for male patients were used depending on body weight. Anaesthesia was maintained using oxygen and sevoflurane or isoflurane. Adequacy of ventilation was monitored clinically by assessing chest expansion, auscultation of the lung fields and the epigastric region. Surgery or any other manipulations were not allowed to commence until the study was completed i.e. for ten minutes after intubation/insertion.

Before end of the operation in a short time, the patient is given paracetamol 1000 mg to relieve pain after the operation.

Study Tools: During the operation, blood sugar is measured 5 times for the patient by using electronic
blood glucose meter, the first time is measured pre-induction of anesthesia, the second time is measured post induction of anesthesia, the third time after surgeon begin the operation, the fourth time after stop the fluid and the fifth time is measured in the recovery room. Method of measurement by applying a drop of blood to a chemically treated, disposable ‘test-strip’, which is then inserted into an electronic blood glucose meter. The reaction between the test strip and the blood is detected by the meter and displayed in units of mg/dL or mmol/L.

Results

The demographical picture of studied groups in table 1, for this study showed that total numbers of patients were 50 including males about 26 (52.0%) and females about 24(48.0%), their age of all individuals ranged from less than 20 years old (<20-29) which number and percentage (22,44.0%) to 50 years old (7, 14.0%). There are no significant difference was observed in the blood sugar levels changes of both males and females (gender) before and after the operation or surgery, also no found any differences (not a statistically significant difference) between blood sugar levels at the age groups and the general anesthesia method, after the operation in different times of surgery.

Table (1): Distribution of group study according to the gender and age groups (year)

<table>
<thead>
<tr>
<th>The Cases (Patients)</th>
<th>No.(n=50)</th>
<th>Percentage (100%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>26</td>
<td>52.0</td>
</tr>
<tr>
<td>Female</td>
<td>24</td>
<td>48.0</td>
</tr>
<tr>
<td><strong>Age groups (year)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(&lt;20-29)</td>
<td>22</td>
<td>44.0</td>
</tr>
<tr>
<td>(30-49)</td>
<td>21</td>
<td>42.0</td>
</tr>
<tr>
<td>(+50)</td>
<td>7</td>
<td>14.0</td>
</tr>
</tbody>
</table>

But the results in table 2, summarized the mean and stander deviation values according to the levels of blood sugar (Mg/dl) among different times of surgery, that show the mean of pre induction period about 83.84, but the stander deviation for this period about 13.610. While the mean of values blood sugar at post induction time at general anesthesia method about 104.94. Also in this table show increase the values of blood sugar in other periods at general anesthesia method such as after incision, and after fluid, that was about 128.66, 137.56 respectively, but in recovery time the mean of value of blood sugar reached to about 125.94.

Table (2): Mean and Std. Deviation values of Blood sugar (Mg/dl) among different time

<table>
<thead>
<tr>
<th>The Times</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre induction</td>
<td>83.84</td>
<td>13.610</td>
</tr>
<tr>
<td>Post induction</td>
<td>104.94</td>
<td>35.720</td>
</tr>
<tr>
<td>After incision</td>
<td>128.66</td>
<td>74.893</td>
</tr>
<tr>
<td>After fluid</td>
<td>137.56</td>
<td>33.739</td>
</tr>
<tr>
<td>Recovery</td>
<td>125.94</td>
<td>29.398</td>
</tr>
</tbody>
</table>

Then the table 3, shows the compare between values levels blood sugar (Mg/dl) changes at pre induction and other times. This table show great differences between the two times that were pre induction and post induction. This means found highly significant between the two means values blood sugar (Mg/dl) at pre induction and post induction for general anesthesia method. So above applies to pre induction and other times at general anesthesia method under probability level (P<0.01).

Table (3): Compare between values of Blood sugar (Mg/dl) at Pre induction and other times

<table>
<thead>
<tr>
<th>The parameters of times</th>
<th>t-test</th>
<th>P-Value</th>
<th>C.S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre induction - Post induction</td>
<td>4.564</td>
<td>.000</td>
<td>P&lt;0.01 (HS)</td>
</tr>
<tr>
<td>Pre induction - After incision</td>
<td>4.208</td>
<td>.000</td>
<td>P&lt;0.01 (HS)</td>
</tr>
<tr>
<td>Pre induction - After fluid</td>
<td>10.354</td>
<td>.000</td>
<td>P&lt;0.01 (HS)</td>
</tr>
<tr>
<td>Pre induction - Recovery</td>
<td>9.557</td>
<td>.000</td>
<td>P&lt;0.01 (HS)</td>
</tr>
</tbody>
</table>

While the table 4, show the compare between values of blood sugar (Mg/dl) at Post induction and other times. This table show great differences between the two times that were post induction and after incision. This means found highly significant between the two means values blood sugar (Mg/dl) at post induction and after incision for general anesthesia method. And above applies to post induction and other times at general anesthesia method under probability level (P<0.01).

Table (4): Compare between values of Blood sugar (Mg/dl) at Post induction and other times

<table>
<thead>
<tr>
<th>The parameters of times</th>
<th>t-test</th>
<th>P-Value</th>
<th>C.S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post induction - After incision</td>
<td>2.123</td>
<td>.039</td>
<td>P&lt;0.01 (HS)</td>
</tr>
<tr>
<td>Post induction - After fluid</td>
<td>5.033</td>
<td>.000</td>
<td>P&lt;0.01 (HS)</td>
</tr>
<tr>
<td>Post induction - Recovery</td>
<td>3.365</td>
<td>.001</td>
<td>P&lt;0.01 (HS)</td>
</tr>
</tbody>
</table>
Also the table 5, demonstrated compare between the values of blood sugar levels (Mg\dl) at after incision and other times. So this table shows no found differences between the two times which wereafter incision and after fluid. And this means no found significant differences between two means values blood sugar (Mg\dl) atafter incision andafter fluid for general anesthesia method. And above applies tothe period after incision and recovery atgeneral anesthesia method under probability level (P<0.01).

Table (5): Compare between values of Blood sugar (Mg\dl) at after incision and other times

<table>
<thead>
<tr>
<th>The Parameters of times</th>
<th>t-test</th>
<th>P-Value</th>
<th>C.S</th>
</tr>
</thead>
<tbody>
<tr>
<td>After incision - After fluid</td>
<td>0.831</td>
<td>.410</td>
<td>P&gt;0.05 (NS)</td>
</tr>
<tr>
<td>After incision – Recovery</td>
<td>0.259</td>
<td>.797</td>
<td>P&gt;0.05 (NS)</td>
</tr>
</tbody>
</table>

Finally the Table 6, show that compare between values of blood sugar levels (Mg\dl) at after fluid and recovery. Also this result in this table shows differences between the two periods that werafter fluid and recovery. While this result means found significant differences between two means values blood sugar (Mg\dl) atafter fluid andrecovery for this general anesthesia method under probability level (P<0.01).

Table (6): Compare between values of Blood sugar (Mg\dl) at after fluid - Recovery

<table>
<thead>
<tr>
<th>The Parameters of times</th>
<th>t-test</th>
<th>P-Value</th>
<th>C.S</th>
</tr>
</thead>
<tbody>
<tr>
<td>After fluid – Recovery</td>
<td>2.075</td>
<td>.043</td>
<td>P&lt;0.05 (S)</td>
</tr>
</tbody>
</table>

From the present study we concluded that in comparison of muscle relaxant ether causes much more hyperglycemia during general anesthesia which is very highly significant rise. But in case of muscle relaxant the change in blood glucose level is just significant. There are because the glucose concider as the main conversion product of carbohydrate food enters the blood from the intestine. Glucose is distributed fairly uniformly throughout the body fluid both extracellular and intracellular. Maintenance of the blood sugar at a constant level is a balance between production and loss\[9]. While this result dis agree with Kouzegaran et al\[10], when reached to the patients had no taken or were not diagnosed with any diseases affecting blood sugar levels. They found no significant difference observed in the blood sugar levels of both groups before and after the operation, but the group which had utilized the general anesthesia method reported with lower levels of blood sugar than the spinal anesthesia group after operation with a significant difference (p < 0.05). A difference has been observed in the levels of blood sugar 2, 12 and 24 hours after the operation in both groups, but it was not a statistically significant difference. As the results indicate, both the general and spinal anesthesia are effective method to reduce the serum level of blood sugar in patients undergoing caesarean. However, none of mentioned method had any influence on reduction of blood sugar levels during the recovery or the period after it. However, none of the mentioned method had any influence on reduction of blood sugar levels during the recovery or the period after it. While the compare between values levels blood sugar (Mg\dl) at pre inductionand other times. There are great differences between the two times that were pre induction and post induction. This result agree with the study of Maitra et al.,\[11], that was undertaken to observe the effect of different maintenance-fluid regimen on intraoperative blood glucose levels in non-diabetic patients undergoing elective major non-cardiac surgery under general anesthesia. That stress induced-hyperglycemic response in patients undergoing major non-cardiac surgery is common in non-diabetic population. Maintenance-fluid therapy by dextrose containing solution as opposed to Ringer’s lactate solution increases the incidence of hyperglycemia. To achieve normoglycemia by intravenous bolus dose of human regular insulin, significantly higher doses are required in patients receiving dextrose containing saline as maintenance fluid. However, they did not mention their intraoperative fluid protocol. Both Saringcarinkul and Kotrawera \[12], found a progressive increase in the
blood glucose values in patients receiving 5% dextrose during surgery.

**Conclusion**

1. The levels of blood sugar (Mg/dl) changes among different times of surgery in general anesthesia method, that show increase the values of blood sugar in other periods at general anesthesia method such as after incision, and after fluid.

2. Found highly significant differences between means values blood sugar (Mg/dl) at pre induction and post induction and between the pre induction - after incision, pre induction - after fluid, and pre induction - recovery for general anesthesia method. Also found highly significant differences between the two means values blood sugar (Mg/dl) at post induction and after incision for general anesthesia method. These because increase the stress hormone, nervous tension, and psychological tension, fear, and terror during the surgery. so found significant differences between two means values blood sugar (Mg/dl) at after fluid and recovery for this general anesthesia method. Because the fear and terror from the idea of performing the operation. To increase the stress hormone specialized in stress factors on the body, which makes the body alert attention to what happens to him whenever occur a surgical incision.

**Conflict of Interest:** None

**Source of Findings:** None

**Ethical Clearance:** None

**References**


12. Saringcarinkul, Ananchanok, and Kriengsak Kotrawera. «Plasma glucose level in elective surgical patients administered with 5% dextrose in 0.45% NaCl in comparison with those receiving lactated Ringer’s solution.» Medical journal of the Medical Association of Thailand 92.9 (2009): 1178.
Knowledge, Attitude and Practice of Periodic Screening of Diabetes Mellitus among Teachers in Tikrit City in Iraq

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Abstract

Background: One of the most prevalent chronic diseases is Diabetes mellitus that have adverse effect on the health, and the goal today being placed on disease prevention, controlling and screening.

Aim: To assess knowledge, attitude and Practice of periodic screening of DM among teachers in Tikrit city.

Subject and Method: The study is a cross-sectional study that had conducted from 1st of November 2018 until 30 of March 2019 on teachers in Tikrit city primary and secondary school using a questionnaire.

Results: The knowledge regarding the diabetes and its screening a 24% were good and 46% were accepted regarding the disease symptoms and about its control 84% mention that diet modification is the best way then exercise and medication in lower percent while regarding complications 68% (much of them) knowledge were bad, About the importance of periodic screening the great percentage was yes.

Conclusion: There was 93.3% who have knowledge about diabetes mellitus screening among school teachers. Teacher’s method for controlling diabetes mostly are diet modifications 84% then exercise 42.5%.

Keywords: Diabetes mellitus awareness, School Teachers, Tikrit.

Introduction

Improvement of the population health depend on disease prevention which is now consider as a superior strategy to decline the morbidity and mortality of most types of diseases[1]. Diabetes mellitus Type 2 has become wide epidemic with marked deformity, premature death and many medical problems[2]. DM is a non-infectious disease of public health importance which have a great effect on the life quality. Prevention and control can be obtained by improving the knowledge[3]. The aim of screening is to discover asymptomatic individuals who are likely to have diabetes. The prevalence of diabetes type 2 is raised strongly[4,5].

DM considered dangerous and life-threatening problems, but may be treated by proper managing and prevention. Diabetic self-care training and education consider important in the controlling of DM[6]. Non-controlled diabetes may end with blindness, limb removal, kidney problems, and vascular and IHD. Screening test to the patients before features appearance may lead to early detection and control, as the same time have no role in reduction of end-organ damage rates[7]. Many studies on (KAP) of diabetes have been support the needs for prevention, detection, and controlling of diabetic risk factor[8]. Good education and healthprogrammers development can lead to improvement of the patients knowledge and alter their practice[9,10]. Cross-section study about the KAP of DM in Saurastha region, India revealed that poverty, low level of education have theresponsibility of low level knowledge about DM[11].

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Daily researches about diabetics in India have been find meager levels of education and awareness about diabetes and very bad self-care method\cite{12}[13]. Thus, the elevated number of undetected cases, as well as the low level of knowledge and practices, has direct effect in increasing sudden deaths, costly complications, and financial burdens\cite{14,15}.

**Aim of the Study:** This study was conducted to assess the knowledge, attitude, and practice of periodic screening of diabetes mellitus among teachers in Tikrit city.

**Objectives of the Study:**

1. Identify the knowledge of teachers about importance of periodic checking and the source of their knowledge.
2. Clarify the knowledge about diabetes mellitus and its complications.
3. Demonstrate the practice of teachers for checking their blood sugar levels.
4. Identify the changes in life style among diabetic patients.

**Subjects and Method**

*Ethical and Approval Consideration:* Permission was taken from the teachers to fill the information and they were assured regarding the confidentiality of their responses.

*Type of Study:* The study is a cross-sectional study that had conducted from 1st of November 2018 until 30 of March 2019. The study was performed among teachers in Tikrit city primary schools (Al Kansa’a School and Al Noor School) and secondary schools (Al Motamizat School, Al Motamizen School, Al Safa School, Science City School and Al Forqan School). Sample:- Sample was chosen by clustered sampling then simple random sampling and the sample include 120 teachers from Tikrit city.

*Questionnaire and Interview:* The questionnaire used for data collection was designed in Arabic language. It include demographic characteristics of teachers, followed by close ended and open questions related to their knowledge, attitude and practice of periodic screening for diabetes mellitus. It was administered by the teachers themselves.

**Presentation and data analysis:** All data management and analysis done by manual statistical method. Data was represented by suitable tables and figures which was designated by computer programs.

**Results**

Knowledge of the teachers about the importance of screening of diabetes mellitus a show higher percentage 93.3% of them show very good knowledge while 6.66% were not well fig (1). The teachers knowledge regarding the disease itself and its symptoms, the results was the following, 25% were good, 45.83% were accepted and 29.16 were bad fig (2). Good knowledge about importance of testing they mention that the source of their knowledge was by doctor counseling 46.66%, media 29.16%, internet 36.66% and 2.5% were by attending a seminar about the disease fig (3). Teachers knowledge about the complications of the diabetes 14.16% of the results of their responses were good which is very small percentage, about 17.5 were accepted and 68.33 were bad fig (4). The result of performing of their periodic screening test of diabetes came as 48% performing the screening test while 52% not which is a high percent, About the method or the test types they used to check their blood sugar, 65% respond with laboratory tests, 42.5% with home devices and 12.5% show that they don’t do tests. The teacher’s attitude toward the best method of controlling diabetes were 42.5% by regular exercise, 84.16% by diet modifications, 24.16 by medication, and 2.5% show that they don’t know fig (5). Regarding the counseling and its role in raising the importance of knowledge about the periodic screening of diabetes mellitus, In the table (1) show the general knowledge of the teachers about the disease and its aspects of treatment and the results came with variable responses.
Figure (1): Knowledge of teachers in Tikrit city about the importance of diabetes mellitus screening.

Figure (2): Knowledge of teachers in Tikrit city about diabetes mellitus symptoms.

Figure (3): Source of knowledge of teachers in Tikrit city about the importance of diabetes mellitus periodic screening.
Figure (4): Knowledge of teachers in TIKRIT city about diabetes mellitus complications.

Figure (5): Diabetes mellitus controlling method among Tikrit city teachers.

Table (1): Teachers overall concepts about diabetes.

<table>
<thead>
<tr>
<th></th>
<th>Agree</th>
<th>Percentage</th>
<th>Disagree</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes mellitus is treatable?</td>
<td>60</td>
<td>50%</td>
<td>60</td>
<td>50%</td>
</tr>
<tr>
<td>Diabetes mellitus is treatable by diet and exercise?</td>
<td>81</td>
<td>67.5%</td>
<td>39</td>
<td>32.5%</td>
</tr>
<tr>
<td>Can be treated by medications?</td>
<td>76</td>
<td>63.3%</td>
<td>44</td>
<td>36.66%</td>
</tr>
<tr>
<td>Regular exercise can be helpful for control?</td>
<td>90</td>
<td>75%</td>
<td>30</td>
<td>25%</td>
</tr>
<tr>
<td>Diabetes mellitus complications can occur if not treated well?</td>
<td>111</td>
<td>92.5%</td>
<td>9</td>
<td>7.5%</td>
</tr>
</tbody>
</table>

Discussion

The knowledge of the teachers in Tikrit city about the importance of periodic screening have higher percentage 93.3% of them show very good knowledge while in DebreTabor town, Northwest Ethiopia 20.8% were strongly agreed and 32.1% were agreed, a total of 52.9%, that people should be examined for diabetes mellitus, this showing better knowledge of teachers in Tikrit than in Ethiopia[16]. Tikrit teachers mention that the source of their knowledge was by doctor counseling 46.66%, media 29.16%, internet 36.66% and 2.5% were by attending a seminar about the disease. In India...
patients believed that they can get information regarding diabetes through Books/Periodicals 28.57% and 10.72% got information by internet and television, 3.57% by other sources while majority of patients 57.14% were not interested to get information\[17\]. Teachers knowledge regarding the disease itself and its symptoms, the results was the following, 25% were good, 45.83% were accepted and 29.16 were bad, in comparison with Galle discrete in southern Seri Lanka \[16\] around 37% of the participants was categorized as having good level of knowledge \[18\]. Teachers knowledge about the screening and its benefits for the improvement of patient outcomes when detecting the disease earlier 40% were agreed and in West Bengal, India \[19\], 46.5% of diabetics patients and 35.5% of non-diabeticconsider that diabetes can be preventable, but 31.9% of diabetics patients and 14.1% of non-diabeticconsider that DM can be controlled not treat, indicating that early detection can help with the prognosis. Teachers knowledge about the complications of the diabetes 14.16% of the results of their responses were good which is very small percentage, about 17.5 were accepted and 68.33 were bad, while in study from Tabuk City, \[20\] about information of teachers about DM complications, the teachers had good knowledge and more appropriate answers.

The practice of teachers in Tikrit city about the performing of their periodic screening test of diabetes and the results was 48% performing the screening test while 52% not which is a high percent after that asked the teachers about the method or the test types they used to check their blood sugar, 42.5% with home devices and 12.5% show that they don’t do tests\[21\]. The teacher’s attitude toward the best method of controlling diabetes were 42.5% by regular exercise, 84.16% by diet modifications, 24.16 by medication, and 2.5% show that they don’t know while in Study conducted in in DebreTabor Town, Northwest Ethiopia \[16\] state that insulin treatment (57.3%), healthy diet (56%) and oral tablets were the main ways of management of diabetes mellitus and regular exercise (32.5%).

About the general overall view of teachers toward the disease and its controlling ways, asked some questions to assess their point of view and by comparing this with other countries results we found that in teachers of Tikrit city 50% of teachers showed by their answers that diabetes cannot be treated, while 51.3% of people in DebreTabor town \[21\], Northwest Ethiopia were agreed that diabetes mellitus is not curable disease, nearly same percentage of knowledge regarding the disease. Regarding comparison of results about the knowledge regarding diet 67.5% of the Tikrit teachers were agreed that diabetes can be treated by diet modification, while 56% of the people of DebreTabor town, Ethiopia \[16\] were agreed that practicing healthy diet is beneficial for controlling diabetes. In another study, 78% of population in Pakistan \[18\] was agreed that controlling sugar will control diabetes. Showing better results of knowledge in Tikrit than Northwest Ethiopia, but Pakistan results were the best. And regarding exercise, in our study 75% were agreed that it can control diabetes, in Pakistan population 73% thought that exercise is helpful to prevent diabetes, thus the results are nearly the same \[18\]. The knowledge regarding treatment in comparison with other studies 63.3% of them thought diabetes is treatable with medications (tabs and injections) while 57.3% of DebreTabor town, Ethiopia \[16\] people thought Insulin is petter for management of DM and 33.2% consider tablets are better for management of diabetes mellitus.

## Conclusion

1. A high percentage 93.3% of teachers know the importance of the periodic screening of diabetes mellitus and their knowledge mostly 46.6% by doctor counseling.

2. The percentage of teachers who perform the periodic screening of diabetes is 48% and 65% of them do the screening in the medical laboratories.

3. Teacher’s method for controlling diabetes mostly are diet modifications 84% then exercise 42.5%.

**Ethical Clearance:** From research ethic committee in Tikrit university/college of medicine

**Source of Funding:** Self

**Conflict of Interest:** Nil

## References


3. Aturaka SO, Omotola O, Abiodun O, Imohi P, Faturoti A. Knowledge of Risk Factors and


Factors that Affect the Performance of COVID-19 Infection Management Administration in General Hospitals

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Abstract

Background: This study aimed to provide basic data for the development of COVID-19 infection management educational programs by confirming the factors that affect the performance of COVID-19 infection management administration in general hospitals.

Method: Data was collected from administrative staff at 192 general hospitals by means of a structuralized questionnaire, and SPSS Ver. 21.0 software was used for data analysis.

Conclusion: The extent of knowledge and execution of COVID-19 infection management processes by administrative staff in general hospitals was positively correlated with the extent of educational demand for COVID-19 infection management, with explanatory power of 16.7%. It is necessary to include factors including COVID-19 transmission route, transmission prevention, and staff safety in COVID-19 infection management educational program administration. In addition, it is essential also to performance COVID-19 infection management education.

Keywords: COVID-19, Knowledge, Importance level, Educational demand, Performance.

Introduction

The outbreak of COVID-19(1) that began in Wuhan, China in December 2019 resulted in the first confirmed case in Korea on January 20, 2020. From that point on, it proliferated explosively in venues of communal life including religious organizations, clubs, mental hospitals, nursing hospitals and nursing homes, and call-centers(2). In particular, since patients with underlying diseases and degraded immunity tend to be hospitalized at medical institutions, mass infection at medical institutions imparted enormous effects not only on patients and guardians but also medical staff, administrative staff, and medical technicians. At the time of the outbreak of Middle East Respiratory Syndrome (MERS) in Korea in 2015, the proportion of medical health staff infected among total cases was 18%, with 30 confirmed cases from a total of 186 (3).

Since the outbreak of MERS in 2015, there have been studies conducted on nurses regarding the actual status and awareness of MERS infection management(4), assessments of the knowledge, intention for infection management activities, and extent of educational demand for respiratory diseases among nurses (5) and studies of infection management prevention knowledge and extent of performance of said management prevention among nursing aids, care workers, and caregivers(6). The majority of these studies have focused on nursing personnel, who generally had the longest period of close contact with patients. In addition, level D practical education on how to put on and take off quarantine gowns properly has been conducted for medical staff working at medical institutions throughout the country since the outbreak of MERS. However, the majority of
such education is aimed at medical staff, with inadequate education provided for administrative staff.

In order to prevent infection at medical institutions, it is essential for all constituent members including physicians, nurses, medical technicians, and administrative staff to comply strictly with the infection prevention guidelines, including directions regarding hand hygiene, personal protective devices, and environmental management[7]. Workers at medical institutions represent the key channel for outbreaks of medically related infections. Since the extent of infection management performance will be elevated with higher awareness of infection management among such workers, infection management education is very important[8,9]. The administrative staff at medical institutions constitute personnel who provide the necessary support for patient treatment and care, including materials and system resources, and are the first to come in contact with patients during visits to medical institutions. All patients need to register with the accounts department before receiving treatment and care. Since it is difficult to assess the state of patient respiratory infections at this time, administrative staff are confronted with very high possibility of being exposed to infection. Nonetheless, there has not been any study that investigated the actual state of the respiratory infection management knowledge among administrative staff until now.

Accordingly, this study aims to provide basic data for the development of educational programs customized for administrative staff by assessing COVID-19 infection management knowledge, importance level, extent of educational demand, and extent of performance among administrative staff members working at 4 general hospitals in the D Region. Study data was collected over a period of approximately 3 weeks from November 4 to 25, 2020. After extracting data from 4 general hospitals in the D Region, the researcher personally visited these institutions to carry out a survey after first explaining the purposes and methods of the study and acquiring the consent of the administrative staff. Minimum numbers of subjects necessary for statistical analysis were calculated using G*power 3.1 Program. Computed with a significance level of $\alpha=0.05$, scale effect of $d=0.15$, test power of 0.95, and 12 prediction variables, the minimum number of subjects was 184. A total of 200 questionnaires were distributed in consideration of the response rate and drop-out rate. Data collated from a total of 192 questionnaires retrieved after excluding 8 questionnaires filled in inappropriately were used for analysis.

A measurement tool was developed by the researcher in accordance with the study goals by making reference to the guidelines to cope with COVID-19 issued by the Korea Centers for Disease Control and Prevention. The questionnaire consisted of a total of 73 questions, comprising 11 questions on general characteristics, 20 questions on knowledge of COVID-19, 20 questions on the importance level of COVID-19, 8 questions on the extent of educational demand for COVID-19 infection management, and 14 questions on the execution of COVID-19 infection management. The final questionnaire was prepared after its content was verified by the administrative managers at the 4 general hospitals, 2 nursing college professors, and 3 nurses specializing in infection management. The Content Validity Index (CVI) exceeded 0.80.

1. **COVID-19 Knowledge:** The survey tool for assessment of COVID-19 knowledge was composed of a total of 20 questions, with each question to be answered with either ‘Yes’, ‘No’, or ‘Don’t know’. 1 point was allocated for each correct answer, while 0 points were allocated for wrong answers and ‘Don’t know’ responses. As such, the total score for each subject ranged from 0 to 20 points, with higher scores signifying that subjects had higher knowledge of COVID-19.

2. **Importance Level of COVID-19:** This section was composed of 20 questions with a 5-point Likert scale applied to each question. Higher scores
signified higher importance placed by the subject on COVID-19. The reliability of the questionnaire as a tool of assessment was secured with a Cronbach alpha value of 0.94 in this study.

3. Extent of Educational Demand for COVID-19 Infection Management: This section was composed of 8 questions with a 4-point Likert scale applied to each question and a range of scores from 1 point for ‘Not important at all’ to 4 points for ‘Very important’. Higher scores signified a higher extent of educational demand for COVID-19 infection management. The reliability of the questionnaire as a tool of measurement of the extent of educational demand for COVID-19 management was indicated by a Cronbach alpha value of 0.83.

4. Performance of COVID-19 Infection Management: It is composed of 14 questions with 4-point Likert scale applied to each question with the range of scores of 1 point for ‘Not performance at all’ to 4 points for ‘Always performance’. Higher score signifies higher level of execution of COVID-19 infection management. The reliability of the questionnaire as the tool for the measurement of the execution of COVID-19 infection management was secured with Cronbach’s alpha value of 0.84.

Method

The data collected was analyzed by means of the SPSS Ver. 21.0 program, employing the following analysis methods. Characteristics of study variables were analyzed by means of descriptive statistics, while differences in the study variables in accordance with general characteristics were analyzed using the t-test and ANOVA. Follow-up analysis was verified with the Duncan test, while the correlations among the study variables were analyzed with Pearson’s Correlation Coefficient. In addition, Multiple Regression Analysis was used to analyze the factors affecting execution of the infection management by study subjects.

Results and Discussion

General Characteristics of Study subjects: The general characteristics of the study subjects are given in Table 1. There were 112 males (80%) and 80 females (41.7%) with an average age of 36.86±9.56 years. Regarding their employment positions, team members were most numerous at 157 (81.8%), while the average period of work experience was 10.78±8.76 years. There were 110 subjects working in departments that come in direct contact with patients (57.3%) and 128 subjects underwent respiratory infection management education during the last 1 year (66.7%). 54 subjects came in contact with patients suspected of COVID-19 (28.1%), while 6 subjects came into contact with confirmed COVID-19 cases (3.1%).

Table 1. General Characteristics of Study Subjects (n=192)

<table>
<thead>
<tr>
<th>Categories</th>
<th>Variables</th>
<th>N</th>
<th>%</th>
<th>Mean±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>112</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>80</td>
<td>41.7</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>20’s</td>
<td>57</td>
<td>29.7</td>
<td>36.86±9.56</td>
</tr>
<tr>
<td></td>
<td>30’s</td>
<td>62</td>
<td>32.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Over 40 years</td>
<td>73</td>
<td>38.0</td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td>Single</td>
<td>83</td>
<td>43.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>107</td>
<td>55.7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>2</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>Position</td>
<td>Team member</td>
<td>157</td>
<td>81.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Part manager</td>
<td>17</td>
<td>8.9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Higher than team manager</td>
<td>18</td>
<td>9.4</td>
<td></td>
</tr>
<tr>
<td>Work experience</td>
<td>Less than 5 years</td>
<td>63</td>
<td>32.8</td>
<td>10.78±8.76</td>
</tr>
<tr>
<td></td>
<td>More than 5 years</td>
<td>129</td>
<td>67.2</td>
<td></td>
</tr>
</tbody>
</table>
COVID-19 Knowledge, Importance Level, Extent of Educational Demand, and Infection Management Performance: The levels of COVID-19 knowledge, importance, extent of educational demand, and infection management performance by general hospital administrative staff are illustrated in Table 2. The average score for COVID-19 knowledge among administrative staff was 14.54±2.69 out of a possible 20 points, while those of the subordinate domains including epidemiology and infection management were 7.72±1.37 and 6.88±1.94 points, respectively. The average score for importance level was 4.09±0.88 out of a possible 5 points, while those of the subordinate domains including epidemiology and infection management were 4.10±0.85 and 4.09±0.98 points, respectively. The average score for the extent of educational demand was 3.66±0.34 out of a possible 4 points, while those of the subordinate domains including characteristics of disease, diagnosis, and examination, treatment methods, transmission route, transmission prevention, putting on and taking off of personal protective devices, isolation guidelines, lifting of patient isolation, and staff safety were 3.64±0.79, 3.60±0.53, 3.53±0.59, 3.84±0.36, 3.71±0.49, 3.70±0.50, 3.47±0.62 and 3.78±0.43 points, respectively. The average score for the performance of infection management was 3.40±0.58 out of a possible 4 points, while those of the subordinate domains including hand hygiene, personal protective devices, environmental disinfection, respiratory etiquette, and infection management by staff were 3.22±0.34, 3.55±0.86, 2.73±1.21, 3.63±0.64 and 3.70±0.59 points, respectively.

**Table 2. COVID-19 Knowledge, Importance Level, Extent of Educational Demand and Infection Management Performance**

<table>
<thead>
<tr>
<th>Categories</th>
<th>Subordinate domains</th>
<th>Mean±SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>Epidemiology</td>
<td>7.72±1.37</td>
<td>0~10</td>
</tr>
<tr>
<td></td>
<td>Infection management</td>
<td>6.88±1.94</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>14.54±2.69</td>
<td>0~20</td>
</tr>
<tr>
<td>Importance level</td>
<td>Epidemiology</td>
<td>4.10±.85</td>
<td>1~5</td>
</tr>
<tr>
<td></td>
<td>Infection management</td>
<td>4.09±.98</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>4.09±.88</td>
<td></td>
</tr>
<tr>
<td>Extent of educational demand</td>
<td>Characteristics of disease</td>
<td>3.64±.79</td>
<td>1~4</td>
</tr>
<tr>
<td></td>
<td>Diagnosis and examination</td>
<td>3.60±.53</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Treatment method</td>
<td>3.53±.59</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transmission route and transmission prevention</td>
<td>3.84±.36</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Putting on and taking off of personal protective devices</td>
<td>3.71±.49</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Isolation guidelines</td>
<td>3.70±.50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lifting of patient isolation</td>
<td>3.47±.62</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Staff safety</td>
<td>3.78±.43</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>3.66±.34</td>
<td></td>
</tr>
</tbody>
</table>
Differences in Study Variables in Accordance with General Characteristics: There were statistically significant differences in the performance of infection management in accordance with general characteristics depending on the department in which the subjects worked ($t=2.076, p=.039$), with those working in departments with contact with patients displaying higher levels of performance of infection management in comparison to those working in departments with no contact with patients (Table 3).

Table 3. Extent of the Execution of COVID-19 Infection Management in Accordance with General Characteristics

<table>
<thead>
<tr>
<th>Categories</th>
<th>Variables</th>
<th>Extent of infection management execution</th>
<th>Mean±SD</th>
<th>t or F (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>3.39±.47</td>
<td>-.467</td>
<td>(.641)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>3.43±.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>20's</td>
<td>3.41±.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>30's</td>
<td>3.41±.44</td>
<td>.058</td>
<td>(.944)</td>
</tr>
<tr>
<td></td>
<td>Over 40</td>
<td>3.38±.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td>Single</td>
<td>3.42±.68</td>
<td></td>
<td>.128 (.880)</td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>3.38±.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>3.50±.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Position</td>
<td>Team member</td>
<td>3.39±.35</td>
<td></td>
<td>1.106 (.333)</td>
</tr>
<tr>
<td></td>
<td>Part manager</td>
<td>3.67±.34</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Higher than team manager</td>
<td>3.74±.26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work experience</td>
<td>Less than 5 years</td>
<td>3.42±.75</td>
<td></td>
<td>.284 (.777)</td>
</tr>
<tr>
<td></td>
<td>More than 5 years</td>
<td>3.39±.48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Department</td>
<td>Department with contact with patients</td>
<td>3.50±.68</td>
<td></td>
<td>2.076 (.039)</td>
</tr>
<tr>
<td></td>
<td>Department with no contact with patients</td>
<td>3.33±.49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respiratory system infection management education within the last 1 year</td>
<td>Yes</td>
<td>3.44±.48</td>
<td></td>
<td>1.083 (.282)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>3.32±.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contact with patient suspected of COVID-19</td>
<td>Yes</td>
<td>3.40±.44</td>
<td></td>
<td>.044 (.965)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>3.40±.63</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contact with confirmed COVID-19 patient</td>
<td>Yes</td>
<td>3.63±.33</td>
<td></td>
<td>.981 (.328)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>3.39±.59</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Correlations Between COVID-19 Infection Management Knowledge, Importance Level, Extent of Educational Demand, and Performance: The correlations between COVID-19 infection management knowledge, importance level, extent of educational demand, and performance are given in Table 4. The level of execution of COVID-19 infection management had a positive correlation with knowledge of \((r=.19, p=.007)\) and extent of educational demand for \((r=.3, p<.001)\) COVID-19.

Table 4. Correlations between Study Variables

<table>
<thead>
<tr>
<th></th>
<th>Knowledge</th>
<th>Importance level</th>
<th>Extent of educational demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance of infection management</td>
<td>.19 (.007)</td>
<td>.12 (.099)</td>
<td>.33 (&lt;.001)</td>
</tr>
</tbody>
</table>

Factors Affecting Execution of COVID-19 Infection Management: In order to analyze the factors that affect performance of COVID-19 infection management by administrative staff at general hospitals, multiple regression analysis was executed, with the departments in which subjects work, COVID-19 infection management knowledge, and extent of educational demand as the independent variables. Analyzing the tolerance limit and Variance Inflation Factor (VIF) confirmed the multicollinearity of the independent variables tolerance limit to be in the range of 0.913~0.981, while the VIF value was in the range of 1.019~1.096, thereby demonstrating that no variables were affected by multicollinearity. Analysis results demonstrated that the factors relating to the performance of COVID-19 infection management included the extent of educational demand \((\beta=.372, p<.001)\), with explanatory power of 16.7% (Table 5).

Table 5. Factors Affecting performance of COVID-19 Infection Management

<table>
<thead>
<tr>
<th></th>
<th>(B)</th>
<th>(SE)</th>
<th>(\beta)</th>
<th>(t)</th>
<th>(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>1.26</td>
<td>.36</td>
<td></td>
<td>3.51</td>
<td>.001</td>
</tr>
<tr>
<td>Knowledge</td>
<td>.02</td>
<td>.01</td>
<td>.11</td>
<td>1.53</td>
<td>.13</td>
</tr>
<tr>
<td>Extent of educational demand</td>
<td>.52</td>
<td>.09</td>
<td>.37</td>
<td>5.29</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Department (Dummy-department with no contact with the patient)</td>
<td>-.09</td>
<td>.07</td>
<td>-.09</td>
<td>-1.39</td>
<td>.17</td>
</tr>
</tbody>
</table>

Discussion

This study aimed to provide basic data for the development of infection management educational programs to stop the spread of COVID-19 by assessing the factors that affect the performance of COVID-19 infection management, with administrative staff at general hospitals as the subjects. 66.7% of subjects received respiratory infection management education during the previous year at the time of the outbreak of the COVID-19 pandemic, with 28.1% coming in contact with patients suspected of COVID-19 and 3.1% with confirmed COVID-19 cases. Although it is difficult to make comparisons due to the lack of preceding studies, it can be seen that not only are medical staff coming in contact with suspected or confirmed COVID-19 patients, but also administrative staff. Therefore, it is necessary to provide infection management education for administrative staff at the time of outbreak of new infectious diseases such as COVID-19.

The average score for COVID-19 infection management knowledge of general hospital administrative staff was 14.54±2.69 out of a possible 20 points. Although the respective study subjects and infectious diseases differed, the results of surveys of nurses’ knowledge of SARS and MERS\(^{(6)}\) were 13.46±2.97 out of a possible 20 points, which is similar to the results of this study. However, in a study of nursing college students\(^{(10)}\), the average score for the extent of the knowledge of personal protective devices to be used against acute respiratory infectious diseases was 17.83
out of a possible 20 points, which is higher than the results of this study. Accordingly, it is thought that the level of knowledge of administrative staff is similar to that of nurses, since COVID-19 infection management education was executed for all staff at the medical institutions, and information regarding COVID-19 ceaselessly conveyed through mass media. The importance placed on COVID-19 infection management had an average score of 4.09±.88 out of possible 5 points. Although it is difficult to make comparisons due to lack of preceding studies, it is deemed that administrative staff also consider COVID-19 infection management to be important at the time of the current COVID-19 pandemic. The average score for the extent of educational demand for COVID-19 infection management was 3.66±.34 out of a possible 4 points, with the highest score for the extent of educational demand for the transmission route and transmission prevention of COVID-19, followed by staff safety, and the putting on and taking off of personal protective devices, while the score for the extent of educational demand on lifting of patient isolation was the lowest. In the study of the extent of educational demand for SARS and MERS information among nurses (5), the scores were in the order of treatment and nursing, isolation method, clinical symptoms, and method of putting on personal protective devices, thereby displaying differences to the results of this study. That is, the medical staff displayed a higher extent of educational demand in the domains of treatment and nursing, since patient treatment and nursing are their main roles. On the other hand, since the roles of administrative staff include allocation of hospital rooms and supply of goods for patients rather than treatment, the scores for the extent of educational demand for transmission route and transmission prevention were the highest. In addition, while nurses displayed lower scores for the extent of educational demand on the use of personal protective devices, since they use these frequently, it is thought that administrative staff displayed higher scores for this domain since they use protective devices only during special situations. The average score for the performance of COVID-19 infection management was 3.40±.58 out of a possible 4 points, with higher scores for the subordinate domains in the order of infection management by staff, respiratory etiquette, and personal protective devices.

There were differences in the scores for the execution of COVID-19 infection management depending on the department that the administrative staff worked in, with the staff working in departments with contact with patients displaying higher scores. It is thought that the frequency of execution of the guidelines for COVID-19 infection management would be higher in the case of more frequent contact with patients. In terms of the correlations among COVID-19 infection management knowledge, importance level, extent of educational demand, and extent of performance, the extent of performance of COVID-19 infection management was found to be higher with higher levels of COVID-19 knowledge and extent of educational demand. According to the results of this study, 28.1% of the administrative staff came in contact with COVID-19-suspected patients. Accordingly, COVID infection management needs to be executed for administrative staff, and it is anticipated that the spread of infectious diseases within medical institutions can be stopped more quickly and easily if the level of the execution of infection management were to increase through more extensive acquisition of accurate COVID-19 infection management knowledge. A factor affecting performance of COVID-19 infection management was the extent of educational demand, with explanatory power of 16.7%. It was found that the level of execution of COVID-19 infection management is higher with a higher extent of educational demand. Therefore, it is important to assess the extent of educational demand of administrative staff regarding infectious diseases other than COVID-19, since there is very high possibility of such future outbreaks.

Conclusion and Acknowledgements

This study was significant in that it assessed COVID-19 infection management knowledge and the extent of educational demand among general hospital administrative staff, providing basic data for the development of COVID-19 infection management education programs for administrative staff by analyzing the factors that affect the performance of COVID-19 infection management. The extent of educational demand was the factor imparting the most significant effect on the execution of COVID-19 infection management by general hospital administrative staff. The extent of educational demand for the domains of transmission path, transmission prevention, and staff safety against COVID-19 was high. Therefore, it is necessary to include the domains of transmission method, insolation guidelines, and staff infection management of COVID-19 at the time of the development of COVID-19 infection management educational programs in the future.
This study has several limitations and the recommended directions for future studies to supplement these limitations are suggested below. First, general hospitals in a single region with easier accessibility were selected in consideration of the response range of the questionnaire. Accordingly, there could be limitations in terms of generalizing the results of this study to all general hospital administration staff throughout the country. Second, it is important to review and confirm the subordinate domains of extent of educational demand in order to increase execution of infection management. Accordingly, it would be necessary in future to execute a follow-up study for the verification of effects after developing individual educational programs for each of the subordinate domains.

**Source Funding:** This paper was supported by the Konyang University Research Fund in the second half of 2020

**Conflict of Interest:** None

**Ethical Clearance:** This research has ethical clearance from the Institutional Review Board of Konyang University (KYU-2020-139-01)

**References**


Effect of Eruca Sativa in Broiler Diet on Productivity

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Abstract
This experiment was conducted on 120 unsexed Cobb chicks of one day old for 28 days. Chicks were randomly divided into 4 groups (30 chicks each) and each group consists of two replicates (15 chicks each). All groups was fed using a basal diet, but the first group drunk water from the tap as a control, while the other drunk water with extract of Eruca Sativa leaves (0.25, 0.50 and 0.75ml/Liter) respectively. This study aimed to determine the effect of extraction of Eruca sativa leaves on broiler performance, some blood parameters and immune response to Newcastle virus. The result showed that the supplementation of the broiler diet with extraction of Eruca sativa especially of levels (0.25 and 0.50ml/L) significantly improve the final body weight (P≤0.05). The weight gain also significantly improved (P≤0.05) but, there were no significantly changes in the weight of internal organs and blood pictures (WBCs, RBCs, Hb and PCV respectively). The antibody titer against the Newcastle virus found to be significantly increased (P≤0.05).

Keywords: Eruca sativa, broiler, performance, immunity.

Introduction
Using of antibiotics in animals feed as growth promoters have been implemented in poultry diets recently. Many studies attempted to find of alternative solutions which would provide positive effects on broiler growth and feed conversion ratio (FCR) (1). Henceforth, essential oils have appeared as a possible alternative to antibiotics in the feed of animal (2). Eruca sativa (Rocket seed meal) locally known in Iraq as “Jarjeer” is containing vitamin C, carotenoids, some flavonoids (like luteolin and appin) and glucosinolates (the precursors of isothiocyanates and sulfaraphene) (3). The Jarjeer is also contain Cu, Zn, Fe, Mn, Mg and other elements which are proposed as elements that enhances the immune system and the reproductive performance(4). And as well as, increases plasma IgG concentration (5). Additionally, Bendich,et al.,(6) reported that Eruca sativa has a role in the enhancing of both T and B lymphocyte proliferative responses and increase the production of certain interleukins .examples of some positive effects of essential oils are improving the feed conversion ratio (FCR) through increase the digestive enzymes secretion, appetite, positive stimulation of the immunity, increase vitality, antiviral and antioxidant activities, regulation the normal micro-flora in the intestine and finally, exhibit antimicrobial properties (7,8). The essential oil (Eso) of Eruca sativa has therapeutic and medicinal properties (9) It has been found that the extract of Eruca sativa exerts a prophylactic and a therapeutic role against oxidative stress by increasing the levels of antioxidant enzymes and antioxidant molecules (10, 11). The E sativa plays important role as antifungal and antimicrobial activity (12,13). The aim of this study is to light the effects of adding Eruca sativa to the diet of the broiler by measuring the performance of the broilers, blood parameters and finally, immune responses of the Eruca sativa fed broiler to Newcastle disease.

Material And Method
A total number of 640 of unsexed broiler chicks (Cobb) aged 28 day-old were weighed and grouped randomly to 4 groups., Each group was additionally subdivided into two equal sub groups with 4 replicates (20 bird per each replicate). All the chickens were fed
using similar starter (day 1-18 of age) and grower (day 18-28 of age) diets in a pellet form (Table 1). Only the water was enriched with the extraction of Eruca sativa and the broiler was irrigated as the following:

1. The first group was given ordinary water to be cosider as a control group.
2. The second group was irrigated using water with 0.25 ml/litter of the extraction of Eruca sativa (0.25 ml/litter).
3. The third group was given water with 0.50 ml/litter of the extraction of Eruca sativa.
4. The fourth group was given water with 0.75 ml/litter of the extraction of Eruca sativa.

All the treatments (diets) were prepared and monitored daily. A vaccination against Bronchitis- virus was administrated to all the broiler on the first day (in drinking water), and a vaccination against Newcastle virus was also applied directly into the drinking water at 1st, 9th, 19th and 28th days of the experimental period. Finally, a vaccine against the Gumboro disease was also given by drinking water at the day 14th of the experiment. At the day 29th of age, three birds per group were randomly selected, weighed and postmortem examined by decapitation to collect some organs that are linked to the weights of the bird such as thyme, spleen and bursa of fabricius (to be used in analyzing the live body weight). Blood samples were collected from the heart directly at 1st, 9th, 19th and 28th days and stored in anticoagulant tubes (contain citrate sodium 3.6% solution). Following a centrifugation (5000 rpm) for 7 min, the serum was separated and at the consequent antibody-titer of Newcastle and Bronchitis disease viruses were measured using the ELISA technique.

### Table 1: Composition of experimental diet

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Growing diet</th>
<th>Finishing diet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soy bean meal</td>
<td>112.30</td>
<td>98.16</td>
</tr>
<tr>
<td>Full fat soybean</td>
<td>200.00</td>
<td>200.00</td>
</tr>
<tr>
<td>Vitamin premix 1</td>
<td>2.00</td>
<td>2.00</td>
</tr>
<tr>
<td>Mineral premix 2</td>
<td>1.50</td>
<td>1.50</td>
</tr>
<tr>
<td>Salt</td>
<td>1.65</td>
<td>1.48</td>
</tr>
<tr>
<td>Crud cotton oil</td>
<td>25.64</td>
<td>27.98</td>
</tr>
<tr>
<td>Anticoccidial</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Antifungal</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Total calculate analysis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crude protein</td>
<td>23.08</td>
<td>20.99</td>
</tr>
<tr>
<td>ME kcal/kg</td>
<td>3338</td>
<td>3400</td>
</tr>
<tr>
<td>Calcium</td>
<td>1.0</td>
<td>0.90</td>
</tr>
<tr>
<td>Available phosphorus</td>
<td>0.48</td>
<td>0.48</td>
</tr>
<tr>
<td>Methionine + Cystine</td>
<td>0.95</td>
<td>0.94</td>
</tr>
</tbody>
</table>

### Results and Discussion

**Broiler performance:** The results of Table 2 showed the effect of extract of Eruca sativa on live body weight. Interestingly, chicks that irrigated by a water supplemented with the extraction of Eruca sativa 0.25ml/L had a significant higher body weight once they reached the third week (p≤0.05) while there were no significant differences between groups at 1st, 2nd and 3rd week respectively compared with control. The current results showed the growth performance was improved in broiler that irrigated by a water containing different levels of essential oil especially the concentration 0.25 ml/L. Possible explanation could be that the extraction of the Eruca sativa may enhances the secretion of digestive enzymes which result in improving the digestion rate. Furthermore, many studies indicated that the essential oils stimulate the activity and secretion of pancreatic enzymes such as amylase, lipase, chymotrypsin and trypsin reported that the essential oils of medical plants stimulate the digestion of proteins, fat and cellulose.
Table 2: Effect of Eruca sativa on average live body weight of broiler per gram

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Hatching weight</th>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Week 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>control</td>
<td>40.6</td>
<td>165.4±1.69a</td>
<td>398.0±3.65a</td>
<td>654.7±9.64b</td>
<td>1163.0±25.96c</td>
</tr>
<tr>
<td>0.25 ml/L</td>
<td>41.2</td>
<td>151.5±1.75ab</td>
<td>380.5±5.49b</td>
<td>705.4±5.90a</td>
<td>1278.0±11.77b</td>
</tr>
<tr>
<td>0.50 ml/L</td>
<td>43.1</td>
<td>148.6±1.69b</td>
<td>377.1±4.98b</td>
<td>662.1±8.80b</td>
<td>1277.2±10.90b</td>
</tr>
<tr>
<td>0.75 ml/L</td>
<td>43.3</td>
<td>153.6±1.70ab</td>
<td>376.1±4.49a</td>
<td>672.1±2.75ab</td>
<td>1236.2±9.78b</td>
</tr>
</tbody>
</table>

Values are means ± standard error. Mean values Similar vertically no significant differences at the level of probability (p < 0.05).

Table 3 showed the effect of extraction of Eruca sativa on weight gain of broiler, the main observation was the significant differences (p≤0.05) at 4th week between all treatments and control as well as accumulative weight body gain. This could be due to high concentration of Eruca acid that contributed to antimicrobial activity(13). Thus, it was expected that the essential oils could have an effect on the gastrointestinal microflora by lowering the number of Escherichia coli and Clostridium perfringens and increased the number of Lactobacillus species.

Table 3: Effect of Eruca sativa on average weight gain of broiler per gram.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Week 4</th>
<th>Accumulative body gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>control</td>
<td>125.4±1.69a</td>
<td>242.6±4.15a</td>
<td>286.7±7.53a</td>
<td>498.3±20.36d</td>
<td>1.153±53.56b</td>
</tr>
<tr>
<td>0.25 ml/L</td>
<td>120.5±1.75ab</td>
<td>230.0±6.55a</td>
<td>340.9±6.89a</td>
<td>576.6±14.14bc</td>
<td>1.268±44.18a</td>
</tr>
<tr>
<td>0.50 ml/L</td>
<td>119.6±1.96b</td>
<td>227.5±4.30a</td>
<td>315.0±6.82bc</td>
<td>605.1±16.83ab</td>
<td>1.267±60.67a</td>
</tr>
<tr>
<td>0.75 ml/L</td>
<td>154.6±1.70ab</td>
<td>241.5±5.33a</td>
<td>306.0±5.83cd</td>
<td>554.1±11.29c</td>
<td>1.256±40.52a</td>
</tr>
</tbody>
</table>

Values are means ± standard error. Mean values Similar vertically no significant differences at the level of probability (p < 0.05).

Tables 4 and 5 showed significant effects of Eruca sativa on feed intake of broiler and feed conversion ratio from 3rd and 4th weeks at 0.50 and 0.25ml/L respectively. Indeed, there were no significant effects of the extraction of Eruca sativa (p≤0.05) at 4th week on feed intake. This could be explained by present more than one active ingredient in the herb and the effects are cumulative. Botsoglou et al., 2002 (20) reported that the different levels of essential oil (20-200 ppm) in poultry diets. Positive effects like, weight gain and feed intake were increased whereas feed conversion ratio decreased as compared with control and this is corresponding to (0.25 and 0.50ml/L) these results are agreed with(7,21) that found that the effect of essential oils can be positively through improve feed conversion ratio through increase digestive enzymes secretion, appetite, stimulation of immunity, increased vitality, antiviral, antioxidant activity, regulation of the intestinal microflora and, they exhibit antimicrobial properties.

Table 4: Effect of Eruca sativa on average feed intake of broiler per gram

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Week 4</th>
<th>Week 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>100±0.01a</td>
<td>440±0.08a</td>
<td>510±0.01b</td>
<td>880±0.11a</td>
<td></td>
</tr>
<tr>
<td>0.25 ml/L</td>
<td>130±0.01a</td>
<td>520±0.02a</td>
<td>510±0.04b</td>
<td>1180±0.05a</td>
<td></td>
</tr>
<tr>
<td>0.50 ml/L</td>
<td>110±0.05a</td>
<td>510±0.08a</td>
<td>630±0.03a</td>
<td>160±0.01a</td>
<td></td>
</tr>
<tr>
<td>0.75 ml/L</td>
<td>120±0.01a</td>
<td>480±0.04a</td>
<td>540±0.01ab</td>
<td>1130±0.06a</td>
<td></td>
</tr>
</tbody>
</table>

Values are means ± standard error. Mean values Similar vertically no significant differences at the level of probability (p < 0.05).
Table 5: Effect of Eruca sativa on average feed conversion ratio of broiler per gram

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Age</th>
<th>Week 1</th>
<th>Week 2</th>
<th>Week 3</th>
<th>Week 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>0.790.17a</td>
<td>1.81±0.32a</td>
<td>1.79±0.02a</td>
<td>1.77±0.08ab</td>
<td>1.77±0.08ab</td>
</tr>
<tr>
<td>0.25 ml/L</td>
<td>1.080.15a</td>
<td>2.26±0.24a</td>
<td>1.50±0.01b</td>
<td>2.05±0.10a</td>
<td></td>
</tr>
<tr>
<td>0.50 ml/L</td>
<td>0.91±0.03a</td>
<td>2.24±0.49a</td>
<td>2.0±0.05a</td>
<td>0.26±0.02b</td>
<td></td>
</tr>
<tr>
<td>0.75 ml/L</td>
<td>0.86±0.15a</td>
<td>2.07±0.12a</td>
<td>1.85±0.14ab</td>
<td>2.03±0.09ab</td>
<td></td>
</tr>
</tbody>
</table>

Values are means ± standard error. Mean values Similar vertically no significant differences at the level of probability (p < 0.05).

**Internal organs and antibody titer:** There were no significant differences in thyme, spleen and bursa percentage of chick irrigated with the extraction of Eruca sativa at 0.25, 0.50 and 0.75ml/L (table 6). However, there were significant differences in antibodies titers at 9th and 28th days of broiler given a water with 0.75ml/L of the extraction of Eruca sativa at 9th and 0.50ml/L at 28th. The negative effect in internal organs might be attributed to high concentration of essential oil and may be a great part of the components are metabolized and then precipitated in the chicken meat. These results agreed those obtained by (24) and (24). Both paper reported that the relative weight of some organs such as bursa and spleen, and also antibody titration against Newcastle virus had no significant differences between some herb extract and control. The enhanced in antibody titer may be result of the mineral content of Cu, Zn, Fe, Mn, Mg and other elements which may enhance the immune response and the reproductive performance (4). Finally enhancing of both T and B lymphocytes responses and interleukins have been reported by (6).

Table 6: Show the effect of Eruca sativa on internal organs weight of broiler at age 28 days.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Parameters</th>
<th>Thyme weight %</th>
<th>Spleen weight %</th>
<th>Bursa weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td></td>
<td>0.35±0.07</td>
<td>0.14±0.84</td>
<td>0.19±0.01</td>
</tr>
<tr>
<td>Mix 0.25%</td>
<td></td>
<td>0.41±0.13</td>
<td>0.13±0.86</td>
<td>0.17±0.02</td>
</tr>
<tr>
<td>Mix 0.50%</td>
<td></td>
<td>0.46±0.09</td>
<td>0.14±0.84</td>
<td>0.19±0.02</td>
</tr>
<tr>
<td>Thyme 0.25%</td>
<td></td>
<td>0.24±0.05</td>
<td>0.12±0.87</td>
<td>0.19±0.01</td>
</tr>
</tbody>
</table>

Values are means ± standard error. Mean values Similar vertically no significant differences at the level of probability (p < 0.05).

**Conflict of Interests:** The authors of this paper declare that he has no financial or personal relationships with individuals or organizations that would unacceptably bias the content of this paper and therefore declare that there is no conflict of interests.

**Source of Funding:** The authors have no sources of funding, so it is self-funding research.

**Ethical Approve:** We declare that the study does not need ethical approval.

**References**

3. TALALAY, Paul; FAHEY, Jed W. Phytochemicals From Cruciferous Plants Protect Against Cancer By Modulating Carcinogen Metabolism. The Journal Of Nutrition, 2001, 131.11: 3027S-3033S.


Anesthetic Potency of Ketamine in Caspian Terrapin, Freshwater Soft Shell Tortoise and Rat Snake Collected from Bahar Al Najaf District, Al-Najaf Province

Ayad N.D. Alhakim

Abstract

The study was carried out during April 2012. Twelve Caspian terrapins, twelve freshwater soft-shell turtles and 6 rat snakes were collected from Baher Al-Najaf by professional reptiles collectors from Al-Rafidin association for hunting and environment protection, the present study include 3 separated experiments. The terrapins placed in 6 glass aquariums (couple per aquariums) the maintenance conditions controlled after adaptation for one week, all terrapins distributed equally into 3 groups. The animals of group 1, 2 and 3 were injected intramuscularly with 40, 60 and 80 mg ketamine. The anesthetic levels were assessed. Freshwater soft-shell turtles experiment, this experiment was same to previous experiment. The rat snakes placed in 2 plastic containers distributed into 2 groups, the maintenance conditions. The snake of 1.2-and 3 group were injected with 40, 60 and 80 mg/kg intramuscularly. The anesthetic levels were assessed. We note in Table 1 that when ketamine was injected at a dose of 40, 60 and 80 mg/kg of body weight, the minimum onset time for doses was (15, 7, 5), while the most time was (17, 10, 5) respectively. While we noticed the minimum a loss of the right reflex, deep anesthesia, recovery right reflex and completed recovery was (21, 12, 8), (47, 58, 76), (87, 120, 140) and (18, 24, 64). We note in Table 3 that when ketamine was injected at a dose of 40, 60 and 80 mg/kg of body weight, the minimum onset time for doses was (4, 4, 3), while the most time was (12, 5, 5) respectively. While we noticed the minimum a loss of the right reflex, deep anesthesia, recovery right reflex and completed recovery was (8, 4, 5), (50, 40, 74), (290, 260, 290) and (62, 70, 70). Therefore, the best dose is 80 mg/kg for Caspian terrapin, while for freshwater soft shell tortoise it is 80 mg/kg. As for rat snake, the ketamine dose of 80 mg/kg of body weight was the best according to the study.

Keywords: Anesthetic potency, Caspian terrapin, Rat Snake, Bahar Al Najaf district etc.

Introduction

The necessity of researches about reptile’s medicine and surgery has been increasing in recent years, either due to considering reptiles as pet animals or for conservation point (1). The reptiles are difficult to handling and the chemical restrain are necessary to clinical examination, minor surgical operation and biometry recording (2). Ketamine was originally developed for human use as cheap, injectable and safe anesthetic, these advantages were formed a ketamine to use in all primates, many zoological and exotic animals, and in birds and reptiles (3). Mostly, there are no anesthetic has been approved to use in reptiles in addition to variable anesthetic effects between individuals of the same species have been observed in reptile anesthesia studies and have been anecdotally attributed to possible differences in temperature, body size, body condition, sex, stress level, administration route and elapsed time since previous dosing (10). For these reasons the present study was designed to determined the anesthetic effect of ketamine in variant dose scale in three reptiles species including Caspian terrapin (Mauremys caspica), freshwater soft shell turtle (Rafetus euphraticus) and rat snake (Colubridae reptilia) collected from Bahar Al-Najaf district-Al- Najaf province/Iraq.

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e-mail: ayadn.dheyaa@uokufa.edu.iq
Materials and Method

Collection and maintenance of reptiles: The study was carried out during April 2012. Twelve Caspian terrapins, 12 freshwater soft-shell turtles and 6 rat snakes were collected from Baher Al-Najaf by professional reptiles collectors from Al-Rafidin association for hunting and environment protection, the present study include 3 separated experiments as followings:

Caspian terrapin experiment: The terrapins placed in 6 glass aquariums (couple per aquariums) the maintenance conditions controlled according to (7). After adaptation for one week, all terrapins distributed equally into 3 groups. The animals of group 1, 2 and 3 were injected intramuscularly (8) with 40, 60 and 80 mg ketamine (5). The anesthetic levels were assessed according (8).

Freshwater soft-shell turtles experiment: This experiment was same to previous experiment. Rat snake experiment: The rat snakes placed in 2 plastic containers distributed into 2 groups, the maintenance conditions (7) approved according to (12,17). The snake of 1.2 and 3 group were injected with 40, 60 and 80 mg/kg intramuscularly in table 3. The anesthetic levels were assessed according (11). All reptiles were released in their natural habit after 2 weeks of experiments.

Results

Table 1: Onset of anesthesia and recovery time induced by the anesthetic agents (ketamine) in 12 Caspian terrapin (mean ±standard deviation)

<table>
<thead>
<tr>
<th>Dose mg/kg b w</th>
<th>Time of onset (min)</th>
<th>Loss Right reflex (min)</th>
<th>Deep Anesthesia (min)</th>
<th>Recovery right reflex (min)</th>
<th>Completed Recovery (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>17</td>
<td>22</td>
<td>48</td>
<td>90</td>
<td>22</td>
</tr>
<tr>
<td>40</td>
<td>16</td>
<td>25</td>
<td>47</td>
<td>87</td>
<td>18</td>
</tr>
<tr>
<td>40</td>
<td>15</td>
<td>32</td>
<td>55</td>
<td>98</td>
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<tr>
<td>40</td>
<td>16</td>
<td>21</td>
<td>51</td>
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<tr>
<td>Mean</td>
<td>16</td>
<td>25</td>
<td>50.25</td>
<td>92.5</td>
<td>20.75</td>
</tr>
<tr>
<td>60</td>
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<td>22</td>
<td>60</td>
<td>120</td>
<td>24</td>
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<td>60</td>
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<td>155</td>
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<td>7</td>
<td>14</td>
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<td>28</td>
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<tr>
<td>60</td>
<td>11</td>
<td>12</td>
<td>60</td>
<td>142</td>
<td>29</td>
</tr>
<tr>
<td>Mean</td>
<td>9.5</td>
<td>15.7</td>
<td>60.5</td>
<td>136.7</td>
<td>27</td>
</tr>
<tr>
<td>80</td>
<td>5</td>
<td>8</td>
<td>77</td>
<td>150</td>
<td>67</td>
</tr>
<tr>
<td>80</td>
<td>4</td>
<td>10</td>
<td>76</td>
<td>140</td>
<td>80</td>
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<td>5</td>
<td>7</td>
<td>91</td>
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<tr>
<td>80</td>
<td>5</td>
<td>8</td>
<td>98</td>
<td>145</td>
<td>64</td>
</tr>
<tr>
<td>Mean</td>
<td>4.75</td>
<td>8.25</td>
<td>85.5</td>
<td>147.5</td>
<td>69.7</td>
</tr>
</tbody>
</table>

We note in Table 1 that when ketamine was injected 40, 60 and 80 mg/kg of body weight, the minimum onset time for doses was (15,7,5), while the most time was (17,10,5) respectively. While we noticed the minimum a loss of the right reflex, deep anesthesia, recovery right reflex and completed recovery was (21,12,8), (47,58,76), (87,120,140) and (18,24,64).

We note in Table 2 that when ketamine was injected 40, 60 and 80 mg/kg of body weight, the minimum onset time for doses was (12,8,6), while the most time was (16,11,8) respectively. While we noticed the minimum a loss of the right reflex, deep anesthesia, recovery right reflex and completed recovery was (22,18,13), (43,65,74), (95,132,134) and (18,30,55).
Table 2 Onset of anesthesia and recovery time induced by the anesthetic agent (ketamine) in 12 freshwater soft shell turtles (Mean±standard deviation)

<table>
<thead>
<tr>
<th>Dose mg/kg b w</th>
<th>Time of onset (min)</th>
<th>Loss Right reflex (min)</th>
<th>Deep Anesthesia (min)</th>
<th>Recovery right reflex (min)</th>
<th>Completed Recovery (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>12</td>
<td>22</td>
<td>44</td>
<td>92</td>
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</tr>
<tr>
<td>40</td>
<td>10</td>
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<td>102</td>
<td>20</td>
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<td>98</td>
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</tr>
<tr>
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<td>16</td>
<td>25</td>
<td>43</td>
<td>95</td>
<td>20</td>
</tr>
<tr>
<td>Mean</td>
<td>13</td>
<td>26.75</td>
<td>47.5</td>
<td>96.75</td>
<td>20.75</td>
</tr>
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<td>60</td>
<td>10</td>
<td>20</td>
<td>76</td>
<td>138</td>
<td>30</td>
</tr>
<tr>
<td>Mean</td>
<td>9.75</td>
<td>19.75</td>
<td>71.25</td>
<td>138</td>
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</tr>
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<td>80</td>
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<td>7</td>
<td>13</td>
<td>75</td>
<td>158</td>
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</tr>
<tr>
<td>Mean</td>
<td>6.75</td>
<td>15</td>
<td>75.75</td>
<td>154</td>
<td>60.25</td>
</tr>
</tbody>
</table>

We note in Table 3 that when ketamine was injected 40, 60 and 80 mg/kg of body respectively. While we noticed the minimum a loss of the right reflex, deep anesthesia, recovery right reflex and completed recovery was (8,4,5), (50,40,74), (290,260,290) and (62,70,70).

Table 3 Onset of anesthesia and recovery time induced by the anesthetic agents (ketamine) in 6 rat Snakes (mean±standard deviation)

<table>
<thead>
<tr>
<th>Dose mg/kg b w</th>
<th>Time of onset (min)</th>
<th>Loss Right reflex (min)</th>
<th>Deep Anesthesia (min)</th>
<th>Recovery right reflex (min)</th>
<th>Completed Recovery (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>4</td>
<td>8</td>
<td>55</td>
<td>320</td>
<td>67</td>
</tr>
<tr>
<td>40</td>
<td>12</td>
<td>10</td>
<td>60</td>
<td>290</td>
<td>58</td>
</tr>
<tr>
<td>40</td>
<td>8</td>
<td>9</td>
<td>50</td>
<td>300</td>
<td>62</td>
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<tr>
<td>Mean</td>
<td>8</td>
<td>9</td>
<td>55</td>
<td>303</td>
<td>62</td>
</tr>
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<td>Mean</td>
<td>5</td>
<td>5</td>
<td>43.5</td>
<td>265</td>
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<td>6</td>
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<td>305</td>
<td>75.5</td>
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</tbody>
</table>
Discussion

A safe and effective anesthetic protocol for the care of turtles, and in particular of the Caspian Pond turtles, is really important, and unfortunately, there are not enough studies on the clinical anesthetic effects of drug combinations in these animals. It is important to observe the animal for respiratory and circulatory abnormalities and possible clinical signs of sepsis (1). Drugs eliminated by the kidneys such as ketamine are not justified in reptiles with a renal dysfunction. Samples from faeces, aspirates, tracheal fluids or blood can help in making an accurate pre-anesthetic diagnosis. There have been various studies that have evaluated the efficacy and side effects of different drug combinations, such as ketamine in turtle Podocnemis expansa, (4) ketamine in tortoises Gopherus polyphemus, (6) and ketamine in Snapping turtles Chelydra serpentine (7).

Ketamine hydrochloride is an anesthetic and analgesic drug that has been widely used in both human and veterinary medicine, especially in tortoises, (8) and the appropriate dose of the drug for the anesthetization of these animals. The importance of anesthetic and analgesic drugs for the animal medical care has previously been described, (1,2) such as the importance of the studies about the efficacy and efficiency of the drugs on the animals. To select the best anesthetic protocol, for any patient, the key elements are efficacy, safety, and reliability. An effective protocol provides for a rapid and smooth anesthesia induction as well as a fast and optimal recovery. Furthermore, the optimal anesthetic agent has a rapid onset of action and is quickly cleared from the bloodstream and central nervous system.

Ketamine hydrochloride is a general anesthetic agent characterized by analgesia (11, 6), rapid induction, and limited duration of action. The analgesic action of ketamine is due to its ability to bind the N-methyl-D-aspartate subtype of glutamate receptor (16). In snakes, inadequate handling was also reported to induce a fatal myositis (18, 20). In our experiments, we demonstrated, for the first time, on the terrapin that the time needed to reach anesthesia [Table 1, 2, 3], using ketamine hydrochloride. We note in Table 1 that when ketamine was injected 40, 60 and 80 mg/kg of body weight, the minimum onset time for doses was (4,4,3), while the most time was (12,5,5) respectively. While we noticed the minimum a loss of the right reflex, deep anesthesia, recovery right reflex and completed recovery was (8,4,5), (50,40,74), (290,260,290) and (62,70,70).

Furthermore, the measurements of the recovery time followed the same trend [Table 1]. In fact, as summarized in Table 1, the onsets of anesthesia, Loss Right reflex, Deep anesthesia, recovery right reflex, completed recovery were found to be, in animals treated with the ketamine hydrochloride. There was evidence that the measurements of efficacy differed between doses. East African reptiles 40-60 mg/kg I.M. or S.C. < 50 mg/kg ~ sedation > 50 mg/kg ~ anesthesia (11). Monitor lizards 50-100 m/kg I.M. Results from these type of studies are increasingly in bodies (except royal python) Snakes 50-75 mg/kg I.M. Ketamine not sufficient, Chelonians 40-90 mg/kg I.M. surgical anesthesia (19). Therefore, the best dose is 80 mg/kg for Caspian terrapin, while for freshwater soft shell tortoise it is 80 mg/kg. As for rat snake, the ketamine dose of 80 mg/kg of body weight was the best according to the study.

Conclusions

The Caspian terrapin, freshwater soft shell turtles and rat Snakes are an important species of turtles and reptiles, whose conservation status has not yet been evaluated that still needs to be studied under different point of views and for which an anesthetization protocol has to be fully evaluated. This research has shown that the ketamine is the anesthetic with the fastest onset time and shortest recovery time compared to the doses. These results provide new and important information for the medical treatment of an animal species, which is yet to be sufficiently studied. Pertinent due to the effect of climate and environmental changes, currently impacting the worldwide turtle populations.

Conflict of Interests: The authors of this paper declare that he has no financial or personal relationships with individuals or organizations that would unacceptably bias the content of this paper and therefore declare that there is no conflict of interests.

Source of Funding: The authors have no sources of funding, so it is self-funding research.
Ethical Approve: We declare that the study does not need ethical approval.

References
Correlation of Chemerin with Lipid Profile in Blood Women Polycystic Ovarian Syndrome in Tikrit City

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Abstract

Background: Polycystic ovary syndrome (PCOS) is the most common endocrine disorder in women of reproductive age, affecting 6%–10% of women worldwide. Objective: The study aimed to assess the relation of serum chemerin level with lipid profile in women with polycystic ovarian syndrome.

Materials and Method: A cross-sectional study was carried out in Salah Al-din City from 10th of October 2019, to 20th of December 2019. The number of polycystic ovary syndrome women under study was 60 women whose ages were between 15 and 36 years old. These women admitted to obstetrics and gynecology unit at Salah Al-din Teaching Hospital. The control group who were matched to the patients studied included 30 women.

Results: The study showed that there is the significant difference between PCOS women and the control group concerning serum chemerin level and lipid profile in PCOS women. This study demonstrates that there was a weak positive correlation between levels of chemerin and cholesterol in PCOS women (r = 0.02) which is mean that cholesterol level is slightly increased with the elevation of chemerin hormone in women with PCOS, There was a positive correlation between levels of chemerin and Triglyceride in PCOS women (r = 0.16) which is mean that level is slightly Triglyceride increased with the elevation of chemerin hormone in women with PCOS, There was a positive correlation between serum levels of chemerin and VLDL in PCOS women, slightly VLDL increased with the elevation of chemerin hormone in women with PCOS. There was a positive correlation between levels of chemerin and LDL in PCOS women, slightly LDL increased with elevation of chemerin hormone in women with PCOS. This study showed negative correlation between Chemerin and, HDL in PCOS women, slightly HDL decreased with the elevation of chemerin hormone in women with PCOS.

Conclusion: Highly significant relation of Chemerin and Cholesterol, Triglyceride, LDL and VLDL in PCOS, While negative correlation between Chemerin and HDL.

Keywords: Polycystic ovary syndrome, Chemerin, Cholesterol, Triglyceride, HDL, VLD and LDL.

Introduction

Polycystic ovary syndrome is the most common endocrine disorder in women of reproductive age, affecting 6%–10% of women worldwide.¹ Polycystic ovary syndrome is characterized by chronic anovulation, hyperandrogenism, and multiple small subscapular cystic follicles in the ovary on ultrasonography.²

Chemerin is a new adipokine of 163 amino acids and a of a molecular weight of 14 kDa.³ Chemerin has been identified as a novel discovered adipocytokine that has been shown to regulate adipocyte differentiation, modulation the expression of adipocyte genes.⁴ Chemerin is found to be highly expressed in adipose tissue and the liver, as well as by cells of the innate immune system, where it modulates the function of innate immune cells. These adipokines are thought to be involved in the development of metabolic syndrome and its related diseases including obesity, T2DM and cardiovascular disease.⁵ Additionally, chemerin levels have been shown to be high in obese PCOS women with insulin resistance.⁶
Materials and Method

A cross-sectional study was carried out in Tikrit City from 10th of October 2019 to 20th of December 2019. The number of PCOS women under study was 60 women whose ages were between 15 and 36 years. The diagnosis of PCOS was based on Rotterdam Criteria: oligo and/or anovulation clinical and/or biochemical signs of hyperandrogenism, and polycystic ovaries in ultrasound, meaning presence of 12 or more follicles measuring 2 – 9 mm in diameter in each ovary and/or ovarian volume more than 10 cm³. In addition the control group consisted of 30 apparently healthy volunteer females with regular menstrual cycles aged between 15 and 36 years. A volume of 5 mls of blood sample was taken by vein puncture from each subject enrolled in this study. Blood samples were placed into sterile test tubes, after blood clotting, the samples were centrifuged at 3000 rpm for 15 min then if a clot was developed, then was removed and re-centrifuged at 3000 for 10 min, and the obtained serum were aspirated using mechanical micropipette and transferred into clean plain tubes with screw which labeled and stored in deep freeze at -20 °C for the biochemical measurement of amylin by ELIZA.

Statistical Analysis: The statistical analysis was performed using Statistical Package for the Social Sciences version 23 (SPSS, IBM Company, Chicago, USA).

Results

This study showed that there was a positive correlations between serum levels of chemerin and cholesterol, triglyceride, VLDL, and LDL as shown in figures (1) (2) (3) (4), while negative correlations between serum levels of chemerin and HDL in PCOS women as shown in figure 5.

![Figure 1: Correlation between levels of Chemerin and Cholesterol in PCOS women.](image-url)
Figure 2: Correlation between levels of Chemerin and triglyceride in PCOS women.

Figure 3: Correlation between levels of Chemerin and S. LDL in PCOS women.
Discussion

Polycystic ovary syndrome (PCOS), is a disorder characterized by heterogeneous clinical presentations including hyperandrogenism, menstrual irregularity, and infertility along with metabolic disturbances manifested by hyperinsulinemia, obesity, hypertension, and dyslipidemia. This study showed that there was a positive correlation between serum levels of chemerin and cholesterol, triglyceride, VLDL, and LDL as shown in figures (1) (2) (3) (4), while negative correlations between serum levels of chemerin and HDL in PCOS women as shown in figure 5. Both visceral fat and insulin resistance are significant determinants for an impaired lipid metabolism. PCOS women are exposed to increased risk for cardiovascular diseases (CVD) through early progression of atherosclerosis and dyslipidemia is an important factor, thus a recent recommendation has been proposed for PCOS women, to assess their lipoprotein lipid profile, in an attempt to prevent CVD. Our data confirms previous reports stating that PCOS women display increased total cholesterol, LDL cholesterol and triglycerides, and low HDL cholesterol, pattern that is usually linked to insulin resistance. Hypertriglyceridemia and low HDL-C are common metabolic abnormalities found in women with PCOS. A study by Aye et al. suggested that
the presence of hypertriglyceridemia could contribute to atherothrombosis via platelet hyperactivation in PCOS.\(^{(12)}\) Chemerin serum levels in this present study were also positively correlated with TG and VLDL in the MetS group. This co-relation was proved also by Bozaoglu et al.\(^{(13)}\) study that was conducted in a large cohort and showed that serum TG was correlated with serum chemerin. Ye et al.\(^{(14)}\) regarding the association of chemerin with HDL-C level, the present study showed that serum chemerin where negatively correlated with HDL-C levels. These results were in agreement with Er et al. found that chemerin levels were negatively correlated with HDL-C plasma levels in Metabolic syndrome.\(^{(15)}\) Although obesity is often associated with metabolic disorders, lean women with PCOS also were found to have hyperinsulinemia and dyslipidemia.\(^{(16)}\)

Hussain found that there were high levels of TG, Cholesterol, and LDL in combination with low level of HDL and with an increase in atherogenic index in women with PCOS.\(^{(17)}\) These data are consistent with prior studies of dyslipidemia in women with PCOS.\(^{(18)}\) Most studies of dyslipidemia and PCOS have reported on cholesterol levels and TG, the lipid profile that is found in women with PCOS consists of elevated TG levels together with low levels of HDL.\(^{(19)}\) Increased secretion of VLDL particles by the liver results in elevated plasma TG concentrations. Subsequently, TG is exchanged for cholesteryl ester by the activity of cholesteryl ester transfer protein. Lipid metabolism in women with PCOS may also be affected by ovarian and-or adrenal secretion of sex-steroid. The effects of sex-steroids on lipid metabolism are complex and involve the actions of both androgens and estrogens. Hyperandrogenism has been associated with increased hepatic lipase (HL) activity. This enzyme, that has a role in the catabolism of HDL particles (partially responsible for the hepatic removal of the HDL particles) exhibits strong dimorphism with exogenous androgens up regulating, and estrogens down-regulating its activity.\(^{(20)}\)

**Conflict of Interest:** None

**Source of Findings:** None

**Ethical Clearance:** None

**References**

Diagnostic Value of Thyroid Cytology: A Meta-analysis

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Abstract

Objective: Thyroid disorders are the most common endocrine disorders worldwide (4-7% of population). Excision of all thyroid lesions is impractical. For rapid diagnosis, Fine needle aspiration cytology (FNAC) is simple, safe, rapid diagnostic procedure. However, indeterminate cases were reported occasionally where the patient cannot be confidently assigned to a manageable category.

Aim: We conducted a systematic review and meta-analysis to evaluate the diagnostic accuracy of FNAC in thyroid lesions and the correlation between cytological and histopathological diagnosis.

Method: A literature search of published studies was conducted using Medline/PubMed, reasearchgate, Scielo (scientific electronic library online), and Google Scholar as international databases, and IVSL (Iraqi Virtual Science Library) and IASJ (Iraqi Academic Scientific Journals) as national databases.

Results: A total of 24 studies are analyzed. The median sample size of the studies included was 100 (range, 20-23). The sensitivity and specificity ranged from 0.38 to 0.98 (pooled sensitivity: 0.81; 95% confidence interval (CI), 0.78-0.83) and from 0.47 to 1.00 (pooled specificity: 0.93; 95% CI, 0.92-0.94), respectively. By SROC curve, the Q-value was 0.883 and the area under the curve (AUC) was 0.945, indicating a high level of overall accuracy.

Conclusion: The recognized accuracy of FNAC in detecting thyroid cancers is applicable only to papillary carcinoma and not to other malignancies. Moreover, FNAC should be considered as a screening rather than diagnostic tool for follicular lesions. Thus, FNAC helps to orientate patient management rather than to provide final definitive diagnosis.

Keywords: Thyroid, cytology, meta-analysis, FNA, fine needle aspiration.

Introduction

Thyroid diseases are the most frequent endocrine disorders globally. In surgical practice, thyroid lesions are seen in 4-7% of population. Moreover, a survey of random patients undergoing neck ultrasonography 20%-76% of adult women was found to have at least one thyroid nodule. The diagnostic challenge facing the clinician is to identify those lesions most at risk and to limit resection of benign conditions as much as is safely possible. Several diagnostic tests, such as radionuclide scanning, ultrasonography, and fine-needle aspiration (FNA) cytology have been used to highlight those patient requiring surgical intervention. FNAC has been used widely because it is safe, and readily doable in outpatient settings. Moreover, Fine-needle aspiration has also been shown to have similar or higher sensitivity and accuracy levels than frozen section examination.

However, there is also evidence of limitations and pitfalls of FNA are those related to specimen adequacy, sampling techniques, the skill of the physician performing the aspiration, the experience of the pathologist interpreting the aspirate, and overlapping
cytological features between benign and malignant follicular neoplasms.\(^{(5)}\)

About one fifth of thyroid nodules with indeterminate cytology found to be malignant after surgery, therefore histopathological examination remains the standard modality of diagnosis.\(^{(6)}\)

**Aim:** we conducted a systematic review and meta-analysis to evaluate the diagnostic accuracy of FNA in thyroid lesions and the correlation between cytological and histopathological diagnosis.

**Materials and Method**

**Search Strategy:** Our study was performed according to the meta-analyses guidelines of diagnostic tests accuracy studies.\(^{(7)}\)

A literature search of published studies was conducted using Medline/PubMed, Reasearchgate, Scielo (scientific electronic library online), and Google Scholar as international databases, and IVSL (Iraqi Virtual Science Library) and IASJ (Iraqi Academic Scientific Journals) as national databases. The study conducted in May 2020.

The database search for eligible studies were made without any restriction (such as (publication date, language, or other restrictions). The search terms included “thyroid”, “cytology”, “FNA” and “fine needle aspiration”. Thereafter, the titles were checked and duplicates were removed, then the abstracts were screened for potentially relevant studies. Full-text articles were then obtained for all potentially relevant studies. Additional references were obtained by checking the reference lists of included studies.

**Inclusion and exclusion criteria:** Candidate studies included in this meta-analysis must conform the following inclusion criteria: (1) studies concerning the diagnostic value of FNAC in thyroid diseases; (2) studies with cytohistopathological correlation. (3) Studies must contain sufficient information regarding true positive, true negative, false positive, false negative or any data from which this information were extractable.

The exclusion criteria were as follows: (1) duplicate articles; (2) case reports, editorials, abstracts, commentaries, (3) lack of essential data and (4) studies without cytohistopathological correlation.

**Data Extraction:** The full texts of all potentially relevant articles were evaluated by the author. Studies were included if they contained extractable data on correlation of cytological diagnosis with histopathological examination of lesions. Data from foreign-language articles (non-English) were extracted from English summary and/or tables. Data extracted from each study included: (1) name of first author; (2) year of publication; (3) number of patients; (4) absolute numbers in TP, FP, FN, and TN, or any data from which this information was derivable.

**Statistical Analysis:** All the analyses were conducted using the following softwares: Statsdirect version 3.2.10, Meta-Disc version 1.4, and Medcalc version 19.3

Statistical heterogeneity was assessed by Cochran’s Q statistic (with a significance level of p ≤ 0.1) and I2 statistic with values of 25%, 50%, and 75% indicating low, moderate, and high degrees of heterogeneity, respectively.

We used random effects model to minimize risk of heterogeneity across studies as diagnostic test accuracy studies are expected to be heterogeneous, making a fixed-effect model inappropriate. Publication bias was assessed using a funnel plot and Eggers test.\(^{(7)}\)

In addition, a summary receiver operating characteristic (SROC) curve was constructed to investigate the impact of thresholds by the Moses-Shapiro-Littenberg method. The AUC was calculated to show the diagnosis authenticity. The closer the AUC was to 1.0, the better the diagnosis authenticity was.\(^{(7)}\)

**Results and Discussion**

**Literature Search:** The process of electronic database search yields 886 potential relevant articles (studies dealing with fine needle aspiration cytology (FNA) for diagnosis of thyroid diseases. An additional 34 eligible studies were identified by scanning references lists of these articles (total records identified n = 920). Title and abstract screening carried out, duplicates and irrelevant studies (studies without cytohistopathological correlation, editorials, case reports) were excluded (n = 858). After reviewing the full-text, we further excluded 38 studies for lacking necessary data (extractable data in the form of true positives, false positives, false negatives, and true negatives). Twenty-four articles are included in the present meta-analysis\(^{(8-31)}\).
Characteristic of the included Studies: The salient characteristics of included studies are outlined in Table 1. The selected studies were published from 1987 to 2019. A total of 24 studies are analyzed. Twenty one of these studies were published in English, one in Arabic and one in Korean. Included studies were from different countries, including India (n=8); Iraq (n=2), Bangladesh (n=2), and one study from each of, Egypt, Iran, Ireland, Korea, Kuwait, Nepal, Saudi Arabia, Syria, Turkey, UK, USA. All included studies compare cytological diagnoses with histopathological ones. Fine needle aspiration cytology (FNAC) was performed and interpreted before histopathology.

1- Role of thyroid FNA and aim of our study: Histopathology examination is the gold standard for thyroid cancer diagnosis. However, this diagnostic process is time-consuming, invasive, and it may expose patients to complications. The quest for simple, safe, diagnostic tool for the initial screening of patients with thyroid diseases deemed rational.

To our knowledge, our study is the first meta-analysis to pool the data regarding accuracy of FNA for the diagnosis of thyroid diseases and provide possible areas of improvement for future studies. Except for one meta-analysis carried out in India and include pediatric patients only. (32)

2- Diagnostic accuracy of thyroid FNAC: At the outset of literature retrieval, we found 24 studies reporting thyroid cases subjected to FNAC and published over a very large period (1987–2019) by Asian, European and American authors. The most significant finding was that the FNAC sensitivity in diagnosing thyroid lesions was noticeably high.

The overall sensitivity and specificity ranged from 0.38 to 0.98 (pooled sensitivity: 0.81; 95% confidence interval (CI), 0.78-0.83) and from 0.47 to 1.00 (pooled specificity: 0.93; 95% CI, 0.92-0.94), respectively. The diagnostic accuracy quantified by AUC was 0.945 (a diagnostic test is considered perfect if the AUC is 100%, excellent if greater than 90%, and good if greater than 80%). All these results demonstrated that FNAC had a considerable potentiality in differentiating thyroid cancers from benign tumors and non-neoplastic lesions. (33)

However, the accuracy of a benign thyroid FNA result is difficult to establish because most patients with a benign result do not have surgery. The false-negative rates reported in the literature reflects only those patients who have their aspirated nodules being surgical excision, and thus the figures may be an undervalue of reality figures. Approximately 18% of patients who have an FNA are actually treated surgically. (34)

3- False-negative: The rate of false-negative results varies from 0 to 22.8% (mean 5%).(9,26) In most series, false negatives are due to inadequate specimens or improper preparation of the smear and, to a lesser extent, to the pathologist’s inability to identify a malignant lesion or to the coexistence of two pathologies. Excluding these causes, the most common errors are due to the presence of a cystic neoplasm, followed by occult lesions and small tumor size. Adherence to strict criteria of specimen adequacy will greatly reduce the number of false negative diagnosis especially, if the benign nodules are followed by a repeated FNA over a period of time, and if ultrasound guidance is used. Large multinodular goiters may represent an important source of false negatives because in 10% of cases, a micropapillary carcinoma may be present. The probability of identifying this type of carcinoma by FNA without US guidance in this gland is practically zero because the aspiration punctures tend to be directed to palpable nodules.(35)

4- False-positive: On the other hand, false-positive diagnoses represent about 0 to 27% of the cases. This figure markedly decline if suspicious malignancies are ruled out, or even nullified in highly skilled hands. Almost false positive diagnoses are due to misinterpretation of hyperplastic nodules and Hürthle cell lesions as papillary or follicular carcinoma.(11-14)

The most common benign lesions giving false positive result are follicular adenoma (including the follicular adenoma with papillary hyperplasia) and hyalinizing trabecular tumor. (34)

5- Study Heterogeneity: We found significant heterogeneity among the 24 studies, so we used a random effect model.

6- Publication Bias: Publication Bias was ruled out from being the potential cause of the heterogeneity in studies. Funnel plot was performed to assess publication bias among the included studies. No publication bias was detected in this meta-analysis, thus heterogeneity cannot be attributed to publication bias. To further confirm the absence of publication bias we did Eggers test (Egger: bias = 3.427 (95% CI = -5.57 to 12.43) P = 0.4381).
6- Summary receiver operator curve (SROC): SROC provides an overall measure of test accuracy. The Q-value, which is the point of intersection of the SROC curve with a diagonal line passing from the left upper corner to the right lower corner of the ROC space and corresponds to the highest common value of sensitivity and specificity for the given test. This point does not indicate the only or even the best combination of sensitivity and specificity for a particular clinical setting, but represents an overall measure of the discriminatory power of a test.

SROC curve demonstrates that the overall area under the curve of 0.945 (standard error: 0.0160). The SROC curve shows the tradeoff between sensitivity and specificity. Our data showed that the SROC curve is positioned near the desirable upper left corner of the SROC curve, and that the maximum joint sensitivity and specificity (ie, the Q-value) was 0.883; while the area under the curve (AUC) was 0.945, indicating a high level of overall accuracy.

7- Conclusion and recommendations: Because of its low cost, relative safety, and rapid sign-out time, FNAC facilitate prompt and appropriate clinical decisions and therapy. However, the recognized accuracy of FNAC in detecting thyroid cancers must be applied only to papillary carcinoma and not to other types of malignancies. Moreover, FNAC should be considered as a screening rather than diagnostic tool for follicular lesions. Thus, the aim of FNAC is to orientate patient management rather than to provide final definitive diagnosis.

Table (1) The characteristics of included studies

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<th>FP</th>
<th>FN</th>
<th>TN</th>
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* H/P correlated = Number of cases in which cytohistopathology correlation done.
TP = true positive, FP = false positive, FN = false negative, TN = true negative.
Ethical Clearance: Taken from the research ethics committee in Tikrit university/College of Medicine

Source of Funding: Self

Conflict of Interest: Nil

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Received and Perceived Status of Health Management Information System (HMIS) Software: A Structural Equation Model (SEM) Approach

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Abstract

More than supply the demand for health care usually determines the design of public health services. This is more so when technological developments, including that of information and communication technologies, pierce through the process of utilization of any service by the public. Although prior research papers have focused on the factors that impact on the adoption of information technology, there are limited empirical research works that simultaneously capture technology factors (TAM, TAM2) and end-user development specific factors (perceived technology usage and intention to recommend) helping healthcare professionals to adopt Health Management Information System (HMIS) software in the healthcare environment. To fill this gap, the present paper used the Technology Acceptance Model (TAM), the extended TAM model (TAM2) and identified the important determinants of user acceptance perceived risk and trust. This is specifically undertaken in order to describe ESIC healthcare professionals behavioral intention to adopt HMIS software services. The study was conducted in the Employees’ State Insurance Corporation (ESIC) main hospital and dispensaries in the Tirunelveli sub-region. The required data were collected from 171 ESIC healthcare professionals in the Tirunelveli sub-region. A Structural Equation Model (SEM) approach was used. Convergence and divergence with earlier findings were found, confirming that Perceived Usefulness (PU), Perceived Ease of Use (PEOU), social influence, facilitating conditions and training had significant influence on the intention of healthcare professionals to adopt HMIS software. The study provided a basis for further refinement of technology adoption model. Improving perceived usefulness factor (perceived long-term usefulness) may turn healthcare professionals towards adoption of HMIS.

Keywords: Information Technology, Technology Acceptance Model, Employees’ State Insurance Corporation, Perceived Usefulness and Perceived Ease of Use.

Introduction

In recent years, there has been growing global emphasis on the need for Information Systems (IS) in all sectors. The elementary conditions that enable global competition in the information society are the development of communication technologies and the importance of the administrative information flows and the inter-institutional communication networks. Therefore, more emphasis is placed on flexible and cost-efficient information systems in the competitive presentation of public services. Information systems are one of the means by which public institutions can save economic indicators, such as time and cost. Assuring and promoting quality in health care services continues to be a priority for any health care system. Besides evaluation of health status through morbidity and mortality estimates, there has been equal emphasis...
on quality of care indicators in health systems research. The continuously increasing demand for assessment of quality in the health care system can be attributed to rising costs, constrained resources and evidence of variations in clinical practice. Hospital management information systems provide an institutional framework consisting of different information about the medical, financial and managerial functions of a particular hospital. The first applications of these systems are limited to the recording of patient information and the billing of health services offered. Today, new modules have been added to health management information systems such as appointment over the internet, follow-up patients, and request analysis and display results. Thus, it has become possible for doctors to transmit their requests directly to the laboratories via automation systems and to monitor the results online. In this respect, the main purpose of the study is to define the role of hospital management information system within the functional context. Further, it is crucial to analyze the genuine perception of healthcare professionals’ willingness to adopt these technologies. In order to identify which factors influence on healthcare professional’s intention to adopt HMIS the researcher has merged the existing and empirically validated theoretical models (TAM and TAM2) with perceived benefits and actual use of technology. The study uses constructs from the Technology Acceptance Model (TAM) and the extended Technology Acceptance Model (TAM 2) and integrates the constructs of facilitating conditions and training in the model. Thus, cognitive factors, perceived social forces and intrinsic characteristics are also included in a unified model along with facilitating conditions and training. The study measures intention-to-use health management information system software in the ESIC healthcare environment. Intention to use has been found to be a strong predictor of actual system usage in the available literature. The study uses a quantitative survey method to record ESIC healthcare professionals’ opinions and attitudes. It analyzes the data using a refinement procedure, controlling reliability and validity, and validates the proposed model using Structural Equation Modeling.

**Review of Literature:** IT stress is said to be an important factor and its evaluation techniques are based on the widely used Technology Acceptance Model (TAM). IT stress could be broadly classified into two types. They were Direct IT stress and Indirect IT stress (Raitoharju, 2005). Direct IT stress has always been a hindrance and is caused by the following factors: person’s fear of breaking something, feeling of ignorance, fear of technology, fear about health, fear about anything new and unfamiliar or sense of threat to intellectual self-assessment. Indirect stress is all about time consumption and pressure. Here, the user is an expert in information technology and spends a lot of time in IT related works. Since he spends a lot of time in front of computers, he is unable to complete other tasks properly. This creates unwanted pressure and such a pressure gives way to indirect IT stress. Further, computer anxiety reduced the effectiveness of computerization. Perceived usefulness and Perceived ease of use played an important role in IT acceptance studies. Perceived usefulness encouraged IT usage and thereby resulted in technology acceptance. However, Perceived ease of use did not have any significant effect on Perceived usefulness. While it is important to look at systemic, organizational and professional factors that shape the integration of ICT in health care systems, studying adoption at the individual level is particularly relevant since the ultimate decision to use a new technology is often that of the individual (Hu et al., 2001; Igbaria et al., 1997).

Health Information System (HIS) could be categorized by their complexity and integrity. The HIS could integrate a large variety of medical and administrative information and further, low quality information could have dramatic repercussions on patient healthcare (Ribière, J.LaSalle, Khorrramshahgol, & Gousty, 1999). HIS quality influences the quality of care by capturing, transferring, storing, managing and displaying medical information. Efficient medical decision making, customer satisfaction and reduced health related risks are found to be the prime goals of health information system. System Quality, Information Quality, Use, User Satisfaction, Individual Impact and Organizational Impact were found to be the important dimensions that come under quality of information system. Moreover, adaptation to common tasks and user friendliness could enable increased levels of performance.

Information Technology (IT) increased quality of care indirectly by improving both relational and management continuity of care. Information Technology, through electronic integration, contributed to relational and management continuity as well as to improving quality of care (Pinsonneault, Dakshinamoorthy, Reidel, & Tamblyn, 2012). IT systems should be designed and implemented in such a way so as to motivate patients to
visit a given physician or at least physicians who share important patient record information. The quality of care could be further improved when physicians were electronically integrated with other specialists, retail pharmacies and the health insurance agency.6

The sustainability of Health Information System depended on the technical features and physical infrastructures. Any lack of technical approach would lead to instability of the information system. Socio-technical aspects played an all important role in information system. Integration of such aspects into the organizational structures would lead to stability (Kimaro & Nhampossab, 2007). They would also enable easy execution of routine activities. Health services mainly include curative and preventive activities. These activities are hampered by scarce resources. The main aim of HIS is to overcome the scarcity and bring about better care.4 Further, extra attention should be given to users' needs, evaluation and feedback generation and future improvements. Information generation and sharing of knowledge within the sustainability strategy framework would also add to the stability of health systems.

Large health care infrastructures would always be confronted by the presence of the World Wide Web and electronic commerce. Community Health Information Networks (CHINs) have been defined as: Inter organizational systems (IOS) using information technology(ies) and telecommunications to store, transmit, and transform clinical and financial information.5 This information can be shared among cooperative and competitive participants, such as payers, hospitals, alternative delivery systems, clinics, physicians, and home health agencies. Customers (patients) were often described as ‘by-products’ of the health care delivery system. Economic dimensions, such as reduced risk, lower transaction costs and increased industry knowledge or competencies, were usually considered prior to the adoption stage of implementation (Payton, 2000).

The decomposed TPB model was advantageous to explain physicians’ adoption and intentions to use the Information system (IS). The three antecedent constructs used in the TPB model were attitude, Subjective norm (SN), and perceived behavioral control (PBC). While attitude was decomposed into perceived usefulness (PU) and perceived ease of use (PEOU), PBC was decomposed into personal innovativeness in IT (PIIT), self-efficacy, and facilitating conditions. Perceived usefulness and perceived ease of use had significant impact on attitude of the physicians; perceived ease of use had significant impact on perceived usefulness. Further, Subjective norm could be predicted by interpersonal influence (Hung, Ku, & Chien, 2008). Facilitating conditions is defined as the beliefs about availability of resources to facilitate that behavior. The facilitating conditions had no significant effect on perceived behavioral control.2 This is because, the information infrastructure (eg) internet is already available to most organizations and hence the influence of the facilitating conditions on perceived behavior control gradually decreases.

**Hypotheses Formulation:** This paper proposes a model, which unifies (a) cognitive factors or cognitive instrumental processes, such as job duties, output quality; (b) perceived social forces or social influence processes, such as subjective norm, voluntariness and image; (c) intrinsic characteristics of innovations compatibility, relative advantage, along with (d) computer self-efficacy; and (e) facilitating conditions. Consequently, in the unified model, the following hypotheses are tested:

- **H1a** System Quality may positively impact the perceived usefulness of HMIS.
- **H1b** System Quality may positively impact the perceived ease of use of HMIS.
- **H1c** System Quality may positively impact the perceived behavioral control of HMIS users.
- **H2a** Computer self-efficacy may positively impact the perceived usefulness of HMIS.
- **H2b** Computer self-efficacy may positively impact the perceived ease of use of HMIS.
- **H2c** Computer self-efficacy may positively impact the perceived behavioral control of HMIS users.
- **H3a** Facilitating conditions may positively impact the perceived behavioral control of HMIS users.
- **H3b** Facilitating conditions may positively impact the computer self-efficacy of HMIS users.
- **H4** Users’ perceived behavioral control may positively impact the intention of HMIS adoption.
- **H5a** HMIS perceived ease of use may positively impact the perceived usefulness of HMIS.
H5b HMIS perceived ease of use may positively impact attitudes toward HMIS adoption.

H6a HMIS perceived usefulness may positively impact attitudes toward HMIS adoption.

H6b HMIS perceived usefulness may positively impact the intention to adopt HMIS.

H7 Attitudes toward adopting HMIS may positively impact the intention of adopting HMIS.

H8 HMIS subjective norms may positively impact the intention of adopting HMIS.

H9 Attitudes towards adopting HMIS may positively impact the perceived behavioral control of HMIS users.

**Methodology**

An empirical research study was conducted using a research questionnaire with close-ended questions. Healthcare professionals in the ESIC main hospital and dispensaries in Tirunelveli sub-region have been chosen to be surveyed. The ESIC healthcare professionals were selected using convenience sampling. Among the ESIC hospital staff, there were 171 healthcare professionals in the Tirunelveli sub-region and all the 171 professionals in different departments of the hospital were selected for the study. The questionnaire used in this study was adopted from previous studies. Five point Likert scales were used, ranging from strongly agree to strongly disagree. The questionnaire consisted of 10 parts:

(1) General Information; (2) General System Quality; (3) Computer Self-efficacy; (4) Facilitating conditions; (5) Perceived Usefulness (PU); (6) Perceived Ease of Use (PEOU); (7) Perceived Behavioral Control (PBC); (8) Attitude; (9) Subjective norm (social influence); (10) Behavioral Intention (BI).

A pilot study using an extended questionnaire containing all the scales proposed in the literature review was conducted by administering the questionnaire to 25 ESIC healthcare professionals. Scales and items used in the questionnaire and the analysis have been successfully used in previous studies to measure information system adoption by the healthcare professionals in the hospital environment. These particular scales may not be adequate for measuring attitudes of the particular target group of ESIC healthcare professionals. However, reliability and validity analysis performed hereafter proves that the scales constitute a reliable and valid instrument for measuring information system adoption by ESIC healthcare professionals. For statistical analysis, Structural Equation Model (SEM) approach was used to identify the influential factors to ESIC healthcare professionals’ acceptance of HMIS software in the hospital environment.

**Data and Analysis:**

Table 1: Model Summary (Goodness of fit Index)

<table>
<thead>
<tr>
<th>Model</th>
<th>RMR</th>
<th>RMSEA</th>
<th>GFI</th>
<th>AGFI</th>
<th>NFI</th>
<th>CFI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.074</td>
<td>.061</td>
<td>.968</td>
<td>.945</td>
<td>.973</td>
<td>.946</td>
</tr>
</tbody>
</table>

*Note.* NFI = Normed-fit index; GFI = Goodness-of-fit index; AGFI = adjusted goodness-of-fit index; RMR = Root Mean Square Residuals; RMSEA = Root Mean Square Error of Approximation; CFI = Comparative fit index.

The above table shows the model fit indices for the overall structural model of behavioral intention. The table reveals that the Root Mean Square Error of Approximation (RMSEA) value 0.61 and Root Mean Square Residuals (RMR) 0.074 which is lesser than equal to 0.08 (i.e. the model is mediocre fit (Hans Muller, 2003), the other model fit evaluation method such as Goodness of fit index (GFI) value 0.968, Adjusted Goodness of fit index (AGFI) value 0.945, Normed Fit Index (NFI) value 0.973 and Comparative fit index (CFI) value 0.946 are attained and satisfied the criteria (thumb rule i.e. greater than equal to .90). It is concluded that items perfectly measures behavioral intention model (i.e. an acceptable fit).

This section presents results of hypotheses testing. Table shows sixteen hypotheses represented by causal paths that were used to test the relationships between the latent constructs. The latent constructs used in the proposed theoretical model were classified in two main categories: exogenous and endogenous constructs. Exogenous constructs were the Facilitating conditions.
(p4_tot) and System Quality (p2_tot) while endogenous constructs were the Computer Self-efficacy (p3_tot), Perceived Usefulness (p5_tot), Perceived ease of use (p6_tot), Perceived Behavioral Control (p7_tot), Attitude (p8_tot), Subjective norm (p9_tot), Behavioral Intention (p10_tot). Goodness of fit indices and other parameters estimates were examined to evaluate the hypothesized structural model. Assessment of parameter estimates results suggested that sixteen hypothesized paths were significant. Thus, indicating support for the sixteen hypotheses. These results are presented in detail as follows.

Table 2: Standardized Regression Weights: (Group number 1 - Default model)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Estimate</th>
<th>Hypotheses</th>
</tr>
</thead>
<tbody>
<tr>
<td>p3_tot</td>
<td>p4_tot</td>
<td>.739 H3b Facilitating conditions and Self efficacy</td>
</tr>
<tr>
<td>p5_tot</td>
<td>p2_tot</td>
<td>.555 H1a System Quality and Perceived Usefulness</td>
</tr>
<tr>
<td>p6_tot</td>
<td>p2_tot</td>
<td>.299 H1b System Quality and Perceived ease of Use</td>
</tr>
<tr>
<td>p5_tot</td>
<td>p3_tot</td>
<td>.280 H2a Self efficacy and Perceived Usefulness</td>
</tr>
<tr>
<td>p6_tot</td>
<td>p3_tot</td>
<td>.389 H2b Self efficacy and Perceived ease of use</td>
</tr>
<tr>
<td>p8_tot</td>
<td>p5_tot</td>
<td>.508 H6a Perceived usefulness and Attitude</td>
</tr>
<tr>
<td>p8_tot</td>
<td>p6_tot</td>
<td>.249 H5b Perceived ease of use and Attitude</td>
</tr>
<tr>
<td>p7_tot</td>
<td>p2_tot</td>
<td>.287 H1c System Quality and Perceived behavioral Control</td>
</tr>
<tr>
<td>p7_tot</td>
<td>p3_tot</td>
<td>.246 H2c Self efficacy and Perceived Behavioral Control</td>
</tr>
<tr>
<td>p7_tot</td>
<td>p4_tot</td>
<td>.395 H3a Facilitating Conditions and Perceived Behavioral Control</td>
</tr>
<tr>
<td>p9_tot</td>
<td>p8_tot</td>
<td>1.044 H9 Attitude and Subjective Norm</td>
</tr>
<tr>
<td>p10_tot</td>
<td>p8_tot</td>
<td>.187 H7 Attitude and Behavioral Intention</td>
</tr>
<tr>
<td>p10_tot</td>
<td>p9_tot</td>
<td>.294 H8 Subjective norm and Behavioral Intention</td>
</tr>
<tr>
<td>p10_tot</td>
<td>p7_tot</td>
<td>.192 H4 Perceived Behavioral Control and Behavioral Intention</td>
</tr>
<tr>
<td>p10_tot</td>
<td>p5_tot</td>
<td>.227 H6b Perceived Usefulness and Behavioral Intention</td>
</tr>
</tbody>
</table>

Figure 1: The research model after validation
The table depicts the standardized regression weights (β) which estimate and predict the intention of ESIC healthcare professionals towards HMIS adoption. The SEM result reveals that the hypotheses Self efficacy_ Perceived Usefulness (H2a), Self efficacy_ Perceived Ease of Use (H2b) and Self efficacy_ Perceived Behavioral Control (H2c) were significant. The standardized regression weights of H2a (.280), H2b (.389) and H2c (.246), show that Self efficacy has a direct significant effect on Perceived Usefulness (28%), Perceived Ease of Use (38.9%) and Perceived Behavioral Control (24.6%).

The hypotheses System Quality_ Perceived Usefulness (H1a), System Quality_ Perceived Ease of Use (H1b), System Quality_ Perceived Behavioral Control (H1c) and Facilitating Condition_ Perceived Behavioral Control (H3a) were significant. The standardized regression weights of H1a (.555), H1b (.299), and H1c (.287), show that System Quality has a direct significant effect on Perceived Usefulness (55.5%), Perceived Ease of Use (29.9%) and Perceived Behavioral Control (28.7%). It also reveals facilitating conditions has a significant direct effect on the Perceived Behavioral control(39.9%) and Self efficacy (73.9%).

The hypotheses Perceived Usefulness_ Attitude (H6a), Perceived Ease of Use_ Attitude (H5b) and Subjective Norm _ Attitude (H9) were significant. The standardized regression weights of H6a (.580), H5b (.249) and H9 show that Perceived Usefulness (58%), Perceived Ease Use (24.9%) and Subjective Norm (104.4%) have a direct significant effect on Attitude of ESIC healthcare professionals.

The hypotheses Perceived Usefulness_ Behavioral Intention (H6b), Perceived Ease of Use_ Behavioral Intention (H4), Attitude_ Behavioral Intention (H7) and Subjective Norm_ Behavioral Intention (H8) were also significant. The standardized regression weights of H6b (.227), H4 (.192), H7 (.187) and H8 (.294) show that Perceived Usefulness (22.7%), Perceived Ease of Use (19.2%), Attitude (18.7%) and Subjective Norm (29.4%) have a significant direct effect on Behavioral Intention of ESIC healthcare professionals.

**Discussion**

The results of this study provide support for the research model presented in Fig.1 and regarding hypotheses directional linkage. Findings from the present study suggest that in the presence of both facilitating variables (Computer Self-efficacy, Facilitating Conditions) and operational variables (Perceived Usefulness, Perceived Ease of Use) it is the second set that has a significant effect on intention to use. In more detail: System Quality, Attitude and Subjective Norm, along with Perceived Usefulness and Perceived Ease of Use are the five factors that influence intention to use HMIS. Computer Self-efficacy and Facilitating Conditions, although included in the model, do not significantly affect intention to use. Previously researchers have focused on the factors that impact on the adoption of health information technology; there is a limited empirical research work that simultaneously captures technology factors and user specific factors that help healthcare professional’s adopt HMIS software. Thus, the study has aimed to develop an integrated technology adoption model with TAM and TAM2 model to predict and explain ESIC healthcare professional’s intention to adopt HMIS software and recommend HMIS in ESIC hospital environment. Convergence and divergence with earlier findings were found, confirming that Perceived Usefulness, Perceived ease of Use and social influence (subjective norms) have significant influence in user’s intention to adopt HMIS and these findings are consistent with previous study conducted by Raitoharju (2005). Contrary to the expectation the researcher has found that facilitating condition and computer self-efficacy with intention to adopt HMIS were not valid, these findings are consistent with Hung, Ku and Chien (2008). What the findings of this paper suggest is that along with emphasizing and augmenting technological benefits of using HMIS services, a greater and primary effort should be made in providing efficient and effective HMIS practices. These could satisfy ESIC healthcare professionals and engage them to use HMIS services further. Raising system quality and enhanced training sessions are important steps, but providing results and efficient solutions to ESIC healthcare professionals through HMIS software is more important in raising their intentions to use them. Users find health information systems useful when they relate to their intrinsic characteristics, their interest and their working settings. Users will use health management information systems if they help them to work more efficiently and effectively.

**Conclusion**

This study has limitations that provide the impetus for further research in this field of investigation. First, this research is cross sectional and measures the ESIC
healthcare professional’s intention at one point in time that may be less generalizable as compared with longitudinal study. Second, testing of this newly developed integrated technology model in other developing countries may be useful for the further generalization of this model. The paper made a contribution to the study of adoption of health management information system by applying a model which joins TAM and TAM2. The effort was to measure the contribution of the separate variables in the presence of a multitude of effects. Thus, it is clear from the findings that for the adoption of HMIS by ESIC healthcare professionals, practical and operational issues regarding the efficiency of services should be considered first. This study can serve as a starting point for other health information system adoption researches. The user has to be placed at the center of future developments, thus, the board of members in the governing body of the hospital should take into consideration user needs, established marketing practices to promote the services and provide training to healthcare professionals in order to make the systems attractive to them. Training programs should stress the potential of health information systems and should help users to understand the relative advantage, job relevance and generally the value of them over existing manual systems. The findings can also provide useful recommendations to the development of practices and policies that influence intention to use HMIS services.

Acknowledgement: The authors express their gratitude and thanks towards all who have directly or indirectly helped them to complete this study.

Conflicts of Interest Disclosure: The authors declare that there is no conflict of interest statement.

Source of Funding: This is a self-funded study.

Ethical Clearance: The ethical approval was taken from ethical committee of Bharathiar university, Coimbatore, Tamil Nadu. Ethical clearance was obtained from the university.

References

Non-Invasive Monitoring of Blood Glucose Concentration Based on Insulin Secretion Level Using NIR Spectroscopy for Diabetes Detection

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Abstract

Diabetes claims millions of lives every year. Diabetes Mellitus is a metabolic disorder that occurs due to the increase in blood sugar level. The blood sugar level control by insulin secreted from pancreas. The diabetes classify as type 1 and type 2 depending on insulin secretion. The type 2 diabetes is more common in people than type 1 diabetes. Traditionally, the blood glucose level estimate with glucometer and blood test. However, the test require invasive blood pricking for blood glucose measurement. The measured blood glucose value also varies due to amount of blood taken for testing, part of blood used for testing, depth of finger pricking, physical activity, stress and underlying illness. Hence, the insulin secretion from pancreas monitor for accurate prediction of blood glucose level. The blood glucose level varies with respect to insulin secretion from pancreas. In this paper, we propose a non-invasive approach to estimate blood glucose accurately through NIR spectroscopy for diabetes control. The NIR spectroscopy signal obtained from pancreas process through Rational Dilation Wavelet Transform to determine the insulin secretion level. The non-invasive NIR spectroscopy method measures glucose level with 90% accuracy compared to lab results.

Keywords: Type 2 Diabetes, RADWT, NIR spectroscopy, Insulin.

Introduction

Diabetes mellitus characterizes by the abnormal increase of sugar level in the blood. When the glucose level in the blood increases, it induces the insulin release from the pancreas. Insulin causes fat cells and muscle to remove glucose from the blood and causes the liver to metabolize glucose and thus reduce blood sugar to normal levels. People with diabetes have high levels of blood sugars ince, pancreas does not produce insulin. The diabetic person have minimal count of β-cells in pancreas which secretes low insulin.

The most general forms of diabetes are type 1, type 2 diabetes, and gestational diabetes. The type 1 diabetes is an autoimmune disorder where, the body attacks the pancreas making it unable to produce insulin resulting in minimal insulin secretion. The type 2 diabetes cause due to factors such as metabolic disorders, age, overweight, obesity, physical inactivity and unhealthy food consumption. The β cell in pancreas produce insufficient insulin coupled with organ resistance to insulin and result in high blood glucose level. The gestational diabetes occurs during pregnancy.

Currently, the blood glucose level control by medication and insulin injection coupled with diet control and physical activity. The blood glucose level determine by blood test or glucometer. The first introduced blood glucose meter was Ames Reflectance Meter. The Ames Reflectance Meter enables diabetic patients to monitor the blood glucose levels themselves. Reffomat is another portable and compact blood glucose meter designed for health care professionals. The Reffomat requires only a small amount of blood to determine blood glucose level. The foresaid meter needs extraction of blood samples through fingertip pricking, ear pricking. The blood glucose monitoring require taking test for up to 4 times every day. Therefore, continuously pricking of finger, ear for blood to determine blood glucose level may cause infection, and calcified nodules. The blood sugar level estimated by glucometer are inaccurate due to damaged blood cells. Further, the frequent skin pricking is uncomfortable, inconvenient and cause skin irritation.
Hence, precise, convenient, safe and comfortable blood glucose measurement method is required.

The blood glucose also measure by non-invasive method. The polarization change is the first introduced non-invasive technique where combination of helium and neon based laser light is coupled to a linear polarizer and the phase matches with the rotation vector is relative to glucose.

Raman Spectroscopy can detect low frequency modes. A Surface Enhanced Raman Spectroscopy (SERS) detects the interaction between glucose molecules and SERS active surface. The monochromatic light on molecule result in photon energy shift. The energy shift of photon is proportional to molecular bond vibration. The molecular vibration have specific Raman spectrum band. The spectrum band features vary for different molecules such as glucose.

Fluorescent spectroscopy is an electromagnetic spectroscopy technique that can analyze a sample’s fluorescence. Fluorescent Spectroscopy utilizes visible light spectrum, to detect energy emitted at different wavelength from glucose molecule. Near-Infrared (NIR) spectroscopy employs near-infrared light of wavelength 780-2500nm. In NIR spectroscopy, glucose level estimates with respect to the variations in the light intensity. Mid-Infrared (MIR) spectroscopy is developed from NIR spectroscopy that utilizes the near infrared light of wavelength 2500-10000nm. MIR spectroscopy is sharper and does not penetrate through the skin effectively. Absorption spectroscopy in the infrared (IR) region is a significant technique for finding unidentified biological substances in aqueous solutions. The technique is based on the process that every molecule has particular resonant absorption peaks. These peaks are caused by molecule’s rotational and vibrational oscillations.

**Literature Survey:** Non-invasive blood glucose monitoring perform through in vitro and in vivo analysis of Differential Continuous Wave Photo Acoustic Spectroscopy (DCW-PAS). The DCW-PAS approach uses amplitude modulation with dual wavelengths of light to identify glucose concentration level. The analysis compares DCW-PAS evaluations including results from invasive blood glucose sensor evaluations of healthy people’s Oral Glucose Tolerance Tests (OGTTs). The blood glucose level estimation from photo-acoustic signal and invasive sensors have good correlation. [1]

The blood glucose level measure with plasmonic sensor made of barium flint glass, gold film and silicon nitride (Si$_3$N$_4$) substrate. The plasmonic sensor rejects infrared wavelength on normal incidence because of coupling between plasmonic wave and incident plane wave. The impact of glucose concentration or ambient refraction analyze for plasmonic structure sensitivity to blood glucose. [2]

A Spoof Surface Plasmon Polariton (SSPP) endfire sensor monitors aqueous glucose solutions and measures on-body glucose. The SSPP endfire sensor radiates an endfire beam into a glucose water solution with minimal effective aperture. At the sensor’s CPW port, a set of triangular ground planes suppresses the side-lobes and limit glucose sensing. The SSPP endfire sensor’s slow wave nature provides the way for measuring glucose concentrations with enhanced sensitivity. [3]

Non-invasive blood glucose monitoring offers an effective solution to diagnose patients with diabetes the glucose response characterize at low Radio Frequency (RF) signals. The relative permittivity and conductivity of aqueous solutions obtain for various glucose concentrations using an impedance analyzer in the frequency range 1 KHz to 1MHz. Further, the blood impedance measure for glucose monitoring the bio-impedance, measure from forearm during cardiac cycle with polygraph at 1000 Hz. The difference in bio impedance evaluate for cardiac cycle. The influence of blood glucose concentration on bio impedance evaluate to remove tissue influence on blood glucose concentration. [4]

The design of a microwave sensor for non-invasive monitoring of blood glucose concentration is presented. Three distinct microwave resonator structures analyze as suitable candidates. The microwave resonator has an open structure to place patient’s finger. The finger’s shape and size should fit in the resonator. The variation in blood glucose concentration alters the tissue’s dielectric properties and changes the structure’s resonant frequency. [5]

A combined millimeter-wave radar system detects various glucose concentration levels of duplicate blood samples made in the laboratory. The mm-wave radar non-invasively monitors blood glucose of patients with diabetes. The mm-wave radar signal with Discrete Time Fourier Transform finds various glucose concentrations in hemoglobin samples. [6]
Thenear infrared spectroscopy non-invasively measures glucose concentration in blood. The infrared light pass through finger and blood glucose concentration evaluate by calculating absorbance through Beer-Lambert law. The infrared absorbance is equivalent to blood glucose concentration and finger thickness. [7]

A sensitive Glucose fringe field Microstrip Line (MLIN), Material under Test (MUT) – glucose as substrate detects concentration of glucose and ports. The electromagnetic field from MLIN interacts with MUT and show variation in $|S_{11}|_{\text{min}}$. The glucose concentration estimate by Single variate, multivariate and multivariate estimation with bin correlation algorithm. [8]

An implanted sensor with telemetry system monitors subcutaneous tissue glucose for long term in diabetic patients. The implantable sensor consist of immobilized glucose oxidase membrane, polydimethylsiloxanemembrane, catalase connected to electrochemical oxygen detection and telemetry system for wireless data transmission. [9]

A planar microwave sensor monitors glucose level continuously. The sensor element contains four different hexagonal-shaped complementary split ring resonators (CSRR) resembling honey-cell pattern. The resonator was fabricated on a FR4 dielectric substrate and connected to planar micro strip with dielectric substrate. The CSRRs were connected through microstrip transmission line to a radar system operating at 2.4-2.5 GHz. The combined sensor system achieves a good sensitivity in detecting the glucose levels that dissolves in the blood similar to aqueous solutions. [10]

A substrate integrated waveguide (SIW) planar sensor’s design measured blood glucose concentration non-invasively. The SIW planar sensor’s structure resembles traditional band stop filter. The SIW planar sensor, yields a considerable and localized field improvement in the sensing region, the inter-digital arms and the slots on the SIW planar sensor cavity’s upper conductor are utilized. Additionally, fingertip is utilized as material under test (MUT) and the effects of finger prints and the finger’s displacement are analyzed. [11]

The ZnO based ultrasonic piezoelectric Micro-Electronics Mechanical Systems (MEMS) receiver monitors blood glucose. The radial displacement and the surface of the ultrasonic piezoelectric MEMS receiver produce voltage due to pressure and stress. The voltage vary with respect to blood concentration level. The simulation analysis of glucose data showed agreeable correlation with glucometer reading. [12]

The blood glucose monitor with RF/microwave technology. The RF sensor measure blood glucose level by detecting dielectric changes of blood. The dielectric variation due to glucose causes the sensor frequency to shift below 8Mhz. The frequency shift also occur due to blood layer, skin, fat, pressure and position of finger. [13]

A wearable, minimum invasive autonomous and pseudo-continuous blood glucose monitoring. This wearable micro system design obtains a whole blood sample from a little lanced skin wound utilizing a new micro-actuator based on a shape memory alloy (SMA) and straightly measures the blood glucose level from the blood sample. [14]

A wirelessly powered implantable electrochemical sensor system monitors blood glucose continuously. The system was powerby 13.56 MHz inductive link and an ISO 15693 radio frequency identification (RFID) standard for telemetric communication. The sensor system comprises awinding ferrite antenna, a RFID front-end, a 10-bit sigma-delta analog to digital converter (ADC), a long-term glucose sensor, an on-chip temperature sensor, a potentiotstandat a digital baseband for controlling and processing protocol. A high frequency (HF) external readerpowers, commands and configures the sensor system directly. The off-chip support circuitry requiresa glucose micro-sensor and a tuned antenna. [15]

**Methodology**

The non-invasive technique of diabetes detection is performed by measuring the blood glucose concentration through NIR spectroscopy. The NIR spectroscopy measures blood glucose concentration by evaluating insulin secretion from pancreas. The NIR sensor is placed on the pancreas region.Figure 1 shows the overview of diabetes prediction with reflected infrared from pancreas.

Pancreas is a gland that is six inches long and located in the abdomen. It is flat and pear shaped, surrounded by liver, small intestine, spleen, stomach. The pancreas’s endocrine cells produce hormones. Hormones are substances that regulate or control particular functions in the body. Hormones are generally formed in one part of the body and passed through the blood to react on another part of the body. The two important pancreatic hormones are insulin and glucagon. The endocrine cells
such as the islet cells present in the pancreas produce and secrete glucagon and insulin in the blood. Glucagon increases the blood sugar level while insulin lowers the blood sugar level. The two hormones function together to maintain proper blood sugar level. The figure 2 shows the structure of pancreas.

Figure 1. Overview of diabetes detection with NIR through RADWT algorithm.

Figure 2. Structure of Pancreas

To find the insulin secretion level from pancreas, NIR spectroscopy is used. NIR spectroscopy is a spectroscopic technique that utilizes the electromagnetic spectrum’s from near infrared region. NIR spectroscopy is used in various medical applications such as pulse oximetry, blood sugar level monitoring, neurology and urology. The NIR sensor is placed on the pancreas region as shown in figure 3. The reflected infrared signal from pancreas acquire with data acquisition tool. The infrared signal from pancreas of normal and diabetic person. The pancreas infrared signal obtain for before meal and after meal condition. The acquired infrared signals processes through Rational Dilation Wavelet Transform (RADWT) to determine infrared variation due to insulin secretion. In RADWT, the Q-factor value change for resolution and subband energy level of pancreas NIR signal.

Rational Dilation Wavelet Transform (RADWT): The Dyadic Wavelet Transform is an effective transformation tool for sparsely representing the smooth signals and it is a constant Q-factor transform and a critically sampled wavelet transform. However, its frequency resolution is poor and has a low Q-factor. The Dyadic Wavelet Transform is not effective for processing NIR signals with oscillatory nature. Some techniques like Cosine Modulated Filter Banks, Short Time Fourier Transform (STFT), wavelet packets are traditionally used for oscillatory type signals rather than using dyadic wavelet transform. The transforms do not have a constant Q-factor. So an efficient transform with constant and high Q-factor and high frequency resolution is required. Another category of wavelet transforms like overcomplete wavelet transform performs efficiently than critically sampled wavelet transforms like dyadic wavelet transform. Overcomplete wavelet transforms extend an N-point NIR signal to a set of M coefficients with $M>N$. Several overcomplete invertible wavelet transforms such as double density wavelet transform, dual tree complex wavelet transform and undecimated wavelet transform exists. These wavelet transforms achieve over completeness through increasing only the temporal sampling in all frequency bands. The frequency spacing between adjacent frequency bands should be reduced to utilize the overcomplete wavelet transform’s redundancy. These overcomplete wavelet transforms are based on rational dilations. The figure 4 represents the Rational Dilation Wavelet Transform (RADWT) where $H(\omega)$ is high pass filter, $G(\omega)$ is low pass filter, $p$ and $q$ are rational dilation factors and $s$ is redundancy factor.
The selection of dilation factor close to one, a wavelet can be dilated from scale to scale and multi-resolution frequency analysis of the NIR signal can be performed. Additionally, the dilation factors $p$ and $q$ and the redundancy factor $s$ enhance the Q-factor and frequency resolution of the NIR signal. The Q factor of the signal resolution depend on the rational dilation factors $q$ and $p$. The filter banks of RADWT is shown in figure 5.

The perfect reconstruction filters for the filter bank shown in figure 5 is derived. The parameters $p$, $q$ and $s$ are positive integers that satisfy $1 \leq p < q$ and $p/q + 1/s \geq 1$. The integers $p$, $q$ are coprime. For perfect reconstruction $p + 1 = q = s$. The only condition for perfect reconstruction filters is

\[
\frac{1}{pq} |H(\omega)|^2 + \frac{1}{s} |G(\omega)|^2 = 1 \quad \text{for} \quad \omega \in [0, \pi] \quad \text{Q(1)}
\]

Finally, the perfect reconstruction filters are given as

\[
H(\omega) = \begin{cases} 
\sqrt{pq} & \omega \in \left[0, \left(1 - \frac{1}{s}\right)\frac{\pi}{p}\right] \\
\sqrt{pq} \theta\left(\frac{\omega - a}{b}\right) & \omega \in \left(1 - \frac{1}{s}\right)\frac{\pi}{p}, \frac{\pi}{q}\right) \\
0 & \omega \in \left[\frac{\pi}{q}, \pi\right]
\end{cases}
\]

\[
G(\omega) = \begin{cases} 
\sqrt{s} \theta\left(\frac{\omega - p\alpha}{p\beta}\right) & \omega \in \left(1 - \frac{1}{g}\right)\frac{\pi}{p}, \frac{\pi}{q}\right) \\
\sqrt{\frac{s}{p}} & \omega \in \left[\frac{p}{q}\pi, \pi\right]
\end{cases}
\]

Results and Discussion

The NIR sensor position over pancreas of diabetic person and infrared signal acquire for before meal consumption and after meal consumption. The infrared signal acquired before meal consumption is shown in figure 6.

The acquired NIR signal decompose up to 11 levels to determine subband signal influenced by pancreas insulin secretion. The NIR signal process through RADWT for multi-resolution frequency analysis. The decomposed subband signal is shown in figure 7. Figure 8 shows the reconstructed subband signal from individual subband.
The multiresolution analysis evaluate for NIR signal subband energy. The RADWT, decomposes the signal and subband energy evaluate for each subband signal. The subband energy level of the NIR signal before meal consumption is shown in figure 9.

In figure 9 the subband energy level is low due to low insulin secretion from pancreas. The low insulin secretion from pancreas cause high blood glucose level. The subband energy level attains a maximum of 24% at fifth subband.

The pancreas NIR signal was obtained from pancreas with NIR sensor after meal consumption is shown in figure 10.
The decomposed signal with RADWT is shown in figure 11. The subband signal reconstructed with RADWT from individual subband is shown in figure 12. In figure 12, the subband energy increases when the insulin secretion level from pancreas increase.
The subband energy level reconstructed NIR signal with RADWT from pancreas after meal consumption is shown in figure 13. In figure 13, the subband energy level increases due to insulin secretion from pancreas. The subband energy level attains a maximum of 28% for fifth subband. The increase in pancreas insulin secretion lowers blood glucose level.

The NIR signal from pancreas of non-diabetic person was obtained for before food consumption and after food consumption scenarios. The NIR subband energy variation was similar to diabetic person. However, the subband energy increased to maximum of 35% at fifth subband before food consumption and increased further to 42% after food consumption due to high insulin response. The subband energy increased proportional to insulin response from pancreas. The high insulin response from pancreas regulated blood sugar level. The table 1 gives information about subband energy, insulin response and glucometer reading of diabetic and non-diabetic person.

![Figure 13. Subband Energy Level of the Pancreas NIR signal (After meal consumption)](image)

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Diabetic person</th>
<th>Nondiabetic person</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before meal consumption</td>
<td>After meal consumption</td>
</tr>
<tr>
<td>Subband energy</td>
<td>24</td>
<td>28</td>
</tr>
<tr>
<td>Glucometer values</td>
<td>183</td>
<td>240</td>
</tr>
<tr>
<td>Lab results</td>
<td>165</td>
<td>228</td>
</tr>
</tbody>
</table>

**Table 1: NIR signal parameter of diabetic and non-diabetic person.**

**Regression Modeling:** The regression modeling is a statistical procedure used to estimate the linear or straight-line relationship that relates two or more variables. The linear relationship represents amount of change in one variable that relates with change in another variable. There regression modeling also evaluate for statistical significance, to check whether the linear relationship emerge by chance or not. The two variable regression model includes two variables such as an independent variable and a dependent variable. The independent variable causes changes in the dependent variable.

**Linear Regression:** Linear regression model determines relationship between two variables through fitting a linear equation for observed data. One variable is considered as an explanatory variable, and the other is considered as a dependent variable.
The equation of a linear regression line is of the form
\[ Y = a + bX \] (3)
where, 
- **X** is the explanatory variable.
- **Y** is the dependent variable.

The slope of line is **b**, and the intercept is **a** (the value of **y** when **x** = 0). The formula for computing intercept **a** and slope **b** is given as
\[ a = \frac{\sum xy - (\sum x)(\sum y)}{n(\sum x^2) - (\sum x)^2} \]
\[ b = \frac{n(\sum xy) - (\sum x)(\sum y)}{n(\sum x^2) - (\sum x)^2} \] (4)

The blood glucose level of diabetic person obtained from subband energy and lab values is represented by the equation
\[ Y = 14.20X - 159.0 \] (5)
and the blood sugar level of non-diabetic person is represented by
\[ Y = 6.393X - 1.357 \] (6)

**Conclusion**
A non-invasive technique for monitoring blood glucose concentration is presented. The blood glucose level determined with insulin secretion level from pancreas, NIR sensor measures the insulin secretion level in pancreas. The intensity of the NIR light varies according to the insulin secretion level in pancreas. The NIR signal obtained from the pancreas is processed through RADWT to evaluate the insulin level in pancreas. The RADWT subband energy level is relative to insulin secretion from pancreas. The subband energy is low when the insulin secretion level in pancreas is low, before food consumption and the subband energy level is high when insulin secretion level in pancreas increases after food consumption. The subband energy of NIR signal validates with glucometer measurement results.

**Conflict of Interest:** The authors declare no conflict of interest.

**Source of Funding:** Self

**Ethical Clearance:** All procedures were in accordance with the 1964 Helsinki Declaration (and its amendments). No approval by ethical committee or institutional review board was required. Informed.

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Visa Regulation of Indonesian Migrant Worker Based on Immigration Control Act of Japan, 2018

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Abstract
Japan as a developed country needs a lot of productive labor to fulfill its human resources needs. With the revised Immigration Act of 2018, Japan has opened up to accept many migrant workers, one of whom is Indonesian migrant worker who can fulfill these needs. The purpose of this research is to find out the form of visa regulation for Indonesian migrant workers in Japan based on the provisions of the Japan Immigration Act 2018 and to know the efforts of the Indonesian Government can make in implementing the visa regulations to facilitate Indonesian migrant workers who will work in Japan.

Keywords: Japan, Indonesia, Visa, Immigration, Control, Act.

Introduction
Japan and Indonesia have a mutually beneficial cooperation program on both sides, namely the cooperation of Indonesian migrant workers in Japan. The Japan - Indonesia cooperation program was formed because of the abundance of productive human resources in Indonesia that has been equipped with the ability in the field of verified engineering to be able to work in labor-deprived Japan for the lower middle class. Indonesian migrant workers will be needed to facilitate development in Indonesia and can be a means of cooperation with Japanese medium and small companies in Indonesia. Indonesian migrant workers in Japan are more commonly known as Indonesian Interns or in Japanese called Kenshuusei (practicing while working) and Jishuusei (working while practicing). These workers require a work visa in Japan based on the Japanese company’s employment contract with the individual. For foreign nationals, to enter a country requires an entry permit or so-called Visa.

With the new visa regulations, Indonesian migrant workers are distinguished by Specific Skilled Worker Visas (PBS) and Technical Internship Training Visas (PMT). The new PBS visa was passed through the latest regulations in April 2019 with the aim of meeting the needs of human resources in Japan to work a minimum of 5 (five) years or without the required time span. In addition, PBS also has only 16 jobs that can be applied for visas, in contrast to PMT which has 16 jobs. A very clear difference, PBS visas do not require migrant workers to be training before entering a routine job in Japan, but it does relate to having to pass migrant workers in skill tests and Japanese language tests.

Method
The main purpose is to find answers to various problems that arise in society is to conduct a research. Research in fact reveals something systematically, methodologically and consistently so that the results of the research should be accountable. Research on Visa Regulation of Indonesian Migrant Worker Based on Immigration Control Act of Japan, 2018 legally binding protection provided by the State with the guidance of the regulation. This study uses data analysis approaches and normative juridical method. It uses descriptive analysis method by using literature, documentary studies and field research related to the primary substance of this study. After the data has been collected, the next process is to

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identify, clarify and analyses systematically. Finally, all research results are presented in a compiled final report.

**Results and Discussion**

Each country has sovereignty of the country which means the highest power for the state to freely conduct various activities in its interests as long as the activity does not conflict with International Law. An important limitation of a country’s sovereignty is that it is limited to the territorial boundaries of the state and that power ends where the power of another country begins. It is clear that understanding the sovereignty, independence and equality of the above countries does not contradict the concept of an International Society governed by International Law, it can even be said that if it is reasonably understood this sovereignty with two understandings that align with it namely the independence and equality of the degrees of countries is an understanding that has a very important function in realizing an International Society governed by International Law as a reality."}

To safeguard the sovereignty and power of the state within the boundaries of its territory, each country has jurisdiction. The jurisdiction of this country is essentially inseparable from the concept of territorial sovereignty of a country which is one of the essential attributes of the state. Countries exercising sovereignty on their territory will be allowed to make their own laws and regulations legally binding on their residents living on their territory including their owners. State accountability as well as with individuals who may give rise to the country’s rights and obligations to foreigners, nationality, extradition, and asylum, as well as human rights.

All countries have the authority and power to accept or reject foreigners on their territory. If a country accepts the entry of foreigners into its territory, it will grant a visa granted by the country through the embassy of the receiving country located in the country. Through such visas, foreign nationals in the destination country have certain rights and obligations. Foreign nationals obtain the right of acceptance of the destination country followed by obligations to comply with local laws and regulations, so-called provisional compliance terms.

There are several opinions regarding the entry of foreigners to the destination country: All states are obliged to grant permission to all foreigners; A state is obliged to grant permission to all foreigners, provided that it has the right to reject certain groups, such as drug addicts, certain people with certain diseases and other unwanted persons; A state is bound to allow foreigners to enter but may impose conditions relating to their entry permit, and; A state has the right to ban all foreigners according to its will.

In International Law, there is a Theory of Social Contract that states that a person who is in society is outside and regardless of state power. This theory was then applied and analyzed against the state that a country engaged in the association of the International Community, the basic right is not separated from the influence of another country. Further development is influenced by the Natural Law which gives rise to the doctrine of inter-state relations and human relations is the same, namely the right to mutual respect, equality of rights and independence. The American Institute of International Law (AIIL) produced the Declaration of the Rights and Duties of Nations, which was followed by a study of fundamental right and duties of American Republics until the completion of the 1933 Montevideo Convention.

In International Law a country has a standard of treatment of foreigners, i.e.:

a. **National Treatment Standards**: According to national treatment standards foreigners should be treated the same as citizens of the destination country, which if applied consistently would benefit foreigners. International Law does not govern the country’s treatment of foreigners in all activities. The disadvantage of the country’s national treatment standards can certainly treat foreigners inhumanely and justify such treatment on the basis that its citizens can be treated equally.

b. **International Minimum Standard**: According to international minimum standards it stipulates that countries must offer the same treatment of foreigners as their citizens enjoy, but such treatment should not be less than the human rights recognized in international instruments.

In principle each country will be responsible for providing legal protection to every citizen wherever it is and foreigners will receive legal protection under certain restrictions both from the country in which it is located and from its home country. Thus, the nationality status of a person is closely related to the protection of International Law to be given to him, against him, property and his family.

Japan’s 2018 immigration oversight law, which
came into force in April 2019, is a new law that has been passed from several parts of the Immigration and Refugee Control Act. The revised law includes new rules, including visa rules for migrant workers. As part of this framework, Japan established migrant worker visas for the ‘professional skilled workers’ category.

The Life of Foreign Workers in Japan: Foreign workers living in Japan as many as 1.28 million. This is a record after there were 480,000 foreign workers in Japan in 2008. However, the figure is only 1% compared to Japan’s population. Nearly 30% of Japan’s foreign workers come from China with significant populations from Vietnam, the Philippines and Brazil. While in 2019, the number of foreign workers in Japan rose 13.6% from the previous year to 1,658,804 people. China accounted for about a quarter of all foreign workers at 412,327, followed by Vietnam at 401,326 and the Philippines 179,685, according to the Ministry of Health, Labor and Welfare. This increase appears to be due to the government’s promotion of the involvement of highly skilled foreign workers, exchange of students and intern trainees in the workforce, as well as improvements in the overall employment situation leading to more hiring permanent residents and spouses of Japanese citizens.

Indonesian migrant workers alone in Japan recorded 49,982 people living in Japan both legally and illegally. Since 1998, the chairman of the factory association in Oarai has invited Japanese descendants and migrants from North Sulawesi to work in the seafood industry, so it is not new that many Indonesian migrant workers in Japan today. According to statistics from the Indonesian Migrant Workers Protection Agency, Japan received 486 Indonesian migrant workers in 2019. The figure decreased from 538 in 2017, which makes Japan number 13 for the largest Indonesian migrant worker placement country.

Arrangement of Worker Visa under Japan Immigration Control Act 2018: After the Second World War, Japan’s labor management system was
reorganized and new labor laws were introduced along democratic lines. The “Employment Law” includes detailed regulations on the realization of labor relations and modern and democratic labor practices. In the 1960s, the labor market changed significantly. Although agricultural residents flocked to the industrial sector, labor shortages were first seen around 1959. With Japan’s rapid economic development, the slow growth of the production age population in Japan, and the growing number of young people going to high school and university instead of looking for work, the availability of productive people in Japan is very limited.

According to Professor Hiroshi Yoshida, an economist at Tohoku University in Japan published in the Daily Mail on May 13, 2012: “Birth rates are starting to show an alarming decline since 1975. In terms of the number of births, this indicates that the age of children in the current 14-year population reaches 16.6 million, and this number decreases by one (1) person every 100 seconds. Recent studies have shown that Japan’s population is expected to become extinct within 1,000 years if left unchecked.”

To find a solution to the problems facing Japan today, namely the deterioration of the Japanese economy, low competitiveness, reduction of productive labor force, and increasing the number of elderly populations is an interconnected problem. Japan believes that it is necessary to serve the lower middle class immediately. Give me the manpower, by introducing workers from abroad, especially those from developing countries such as Indonesia. Other issues that arise are Japan’s Employment and Employment Law and Immigration Law, which cannot be changed automatically. For the fulfillment of the foreign workforce, the Japanese government adheres to the term apprenticeship program (kenshuusei-jisshuusei). Since 1994 there has been a Memorandum of Understanding (MoU) between the Directorate General of The Ministry of Foreign Affairs and The Association for International Manpower development of Medium and Small Enterprises Japan (IMM).

According to international law, Japan has applied several exceptions to the influx of foreigners, one of whom is poor or has no permanent residence, and can be a burden for the Japanese government or public bodies due to their inability to make a living. Therefore, in accordance with current regulations, any foreign workers with certain professional knowledge can give him the opportunity to stay and work long term in accordance with the period of the contract that can be extended.

Visa arrangements for foreign workers in the latest law make up the difference between interns and workers with special skills. Interns (Kenshuusei) are part of a work training system organized in an integrated way between training in training institutions by working directly under the guidance and supervision of instructors or workers who are more experienced in order to master certain skills or skills. While workers with special skills (Specified Skilled Worker/Tokutei Ginou) are workers who will work in certain fields in accordance with the certificate of expertise or Certificate of Japanese language owned from their country.

The granting of work visas to foreign workers began to be distinguished by the Japanese Government after the revised regulations. Special Type 1 skills are open only to those with adequate technical and Japanese skills. Special Type 2 skills are given to workers working in construction and shipbuilding. Only type 2 visas are allowed to bring their spouses and children to Japan. Information on the rules of residence of foreign workers in Japan, explained article 2-2 of Immigration Control and Refugee Recognition Act (Cabinet Order No. 319 of October 4, 1951) namely:

Article 2-2:

(1) Except as otherwise provided in the Immigration Control and Refugee Recognition Act and other laws, a Foreign National is to reside in Japan under the status of residence (in the case of the status of residence of “Highly Skilled Professional”, including the category of item (i), sub-items (a) through (c) or item (ii) listed in the right-hand column under “Highly Skilled Professional” of Appended Table I (2); in the case of the status of residence of “Specified Skilled Worker”, including the category of item (i) and (ii) listed in the right-hand column under “Specified Skilled Worker” of the same table; in the case of the status of residence of “Technical Intern Training”, including the category of item (i), sub-item (a) or (b), item (ii), sub-item (a) or (b) or item (iii), sub-item (a) or (b) listed in the right-hand column under “Technical Intern Training” of the same table; the same applies hereinafter) associated with that Foreign National’s permission for landing, under the status of residence that the Foreign National has acquired, or under the
status of residence following a change to either of these.

(2) The categories of status of residence are to be as listed in the left-hand column of Appended Table I (in the case of the status of residence of “ Highly Skilled Professional”), including the category of item (i), sub-items (a) through (c) or item (ii) listed in the right-hand column under “ Highly Skilled Professional” of Appended Table I (2); in the case of the status of residence of “ Specified Skilled Worker”, including the category of item (i) and (ii) listed in the right-hand column under “ Specified Skilled Worker” of the same table; in the case of the status of residence of “ Technical Intern Training”, including the category of item (i), sub-item (a) or (b), item (ii), sub-item (a) or (b) or item (iii), sub-item (a) or (b) listed in the right-hand column under “ Technical Intern Training” of the same table; the same applies hereinafter) and II. A Foreign National residing in Japan under a status of residence listed in the left-hand column of Table I may engage in the activities listed in the right-hand column corresponding to that status, while a Foreign National residing under a status of residence listed in the left-hand column of Table II may engage in the activities of a person with the status or position listed in the right-hand column corresponding to that status.

(3) The period during which a Foreign National may reside as set forth in paragraph (1) (hereinafter referred to as “ Period of Stay”) is determined for each status of residence by Ministry of Justice Order; and when the status of residence is one other than that of “ Diplomat”, “ Official”, “ Highly Skilled Professional” or “ Permanent Resident” (in the case of the status of residence of “ Highly Skilled Professional”, limited to those pertaining to item (ii) in the right-hand column under “ Highly Skilled Professional” of Appended Table I (2)), the Period of Stay does not exceed 5 years.

The application processes and documents required to apply for a worker visa with the latest conditions are:

a. Application to the Regional Immigration Services Bureau
   • Applicants must submit a form for issuance of a certificate of eligibility in accordance with the individual’s professional expertise for residency status.

   b. Checks by the Immigration Services Agency

   The examination of requirements is regulated in accordance with Article 7 paragraph (1) of item (ii) of the Immigration Control Act, namely: “ Article 7 (1) When the application set forth in paragraph (2) of the preceding Article is made, an Immigration Inspector must conduct an examination of the Foreign National as to whether or not the Foreign National conforms to each of the following conditions for landing in Japan (with respect to a person who has been granted re-entry permission pursuant to the provisions of Article 26, paragraph (1) or a person who possesses a Refugee travel document issued pursuant to the provisions of Article 61-2-12, paragraph (1), only the conditions listed in the following items (i) and (iv) are to be applied): (i) the Passport possessed by the Foreign National and the visa affixed thereto, if such is required, must be valid.”

   c. Issuance of certificate of eligibility: If the eligibility certificate requirements have been approved, foreign nationals can obtain visas and permission to land smoothly by presenting a certificate of eligibility when applying for a visa.

Conclusion

Japan revised, added and updated the Immigration Supervision Act 2018 primarily on visa arrangements for migrant workers or Foreign Workers who will work in the country. With the revision, other countries including Indonesia also feel the benefits and interest to be able to send migrant workers to Japan. There is a reciprocal interest between Japan and Indonesia; Japan lacks many productive middle-class workers to meet the needs and demands of its companies, while Indonesia has many productive-age workers who are expected to meet Japan’s quotas or the amount needed. This change in Japanese government policy demonstrates an open attitude towards other countries by accepting foreign workers to enter and participate in the development of their country. In the previous law Japan only applied admission to interns (Kenshuusei/Jishuusei) for 3 (three) to 5 (five) years, while the new Immigration Supervision Act applies the provision of residence visas for migrant workers if they fall into the category of skills and meet the conditions mentioned.Efforts can be made by the Government of Indonesia in implementing the new visa
arrangements by Japan, namely by carefully preparing adequate facilities and infrastructure for prospective Indonesian migrant workers. The Government of Indonesia and the Government of Japan, in this case the Japanese Embassy in Indonesia, immediately prepared technically the terms and conditions that must be met for prospective Indonesian migrant workers to Japan. Then the Government of Indonesia is obliged to conduct optimal coaching and supervision to the officers in order to be more professional in handling, educating and training prospective Indonesian migrant workers to comply with the applicable terms and conditions in Japan (Receiving Country).

**Conflict of Interest:** There is no conflict of interest.

**Source of Funding:** This research was funded by the Diponegoro University Faculty of Law Research Grant Fund for the 2020 Fiscal Year.

**Ethical Clearance:** Ethical clearance from the institutional ethical committee obtained for the study.

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Determinants of Modern Contraceptive Utilization among Women of Reproductive Age in Cambodia

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Abstract

Background: Contraceptive uptake remains a public health concern in Cambodia. Therefore, the aim of this study was to determine the modern contraceptive use pattern and its associated factors among women of reproductive age in Cambodia.

Method: A cross-sectional study used the data from the Cambodia Demographic and Health Survey. This survey adopted a two-stage stratified random sampling process to select respondents to respond a structured questionnaire interview. The multiple logistic regression was applied to determine the association.

Results: Of the total 7,606 women, 51.04% used modern contraceptives. The multivariable analysis indicated the use of modern contraceptives was strongly associated with fertility preferences, ideal number of children, number of living children, husband’s desire for children, age at first marriage, number of induced abortions, and marriage to a first birth interval. Health service factors including sources of family planning information, visited health facilities, inaccessibility to health service as well as sociodemographic factors such as women’s age, occupation, and geographical regions also significantly associated with modern contraceptive use.

Conclusions: About half of women in Cambodia used modern contraceptives. Reproductive, health service and sociodemographic factors were essential for modern contraceptive utilization.

Keywords: Determinants, modern contraceptives, women of reproductive age.

Introduction

Contraception has helped millions of people to control their fertility. The adoption of effective contraception can lower the burden of obstetric complications during childbirth and pregnancies, mitigate the number of abortions, prevent undesired pregnancies, and reduce infant and maternal mortality. Globally, an overwhelming majority of reproductive age women are using various contraceptive method, with more than one out of ten in-union or married women were not practicing any contraceptive method but wanting to halt and delay their childbearing. More than 90% of all contraceptive users, modern contraceptives were practiced by approximately 55% of married reproductive age women in almost all territories in the world in 2000, with a marginal increase of roughly 58% in 2017.

Contraceptive use can prevent approximately 54 million unplanned pregnancies, a million infant deaths, and 79,000 maternal mortality. In 2019, approximately 842 million reproductive age women used any kinds of modern method, constituting female sterilization (24%), male condom (21%), IUD (17%), and pills (16%). Around 225 million women in developing nations averted the contraceptive utilization despite wanting to postpone or stop their motherhood. There were approximately 213 million pregnant women, of which 85 million (40%) were undesired pregnancies, with the highest proportion in the Latin America and Caribbean zones and the lowest in Africa.
Extensive research has been studied to identify factors influencing modern contraceptive utilization. In particular, a wide of determinants including residence site, religion, education level, parity, financial status, access to media, number of living children, age at first marriage, age at first sexual intercourse, and perceptions on contraceptive uses. Other possible associated factors were women’s fertility preference or partners’ desire for children, employment status, counseling about family planning by healthcare providers, and couple’s discussion concerning contraceptive utilization.

Cambodia, one of the least developed nations in Southeast Asia, has only about 16 million population. Cambodia had an extremely low modern contraceptive coverage rate despite a considerable rise in contraceptive uptake from 24% in 2000 to around 51% in 2010 among married reproductive age women. Cambodia still faces many significant challenges affecting contraceptive utilization among women. The findings of the 2014 Cambodia Demographic Health Survey showed that opportunities to meet women’s family planning need have not been well improved and the number of nonusers remains high, which will place a burden on the economy and the welfare of the country as a whole. Hence, the understandings of factors influencing modern contraceptive utilization become incredibly crucial to inform policymakers to select appropriate and tailored interventions to mitigate adverse effects of reproductive health and expand the coverage of contraceptive uptake among women. Few studies have explored information regarding characteristics and related factors of modern contraceptive uptake in Cambodia. Thus, this study aimed to describe the modern contraceptive coverage and identify the association between modern contraceptive use and other factors.

Materials and Method

Study Design: This analytical cross-sectional study used the data retrieved from the 2014 CDHS. The 2014 CDHS was conducted between June 2nd and December 12th, 2014. Further details can be seen in the 2014 CDHS report.

Dependent Variable: The outcome was modern contraceptive uptake of married or in-union women of reproductive age (15-49 years old). Modern contraceptive use was defined as married/in-union reproductive women or her husband/partner used at least one of the contraceptive method including condoms, emergency contraception, pills, injectables, female sterilization, male sterilization, implants, and IUD coded as 1. Those who did not use any contraceptives (either coitus interruptus, rhythm method, or folkloric method) were coded as 0. The responses were then created and categorized as a dichotomous variable (Yes/No).

Independent variables: A set of explanatory variables was selected for the analysis.

Statistical analysis: All analyses were performed by using the Stata program version 14.0. The baseline characteristics and other variables were analyzed and presented as frequency and proportions for categorical data and mean, standard deviation, median, maximum, minimum for continuous data. The data was analyzed considering complex sampling design of the CDHS data.

A simple logistic regression was used to identify the association of each independent variable with modern contraceptive uptake. The independent variables that had p-value<0.25 were processed to the multivariable analysis. The multiple logistic regression was utilized to determine the strength of the association between modern contraceptive use and other variables, adjusted all confounders, and showed adjusted OR, 95% CI, and p-value. In the final model, the significance level was considered at p-value less than 0.05.

Results

Sample Characteristics: Out of 7606 women of reproductive age, 87.27% resided in rural areas, 43.62% were in Central plain, and 43% were poor. The women average age was 32.99 years old, 56.29% of women and 47.88% of husbands attained primary education. The highest proportion (42.38%) were self-employed in the agricultural sector. The mean age of husband was 35.88 ± 9.02 years old.

The mean age at marriage was 19.50 ± 3.76 years, 34.38% got married between the age of 18 and 20 years old, 55.97% had first sexual intercourse before the age of 20 years.

Most of the respondent had two or more parities (73.41%), 83.14% never had induced abortions, 41% had three or more living children, 47.20% had 12-24 months first birth interval after marriage. Majority did not want any more children (55.42%), 64.10% of the couples desired the same number of children and 31% had not want more than 2 ideal children.
More than half (55.77%) heard about family planning from family and friends, 48.36% from TV, 47.37% from billboards or posters, radio (36.33%). A quarter 25% got the information from community councils and 21.26% from local campaign. More than half (51.13%) of women visited health facilities during the past 12 months, 24.22% were visited by family planning staff, 24.75% experiencing inaccessibility to health services. Only 51.04% (49.19%-52.88%) of the women of reproductive age used modern contraceptives, of which 25.08% of all respondents used oral pills, followed by injection (13.09%), IUD (6.37%), and Norplant (3.13%). Only 2.99% used condoms and 0.38% used other method.

**Bivariate Analysis:** The bivariate analysis indicated that potential associated factors with contraceptive use (p-value<0.25) were: women’s age, women’s education, women’s occupation, geographical region, husband’s age, husband’s occupation, parity, age at first marriage, age at first sexual intercourse, number of living children, number of induced abortions, marriage to first birth interval (months), media exposure to family planning from TV or newspapers, sources of family planning information, perceived problems in accessing to health services, fertility preferences, husband’s desire for children, and ideal number of children. These variables were employed to the multiple variable analysis using multiple logistic regression.

**Multivariable Analysis:** The multivariable analysis indicated that the modern contraception was significantly more likely to be used among women who wanted children after two years (adj.OR=5.35, 95%CI=4.09-7.00), despite unsure timing (adj.OR=4.40, 95%CI=2.75-7.04), and undecided (adj.OR=2.97, 95%CI=2.32-3.82); had 2 ideal children (adj.OR=2.65, 95%CI=2.09-3.37), 3 ideal children (adj.OR=1.91, 95%CI=1.55-2.35); and 4 ideal children (adj.OR=1.48, 95%CI=1.19-1.83); had two living children (adj.OR=2.22, 95%CI=1.82-2.70), and more living children (adj.OR=2.55, 95%CI=1.96-3.31); husband desired for fewer children (adj.OR=1.71, 95%CI=1.23-2.38), more children (adj.OR=1.49, 95%CI=1.18-1.88), and the same number as his wife (adj.OR=1.45, 95%CI=1.18-1.79); first birth interval less than 12 months after marriage (adj.OR=1.64, 95%CI=1.37-1.96), one year to two years (adj.OR=1.39, 95%CI=1.20-1.60) respectively. Health education especially received family planning information from community councils (adj.OR=1.24, 95%CI=1.06-1.45) as well as visiting health facilities (adj.OR=1.23, 95%CI=1.09-1.38) and had accessibility to health services were also associated factors. Other significant factors were socio-demographic characteristics including women aged <25 years (adj.OR=2.03, 95%CI=1.70-2.44), 25 to 29 years (adj.OR=1.85, 95%CI=1.52-2.26), and 30 to 34 years (adj.OR=1.34, 95%CI=1.04-1.74); worked as manual workers (adj.OR=2.49, 95%CI=1.94-3.22), agricultural sector’s self-employed (adj.OR=1.91, 95%CI=1.60-2.28), professional and other jobs (adj.OR=1.79, 95%CI=1.46-2.19) (Table 1).

### Table 1: Multivariable analysis of modern contraceptive use and other factors among women in Cambodia

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
<th>% MC</th>
<th>Cru.OR</th>
<th>Adj.OR</th>
<th>95%CI</th>
<th>P-value</th>
</tr>
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<tr>
<td><strong>Women’s age</strong></td>
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<tr>
<td>≥35</td>
<td>2941</td>
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<tr>
<td>30-34</td>
<td>1340</td>
<td>49.94</td>
<td>1.36</td>
<td>1.34</td>
<td>1.04-1.74</td>
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<td>25-29</td>
<td>1551</td>
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<td>1.85</td>
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<tr>
<td>&lt;25</td>
<td>1774</td>
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<td>2.08</td>
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<td>Unemployed</td>
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<td>Professional and other jobs</td>
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<td>1.79</td>
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<td>Central plain and Plateau</td>
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<td>1</td>
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<tr>
<td>Tonle sap and Coastal sea</td>
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<tr>
<td>Variable</td>
<td>Number</td>
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<td>Cru.OR</td>
<td>Adj.OR</td>
<td>95%CI</td>
<td>P-value</td>
</tr>
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<td><strong>Age at first marriage</strong></td>
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<td>18-20</td>
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<td><strong>Number of living children</strong></td>
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<td>2</td>
<td>2322</td>
<td>59.02</td>
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<td>50.16</td>
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<tr>
<td>≥1</td>
<td>1282</td>
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<td><strong>Marriage to first birth interval</strong></td>
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<td>(months)</td>
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<td></td>
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<tr>
<td>≥25</td>
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<td>12-24</td>
<td>3590</td>
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<td>1.20-1.60</td>
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<tr>
<td>&lt;12</td>
<td>1949</td>
<td>55.39</td>
<td>1.53</td>
<td>1.64</td>
<td>1.37-1.96</td>
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<td><strong>Received FP information from community councils</strong></td>
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<tr>
<td>Yes</td>
<td>1942</td>
<td>55.15</td>
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<td>1.24</td>
<td>1.06-1.45</td>
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<td><strong>Visited health facility during the last 12 months</strong></td>
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<td></td>
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<td>0.001</td>
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<tr>
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<td>50.33</td>
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<tr>
<td>No</td>
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<td>51.78</td>
<td>1.06</td>
<td>1.23</td>
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<tr>
<td><strong>Perceived problems in accessing health services (distance to health facilities, affordability, permission to go, and presence of companion)</strong></td>
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<td></td>
<td></td>
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<tr>
<td>≥1 barrier</td>
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<td>No barrier</td>
<td>1882</td>
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<td>1.23</td>
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<tr>
<td><strong>Fertility preference</strong></td>
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<td></td>
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<td>&lt;0.001</td>
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<tr>
<td>Want within 2 years</td>
<td>813</td>
<td>23.07</td>
<td>1</td>
<td>1</td>
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</tr>
<tr>
<td>Want after 2 years</td>
<td>2162</td>
<td>59.65</td>
<td>4.93</td>
<td>5.35</td>
<td>4.09-7.00</td>
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<tr>
<td>Want, unsure timing</td>
<td>139</td>
<td>55.32</td>
<td>4.13</td>
<td>4.40</td>
<td>2.75-7.04</td>
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<tr>
<td>Undecided/want no more</td>
<td>4492</td>
<td>51.81</td>
<td>3.59</td>
<td>2.97</td>
<td>2.32-3.82</td>
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<td><strong>Husband’s desire for children</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>0.002</td>
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<tr>
<td>Do not know</td>
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<td>41.00</td>
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<td>1</td>
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<tr>
<td>Both want same</td>
<td>4876</td>
<td>52.30</td>
<td>1.58</td>
<td>1.45</td>
<td>1.18-1.79</td>
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<tr>
<td>Husband wants more</td>
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<td>52.28</td>
<td>1.57</td>
<td>1.49</td>
<td>1.18-1.88</td>
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<tr>
<td>Husband wants fewer</td>
<td>453</td>
<td>54.52</td>
<td>1.72</td>
<td>1.71</td>
<td>1.23-2.38</td>
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<tr>
<td><strong>Ideal number of children</strong></td>
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<td>≥5</td>
<td>1056</td>
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<tr>
<td>4</td>
<td>2029</td>
<td>47.95</td>
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<td>1.48</td>
<td>1.19-1.83</td>
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<tr>
<td>3</td>
<td>2186</td>
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<td>1.89</td>
<td>1.91</td>
<td>1.55-2.35</td>
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<td>0,1,2</td>
<td>2335</td>
<td>56.88</td>
<td>2.14</td>
<td>2.65</td>
<td>2.09-3.37</td>
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</table>
Discussion

Our study identified the factors associated with the use of modern contraceptives among women of reproductive age in Cambodia. The result showed that about half (51.04%) of respondents used modern contraceptive method. It was in line with the uptake rate in a study conducted in Rwanda (50.40%). However, this finding was lower than a study in Kenya (58.8%). The possible discrepancy might be because our study covered both urban and rural areas. Women residing in rural areas of Cambodia have limited access to modern contraceptives from socioeconomic condition as well as health service system.

A significant relationship between women’s age and modern contraceptive use was observed in this study. The use of modern contraception decreased with increasing age of the respondents. This might be due to the fact that women often think they may be too young or immature to take good care of a child and may have to drop or suspend their education; therefore, they used contraceptives to avert pregnancy. This finding is in line with a study in Spain. It is commonly known that late adults in their menopausal phase tend to use contraceptives less due to decreased sexual activities and fertility. A study showed that age was negatively associated with contraceptive utilization.

Women with less stable and paid job were more likely to use contraceptives. The economic constraints might force women to use contraceptives for fear of child rearing burden. Women who had two or more living children were much more likely to use modern contraceptives than those with one or no child. It was consistent with a study in Ethiopia, revealed that as the use of modern contraceptives raised, the number of living children also raised. Generally, this might be influenced by the fact that women with more living children could satisfy their family size and minimize a substantial financial burden in their daily life.

A study in Uganda reported that women desired to have children after two years were more likely to utilize modern contraceptives than those desired children within two years. The main reasons for this delayed childbearing were that women could have more involvement on the labor market including higher education and career engagement.

The finding indicated that women whose husband desired few children were more likely to use modern contraceptives compared to those who did not know whether their husband preferred more, less or the same children. One of the possible explanations was men have been considered as the head of the family and responsible for all expenses and making a final decision in the family in Cambodian context. This study, in agreement with other findings, elucidates that a husband’s desire for fewer children was found to be significantly correlated with contraceptive use. This study also found a significant relationship between the ideal number of children and modern contraception. When the ideal number of children decreased, the odds of women’s use of modern contraceptives increased. This is probably a reflection of the fact that women may not reach their desired family size or prefer to discuss with their spouse after having one child. However, women are more likely to use contraceptives to avert pregnancy. This result is in line with other studies in Ethiopia and Zimbabwe. Sources of family planning information and accessibilities to health services also increased the odds of contraceptive uses. This might reflect the better coverage of services and access to modern contraceptives in the areas.

Limitation: The major strength of the study is this survey covered all areas of Cambodia with a large sample size. However, as a cross-sectional study, a causal relationship between modern contraceptive use and other explanatory variables could not be established. Future study should be a longitudinal study with the aim of identifying relevant trends and patterns of contraception over a long time period.

Conclusion

About half of women used modern method in Cambodia. Factors strongly associated with modern contraceptive utilization were number of living children, fertility preferences, husband’s desire for children, and number of ideal children as well as sociodemographic, health services and health information. Recommendations are to raise awareness of family planning services to both genders. Policy makers, communities, and partitioners should establish multi-sectoral collaboration for integrated family planning programs to improve the access to health education and family planning services. Promoting income-generating activities and creating more employment opportunities are essential for vulnerable families that faced inaccessible to health services and other essential resources.
Ethical Considerations: This study was approved by the KhonKaen University Ethics Committee for Human Research based on the Declaration of Helsinki and the ICH Good Clinical Practice Guidelines (reference number HE632199).

Acknowledgement: The authors would like to express our sincere appreciation to the CDHS for the data and the Faculty of Public Health, KhonKaen University, Thailand for funding.

Conflict of Interest: No conflicts of interest to declare.

Source of Funding: Faculty of Public Health, KhonKaen University

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18. Ruiz-Muñoz D, Pérez G, Gotsens M, Rodriguez-


Results of Renogram and eGFR in Assessing Kidney Function of Chronic Kidney Disease Patients

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Abstract

Background: The ability to assess kidney function properly has important health implications. Glomerular filtration rate (GFR) is still accepted as the best measurement index of kidney function. The formula of the Modified of Diet in Renal Disease (MDRD) is currently widely used by the medical community to estimate GFR (estimated GFR or eGFR). The renogram with radiofarmaka I131-Hippuran is considered to have an inherent accuracy of inulin cliren as the gold standard of GFR measurement.

Objective: To determine the description of renogram and eGFR’s results in assessing kidney function of CKD patients.

Method: This study was a retrospective observational that used medical records from 113 CKD patients undergone renogram examination at Dr. Soetomo General Hospital Surabaya in 2012. eGFR was calculated based on the serum creatinine, age, and sex of the patient. Data of renogram and eGFR examination were presented descriptively.

Results: We obtained male of 63% and female of 37% with age range between 20-69 years. The highest percentage in the age range of 50-59 years. The CKD cases in this study were mostly caused by urinary tract stones of 44%. The most common renogram results were 2 kidney failure by 48% and the highest eGFR was <15 ml/min/1.73m2 score of 73%.

Conclusion: There were no normal results of renogram or eGFR. The most renogram results with 2 kidney failure were found in 48% of all subjects with eGFR of <15 ml/min/1.73m2.

Keywords: Chronic Kidney Disease, Renogram, eGFR

Introduction

Chronic kidney disease (CKD) is a world public health problem with a high incidence rate that is progressive and associated with disadvantageous outcomes. The prevalence of CKD in the United States increased from about 10% in 1988-1994 to 13% in 1999-2004¹-². The US renal data system stated that the incidence of ESRD has continued to increase over the last 15 years, from 142 cases/million in 1987 to 308 cases/million in 2000². There were 2.131 cases of CKD with hemodialysis in Indonesia (1995) which increased to 6.314 cases in 2004³.

GFR (glomerular filtration rate) is the best global index for renal function. GFR describes the flow rate of fluid that is filtered through the glomerular capillaries into Bowman’s capsule per unit of time. The normal range of GFR is adjusted for body surface area of about 100-130 ml/min/1.73m2 in male and female. GFR is measured with inulin clearance of about 110 ml/min/1.73m22 until the age of 2 years and then decreases. GFR decreases progressively by about 0.4-1.2 mL/min per year at the age of >40. The available GFR calculation was eGFR or estimated GFR. The equation was obtained by using the regression technique to model the association...
between serum creatinine and GFR measurements in population studies. eGFR provides a substantial increase in serum creatinine examination for clinical assessment of renal function. Although the equations developed in one population are appropriate for its population, evaluation in other populations is needed to indicate the generalization of the observed association. Two creatinine-based equations have been studied and widely applied, namely the Cockcroft-Gault equation study and the Modification of Diet in Renal Disease (MDRD)\(^1\)\(^-\)\(^7\). The Cockcroft-gault formula was developed in 1973 with the equation Ccr = [(140-age)×weight/] (72×Scr)×0.85 (if the subject was female), where Ccr is expressed in ml/min, age in year, body weight in kg, and Serum creatinine (Scr) in mg/dl. It was exceeding GFR estimates systematically because they were not adapted to body surface area\(^8\). The latest formulation developed by The MDRD Study Group(1999)\(^1\)\(^-\)\(^4\) to measure GFR was the “4-variable MDRD” that used four variables, i.e., serum creatinine (mg/dl), age (year), race, and sex. The estimated GFR (eGFR) was adjusted to the surface area of the body with the equation GFR = 186×(Scr)-1.154×(age)-0.203×0.742 (if the subject was female) or ×1.212 (if the race of a subject was black skin). The validated formula of eGFR from Modified of Diet in Renal Disease (MDRD) is a formula that widely used by medical professionals (mainly the United States and the United Kingdom) to estimate GFR\(^9\)\(^-\)\(^11\).

This formula has been validated in CKD patients; however, the usage is still uncertain in healthy patients with GFR >60 ml/min or in patients with acute renal failure. Currently, most laboratories in Australia and the United States calculate and report MDRD-eGFR along with creatinine measurements. Inulin clearance is a gold standard for GFR measurements, but it is less used because of the method of examination and the unavailability of pure insulin. Further development of ciren of several radioisotope materials such as Chromium51-EDTA or Technetium99-DTPA, Iothalamate or Iohexol or I131-Hippuran have an inherent accuracy of insulin ciren, thus they can be used instead of insulin ciren\(^12\)\(^-\)\(^13\). This study was conducted to obtain a description of the results of renal function evaluation of the renogram and eGFR calculation based on serum creatinine values in CKD patients.

**Method**

113 patients with CKD who underwent renogram in Dr. SoetomoTeaching Hospital Surabaya were enrolled in this study from April to December 2012. Renogram was a noninvasive examination to evaluate renal function by using radiofarmaka. CKD was a disease characterized by progressive and irreversible changes or impairment of renal function. Meanwhile, GFR was the volume of filtrate filtered from the glomerular capillaries into the Bowman capsule per unit time. The inclusion criteria in this study were CKD patients with a history of hemodialysis and CKD patients aged between <20 to 70 years old.

This study was a retrospective study by observing the medical record to obtain a description of Renogram and eGFR in assessing kidney function of CKD patients. Patients who have performed a Renogram examination on the Radio-Diagnostic Installation of Nuclear Medicine Division at Dr. SoetomoTeaching Hospital Surabaya were enrolled based on the inclusion criteria. The results of the Renogram examination showed as follows: 2 normal kidneys, 1 kidney obstruction, 2 kidney obstructions, 1 kidney obstruction-1 kidney failure, 1 kidney failure, and 2 kidney failure..

**Results**

113 CKD patients who fulfilled the inclusion criteria consisted of 43 females (38%) and 70 males (62%) with the highest distribution at the age range of 50-59 years by 38 patients (66%) (Table 1).

<table>
<thead>
<tr>
<th>Age (Year)</th>
<th>Sex</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>20-29</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>30-39</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>40-49</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>50-59</td>
<td>24</td>
<td>13</td>
</tr>
<tr>
<td>60-69</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>70</td>
<td>43</td>
</tr>
</tbody>
</table>

The most common cause in all subjects was urinary tract stones (44%) (Table 2).

**Table 2 Distribution of subjects by cause**

<table>
<thead>
<tr>
<th>CKD Causes</th>
<th>Amount</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urinary tract stones</td>
<td>50</td>
<td>44</td>
</tr>
<tr>
<td>Abdominal Tumors</td>
<td>17</td>
<td>15</td>
</tr>
<tr>
<td>DM</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>
There were 83 subjects (73%) with eGFR of <15 ml/min/1.73 m2 (CKD stage V), meanwhile two kidney failure was found in 54 subjects (54%) from renogram results (Table 3).

The highest result of eGFR was <15 ml/min/1.73m2 (CKD stage V) in 83 subjects that consisted of 50 males and 33 females with the highest incidence at the age range of 50-59 years by 29 patients (Table 4).

The renogram results found 54 subjects with two kidney failure that consisted of 36 males and 18 females. The most age range was 50-59 years of 16 subjects. There were no normal renogram results as the absence of normal eGFR results (> 90 ml/min/1.73 m2). We obtained most of the renogram results with 2 kidney failure of 54 subjects and the highest eGFR of <15 ml/min/1.73m2 by 52 subjects (Table 5).
Table 5 Distribution of Renogram by Sex, Age, eGFR

<table>
<thead>
<tr>
<th>Variable</th>
<th>Renogram</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal</td>
<td>1 kidney obstruction</td>
</tr>
<tr>
<td>Sex</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Male</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Female</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>% Total</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Age</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>20-29</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>30-39</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>40-49</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>50-59</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>60-69</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>% Total</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>eGFR</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>&gt; 90</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>60-89</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>30-59</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>15-29</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>&lt; 15</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>% Total</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

**Discussion**

It was in accordance with a previous research, most of CKD was caused by urinary tract stones (obstructive uropathy) by 44% of all subjects\(^\text{14}\). This result was in accordance with a research by Pais VM in 2007. The age range of most subjects was 50-59 years. According to research by Coresh et al, that there was a decrease of progressive GFR about 1 ml/min/1.73m\(^2\) per year after 30 years. It was also associated with the aging biological process that initiated structural and functional changes in the kidneys(8). No normal results of the renogram were found, it was in accordance with the absence of normal eGFR results (>90 ml/min/1.73 m2). The most results of the renogram with two kidney failure were found in 54 patients. Most eGFR was found as many as <15 ml/min/1.73m2 in 52 subjects. The renogram has more benefits because it can assess the kidney function separately.

Renogram results obtained 58 obstruction kidneys both in one kidney and two kidneys. It was in accordance with a research by Taylor AT in 2007 that mentioned the renogram was a non-invasive examination, especially to evaluate patients with suspicion of obstruction. Renogram as reference method had a number of limitations, especially in patients with severe renal dysfunction or patients with severe dilatation of the collecting system. Despite its limitations, this method was chosen because it was a non-invasive optional method in the context of clinical diagnostic impairment of renal function\(^\text{15-17}\).

**Conclusion**

There were no normal results of renogram or eGFR. The most renogram results with 2 kidney failure were found in 48% of all subjects with eGFR of <15 ml/min/1.73m\(^2\).

**Ethical Clearance:** This research is in accordance with ethical clearance, has not been published before and is not being considered for publication elsewhere.

**Conflict of Interest:** There is no conflict of interest in this study.
Source of Funding: This research was carried out by a team and funded independently.

References


5. Comparison of Asymmetric Dimethylarginine Levels Between Stages Three, Four, and Five Non-dialysis Chronic Kidney Disease.


Evaluation of Depression Symptoms in Students of Dental Medicine

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¹Undergraduate Student, Faculty of Dental Medicine, Universitas Airlangga, ²Graduate Student of Health Administration and Policy, Faculty of Public Health, Universitas Airlangga, ³Department of Dental Public Health, Faculty of Dental Medicine, Universitas Airlangga

Abstract

Background: Mental illness that is often found in daily life is depression. Not many people know that depression is a medical condition with real symptoms. Many factors can trigger psychological illnesses among students such as adjustment to the new school environment, information overload, lack of free time, financial issues, family-related issues and the competition for higher grades.

Purpose: The authors are interested in discussing the evaluation of depressive symptoms among Universitas Airlangga Faculty of Dental Medicine students.

Method: The research design that will be used in this research is descriptive with a research instrument in the form of a questionnaire. The author chose this method because the author want to know the prevalence of students with major depressive disorder in Universitas Airlangga Faculty of Dental Medicine.

Result: The results of this study shows that 34% were in normal condition, 21% experienced mild mood disorders, 11% experienced borderline clinical depression, 28% experienced moderate depression and as many as 6% experienced severe depression.

Conclusion: Based on the results of the study, it can be concluded that the majority of Universitas Airlangga Faculty of Dental Medicine students experience mild mood disorders or mild depression.

Keyword: Evaluation, Depressive Symptomps, Dental Medicine Students, Sociodemographic.

Introduction

Human in the world must have felt sick. Sick is a condition when someone’s health is disturbed. When humans are not in a good condition, humans will be easily infected with a disease. Diseases are divided into 2 types, namely diseases that can be seen and diseases that are not visible to the eye. Visible diseases are common in daily lives, for example, cough, flu, measles, dengue fever, and so on. Different from the visible diseases, diseases that cant be seen was hard to detect, because the patient did not show a specific clinical symptoms. An example of this invisible disease is a mental illness.

Mental health affects the way humans feel, think, and carry out daily activities. Mental health and physical health affect each other. Therefore, like physical health, mental health is also very important. But today, the public awareness of on mental illness is still relatively low as seen from the results of the Basic Health
Research in 2018 which shows the prevalence of mental emotional disorders in adolescents over 15 years old at 9.8 percent\(^3\). This figure increased compared to 2013 which was 6 percent\(^4\).

The most common mental illness that is often found in daily life is depression\(^5\). Not many people know that depression is a medical condition with obvious symptoms. A lot of stigma has been circulating so far but only a few know about the truth. Those who are struggling with depression are sometimes questioned by those around them.

Mental health also affects the ability to learn and achieve maximum professional potential. Depression is a mental health condition that is often found and affects the majority of health care students\(^6,7\). Dentistry schools are known to have a very demanding and stressful learning environment that often results in medical condition such as depression, obsessive-compulsive disorder, psychosomatic activity related to stress and increased mood disorders, and excessive interpersonal sensitivity\(^8\).

There are many factors that can trigger psychological illnesses among students such as adjustment to the new school environment, information overload, lack of free time, financial issues, family-related issues and the competition for higher grades. Therefore, with this paper, the author wants to know the prevalence of major depressive disorder in Universitas Airlangga Faculty of Dental Medicine students. Thus, the purpose of the writing of this paper is to determine the level of depressive symptoms in preclinical students of the Faculty of Dental Medicine, Universitas Airlangga.

**Research Method**

The research design that will be used in this research is descriptive study. The author chose this method because the author wants to know the prevalence of major depressive disorder in Universitas Airlangga, Faculty of Dental Medicine students. This research was conducted in the area of the Faculty of Dental Medicine, Universitas Airlangga. Researchers chose this location because based on observations that shows the awareness of the Dental Medicine of Universitas Airlangga community on mental health is still relatively low. Researchers chose the location with the aim of wanting to know the prevalence of major depressive disorder in the Faculty of Dental Medicine, Universitas Airlangga. The population in this study were students of the Faculty of Dental Medicine who were educated at Universitas Airlangga in 2019. Sampling is based on pre-clinic students who are randomly assigned to each school year with a total of 100 samples.

**Table 1. Research Variable**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Operational Definition</th>
<th>Category and Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students of Dental Medicine of University of Airlangga (Independent Variable)</td>
<td>Class of</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 years old</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17 years old</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 years old</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19 years old</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 years old</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21 years old</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22 years old</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home Address</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surabaya</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outside of Surabaya</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Variable | Operational Definition | Category and Criteria
--- | --- | ---
Depressive Symptoms (Dependent Variable) | Range of Values from 0-10 | Normal
| Range of Values from 11-16 | Mild mood disorder
| Range of Values from 17-20 | Borderline clinical depression
| Range of Values from 21-30 | Moderate depression
| Range of Values from 31-40 | Severe depression
| Range of Values over 40 | Extreme depression

The research data is collected by filling out the Beck Depression Inventory questionnaire. After all data from the BDI questionnaire is obtained, the number of questionnaire values is calculated. The range of values 0-10 indicates minimal depression (no depression), 11-16 indicates mild mood disorder, 17-20 shows borderline clinical depression, 21-30 shows moderate depression, 31-40 indicates severe depression, and more than 40 indicates extreme depression.

**Results**

In the study conducted using a questionnaire survey of 100 random samples in preclinical students of the Faculty of Dental Medicine, Universitas Airlangga, it was found that as many as 34% of the study samples did not suffer from any depressive symptoms, 21% of the study samples suffered a mild mood disorder, 11% suffered borderline depression, 28% moderate depression, and 6% of the study sample suffered severe depression.

**Table 2. Result of the Research**

<table>
<thead>
<tr>
<th>Depressive Symptoms</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>34</td>
<td>34%</td>
</tr>
<tr>
<td>Mild Mood Disorder</td>
<td>21</td>
<td>21%</td>
</tr>
<tr>
<td>Borderline Depression</td>
<td>11</td>
<td>11%</td>
</tr>
<tr>
<td>Moderate Depression</td>
<td>28</td>
<td>28%</td>
</tr>
<tr>
<td>Severe Depression</td>
<td>6</td>
<td>6%</td>
</tr>
</tbody>
</table>

**Table 3. Result of the Research based on Variables**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Normal</th>
<th>Mild Mood Disorder</th>
<th>Borderline Depression</th>
<th>Moderate Depression</th>
<th>Severe Depression</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class of</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>9</td>
<td>3</td>
<td>6</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>2017</td>
<td>6</td>
<td>6</td>
<td>0</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>2018</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>2019</td>
<td>16</td>
<td>8</td>
<td>3</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 year old</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
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<td>17 year old</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>18 year old</td>
<td>12</td>
<td>6</td>
<td>1</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>19 year old</td>
<td>3</td>
<td>6</td>
<td>3</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>20 year old</td>
<td>10</td>
<td>4</td>
<td>0</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>21 year old</td>
<td>3</td>
<td>2</td>
<td>6</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>22 year old</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
**Discussion**

The results of this study indicate that among 100 students studying at the Faculty of Dental Medicine, Universitas Airlangga, 30 students in the class of 2016 students 9 was normal, 3 students suffered from mild mood disorder, 6 students with borderline depression, 11 students with moderate depression, and 1 student with severe depression. The results of this study indicate that depression among students in the class of 2016 is more on the moderate type.

Then, in 21 students in the class of 2017, 6 was normal, while 6 students suffered from mild mood disorder, 6 students with moderate depression, and 3 students with severe depression. These results indicate that depression among students class of 2017 is more in the moderate type, mild mood disorders, and normal. In class of 2018 3 students was normal, 4 students suffered from mild mood disorder, 2 students with borderline depression, 5 students with moderate depression, and 2 students with severe depression. These results indicate that depression among students in the class of 2018 is more in the moderate depression.

Then, in the class of 2019 16 students was normal, 8 students suffered from mild mood disorder, 3 students with borderline depression, and 6 students with moderate depression. These results indicate that depression in students in the class of 2019 falls into the normal category.

From the results of this study it can be concluded that in the class of 2018 and 2016 more students experienced symptoms of moderate depression than with other class. This can be caused because students are on a temporary transition period from adolescence into adulthood and can be the most stressful time in a person’s life. The process of adapting into the environment on campus, maintaining good grades, thinking about the future, and being away from home are often the cause of anxiety for most students so that they will end up suffering depression⁹.

From the age variable, the results of this study indicate that among 100 students studying at the Faculty of Dental Medicine, Universitas Airlangga, 1 student who was 16 years old suffered mild mood disorder. Then, 3 students aged 17 years 2 of them was normal while the other one suffer a moderate depression. These results indicate that depression among 17-year-old students is more in the normal. Then in 26 students aged 18 year there were 12 students that was normal, 6 students suffered a mild mood disorder, 1 student with borderline depression, 6 students with moderate depression, and 1 student with severe depression. These results indicate that depression among students aged 18 years is more in the normal type.

In 20 students aged 19 years there were 3 students that was normal, 6 students suffered from mild mood disorder, 3 students with borderline depression, 5 students with moderate depression, and 1 student with severe depression. These results indicate that depression among 19-year-old students is more in the mild mood disorder. Then in 21 students aged 20 years there were 10 that was normal, 4 students with mild mood disorder, 6 students with moderate depression, and 1 student with severe depression. These results indicate that depression among students aged 20 years is more in the normal type.

In 20 students aged 21 years there were 3 students that was normal, 2 students with mild mood disorder, 6 students with borderline depression, and 9 students with moderate depression. These results indicate that depression among 21-year-old students is more in the moderate depression. Then, in 9 students aged 22 years there were 4 students that was normal, 2 students with mild mood disorder, 2 students with moderate depression, and 1 student with severe depression. These
results indicate that depression among students aged 22 years is more in the normal type.

In the research results above it is known that students in the 16-22 age category are young adult age categories\textsuperscript{10}. According to the journal it is said that young adults are a transition phase that experiences new challenges, roles and tasks for some individuals. Risk factors for mental disorders in this phase can be influenced by low social life. Mental disorders may make it difficult to transition from adolescence to adulthood so that it will become depressed. This depression can cause distress to an individual in the school environment and in the formation of social relations. Social life is associated with better mental health and is the most influential factor being young adulthood. Detection of depression in young adults becomes very important to get better treatment results and to improve the long-term prognosis of people who initially experience symptoms of depression\textsuperscript{10}.

In the gender variable, the results of this study indicate that among the 100 students studying at the Faculty of Dental Medicine, Universitas Airlangga, of the 23 male students there were 6 students that was normal, 5 students with mild mood disorder, 2 students with borderline depression, 7 students with moderate depression, and 3 students with severe depression. The results of this study indicate that depression among male students is more in the moderate depression. Whereas in 77 female students there were 28 students that was normal, 16 students with mild mood disorder, 9 students with borderline depression, 21 students with moderate depression, and 3 students with severe depression. The results of this study indicate that depression among female students is more in the normal type.

In the original variable, the results of this study indicate that among 100 students studying at the Faculty of Dental Medicine of Universitas Airlangga, of the 31 students from Surabaya there were 12 students that was normal, 7 students with mild mood disorder, 3 students with borderline depression, 8 students with moderate depression, and 1 student with severe depression. The results of this study indicate that depression among students who come from Surabaya is more in the normal type. Whereas 69 students from outside Surabaya assumed that all samples in this variable were overseas students, there were 22 students that was normal, 14 students with mild mood disorder, 8 students with borderline depression, 20 students with moderate depression, and 5 students with severe depression. The results of this study indicate that depression among students who come from outside Surabaya is more in the normal type. In the results of the above study it is known that the origin of the sample does not greatly affect a person’s level of depression\textsuperscript{17}. This is because the prevalence of depression of students from Surabaya and outside Surabaya shows the same results, namely the highest prevalence in the normal category.

Conclusion

Based on the results of the study, it can be concluded that 34\% of Universitas Airlangga Faculty of Dental Medicine students do not suffer from major depressive disorder, but 66\% of Universitas Airlangga Faculty of Dental Medicine students suffer from depression with varying degrees of severity namely mild mood disorders, borderline depression, moderate depression, to severe depression.

Based on this study, the authors suggest to the general public, especially the academic community of the Faculty of Dental Medicine, Universitas Airlangga to improve their knowledge about depression symptoms. This is to prevent excessive mental burden so that it cant endanger the students themselves.

Conflicts of Interest: There are no conflicts of interest.

Source of Funding: Self-Funding
**Ethical Clearance:** Approved

**References**


Effect of Job Satisfaction on Empathic Skills among Oncology Nurses at Kirkuk City

Dhiaa Alrahman Hussein¹, Waleed Ibrahim Saad¹

¹Master Degree in Nursing / University of Kirkuk / College of Nursing / Iraq

Abstract

Background: Nursing care delivered to the patients by using physical, mental, social, spiritual and emotional skills. Increasing the level of job satisfaction can promote the level of empathy skills. Thus improving nursing care quality

Objectives: The aims of the study were to assess of the level of job satisfaction and the level of empathy skills, as well as to assess the effect of job satisfaction on empathy skills among oncology nurses.

Methodology: A correlational study (quantitative design) was carried out at oncology and hematology disease center at Kirkuk city for oncology nurses from first of February, 2020, up to the first of October, 2020. A purposive sampling (non- probability) of (56) oncology nurses both males and females was selected. The instrument used in the study was designed by the researchers according to the previous literature to achieve the purposes of the study. The instrument of the study was consisting of four parts: the first part was the demographical data of the participants, the second part was the Occupational data. The third Part was the Job Satisfaction Scale. And the fourth part was the nurses Empathy skills level. The data collection process were utilized by using self-report technique. The data analysis were by using the descriptive statistical analysis (frequency and percentage) and inferential statistical analysis (Pearson correlation).

Results: The results of the study demonstrate that (80%) of the nurses were dissatisfied regarding nursing job, also the results demonstrate that (64 %) of the participants having moderate empathy skill level, (32 %) of the participants having low empathy skills level.

Conclusions: The study concluded that job satisfaction have clear effect on empathy skills among oncology nurses.

Keywords: Effect, Job satisfaction, empathic skills, oncology nurses.

Introduction

Empathy is a broad and complex concept that the person feel of others. In the nursing profession use empathy is important and very necessary for the delivery of integrated care for patients. Empathy is a multi-dimensional concept with cognitive matter as well as emotive matter. Cognitive empathy is an individual’s abilities to understand the perspective of the others about their conditions and emotive empathy is an individual’s issues for the feelings of the others¹. Oncology and intensive care units are distinct areas in terms of interaction and communication with the patients demonstrate passion and empathy skills. To improve patients care, nurses should develop empathy skills. Nurses with enhanced empathic abilities can understand the patient needs. There are general agreements that the positive correlation between empathy, patients’ outcomes and clinical competence; there are still some conflict in the Relationship between empathy and nurses’ well-being². Understanding patients’ needs, feelings, and their situation is the essential nursing tasks and empathy is the basis for this understanding. Therefore, highlight

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to this concept, from the perspective of medical and nursing staff is important.

Objective of the study:
1. To assess demographic and occupational data of the study sample
2. To assess job satisfaction level among oncology nurses
3. To assess empathy skills level among oncology nurses
4. To find correlation between job satisfaction and empathy skills

Methodology

A correlational study (quantitative design) was conducted in oncology and hematology disease center at Kirkuk City for oncology nurses from first of February, 2020, up to the first of October, 2020. To assess the effect of Job Satisfaction on Empathy Skills among oncology nurses at Kirkuk City. A non-probability (purposive sampling) of 56 nursing staff working in oncology and hematology disease center both males and females was selected. The instrument of the study was designed by the researchers according to the previous literature to achieve the purposes of the study. The instrument of the study was consisting of four parts. The first part was the demographical data of the participants consist of (3) items, the second part was the Occupational data consist of (3) items. The third part was the Job Satisfaction Scale consisting of (15) items. And the fourth part was the Nurses Empathy skills level consisting of (20) items. The data collection process were done by the use of self-reporting technique from the period 1st May 2020 to 1st June 2020. The informed consent was obtained from the nurses to participate in the current study. The data analysis were done by using the Statistical Package for Social Science (SPSS). The data analysis done by using the descriptive statistical analysis (frequency and percentage) and inferential statistical analysis (Pearson correlation). to find the effect of Job Satisfaction on Empathy Skills.

Results

Table (1): Occupational data of the samples (n=56)

<table>
<thead>
<tr>
<th>No.</th>
<th>Variables</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Salary (monthly income) in Iraqi Dinar</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>less than 500000 IQD</td>
<td>12</td>
<td>21.4</td>
</tr>
<tr>
<td></td>
<td>500000- 1 million IQD</td>
<td>40</td>
<td>71.4</td>
</tr>
<tr>
<td></td>
<td>more than 1 million IQD</td>
<td>4</td>
<td>7.2</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>56</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>Number of working hours per week</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>30 - 40 hours/week</td>
<td>34</td>
<td>60.7</td>
</tr>
<tr>
<td></td>
<td>More than 40 hours/week</td>
<td>22</td>
<td>39.3</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>56</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>Type of working shift</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Day shift</td>
<td>20</td>
<td>35.7</td>
</tr>
<tr>
<td></td>
<td>Night shift</td>
<td>10</td>
<td>17.9</td>
</tr>
<tr>
<td></td>
<td>Day and Night shift</td>
<td>26</td>
<td>46.4</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>56</td>
<td>100</td>
</tr>
</tbody>
</table>

This table reveals that (71.4 %) were 500000-1 million IQD, (60.7 %) of the participant working between 30-40 hours/week, most study sample having day and night shift, and most participant havn’t other work and havn’t job related disease.
Figure (1): Level of job satisfaction among oncology nurses. The figure revealed that the majority of the participant were not satisfied about their job. (20%) were satisfied.

Figure (2): Level of empathy skills among oncology nurses. The figure revealed that most participant having Moderate empathy skills, (32%) of the participant with Low empathy skills. And (4%) were High empathy skills.

Table (2): The correlation between Job satisfaction and Empathy skills

<table>
<thead>
<tr>
<th></th>
<th>Job Satisfaction</th>
<th>Empathy Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job satisfaction</td>
<td>Pearson Correlation</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>56</td>
</tr>
<tr>
<td>Empathy level</td>
<td>Pearson Correlation</td>
<td>.701**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>56</td>
</tr>
</tbody>
</table>

**Correlation is significant at 0.01 level (2 - tailed)**

This table shows the Job satisfaction have an obvious effect on Empathy skills.
Empathy skills are essential when care of patients, especially in oncology setting and critical cases. Nursing profession includes the human, emotional, mental and social aspect when providing nursing care to hospitalized patients. Nursing services are not only limited to the physical care, but also the nurse provides physical, psychosocial, and emotional care for patients, especially critically ill patients and cancerous patients. According to Fan et al 2017 which state that psychosocial support included not only disease events but also emotional and supporting family. The nursing profession is affected by several factors, including professional and administrative factors that affect the provision of nursing services by nurses. The study aims to assess the effect of job satisfaction on empathy skills among oncology nurses.

The results demonstrate that most of the nurses were dissatisfied about nursing profession and with the nature of work with other health personnel. may be several reasons leading to dissatisfaction, including the inadequate monthly income compared to several countries and neighboring countries, and there are also professional and administrative reasons that determine the independency of the nurse at work, the nature of the work, and the lack of material and moral rewards for the nursing staff. According to the level of empathy skills of the oncology nurses, the results revealed that most of the nurses had moderate level of empathy skill, and this resulted from job dissatisfaction with the nursing profession. This results is similar with the study conducted on nursing students which indicate that the Participants having moderate degree of empathy skills level. According to Perez et al, Empathy Levels are reflected more in women than in men in general. The study of Elayyan et al concluded that empathetic of healthcare workers responses to patients are correlated and connected to a well-resourced, collegial, professional organizational environment that builds empathy for nurses and doctors. The results of the current study also revealed whenever level of job satisfaction is low, it may lead to less interest in patients and thus less empathy skills of the nursing staff, meaning that job satisfaction has a clear effect on the empathy skills of the oncology nurses. As stated by Buyuk et al that the nurses who chose nursing Willingly had a higher level of empathy skills than those whose families chose nursing for them. Karem et al 2019 indicated that there is a significant effect of Job satisfaction on nurses’ skills. Study of Karem et al 2019 indicates if the nurses have high beliefs, and support the current value by the hospital, have the readiness to provide much effort for the hospital, and working with a high level of commitment.

Conclusions

Job satisfaction have an obvious effect on empathy skills, Most nurses working 30-40 hour/week, and most of them working in day and night shift, The majority of the participant were dissatisfied about nursing job, Most participant having Moderate empathy skills.

Acknowledgement: The authors would like to acknowledge the nursing staff who took part in this study and to Kirkuk health directorate and Deanship of Nursing College at University of Kirkuk for their endless assistance.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: Official approval was obtained from directorate of health in Kirkuk city to conduct the study and data collection. Informed consent was obtained from the oncology nurses.

Reference


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Successfully Tracheostomy and Monobloc Advancement with External Frontofacial Distraction Followed by Simultaneous Adenoidectomy, Conchotomy, and Septoplasty in Severe Late Crouzon Syndrome

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Abstract

A 10-year-old male patient presented with Severe Late Crouzon Syndrome, with turri-brachycephaly, and severe exorbitism of both eyes, visual loss, beaked nose and maxilla hypoplasia. The head circumference was 54 cm and 90 percentile. Patient had a high arched palate, tonsil hypertrophy and type III malocclusion. From the multidisciplinary meeting, in the first stage it was decided to first secure the airway with Tracheostomy then immediately followed by Monobloc Advancement with External Frontofacial Distraction. Then in the second stage, after removal of the rigid external distractor, by 9 months after first surgery, the patient underwent a simultaneous procedures of Adenoidectomy, Conchotomy, and Septoplasty. Thus, after patient got stable in follow-up, Nasendoscopy and Tracheostomy devices was removed. After 11 months follow-up. Visual function still not getting better. However turri-brachycephaly, exorbitism of both eyes, beaked nose and maxilla hypoplasia, head circumference, arched palate, tonsil hypertrophy and the malocclusion were getting much reduced, and the patient getting happier and more active.

Keyword: Adenoidectomy, conchotomy, septoplasty, crouzon syndrome.

Introduction

Crouzon syndrome is a congenital abnormality in the fetus in the womb during organ formation and is a dominant autosomal disorder. This disease was first described by neurosurgeon Octave Crouzon from France in 1912. This syndrome is classified as a group of syndromes that are rarely found with the main characteristic of craniosinostosis. Craniosinostosis is a condition in which one or more fibrous sutures on the babies cranium merge and harden prematurely, thereby changing the pattern of cranial growth. In the case of Crouzon syndrome organ formation does not develop properly, especially in cranium sutures that close prematurely so that when the head forms it becomes imperfect (1-4).

The four main physical findings that are characteristic of Crouzon’s syndrome are exorbitism, retro maxillary, inframaxillism, and paradox retrognathia. The manifestations of Crouzon syndrome that can be found in the oral cavity, namely mandibular prognathy, crowded teeth in the maxilla, maxillary atresia, crossbite anterior

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with posterior open bite, curvature of the maxillary jaw and cleft palate. Crouzon’s syndrome accounts for 4.8% of all cases of craniosinostosis, with an incidence of 1: 25,000 to 1: 65,000 births and an autosomal dominant disorder. This pathological variation is believed to be caused by the mutation of the Fibroblast Growth Factor Receptor 2 gene (FGFR2) on chromosome 10q26(3, 4).

Children with craniosinostosis syndrome including Crouzon syndrome are prone to obstructive sleep apnea (OSA) syndrome with an estimated prevalence of between 40 and 85%. The cause of OSA is mainly caused by anatomical midfacial hypoplasia. Premature stitch fusion causes midfacial hypoplasia, increased nasopharyngeal resistance, and narrowed oropharyngeal space, all together contributing to OSA. Continuous positive airway pressure (CPAP) and surgical techniques are the two main OSA therapies for adults. Children with Crouzon syndrome are faced with more complicated problems including corneal exposure, craniofacial abnormalities, and malocclusion. Surgery for osteogenesis and craniomaxillofacial disorders seems to be a better choice for these children because it can relieve or even complete OSA by correcting midfacial hypoplasia and improving facial profiles (5-7).

The diagnosis of Crouzon syndrome is done by history, physical examination, oral cavity, functional and radiographic analysis. In general, before the treatment of orthodontic anomalies, surgery is needed first. The treatment of Crouzon syndrome patients requires several stages. The first stage involves treating craniosinostosis by correcting its frontal-orbital abnormalities in the sagittal direction. Next stage is reconstruction of the face and so on until it reaches the final stage of reconstruction which is a class III dental malocclusion treatment (8, 9).

Case Presentation: Patient was referred from a social organization and presented with turri-brachycephaly, severe exorbitism of both eyes, visual loss, beaked nose and maxilla hypoplasia (Figure 1). The head circumference was 54 cm and 90 precentile (figure 2). Patient had a high arched palate, tonsil hypertrophy and type III malocclusion. Ophthalmologic review revealed decreased vision in both eyes to light perception. Funduscopic examination was not able to be performed due to patient’s agitation. Neurosurgical review supported monobloc surgery and based on MRI showed Arnold Chiari malformation type 1. Paediatric review revealed obesity and good development based on IQ, PEDSQL and PSC-17. ENT review revealed adenoid hypertrophy through nasoendoscopy, septal deviation, severe bilateral conductive hearing loss. Psychiatric review showed IQ scored 90. Polisomnography revealed Sleep Apnea (central sleep apnea, obstructive sleep apnea and mixed apnea with severe AHI 74x/hours).

From the multidisciplinary meeting, in the first stage it was decided to first secure the airway with tracheostomy by head and neck surgeon then immediately followed by monobloc advancement with distraction. Then in the second stage, after removal of the rigid external distractor, ENT would do an adenoidectomy, septoplasty and conchotomy. In the final stage, after re-evaluation by ENT and Head and Neck surgeon. Monobloc advancement with RED was strongly indicated due to severe OSA, increased ICP and threatening blindness. It is a standard protocol for Crouzon beyond 8 years of age. We performed the surgeries in stages and only after securing the airway with a tracheostomy. Adenoidectomy was done nine months after the monobloc.

The tracheostomy was removed only after ENT review indicated no contraindication and weaning was successful. He recovered uneventfully. He became active and happy, breathing spontaneously, sleeping well, and his eyes were fully healed even though the visual acuity remained at light perception and mastication became more effective. Details of patient development from the beginning to the end of treatment can be seen in figures 3-4.

Figure 1. The patient’s condition on pre-surgery (A) and post-surgery (B)
Discussion

Sleep apnea syndrome is a syndrome with the discovery of episodes of apnea or hypopnea during sleep. Apnea can be caused by a central disorder, obstructive airway, or a mixture. Obstructive apnea is the cessation of air flow to the nose and mouth even with breathing efforts, while central apnea is the cessation of breathing which is not accompanied by an effort to breath due to the absence of breath stimulation. Obstructive hypoventilation is caused by partial obstruction of air flow which causes hypoventilation and hypoxia. The term obstructive hypoventilation is used to indicate the presence of hypopnea, which means a reduction in air flow (7, 10).

The term OSAS is used in total or partial airway obstruction syndrome which causes significant physiological disorders with variation clinical impacts. The term primary snoring is used to describe children with snoring habits that are not related to obstructive apnea, hypoxia or hypoventilation. Guilleminault et al. Defined sleep apnea as apnea episodes 30 times or more in 8 hours, for at least 10 seconds and occurred both during the sleep phase of rapid eye movement (REM) and non rapid eye movement (NREM). There are terms of apnea index (AI) and hypopnea index (HI), namely the frequency of apnea or hypopnea per hour. Apnea or hypopnea index can be used as an indicator of the mild severity of OAS (7-9).

Risk factors for OSAS in children include the result of adenoid and tonsillar hypertrophy, craniofacial disproportion, obesity. Adenoid and tonsillar hypertrophy are the conditions that most often cause OSAS in children. Adenoid and tonsil size is not directly proportional to the severity of OSAS. There are quite large children with adenoid hypertrophy, but OSAS that occurs is still mild, other children with mild adenoid enlargement show severe OSAS symptoms. Adenoid and tonsil hypertrophy can also cause complications in children with basic bone disorders. Although in most OSAS children it improves after adenotonsillectomy, a small portion will remain after surgery. In one study a small proportion of children with OSAS who had been successfully treated with adenotonsillectomy surgery then experience recurrence of symptoms during adolescence. Children with craniofacial anomalies that experience a marked narrowing of the airway structure (micrognation and midface hypoplasia) will experience OSAS. In children with craniofacial disproportion can cause airway obstruction even without adenoid hypertrophy (7, 10).

Another cause of OSAS is obesity. In adult obesity is the main cause of OSAS whereas in obese children it is not the main cause. The mechanism of the occurrence of OSAS in obesity because there is a narrowing of the upper airways due to accumulation of fat tissue in the muscles and soft tissues around the airways, as well as external neck and jaw compression. Determination of obesity can be done by counting body mass index (BMI) and measurement of neck circumference. For OSAS determination, the more important is the neck circumference compared to BMI. It is well known that
large neck circumference or obesity in the upper area is associated with an increase in cardiovascular disease, as well as allegedly associated with snoring and OSAS. It is suspected that the accumulation of fat in the neck area can make the upper airway more narrow. Another possibility is that obese patients with large necks have velofarings that are more prone to collapse so that it can facilitate the occurrence of upper airway obstruction at bedtime (7, 10).

The most common clinical manifestations are difficulty breathing during sleep, which usually progresses slowly. Before symptoms of breathing difficulties occur, snoring is a symptom that initially arises. Snoring in children can occur continuously (every sleep) or only in certain positions. In OSAS, children generally snore every time they sleep with loud snoring coming from outside the room and see episodes of apnea that may end with body movements or wake up. A small number of children do not show classic snoring, but in the form of grunting or breathing, noisy breathing. Breathing efforts can be seen with retraction. The position during sleep is usually on his stomach, half sitting, or neck hyperextension to maintain airway patency (7, 10).

On physical examination can be seen mouth breathing, adenoidal facies, midfacial hypoplasia, retrognation, micrognation or other craniofacial abnormalities, obesity, failure to thrive, allergic stigmata such as allergic shiners or horizontal nasal folds. The patency of the nasal passages must be assessed, note the presence of septal deviation or nasal polyps, tongue size, integrity of the palate, orofarings, redundant palatal mucosa, tonsil size, and size of the uvula, may be found pectus excavatum. The lungs are usually normal on auscultation examination. Examination of the heart can show signs of pulmonary hypertension such as increased pulmonary component of heart sound II, right ventricular pulsation. Neurological examination must be performed to evaluate muscle tone and development status (7, 10).

OSAS management in children is divided into two major groups, namely surgical and medical (non surgical). Surgical measures performed are tonsillectomy and or adenoidectomy and correction of craniofacial disproportion, while medical therapy can be a diet in obese children and nasal use of CPAP (Continuous Positive Airway Pressure) (7, 10).

Many experts argue that the action of tonsillectomy and or adenoidectomy is a necessary action because the benefits are greater. The rate of recovery of this action in children is around 75%-100%. In children with etiology of adenoid hypertrophy and tonsils alone the success rate is high but if accompanied by other risks such as obesity and craniofacial disproportion then postoperative OSAS will still occur. However, because OSAS occurs due to the size of the structure of the upper respiratory tract components relative to the absolute size of the tonsils and adenoid, the experts believe that tonsillectomy and or adenoidectomy is still needed in the above conditions. Post tonsillectomy and or adenoidectomy polysomnographic monitoring is needed as a follow-up. Sometimes symptoms persist and within a few weeks they disappear. Other non-medical treatments such as handling obesity are still carried out despite tonsillectomy and or adenoidectomy (7, 10).

Conclusions

One of the rare cases of Crouzon syndrome which is handled in a multi-disciplinary manner by the person in charge of the reconstructive plastic surgeon, is consulted to the otorhinolaryngology – head and neck surgery with a diagnosis of obstructive sleep apnea. The interventions given were adenoidectomy, conchotomy, and septoplasty which were able to improve the quality of life of patients.

Conflict of Interest: The authors declare that they have no conflict of interest.

Funding: Nothing.


Compliance with Ethical Standards: Authors declare no conflicts of interest. There are no funding sources for the underlying scientific work. This case report was used only for academic purposes and we have obtained the consent of the patient’s guardian.

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Digitalization of Criminal Proceedings in the Context of the Coronavirus Pandemic (Covid-19) in Uzbekistan

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Abstract

The widespread introduction of modern technologies in all spheres of life, including in the activities of the judiciary, has made it possible to make justice accessible to citizens. This became especially obvious due to the negative impact of the COVID-19 pandemic on the administration of justice, including the legal regulation of public relations in the field of criminal justice. The consideration of criminal cases in the mode of videoconferencing in the context of the pandemic contributed to the acceleration of the use of digital technologies in judicial activities. The goal of the research is to consider some issues related to the use of digital technologies in criminal proceedings, especially in the context of the spread of coronavirus infection and the introduction of quarantine measures.

Keywords: Criminal justice, digitalization, videoconferencing, electronic document management, rights and freedoms of citizens, coronavirus pandemic, COVID-19.

Introduction

It should be recognized that the introduction of information and communication technologies into judicial activity was not an innovation when it became known about the COVID-19 pandemic as a global challenge to the entire world community. By this time, the courts of many states, including Uzbekistan, used in criminal proceedings the experience of conducting court proceedings in the mode of videoconferencing (VKS), automatic distribution of cases, fixing the course and results of investigative actions with audio and video recordings, publishing court decisions on the Internet, sending executive documents for compulsory execution in electronic format, etc.

The use of digital technologies by courts in Uzbekistan dates back to the adoption of the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan “On measures to introduce modern information and communication technologies into the activities of courts” dated December 10, 2012, which was the basis for the provision of interactive services and the introduction of electronic document management into the judicial system. Since 2013, Uzbekistan has developed and launched the National Information System of Electronic Judicial Proceedings “E-SUD”.

By the Law of the Republic of Uzbekistan dated May 23, 2019, amendments were made to the criminal procedure legislation regarding the use of videoconferencing in criminal proceedings. This computer technology has made it possible to conduct trials at a considerable distance when the court and the convicted person are far from each other. Positive aspects can be noted when considering a criminal case in the videoconferencing regime: the possibility for witnesses, victims who are outside the territory where the trial is taking place, to save their money, to participate in court and give evidence at the place of residence, the likelihood of interrogating additional witnesses in court to establish truth in the case, reduction of the time for consideration of cases.

With the onset of the COVID-19 pandemic, the relevance of remote court hearings has increased, the highest judicial body of Uzbekistan explained to the courts about the need to take measures to timely consider criminal cases using videoconferencing1.

It should be noted that to protect the rights and freedoms of citizens, ensure openness and transparency of the courts, the leadership of Uzbekistan is taking all necessary measures, including those aimed at introducing modern information and communication
technologies into the judicial system. On September 3, 2020, the President of Uzbekistan signed the Decree “On Measures to Digitalize the Activities of the Judiciary”, which defines the tasks of digitalizing the activities of the judicial authorities, namely: ensuring the openness and transparency of the activities of the judicial community by introducing special information programs; expanding the possibility of remote participation in court sessions, including through mobile devices and other forms of electronic interaction, as well as creating conditions for the parties to receive court decisions online; recording of court sessions in all courts using audio recording based on the petition of the parties in the case and with the consent of the presiding judge, as well as the formation of court records using the system of automatic generation of court documents, the development of a mobile application that provides an opportunity to participate in court sessions in the mode of videoconferencing and much more².

Method

The article uses general scientific research method, the method of system analysis of the theoretical foundations of the task, the practice of using digital technologies in Uzbekistan and some foreign countries.

Findings: The digitalization of the activities of the courts will undoubtedly ensure openness and transparency in the consideration of criminal cases, increase the level of citizens’ access to justice, and facilitate effective interaction of courts with the bodies of inquiry, preliminary investigation to promptly consider criminal cases. In Uzbekistan, the country’s leadership and its government have taken appropriate decisions regarding the digitalization of the activities of the judiciary. In the country’s law enforcement practice, the procedure for considering criminal cases via videoconferencing is successfully applied.

Discussion and Results

In different countries of the world, procedures related to the introduction of remote justice have both similarities and differences. In many countries, before the outbreak of the COVID-19 pandemic, laws and regulations on the organization of videoconferencing in court sessions had already been passed. However, it was the coronavirus pandemic and the quarantine measures taken by the states that became a kind of the impetus for the mass use of communication technologies by courts.

Professor Richard Susskind, a member of the Computer and Law Society of Britain, has dedicated an entire book on the active implementation of modern technology in the judicial system³. Under his leadership, the Internet project “Remote Courts Worldwide” was implemented, which allowed all the judges of the world to share their experience for the development of remote justice⁴.

Videoconferencing is being conducted by UK courts via Skype for Business at HMCTS. To join these video conferences, a free Skype meeting application has been developed. Each participant in the criminal case receives instructions and a link to go to the hearing as a “guest”. The issue of communication between a lawyer and his client in the UK was resolved by introducing an independent system, outside of interaction in the criminal process, through which a lawyer and his client can communicate for an unlimited time⁵.

Besides, the UK Courts and Tribunals Service is expanding its cloud-based video platform to enable remote hearings for any courtroom that has the technology and the right equipment. Participants in the process can access such a meeting through any laptop or video device. There are video points in courts, prisons and police stations. The instruction dictates that on the day of the hearing of the case, all participants must be in a closed, quiet place where they cannot be overheard. They should be prepared to take on a challenge during the meeting An employee of the Courts and Tribunals Service helps to connect to the system. He also records the hearings and ensures its storage.

Since 1995, the Court Call company has been operating in the United States, providing the remote presence of the parties at court hearings. During a pandemic, the company’s employees not only connect the parties and the courts by phone, but also organize court sessions in the videoconferencing mode, as well as check the appearance and identity of persons participating in court sessions, and monitor the quality of communication to help the judges⁶.

Professor Michael Legg of the University of South Wales in Sydney, Australia, in his article “COVID-19 Pandemic, Courts and Online Hearings: Maintaining Open Justice, Procedural Fairness and Impartiality”⁷, pointed out that “even in a pandemic, the courts must function under their institutional role and its main characteristics”. This article uses the unique
circumstances of the pandemic to consider how courts can use technology while still upholding the core or substantive demands of the court and identifies the three core characteristics of courts - open justice, procedural fairness and impartiality”.

In July 2020, Judge Lee Seyu Kin was one of the first to conduct a virtual trial in Singapore. Subsequently, the state took appropriate measures to transfer almost all courts online, which gave positive results. We learned about how Singapore’s judicial system quickly switched to remote hearings during the COVID-19 pandemic in an article by Aaron Jung, Secretary of the Supreme Court of Singapore. In particular, the author indicated that the adopted “Law on COVID-19” provided for the conduct of trials and proceedings in the Sharia court using remote communication technologies. However, the accused or witness may testify via live video link or live TV broadcast approved by the Chief Justice. Appearances and other testimonies given through remote communication are accepted in the same way as they were given in the courtroom.

In Spain, on 28 April 2020, Royal Decree-Law 16/2020 was issued on procedural and organizational measures to combat COVID-19 in the area of administration of justice. The provisions of the Law provided for the possibility of carrying out procedural actions (including court sessions) in telematic presence, provided that the courts, tribunals and prosecutors have the necessary technical means at their disposal.

The Bulgarian parliament has allowed courts to use videoconferencing in administrative, civil and criminal proceedings. Persons involved in the case may request participation in the court hearing through the HQS if they cannot attend in person. In this case, the trial must be held in a regional court equipped for videoconferencing.

In Germany, in addition to conducting court sessions in the videoconferencing regime, an electronic dossier is created with digitized materials of the criminal case, and to reduce the time for acquaintance with the materials of the criminal case, the defender receives its electronic materials through his special e-mail box.

An analysis of the practice of courts on the use of information technology in the administration of justice has shown that during the period of restrictive measures associated with the coronavirus pandemic, most countries of the world have transferred legal proceedings to a remote format to prevent the threat of the spread of coronavirus infection.

At the same time, the increase in the volume of criminal cases, the consideration of which is carried out in the videoconferencing regime, the conduct of electronic document management has revealed some features of information technology. The analysis of the remote court session showed the following:

- In areas remote from the centre, there is still a problem with connecting to a single Internet network;
- Not all citizens acting as victims, witnesses can use new technologies, the trial and interview of its participants in most cases takes place in court buildings, which can put pressure on victims and witnesses when they give evidence;
- Network insecurity, i.e. conducting a public court session via the Internet can give wide publicity to the participation of a citizen in court and cause a violation of his honour and dignity;
- The participation of the accused in custody in the court session in the videoconferencing regime and giving testimony to them raises some doubts about their veracity since the interview procedure is carried out with the participation of employees of the remand prison;
- It is noted that the conduct of the court session in the videoconferencing regime limits the rights of the defender and the accused to talk with each other, correct their testimony and formulate questions;
- Lack of legislative regulation of the court session in the format of the videoconferencing.

Conclusions

The introduction of digital technologies in the activities of courts, the holding of court sessions in the videoconferencing regime, especially during the COVID-19 pandemic, helped to solve the primary tasks of the state in the administration of justice. But still, given the specifics of criminal proceedings, the following factors should be taken into account, requiring an early decision.

1. When working with electronic documents, legislative protection against unauthorized access and prevention of changes in their content to documents is required. Digitalization must meet the requirements of criminal proceedings, its features,
including those related to the confidentiality of the testimony of victims, witnesses and other participants in the process.

2. During the height of the COVID-19 pandemic, the likelihood of its second wave, there is a need to develop a unified digital platform for courts with an increased level of channel protection, through which the information of persons involved in the case is transmitted, as well as an independent server for storing information on each specific case ... It is pertinent to note the specifics of cases in which offline court hearings would be held in closed court sessions (crimes against sexual freedom, in cases involving state secrets, etc.) since this issue should be regulated separately in the law.

3. Conducting court sessions in the videoconferencing regime should in no way violate the rights of participants in criminal proceedings. The accused must be allowed to communicate with his defence lawyer in unlimited time, victims and witnesses must give their testimony in court freely, without any pressure from the organizers of the videoconferencing process. At the same time, ensuring the safety of all participants in a trial is a fundamental element of a fair trial.

4. All participants in the process should be guaranteed the right to defend both the accused and the victims and witnesses. As a rule, the defender needs to provide a separate room with an established Internet network or Skype, to communicate freely with his client in an unlimited period. In this context, the accused should also be ensured his right to an objective, a free narration of the events of the crime, since the accused in custody participates in the court session in the videoconferencing regime in the presence of the staff of the institution for the execution of punishment and is under their supervision.

5. Of course, we cannot completely replace real litigation with digital technologies. However, today’s events related to the coronavirus pandemic have forced the judiciary to use the power of videoconferencing in judicial activities, and thus exercise their functions of administering justice.

Therefore, our task is to use new technologies only with the condition of guaranteeing the rights of citizens participating in criminal proceedings. Besides, it should be borne in mind that when assessing the evidence collected in the case, the court must check their reliability, taking into account the quality of the image, sound and other factors that may subsequently be important for deciding whether a person is guilty or innocent.

The danger of the spread of coronavirus infection obliged judges to promptly consider criminal cases using digital technologies. It is necessary to thoroughly analyze the current practice of the courts in the consideration of criminal cases in the mode of videoconferencing and develop the necessary legislative mechanisms to regulate the use of digital technologies. This process should in no way violate the rights and freedoms of citizens guaranteed by the Constitution.

Conflict of Interest: None to declare

Source of Funding: Self

Ethical Approval: No ethical approval is needed.

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Correlation of Pharyngeal Residue with Penetration-Aspiration in Post-Radiotherapy Nasopharyngeal Carcinoma Patients with Oropharyngeal Dysphagia

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Abstract

Background: Nasopharyngeal carcinoma (NPC) ranks first for head and neck malignancies, and radiotherapy is a recommended treatment. Most post-radiotherapy NPC patients experience oropharyngeal dysphagia that results in pharyngeal residue. Pharyngeal residue is thought to be a risk factor for aspiration-penetration.

Objective: Examining the correlation between pharyngeal residue and penetration-aspiration in post-radiotherapy NPC patients.

Method: Participants have been identified since 2018 to find out the total number of NPC patients. In the period January-October 2019, identification of NPC patients was performed according to participant criteria. Participants were examined for fiberoptic endoscopic evaluation of swallowing (FEES), pharyngeal residue using the Yale Pharyngeal Residue Severity Rating Scale (YPR-SRS), and penetration-aspiration using Penetration-Aspiration Scale (PAS). Statistical tests were used Spearman correlation test with \( p < 0.05 \).

Results: The highest participant’s pharyngeal residue appeared in vallecula when given soft bolus (96.55%), and in pyriform sinus when given thick liquid bolus (72.41%). Most participants with soft bolus had the highest negative penetration (72.59%) and positive penetration in thick liquid bolus (51.72%), while most had negative aspirations with the lowest value (89.66%). There is aspiration in 10.34% of patients when given a dilute liquid. There was a significant correlation between pharyngeal residue in vallecula and pyriform sinus with penetration-aspiration (\( p < 0.05 \)). There was a positive association with the use of soft bolus (\( r = 0.623 \)), thick liquid bolus (\( r = 0.631 \)), and dilute liquid bolus (\( r = 0.891 \)).

Conclusions: There is a significant association between pharyngeal residue and penetration-aspiration in post-radiotherapy NPC patients.

Keywords: Nasopharyngeal carcinoma, radiotherapy, pharyngeal residue, penetration-aspiration

Introduction

Nasopharyngeal carcinoma (NPC) is a squamous cell carcinoma originating from nasopharyngeal epithelium. This carcinoma ranks first for head and neck malignancies\(^1\). Radiotherapy is a recommended treatment because of the radiosensitive nature of NPC. Giving radiotherapy in addition to killing cancer cells can also damage normal cells that causes various side
effects. Protection of surrounding organs is difficult to perform when using conventional radiotherapy. Organs such as parotid, tongue, pharyngeal mucosa and pharyngeal constrictor muscle are often sacrificed during radiotherapy, resulting in oropharyngeal dysphagia. Oropharyngeal dysphagia can cause reduced food intake, malnutrition, decreased activity, and even aspiration. Aspiration is the most serious complication of oropharyngeal dysphagia because it can lead to aspiration pneumonia to death. Management of oropharyngeal dysphagia in post-radiotherapy NPC patients is still not optimal, so parameters are needed to predict the incidence of aspiration(2-4).

Oropharyngeal dysphagia can result in pharyngeal residue, which is a risk factor for penetration-aspiration. Pharyngeal residue are secretions before swallowing and bolus residue after swallowing in pharynx which cannot be completely cleansed by swallowing(5, 6). The incidence of aspiration increases as a result of pharyngeal residue because larynx has experienced relaxation so that bolus can enter the airway(7). Aspiration occurs when bolus has passed under vocal cords, whereas penetration is the presence of bolus material in larynx that does not pass through vocal cords(4, 8).

Post-radiotherapy NPC patients often experience oropharyngeal dysphagia with a prevalence reaching 75%. Management of oropharyngeal dysphagia is needed to eliminate aspiration which can cause aspiration pneumonia to death. As many as 65.9% of post-radiotherapy NPC patients have aspiration. One risk factor for penetration of aspiration is pharyngeal residue. Patients with pharyngeal residues have a thirty times greater risk for aspiration(5, 9, 10).

The most common procedures for evaluating oropharyngeal dysphagia in head and neck cancer patients are videofluoroscopy (VFS) and fiberoptic endoscopic evaluation of swallowing (FEES). Videofluoroscopy is considered a gold standard for examination of oropharyngeal dysphagia, but its use is limited because of high costs, cannot be removed, and the presence of radiation exposure. The FEES method is currently more widely used because it can be performed at the bedside and allows direct visualization of swallowing structures including nasopharynx, hypopharynx, larynx, and vocal cords(11).

Assessment for penetration-aspiration during ingestion process can use Penetration-Aspiration Scale (PAS). This method consists of eight scales that describe the depth of bolus penetration or aspiration into the airway, the sensation felt by patient to the presence of penetration or aspiration, and the effectiveness in removing bolus from the airway(7, 12). Different parameters can be used to assess pharyngeal residue because there is no consensus on the scale of assessment of the value of pharyngeal residue. Recent research showed that The Yale Pharyngeal Residue Severity Rating Scale (YPR-SRS) has the highest reliability when compared to other parameters(5, 9).

The number of NPC patients in Dr. Soetomo General Academic Hospital, Surabaya, Indonesia, has increased annually in 2017 by 125 patients, in 2018 by 137 patients, and in 2019 (until October) by 101 patients. Thus far, there is no study examining correlation between pharyngeal residue and penetration-aspiration in post-radiotherapy NPC patients at hospital. Based on the description above, the researchers aimed to analyze the association between pharyngeal residue and penetration-aspiration in post-radiotherapy NPC patients.

**Method and Materials**

**Participants:** Participants in this study were NPC patients who had completed radiotherapy that met the inclusion and exclusion criteria. Inclusion criteria were NPC patients aged 18-74 years, had completed radiotherapy using three-dimensional conformal radiation therapy (3D-CRT) techniques for 35 times in accordance with NCCN guidelines(13), had dysphagia complaints, were willing to undergo FEES examination in maximum twelve months after radiotherapy, the Glasgow Coma Scale of compos mentis (456), and can sit. Exclusion criteria included patients having other diseases that can cause dysphagia (stroke, head trauma, brain base tumors, cervical vertebral trauma, meningitis, Guillain Barre syndrome, diabetes mellitus, and goitre), underwent radiotherapy for more than 35 times, used nasogastric tubes, used tracheostomy tubes, respiration rate more than 24 times per minute, and oxygen saturation <94%. Participants first received an explanation of the study details including the benefits, objectives, rights and obligations of the participant. In addition, participants who were willing to take part in the research must fill in the consent form.

**Design:** The study was conducted at the Oncology Poly of Dr. Soetomo General Academic Hospital,
Surabaya, Indonesia, from January-October 2019. This study used a cross-sectional design with consecutive sampling techniques. The number of participants was 29 NPC patients. Participants were assessed for characteristics, pharyngeal residue, and penetration-aspiration after receiving radiotherapy for 35 times. This study had passed ethical test (1031/KEPK/III/2019). NPC stadium referred to the classification of Tumors, Nodules, Metastases (TNM) developed by Union International Against Cancer (UICC) and the American Joint Committee on Cancer (AJCC)(14, 15).

Fiberoptic Endoscopic Evaluation of Swallowing: Participants were examined for FEES by the Otorhinolaryngology Head and Neck Surgery Specialist (Broncoesophagologist consultant). FEES examination used endoscopy (Olympus Evis Exera II, Olympus Medical System, Tokyo, Japan). Patients were seated, and left and right nasal cavity were given decongestant Oxymetazoline HCl spray 0.05%. The endoscopy tip was inserted through nose to nasopharyngeal cavity (between soft palate and top of epiglottis) where the gel was applied first. Prepare three bolus of different consistency (soft, thick liquid, dilute liquid) each ± 5 ml. Participants were asked to swallow the bolus once to see whether there was vallecular residue and pyriform sinus after the white-out period. The white-out period is formed due to changes in tissue position after swallowing reflex. The order of bolus usage was soft bolus, thick liquid, and dilute liquid. Furthermore, the endoscopy was rapidly moved to the area of laryngeal vestibule to evaluate penetration and aspiration.

Pharyngeal Residue Assessment: Pharyngeal residue is secretion before and after ingestion of bolus residue in vallecula and pyriform sinus which cannot be completely cleansed by swallowing. Pharyngeal residual assessment was obtained through FEES examination using the YPR-SRS scale(5). The scale of vallecular residue is divided into five, namely scale 1 (none) if there are no residuals found in vallecula, scale 2 (trace) if the residue only covers vallecular mucosa or fills 1%-5%, scale 3 (mild) if the residue fills vallecula up to a quarter full (5%-25%) with visible epiglottic ligaments, scale 4 (moderate) if the residue fills vallecula to half full (25%-50%) with invisible epiglottic ligaments, and scale 5 (severe) if the residue fills vallecula more than 50% to the upper edge of epiglottis. Pyriform sinus residual rating scale is also divided into five, namely scale 1 (none) if there is no residual pyriform sinus, scale 2 (trace) if the residue only covers pyriform sinus mucosa or fills 1%-5%, scale 3 (mild) if the residue fills pyriform sinus up to a quarter full (5%-25%), scale 4 (moderate) if the residue fills pyriform sinus up to half full (25%-50%), and scale 5 (severe) if the residue fills pyriform sinus more than 50% to reach aryepiglottic folds.

Penetration-Aspiration Assessment: Penetration is the presence of bolus material in larynx which does not pass through vocal cords after swallowing phase. Aspiration is the presence of bolus material that has passed under vocal cords. Penetration-aspiration assessment used PAS, which the rating scale is divided into eight(12). Scale 1 indicates no boluses enter larynx. Scale 2 shows that the bolus has entered larynx, remains above vocal cords, and can be removed from larynx. Scale 3 shows that the bolus has entered larynx, remains above vocal cords, but cannot be removed from larynx. Scale 4 is a condition when bolus has entered larynx, touches vocal cords, and can be removed from larynx. Scale 5 indicates that the bolus has entered larynx, touches vocal cords, but cannot be removed from larynx. Scale 6 shows that the bolus has entered larynx, passes through vocal cords and can be removed from larynx. Scale 7 is a condition when the bolus has entered larynx, passes through vocal cords, but cannot be removed from larynx despite attempts to remove it. Scale 8 shows that the bolus enters larynx, passes through vocal cords, and no attempt to remove it. Scale 1 shows the absence of penetration-aspiration. Scale 2-5 illustrates penetration, while scale 6-8 shows aspiration. Aspiration may not be identified in post-radiotherapy of head and neck cancer patients. Symptoms of aspiration in patients who have undergone radiotherapy are often unclear, and they do not feel anything due to sensory disturbance in the trachea area that is called silent aspiration.

Statistic Analysis: Data obtained in the study were displayed in tabular form, and were analyzed statistically. The association between pharyngeal residues with penetration-aspiration was analyzed using the Spearman correlation test. This research used significance level \( p<0.05 \). Statistical test analysis employed the IBM SPSS Statistics software version 21.0 (IBM Corp., Armonk, NY, USA).

Results

Characteristics of Participants: Most participants belonged to the age group of 46-55 years (37.93%), followed by age group of 36-45 years and 56-65 years (20.69% each). The average participant age was...
48.41±13.20 years, with the youngest age at 18 years and the oldest age at 68 years. Most participants were male (72.41%). All participants did not undergo metastasis to other organs, and most participants had stage-IV NPC (55.17%). Most participants had a T4-type tumor classification (41.38%) and followed by a T3-type tumor (27.59%). T4 is a tumor that extends intracranially and/or involves cranial nerve, hypopharynx, infratemporal fossa, or masticator space, while T3 is a tumor that invades bone structure and/or paranasal sinuses. In addition, most participants had an N2-type nodule (44.83%), followed by an N3-type nodule as much as 27.59%. N2 is categorized as bilateral cervical lymph node, with the largest size ≤6 cm, above Supraclavicular fossa, while N3 is categorized as cervical lymph node >6 cm, and/or towards Supraclavicular fossa. Most participants suffered injuries due to radiotherapy in the range of 3-6 months as much as 51.72% (Table 1).

Participants complained of several problems related to dysphagia, including drooling or saliva coming out of the mouth as much as 2 participants (6.90%), food came out of the lips as much as 3 participants (10.34%), regurgitation or food and drink coming out of nose as much as 5 participants (17.24%), cough when eating or drinking as much as 7 participants (24.14%), choking while eating or drinking as much as 9 participants (31.03%), reduced saliva that leads to difficulty swallowing as many as 29 participants (100.00%), require water to help swallow as many as 28 participants (96.55%), avoiding foods with certain consistency as much as 18 participants (62.07%), require certain portion size as much as 7 participants (24.14%), longer mealtime length as much as 27 participants (93.10%), having the sensation of food getting stuck in the throat as many as 20 participants (68.96%), and changed voice as many as 16 participants (55.17%).

**Pharyngeal Residue:** Most participants had vallecular residue when given soft bolus (96.55%; 3.21±1.01), while 89.66% of participants had the residue when given thick liquid bolus (2.41±0.87). On the other hand, when given dilute liquid bolus, most participants experienced pharyngeal residue in vallecula as much as 68.97% (2.41±0.87). Most participants experienced pharyngeal residue in pyriform sinus when given soft bolus as much as 62.07% (2.41±1.18), thick liquid bolus as much as 72.41% (2.00±0.93), and dilute liquid bolus as much as 62.07% (2.03±1.08; Table 2).

**Penetration-Aspiration:** Most participants had no penetration-aspiration when given soft bolus as much as 72.59% negative penetration and all negative aspirations (2.07±1.25). When given thick liquid bolus, most participants (51.72%) had positive penetration and all negative aspiration (2.07±1.25). On the other hand, when given dilute liquid bolus, most participants had no penetration-aspiration as much as 55.17% of negative penetration and 89.66% of negative aspiration (2.52±1.78). When, we gave a dilute liquid bolus as much as 10.34% of the participants experienced aspiration (table 3).

**Correlation of Pharyngeal Residue with Penetration-Aspiration in Post-Radiotherapy NPC Patients:** Correlation between pharyngeal residue in vallecula with penetration-aspiration in the administration of soft bolus was \( p=0.025 \) with \( r=0.416 \), thick liquid bolus was \( p=0.003 \) with \( r=0.494 \), and dilute liquid bolus was \( p<0.001 \) with \( r=0.807 \). These results indicated a significant association between pharyngeal residue in vallecula and penetration-aspiration. Correlation between pharyngeal residues in pyriform sinus and penetration-aspiration in the administration of soft bolus was \( p<0.001 \) with \( r=0.623 \), thick liquid bolus was \( p<0.001 \) with \( r=0.631 \), and dilute liquid bolus was \( p<0.001 \) with \( r=0.891 \). These results showed a significant association between pharyngeal residue in pyriform sinus and penetration-aspiration (Table 3).

### Table 1. Characteristics of Nasopharyngeal Carcinoma Patients with Oropharyngeal Dysphagia

<table>
<thead>
<tr>
<th>Characteristics of Participants</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Year)</td>
<td></td>
</tr>
<tr>
<td>17 – 25</td>
<td>3 (10.34)</td>
</tr>
<tr>
<td>26 – 35</td>
<td>1 (3.45)</td>
</tr>
<tr>
<td>36 – 45</td>
<td>6 (20.69)</td>
</tr>
<tr>
<td>46 – 55</td>
<td>11 (37.93)</td>
</tr>
<tr>
<td>56 – 65</td>
<td>6 (20.69)</td>
</tr>
<tr>
<td>66 – 74</td>
<td>2 (6.90)</td>
</tr>
</tbody>
</table>
### Characteristics of Participants

<table>
<thead>
<tr>
<th>Characteristics of Participants</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>21 (72.41)</td>
</tr>
<tr>
<td>Female</td>
<td>8 (27.59)</td>
</tr>
<tr>
<td><strong>Tumor Classification</strong></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>2 (6.90)</td>
</tr>
<tr>
<td>T2</td>
<td>7 (24.14)</td>
</tr>
<tr>
<td>T3</td>
<td>8 (27.59)</td>
</tr>
<tr>
<td>T4</td>
<td>12 (41.38)</td>
</tr>
<tr>
<td><strong>Nodule Classification</strong></td>
<td></td>
</tr>
<tr>
<td>N0</td>
<td>2 (6.90)</td>
</tr>
<tr>
<td>N1</td>
<td>6 (20.69)</td>
</tr>
<tr>
<td>N2</td>
<td>13 (44.83)</td>
</tr>
<tr>
<td>N3</td>
<td>8 (27.59)</td>
</tr>
<tr>
<td><strong>Metastasis Classification</strong></td>
<td></td>
</tr>
<tr>
<td>M0</td>
<td>29 (100.00)</td>
</tr>
<tr>
<td>M1</td>
<td>0 (0.00)</td>
</tr>
<tr>
<td><strong>Stage</strong></td>
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<tr>
<td>Stage I</td>
<td>0 (0.00)</td>
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<tr>
<td>Stage II</td>
<td>3 (10.34)</td>
</tr>
<tr>
<td>Stage III</td>
<td>10 (34.48)</td>
</tr>
<tr>
<td>Stage IV</td>
<td>16 (55.17)</td>
</tr>
<tr>
<td><strong>Time of Injury due to Radiotherapy (month)</strong></td>
<td></td>
</tr>
<tr>
<td>&lt;3</td>
<td>9 (31.03)</td>
</tr>
<tr>
<td>3-6</td>
<td>15 (51.72)</td>
</tr>
<tr>
<td>&gt;6</td>
<td>5 (17.24)</td>
</tr>
</tbody>
</table>

T = tumor, N = nodule, and M = metastasis based on Union International against Cancer (UICC) and American Joint Committee on Cancer (AJCC)

### Table 2. Pharyngeal Residue Distribution

<table>
<thead>
<tr>
<th>Pharyngeal Residue</th>
<th>Soft Bolus (%)</th>
<th>Thick Liquid Bolus (%)</th>
<th>Dilute Liquid Bolus (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Vallecula</td>
<td>28 (96.55)</td>
<td>1 (3.45)</td>
<td>26 (89.66)</td>
</tr>
<tr>
<td>Pyriform sinus</td>
<td>18 (62.07)</td>
<td>11 (37.93)</td>
<td>21 (72.41)</td>
</tr>
</tbody>
</table>

### Table 3. Correlation of Pharyngeal Residue with Penetration-Aspiration in Post-Radiotherapy Nasopharyngeal Carcinoma Patients

<table>
<thead>
<tr>
<th>Variables</th>
<th>Soft Bolus</th>
<th>Thick Liquid Bolus</th>
<th>Dilute Liquid Bolus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penetration (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(+)</td>
<td>8 (27.59)</td>
<td>15 (51.72)</td>
<td>13 (44.83)</td>
</tr>
<tr>
<td>(-)</td>
<td>21 (72.41)</td>
<td>14 (48.28)</td>
<td>16 (55.17)</td>
</tr>
<tr>
<td>Aspiration (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(+)</td>
<td>0 (0.00)</td>
<td>0 (0.00)</td>
<td>3 (10.34)</td>
</tr>
<tr>
<td>(-)</td>
<td>29 (100.00)</td>
<td>29 (100.00)</td>
<td>26 (89.66)</td>
</tr>
<tr>
<td>Vallecula</td>
<td>0.025*</td>
<td>0.003*</td>
<td>0.000**</td>
</tr>
<tr>
<td>Pyriform sinus</td>
<td>0.000**</td>
<td>0.000**</td>
<td>0.000**</td>
</tr>
</tbody>
</table>

* Significant p <0.05; ** Significant p <0.001
Discussion

Oropharyngeal dysphagia in post-radiotherapy NPC patients is secondary due to nerve and soft tissue damage. This can occur in the short or long term with varying degrees of severity. Changes in swallowing structure can occur due to early and late effects of radiotherapy. Radiation causes axonal injury, demyelination, extensive fibrosis in and around nerves, and ischemia in blood vessels that provide vascularization to nerves. Not all structural changes in swallowing due to radiotherapy can be explained completely. Reduced retroflexion from epiglottis and retraction of tongue base will cause pharyngeal residue in vallecula. Reduction of pharyngeal contraction and relaxation of upper esophageal sphincter results in pharyngeal residue in pyriform sinus. Pharyngeal residue is a risk factor for aspiration after the ingestion phase. Aspiration in post-radiotherapy head-neck cancer patients mainly occurs after swallowing phase, thus pharyngeal residue must be considered as primary symptoms of oropharyngeal dysphagia in this population. Pharyngeal residue can cause penetration-aspiration after swallowing phase because bolus enters airway when larynx has been relaxed (7, 16-19).

Pharyngeal residue is a risk factor for penetration-aspiration in post-radiotherapy head-neck cancer patients. A study found a significant association between pharyngeal residue and penetration-aspiration at each given bolus consistency (\(p<0.05\)) (10). Increased pharyngeal residue in dysphagia patients is directly proportional to the incidence of penetration-aspiration. Penetration-aspiration increases along with the increase in pharyngeal residue in vallecula and pyriform sinus at each given bolus consistency and is statistically significant (\(p<0.001\)) (9). The results of penetration-aspiration in post-radiotherapy head-neck cancer patients mainly occur after the swallowing phase compared to before or when swallowing (\(p<0.05\)) (7).

The location of pharyngeal residue in vallecula or pyriform sinus influences penetration-aspiration although there are still differences regarding the more dangerous location. Some studies mentioned residue in pyriform sinus are more dangerous than in vallecula, while other studies showed the opposite (7). A study found a significant correlation between pharyngeal residue in pyriform sinus and aspiration in post-radiotherapy NPC patients (\(p<0.001\)) (20). Aspiration is more often caused by pharyngeal residue in pyriform sinus compared to vallecula. The greater distance between vallecula to laryngeal anterior chamber than pyriform sinus to laryngeal anterior chamber might result in aspiration due to a large amount of residue in pyriform sinus. Residue in the lower pharyngeal area increase the risk of penetration-aspiration. Vallecular residue are more difficult to enter laryngeal vestibule because of the presence of epiglottis as a barrier, but epiglottic function in head and neck cancer patients can be damaged due to fibrosis, malformations, or tissue damage so that failure continues to prevent residues from entering larynx (7, 21).

This study found a significant correlation between pharyngeal residue in vallecula and pyriform sinus with penetration-aspiration, but did not distinguish the more dangerous areas between the two. The association between pharyngeal residue in pyriform sinus and penetration-aspiration showed a stronger correlation when compared with residue in vallecula at all given bolus consistencies. The type and consistency of bolus also play an important role in the occurrence of penetration-aspiration. Some studies mentioned that dilute bolus is easier to cause aspiration when compared with thick bolus, whereas other studies showed the opposite results (7, 9, 22, 23). Some studies found a significant association between pharyngeal residue with penetration-aspiration, and the correlation was stronger when given dilute bolus (21, 24). Pharyngeal pressure decreases significantly when given liquid compared to soft bolus. This might be due to liquid viscosity that allows gravity to take over the transfer of flow through pharynx. Liquids are more at risk of causing penetration-aspiration when compared to soft boluses in post-radiotherapy NPC patients who experience pharyngeal contraction disorders. Liquid boluses cannot provide enough stimulation to pharyngeal wall due to interference with nerve function that plays a role in swallowing (3, 25).

Some studies reported a stronger correlation between pharyngeal residue and penetration-aspiration when given soft bolus compared to liquid (9, 10). This might be caused by differences in types of bolus given, which are solid, soft, and liquid. The last fluid bolus given can be overestimated due to residual residues from previous solid and soft boluses. Assessment of repeated swallowing management to clear pharyngeal residues can provide a different interpretation of penetration-aspiration. Fluid boluses can easily flow into the airways, but are also easier to cough out. Thick bolus is difficult to enter the airway, but it is not easy to be removed again after entering so that it can cause airway obstruction. Assessments made after repeated swallowing will cause
soft boluses to appear to be more likely to result in aspiration than liquid boluses \(^{(9, 26)}\).

This research did not distinguish which type and consistency of boluses that are more dangerous for penetration-aspiration. A stronger correlation between pharyngeal residues and penetration-aspiration was obtained when given dilute liquid bolus compared to thicker bolus on vallecula or pyriform sinus. This study proved that there was a significant association between pharyngeal residue and aspiration-penetration in post-radiotherapy NPC patients, so that pharyngeal residue could be used to predict penetration-aspiration in post-radiotherapy NPC patients.

**Conclusions**

Most post-radiotherapy NPC patients have oropharyngeal dysphagia, which can lead to penetration-aspiration. FEES examination is performed to assess penetration-aspiration and pharyngeal residue, while YPR-SRS is used to pharyngeal residue scoring and PAS is used to penetration-aspiration scoring. There is a significant correlation between pharyngeal residue and penetration-aspiration in post-radiotherapy NPC patients. The correlation between pharyngeal residue and penetration-aspiration in the administration of dilute liquid bolus shows the strongest results. There is a strong association between pharyngeal residues in pyriform sinus and penetration-aspiration in the administration of liquid bolus.

**Conflict of Interest:** The authors declare they have no conflict of interest.

**Funding:** None

**Informed Consent:** Informed consent was obtained from all individual participants included in the study.

**Ethical Approval:** All procedures performed in studies involving human participants were accordance with the 1964 Helsinki Declaration at the ethics committee in Dr. Soetomo General Academic Hospital, Surabaya, Indonesia (1031/KEPK/III/2019).

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Effect of Supportive Care Activities on Negative Emotional Feelings of Children with Nephrotic Syndrome

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Abstract

Nephrotic syndrome is a collection of symptoms due to kidney damage. This includes protein in the urine, low blood albumin levels, high blood lipids, and significant swelling. Other symptoms may include weight gain, feeling tired, and foamy urine. Complications may include blood clots, infections, and high blood pressure.

Aim of the study: This study was aimed to assess the effect of supportive care activities on negative feelings of nephrotic syndrome children. Setting: The study was carried out at medicine department of children’s hospital affiliated to Ain Shams University Hospitals. The subjects: The subject of this study was purposive sample composed of (50) children were attended to the previously mentioned setting and accompanying mothers. Tools of data collection: An Interviewing Questionnaire, Children’s Assessment of Participation and Enjoyment (CAPE), multidimensional Scale of Perceived Social Support (MSPSS).

Results: Less than half of the studied children having negative Emotional Feelings.

Conclusion: The study concluded that the studied children with Nephrotic Syndrome have negative feelings need Supportive Care.

Recommendations: This study recommended the importance of Encourage use of Supportive care activities programs to help them to prevent the negative feelings of Nephrotic syndrome children.

Keywords: Children, Emotional, Supportive, Negative, Nephrotic Syndrome.

Introduction

Nephrotic syndrome may occur when the filtering units of the kidney are damaged. this damage allows protein normally kept in the plasma to leak into the urine in large amounts, which reduces the amount of protein in your blood. Since the protein in the blood helps keep fluid in the bloodstream, some of this fluid leaks out of the bloodstream into your tissues, causing swelling, called edema.¹⁴

Nephrotic syndrome is a problem where too much protein called albumin is released from the body into the urine. it means that one or both kidneys are damaged. the kidneys contain many coils of tiny blood vessels. each of these is called a glomerulus. glomeruli filter substances from the blood into the urine. nephrotic syndrome occurs when the glomeruli stop working normally.¹⁰

Glomerular disease may be caused by an infection or a drug it may be caused by a disease that affects the entire body, like diabetes or lupus. Many different diseases can cause swelling (inflammation) or scarring (sclerosis) of the glomerulus. Sometimes glomerular disease is idiopathic, meaning it happens without any cause that can be found, the glomerular diseases that cause nephrotic syndrome generally can be divided into primary and secondary Nephrotic Syndrome.¹⁶
Primary nephrotic syndrome is known as idiopathic nephrotic syndrome. It is associated with glomerular disease without an identifiable causative disease or drug. Idiopathic nephrotic syndrome includes multiple histologic types such as: minimal change disease, mesangial proliferation, focal segmental glomerulosclerosis. Secondary nephrotic syndrome refers to an etiology extrinsic to the kidney. Approximately 10% of children with nephrotic syndrome have secondary nephrotic syndrome.

Childhood nephrotic syndrome is a group of symptoms that occur because of damage to the kidneys. Nephrotic syndrome can occur in children at any age, but usually is found in children between 18 months and 5 years of age. You should check with your child’s pediatrician or a pediatric kidney disease specialist if your child has signs of nephrotic syndrome.

Supportive care is an important aspect of managing children with nephrotic syndrome. Patient and parent education is adequate information about the disease, associated complications and the expected course should be provided. Parental motivation and involvement are essential in management of a child with nephrotic syndrome. Measures are emphasized such as urine examination for protein at home, maintain a diary showing proteinuria, medications received and intercurrent infections, ensure normal activity and school attendance.

Negative emotional for children with Nephrotic syndrome has biological, behavioral, and social manifestations that have implications on the mental health, social and personality development of the child, and family coping. Nephrotic syndrome in children has a significant impact on intellectual functions and behavioral aspects, including anxiety and depression. Parents of children with nephrotic syndrome are more likely to develop psychosocial problems, have less social adjustment, and have a poorer quality of life compared with parents of healthy children.

The Role of the nurse is very important to aiding mother in acceptance of their child’s condition, encourage the mother to know diagnosis and teach them how they can support their children by living normal life and accept negative emotion feelings, nurses should provide educational classes for the mothers and their children about nephrotic syndrome to elevate their level of health awareness about disease and its care. As well provide children and their mothers with useful source of information at home, in addition to mass media should provide educational mass media programs for such diseases.

Significance of the study: Pediatric Nephrotic syndrome is the most common renal disorder, in childhood and adolescences; pediatric Nephrotic syndrome prevalence is 4-5% worldwide and in Egypt ranged from 11-12%. (National Center of Biological Information’s NCBI., 2017). Also no one provide supportive care for children with Nephrotic syndrome at pediatric care setting.

Aim of the Study: This study aimed to assess the effect of supportive care activities on negative emotional feelings of Nephrotic syndrome children

Subjects and Method

I. Research Design: A quasi-experimental design was used to conduct this study.

Study Setting: The study was carried out at medicine department of children’s hospital affiliated to Ain Shams University Hospitals.

Subjects: The subject of this study was purposive sample composed of (50) children were attended to the previously mentioned setting and accompanying mothers.

II. Technical Design: Tools of data collection: Data were collected through use of the following tools:

I. Interview Questionnaire:

1. An Interviewing Questionnaire: It was designed by the researchers after reviewing the related literature:

(1): Characteristics of children

(2): Characteristics of mothers of children and their knowledge.

Scoring System: Scores used to evaluate Mother’s knowledge regarding nephrotic syndrome. The correct answer was taken score one and for the incorrect answer was taken zero scores. The total knowledge score interpreted as follows:

- Satisfactory knowledge was considering from 60 to 100%
- Unsatisfactory knowledge less than 60%
II. Children’s Assessment of Participation and Enjoyment (CAPE): It was designed to examine how children and adolescence participate in everyday activities outside of their school classes. It measures children’s participation in recreation and leisure activities outside of mandated school activities.

Scoring System: Scoring system was done by allocating to each sentence a score (0) for No and (1) Yes. The score of items was summed-up and the total divided by a number of the items, giving a mean score of the part. These scores were converted into a percent score was classified as the following:

- < 60% Not participated in activity from zero < 33
- ≥ 60% Participated in activity from 34 – 55

III. Multidimensional Scale of Perceived Social Support (MSPSS), it was used to measure perceived social support.

Scoring System: Scoring system was done using three points Liker scale ranging from Zero to 2 respectively as (0) Rarely; (1) Sometimes; and (2) Always. The score of items was summed-up and the total divided by a number of the items, giving a mean score of the part. These scores were converted into a percent score was classified as the following:

- < 50% Low perceived social support from zero <12
- 50 %< 75% moderately perceived social support from 12 <18
- ≥ 75% highly perceived social support from 18 – 24

III. Operation Design: The operational design for this study consisted of three phases, namely preparatory phase, pilot study, and fieldwork.

Preparatory Phase: The researcher reviewed the literature and prepared the data collection tools including the socio-demographic and clinical data parts, as well as children’s emotional negative feelings scale, children’s assessment of participation and enjoyment and multidimensional scale of perceived social support among children having nephrotic syndrome. This was served to develop the study tools for data collection. During this phase, the researcher also visited the selected place to get acquainted with the personnel and the study settings. Development of the tools was under supervisors’ guidance and experts’ opinions were considered.

Pilot Study: A pilot study was carried out in the first half of July 2018, before data collection. The pilot study included 10% of the study subject fulfilling the previously mentioned criteria; it was conducted to evaluate the simplicity, practicability, legibility, understandability, feasibility, validity and reliability of the tool, it was also used to find the possible problems that might face the researcher and interfere with data collection to estimate the time needed to fill in the sheets. According to the results of the pilot study, no modifications were done in the tools. Those who shared in the pilot study were included in the main study sample.

Fieldwork: Once permission was granted to proceed with the study, the researcher visited the study setting and met with mothers/children having nephrotic syndrome who fulfilled the inclusion criteria. The purpose of the study was explained to mothers/children. The researcher started the interview with the mothers/children individually using the data collection tools. The researcher read, explained the steps of the study and choices were recorded for illiterate mothers, while educated mothers read and full the questionnaire by themselves.

The time consumed to fill out the full questionnaire ranged from 35 to 45 minutes for one questionnaire, each Saturday, Monday, and Thursday from 9:00 am to 12:00 pm in previously mentioned sitting.

IV. Administrative Design: An official letter requesting permission to conduct the study was submitted from the Dean of Faculty of Nursing, Ain Shams University to obtain permission from the general director of children’s hospital affiliated to Ain Shams University Hospitals to collect the data of the study. The agreement of each relative was obtained after explaining the aim and nature of the study.

Ethical Considerations: Approval was obtained from the ethical committee to conduct this study. The researcher explained the study aim in a simple and clear manner to be understood by eligible mothers/children. Verbal consent was obtained by each participant before collecting any data. Participants were informed about their right to withdraw from the study at any time without giving any reason. Data were considered confidential and not be used outside this study without mothers approval.

V. Statistical Analysis: Data collected from the studied sample was revised, coded and entered using PC. Computerized data entry and statistical analysis.
were fulfilled using the statistical package for social sciences (SPSS) version 20. Data were presented using descriptive statistics in the form of frequencies, percentages. Categorical data were tested with the Chi-square test (X2) for qualitative variables and independent sample t-test for quantitative variables. Statistical significance was considered at p-value <0.05.

**Results**

Table (1) shows that, near to two thirds (64.0%) of the studied children were males, 32.0% of them their age ranged between 8<10 years old with mean± SD 8.1±1.4. Regarding to educational level, nearly to two thirds (60.0%) of the studied children were in primary school.

Table (2) shows that, more than one third (40%) of the studied children were fathers age ranged between 35<40 years old with mean± SD 37.1±2.9, while nearly to two thirds (60.0%) of the studied children fathers were age ranged between of 40<45 years old with mean± SD 42.6±2.4.

Table (3) shows that, more than one third (38.0%) of them were had illness for 2<4 years with mean± SD 2.3±0.8, near to three quarters (70.0%) of the studied mothers were discovered disease through signs and symptoms and the majority (94.0%) of them were treated with immunosuppression.

Table (4) shows that, nearly to half (42.0%) of the studied children were overweight, 46.0% of them were shorter than normal, 56.0% of them had normal head circumference, while 34.0% of them were had large arm circumference than normal.

Table (5) clarifies that, there were statistically significant differences between the studied mothers regarding their knowledge in relation to meaning, causes and signs & symptoms of nephrotic syndrome throughout the pre and post intervention respectively (p<0.05).

Table (6) clarifies that, there were statistically significant differences between the studied mothers regarding their knowledge in relation to treatment & precautions of nephrotic syndrome throughout the pre and post intervention respectively (p<0.05).

**Table (1): Number and percentage distribution of the studied children according to their characteristics (no= 50)**

<table>
<thead>
<tr>
<th>Items</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>32</td>
<td>64.0</td>
</tr>
<tr>
<td>Female</td>
<td>18</td>
<td>36.0</td>
</tr>
<tr>
<td><strong>Age in years</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;6</td>
<td>2</td>
<td>4.0</td>
</tr>
<tr>
<td>6&lt;8</td>
<td>13</td>
<td>26.0</td>
</tr>
<tr>
<td>8&lt;10</td>
<td>16</td>
<td>32.0</td>
</tr>
<tr>
<td>10&lt;12</td>
<td>9</td>
<td>18.0</td>
</tr>
<tr>
<td>12&lt;14</td>
<td>7</td>
<td>14.0</td>
</tr>
<tr>
<td>14&lt;15</td>
<td>3</td>
<td>6.0</td>
</tr>
<tr>
<td><strong>Mean ±SD</strong></td>
<td>8.1±1.4</td>
<td></td>
</tr>
<tr>
<td><strong>Level of Educational</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Read and write</td>
<td>8</td>
<td>16.0</td>
</tr>
<tr>
<td>Primary school</td>
<td>30</td>
<td>60.0</td>
</tr>
<tr>
<td>Preparatory education</td>
<td>14</td>
<td>28.0</td>
</tr>
<tr>
<td>Secondary school</td>
<td>2</td>
<td>4.0</td>
</tr>
<tr>
<td>Technical school</td>
<td>1</td>
<td>2.0</td>
</tr>
</tbody>
</table>
### Table (2): Number and percentage distribution of the parents according to their socio-demographic characteristics (no=50)

<table>
<thead>
<tr>
<th>Items</th>
<th>Mother</th>
<th></th>
<th></th>
<th>Father</th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
<td>%</td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td><strong>Age in year</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 &lt; 35</td>
<td>13</td>
<td>26.0</td>
<td>4</td>
<td>8.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35 &lt; 40</td>
<td>20</td>
<td>40.0</td>
<td>10</td>
<td>20.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40 &lt; 45</td>
<td>12</td>
<td>24.0</td>
<td>30</td>
<td>60.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45 &lt;50</td>
<td>4</td>
<td>8.0</td>
<td>5</td>
<td>10.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 50</td>
<td>1</td>
<td>2.0</td>
<td>1</td>
<td>2.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mean ± SD</strong></td>
<td>37.1±2.9</td>
<td></td>
<td>42.6±2.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Educational level</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>3</td>
<td>6</td>
<td>2</td>
<td>4.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Read &amp; write</td>
<td>5</td>
<td>10.0</td>
<td>4</td>
<td>8.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>11</td>
<td>22.0</td>
<td>10</td>
<td>20.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preparatory</td>
<td>10</td>
<td>20.0</td>
<td>9</td>
<td>18.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary</td>
<td>20</td>
<td>40.0</td>
<td>22</td>
<td>44.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>University</td>
<td>1</td>
<td>2.0</td>
<td>3</td>
<td>6.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Job</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working</td>
<td>30</td>
<td>60.0</td>
<td>41</td>
<td>82.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did not working</td>
<td>20</td>
<td>40.0</td>
<td>9</td>
<td>18.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table (3): Number and percentage distribution of the studied children according to their illness history (no=50)

<table>
<thead>
<tr>
<th>Items</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Duration of illness in year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 2</td>
<td>17</td>
<td>34.0</td>
</tr>
<tr>
<td>2 &lt; 4</td>
<td>19</td>
<td>38.0</td>
</tr>
<tr>
<td>4&lt; 6</td>
<td>9</td>
<td>18.0</td>
</tr>
<tr>
<td>≤ 6</td>
<td>5</td>
<td>10.0</td>
</tr>
<tr>
<td><strong>Mean ± SD</strong></td>
<td></td>
<td>2.3±0.8</td>
</tr>
<tr>
<td><strong>Disease discovered through</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accidental</td>
<td>2</td>
<td>4.0</td>
</tr>
<tr>
<td>Regular follow-up</td>
<td>4</td>
<td>8.0</td>
</tr>
<tr>
<td>Complications of other disease</td>
<td>9</td>
<td>18.0</td>
</tr>
<tr>
<td>Signs &amp; symptoms</td>
<td>35</td>
<td>70.0</td>
</tr>
<tr>
<td><strong>Type of treatment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immunosuppression</td>
<td>47</td>
<td>94.0</td>
</tr>
<tr>
<td>Antihypertensive</td>
<td>39</td>
<td>78.0</td>
</tr>
<tr>
<td>Antibiotics</td>
<td>28</td>
<td>56.0</td>
</tr>
</tbody>
</table>
Table (4): Number and percentage distribution of the studied children according to their anthropometric measurement (no=50)

<table>
<thead>
<tr>
<th>Items</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over weight</td>
<td>21</td>
<td>42.0</td>
</tr>
<tr>
<td>Normal</td>
<td>17</td>
<td>34.0</td>
</tr>
<tr>
<td>Under weight</td>
<td>12</td>
<td>24.0</td>
</tr>
<tr>
<td>Height</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shorter</td>
<td>23</td>
<td>46.0</td>
</tr>
<tr>
<td>Normal</td>
<td>16</td>
<td>32.0</td>
</tr>
<tr>
<td>Longer</td>
<td>11</td>
<td>22.0</td>
</tr>
<tr>
<td>Arm circumference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smaller</td>
<td>9</td>
<td>18.0</td>
</tr>
<tr>
<td>Normal</td>
<td>14</td>
<td>28.0</td>
</tr>
<tr>
<td>Larger</td>
<td>27</td>
<td>34.0</td>
</tr>
</tbody>
</table>

Table (5): Distribution of mothers regarding their knowledge about meaning, causes and signs & symptoms of nephrotic syndrome throughout the pre and post intervention (no=50)

<table>
<thead>
<tr>
<th>Items</th>
<th>Pre</th>
<th>Post</th>
<th>X²</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meaning of nephrotic syndrome</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Known</td>
<td>19</td>
<td>29</td>
<td>4.0</td>
<td>*0.04</td>
</tr>
<tr>
<td>Unknown</td>
<td>31</td>
<td>21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Causes of nephrotic syndrome</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Known</td>
<td>22</td>
<td>33</td>
<td>4.88</td>
<td>*0.03</td>
</tr>
<tr>
<td>Unknown</td>
<td>28</td>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signs &amp; symptoms of nephrotic syndrome</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Known</td>
<td>9</td>
<td>27</td>
<td>14.06</td>
<td>**0.002</td>
</tr>
<tr>
<td>Unknown</td>
<td>41</td>
<td>23</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table (6): Distribution of mothers regarding their knowledge about diagnosis, complications, treatment and precautions of nephrotic syndrome throughout the intervention (no=50)

<table>
<thead>
<tr>
<th>Items</th>
<th>Pre</th>
<th>Post</th>
<th>X²</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosis of nephrotic syndrome</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Known</td>
<td>28</td>
<td>37</td>
<td>3.56</td>
<td>0.6</td>
</tr>
<tr>
<td>Unknown</td>
<td>22</td>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complications of nephrotic syndrome</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Known</td>
<td>21</td>
<td>25</td>
<td>0.64</td>
<td>0.4</td>
</tr>
<tr>
<td>Unknown</td>
<td>29</td>
<td>25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Discussion**

Nephrotic syndrome is a problem where albumin is released from the body into the urine. It means that one or both kidneys are damaged. The kidneys contain many coils of tiny blood vessels. Each of these is called a glomerulus. Glomeruli filter substances from the blood into the urine. Nephrotic syndrome occurs when the glomeruli stop working normally. A child with nephrotic syndrome may have: (very high levels of protein “albumin” in the urine, low levels of protein in the blood, tissue swelling all over the body “edema” especially in the belly “ascites”, weight gain from excess fluid, high cholesterol levels in the blood and less urine) 2.

The most common type is called Minimal Change Nephrotic Syndrome (MCNS). With MCNS, a child has times when symptoms get worse (relapses). But the condition can be managed over time. In rare cases, a child may develop kidney failure and need dialysis. Most children with this problem have idiopathic nephrotic syndrome. Idiopathic means that it occurs with no known cause. 18

In rare cases, a nephrotic syndrome may occur in the first week of life. This is called congenital nephrotic syndrome. It is inherited by an autosomal recessive gene. This means that boys and girls are equally affected. A child inherits 1 copy of the gene from each parent, who are carriers. Carrier parents have a 1 in 4 chance of having a child with this syndrome with each pregnancy. The outcome for this type of nephrotic syndrome is very poor. 8

This was supported by 5, who studied “Nephrotic syndrome in childhood” mentioned that, one third of the studied children were in the age group (8-10 years old), were the first child in their families and two thirds of them were males.

But this was not in accordance with 6 who conducted a study about “Psychiatric adjustment in children with nephrotic syndrome” showed that, one third of the studied children were in the age group (6-8 years old) and were males.

The current work mentioned that, more than one third of the studied children mothers were in the age group (35<40 years old), while two thirds of their fathers were in the age group (40<45 years old). As regards their education level it was found that, less than half of them had secondary educational level. Also two thirds of the studied children mothers were working and the majority of their fathers were working (table 2).

This was in agreement with 15 whose study was about “Long-term outcome of children with steroid-sensitive idiopathic nephrotic syndrome” clarified that, regarding the educational level of the studied children parents less than half of them had moderate educational level, the majority of their fathers were working while two thirds of their mothers were working mothers.

In the study of 20, which was about “Treatment of idiopathic nephrotic syndrome: regimens and outcomes in children” showed that, two thirds of the studied children were shorter than normal and it was clear from this study that there was significant correlation between the growth retardation and nephritic syndrome.

Having knowledge and health related practice regarding chronic illness such as nephritic syndrome improve child and family health outcomes by promoting recovery, speeding return to school, promoting health behavior, and appropriately involving the child on his
or her own care decisions. Important strategies for helping child to cope include providing information within the child’s cognitive ability, and helping parent to understand what choices they have.

This was in accordance with whose study was about “How mothers perceive their children with the nephrotic syndrome” mentioned that, there was statistically significant difference between knowledge of mothers about nephrotic syndrome in relation to treatment, complications and follow up pre and post intervention.

This was supported by, who conducted “A study about knowledge of mothers of children with nephrotic syndrome toward recurrence of disease” clarified that, there was statistically significant difference between mothers of the studied children regarding their total knowledge in relation to nephrotic syndrome.

The study of, which was about “Assessment of mothers’ practices toward children with steroid-sensitive nephrotic syndrome at pediatrics hospitals in Baghdad city college of nursing, university of Baghdad” showed that, there was highly statistically significant difference between perceived social support to nephrotic syndrome children in relation to (there is family that tries to help, have friends with whom can share joys and sorrows and can talk about problems with friends) pre and post intervention.

This was in agreement with whose study was about “Psychological status of both children with the nephrotic syndrome or acute glomerulonephritis and their parents” clarified that, there was statistically significant difference between the studied children regarding their self-improvement activities in relation to (reading and doing homework) and their physical activities in relation to (performing activities and team sports).

This was supported by who studied “Health-related quality of life and psychosocial adjustment in steroid-sensitive nephrotic syndrome” mentioned that, there was statistically significant difference between the studied children regarding their participation and enjoyment throughout the pre and post intervention.

This was supported by, who studied “Correlations between performance on neuropsychological tests in children with nephrotic syndrome “mentioned that, there was statistically significant difference between the studied children regarding their emotional negative feelings pre and post intervention.

**Conclusion**

The result of the present study concluded that Supportive care activities as, social support, recreational Activities, Social Activities, Self-improvement Activities, Active Physical Activities, Skill-based Activities intervention prevent the negative emotional feelings of Nephrotic syndrome children, namely, Emotion liability, Negativity dimension and Emotion Regulation dimension.

**Recommendations**

In the light of the study findings, the following recommendations are suggested:

1. Encourage use of Supportive care activities programs periodically for children with nephrotic syndrome disease and their mothers based upon their actual assessment to help them to prevent the negative emotional feelings of Nephrotic syndrome children.
2. Further studies should be conducted to study risk factors of rapid progression of the negative emotional feelings of Nephrotic syndrome children.
3. Availability of multidisciplinary team of supportive care as well as follow-up out-patient clinic that include pediatric nurses, renal physicians, social workers, dietitian, psychotherapists and physiotherapist to assist children and their families in maintaining near normal lifestyle at highest possible level of emotional feeling.

**Conflict of Interest:** Nil

**Source of Funding:** Self

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Building the Politics of the Law of Protection of Well-Known Drug Brands in Indonesia

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Abstract

Introduction: Utilization of well-known drug brands in bad faith at this time is increasingly rampant and leads to losses to both consumers and owners of such well-known brands.

Research Objective: The purpose of this study is to analyze and find the political formulation of the law of protection of well-known drug brands from the act of passing off in Indonesia.

Research Method: This research uses a normative juridical research approach because it seeks to examine the legal politics related to Law Number 20 of 2016 on Brand and Geographical Indications.

Research Results: Protection of well-known drug brands in Indonesia based on Law Number 20 of 2016 on Brand and Geographical Indications, consisting of brand scope, actual use, nature of goods, announcements, rights granted, application requirements to obtain brand certificates, transfer and licenses, and brand registration. The politics of the protection of well-known drug brands in the future, that in accommodating the passing off of well-known drug brands in Indonesia, it is necessary to protect holders of well-known brand rights in Indonesia.

Keywords: Legal Protection; Political Law; Famous Drug Brands.

Introduction

In the face of free markets, Indonesia needs various implementations as an action to carry out the plan that has been made. One of the implementations of The Indonesian state and society towards the 2020 free-market era is to become a free open market for goods and services both intellectual creativity of individuals and foreign companies. The trend of increasing trade in goods and services will continue in line with the increasing national economic growth. Like other human intellectual goods and creativity, it is necessary to acknowledge and reward the legal order called intellectual property law. One form of intellectual property rights is a brand specifically regulated in Law Number 20 of 2016 on Brand and Geographical Indications¹.

The use of well-known brands in bad faith at this time is increasingly rampant and leads to losses to both consumers and owners of such well-known brands. The success and high reputation of a company with products and also brands attached to the product often tempts other parties who have bad intentions to deal with in ways that violate business ethics, norms of decency, and the law².

Acts that try to gain profit by brand-blocking so that it can cause deception, misdeeds, or violations of the brand as above is known as passing off. Passing off over a well-known brand today can only be said to be a reputational hitch that leads to fraudulent competition conducted by irresponsible manufacturers³. The form of passing off action can give an idea, among others, the likelihood of confusion, mistake, or deception, namely there is a form of a brand that resembles or has similarities with well-known brands.
The problem that is often encountered in IPR, especially in the field of brands is the emergence of unhealthy business competition. Basically, with Indonesia’s participation in the WTO which includes the TRIPs Agreement, it indirectly means agreeing to a world competition plan in the framework of free trade. One of the consequences of participation is how to prepare businesses in Indonesia to be able to conduct business competition honestly and healthily in the global market. This can only be realized if the government can provide a sense of fairness and legal certainty to unhealthy business competition practices. Unhealthy business competition practices have had widespread impacts in various fields, including imported drugs. This is a very concerning issue considering the provision of drugs is one of the efforts of public health services. Everyone has the right to a level of life that ensures health and good health for himself and his family, including food, clothing, boards, and health services as well as necessary social enterprises, and is entitled to guarantees at a time of unemployment, illness, disability, widows/widowers, the elderly or experiencing other lack of living because of circumstances beyond his control.

An example of a well-known drug brand dispute case is between PT. LAPI and PT. GRAHA FAJAR FARMACEUTICALLABORATORIES. PT. LAPI which has the trademark “LAMESON” with Trademark IDM000234288 (Extension of Number471636) for the type of goods: “Pharmacy preparations, ingredients for hand-feeding/diet tailored for medical use, healthy food/food supplement and herbs” which belongs to the class 5 that filed a lawsuit against PT. GRAHA FAJAR FARMACEUTICALLABORATORIES which has a trademark “FLAMESON” with the number IDM00008448 for the type of goods: “Cleaning cotton, plasters and adhesive tapes for medical purposes, odor removal/neutralizer preparations, air fresheners and air purifiers, anti-parasitic preparations, anti-septic cotton, anti-septic, sterile cotton, medium for bacterial breeding, Hygienic pads, sanitary napkins, wound dressings, blood for medical purposes, blood plasma, camphor and camphor oil for medical purposes, deodorant other than for personal use, sanitary napkins for hygiene purposes, sanitary pads for medicine and surgery, fungal dressings, gases for medical purposes, gauze to bandage, diapers or pants for people who are powerless to withstand urination or large, carbolic, fuel and liquid mosquito repellents, insect repellents, exterminators (materials), disinfectants (ingredients), flea repellents (germs), moss exterminator (material), bandages, insect repellent preparations, preparations to eradicate destructive animals, preparations to eradicate bad plants” which also belong to class 5.

The laws governing passing off specifically in Indonesia to date do not exist because Indonesia adheres to the Civil Law legal system. This legal system uses basic divisions into civil law and public law, both of which are not known in the common law system. Directorate General of Intellectual Property Rights only handles passing off cases that indicate a violation of a brand that has a good intention, such as an equation in essence or whole (using a certain form, look (packaging), or design or logo of a particular brand. Therefore, it is important to make a study on the legal politics of drug brand protection in Indonesia.

Given the study of the politics of law leads to law enforcement, in particular protecting IPR, in this case, well-known brands from brand violations including passing off actions, then it should be legal politics to enforce the protection of well-known brands against the act of passing off against the community needs to be realized. From the above problems, the purpose of this research is to analyze and find the political formulation of the law of protection of well-known drug brands from the act of passing off in Indonesia.

**Research Methodology**

The research approach that will be used in this research is the normative juridical approach, which is carried out based on the main legal materials, which include ways to study the theories, concepts, legal principles, and laws and regulations related to this research. Also, the use of normative juridical approaches related to the purpose of the study that seeks to examine the politics of law relating to Law Number 20 of 2016 on Brand and Geographical Indications along with regulations related to the law related to the act of passing off, such as impersonation or denotation of the reputation of well-known drug packaging that has the insecurity of packaging impersonation.

**Discussion**

According to Article 1 of Law Number 36 of 2009, that drug is an ingredient or alloy of ingredients, including biological products used to influence or investigate the physiological system or state of pathology in the determination of diagnosis, prevention, healing,
recovery, improvement of health and contraceptives for humans.

By the Regulation of the Minister of Health of the Republic of Indonesia Number 917/MENKES/PER/X/1993 concerning Mandatory List of Finished Drugs in Article 1 Part 3 that drugs can be grouped into several groups. Classification intended for increased safety and provision of use and security of distribution consisting of over-the-world drugs, limited over-the-world drugs, mandatory drug pharmacies, hard drugs, psychotropics, and narcotics.

Included in the group above are drugs made with chemicals and/or with materials from plant and animal elements that have been categorized as medicinal ingredients or mixtures/alloys both, so that in the form of synthetic drugs and semi-synthetic drugs, respectively. Herbal medicine/traditional (TR) is not included in this group.

Classification of drugs based on marking on the packaging of the drug consists of First is an over-the-world drug can be purchased freely without a prescription and can be purchased at pharmacies and licensed drug stores to overcome (minor illnesses) that are nonspecific. Over-the-top medicine is relatively safe, can be used to deal with mild symptomatic diseases that are widely suffered by the general public whose treatment can be done alone by the sufferer or self-medication (self-treatment or self-medication). The drug has been used in scientific (modern) drug and is shown to have no risk of alarming harm. Marking on the packaging: dot a green circle with a black border. Examples: Oralite, some analgetic or pain killer (painkillers) and some antipyretics (heat-lowering drugs) such as paracetamol, ibuprofen, aceosal (aspirin), some vitamin and mineral supplements/multivitamins such as vitamin C, and vitamin B complex, antacid DOEN, eucalyptus oil, liniment, outer wound medicine, and so on.

Second, is a limited over-the-free drug also called drug list W (W: Waarschuwing= warning/alert) is a hard drug that can be purchased without a doctor’s prescription but its use should pay attention to the drug information on the packaging. In the sale has a limit on the amount and content level must be accompanied by a warning sign, warning P1 - P6. Restricted can only be purchased at pharmacies or licensed drugstores. Restricted over-the-world drugs are relatively safe as long as they comply with the rules of use.

Third, is hard drugs (Drug list G or “Gevaarlijk”, dangerous) including also psychotropics to obtain it must be by prescription and can be purchased at a pharmacy or hospital. However, there are hard drugs that can be bought in pharmacies without a doctor’s prescription that is handed over by pharmacists called Mandatory Medicine Pharmacy (OWA) such as linestrenol, antacids, salbutamol, bacitracin cream, ranitidine, and others.

All types of drugs require a brand in the process of trading. Brands distinguish products from competitor’s products. The brand will provide identification that a product different from other products. Product identification is also useful when sending and promotions. Adding value to the product, consumers see the brand as a benchmark and add value to a product. Brands can add an image of a product. Consumers also tend to choose branded products because more trustworthy, the origin of the product can be shrinking. The need to manage the brand will be more felt by Small Business entrepreneurs who will open branches. The brand is part of intellectual property rights.

The term Intellectual Property Rights (IPR) was first used in 1790, then in 1793. Fichte says the creator’s property rights are in his book. The property in question is not a book as an object, but a book in the sense of its contents. The term IPR consists of three keywords, namely Rights, Property, and Intellectual. Wealth is an abstraction that can be owned, transferred, bought, or sold. Intellectual Property is the property of all the production of intelligence of thought, such as technology, knowledge, art, literature, song composition, writing, caricature, and so on. IPR is also the right, authority, or power to do something about such intellectual property, leading to the politics of the law (leading to the regulation of applicable norms or laws).

So far there are still various opinions including the mention of the term IPR with Intellectual Property Rights/ Hak Milik Intelektual (HMI). One of them is William Fisher who concluded that there are four approaches related to the regulation of Intellectual Property Rights, including: that the regulation of property rights should be maximized for the welfare of many communities thereby should be optimized the balance between the power of exclusive rights that creators have to encourage creation and discovery, as well as the right of the public to acquire or enjoy a creation. This view was influenced by utilitarians Jeremy Bentham and John Stuart Mill. Furthermore, this view was developed by Posner in the
theory of economic analysis of law (theory of economic analysis of law). This theory is a new theory that has an impact on civil law adherents such as Indonesian law. Through economic principles, Posner hopes to improve legal efficiency including efficiency in improving social welfare (social welfare). In the principle of efficiency, Posner emphasizes “pareto improvement” where the purpose of the legal arrangement can provide valuable input for justice and social welfare. According to Posner sees an optimistic future and believes that judges can create good law/liberal law if they diligently adore social change and external changes with a clear goal, namely the efficiency of the judge’s ruling. Furthermore, the depiction of economic viewpoints on the law gave birth to the behavior of law and economy. This behavioral principle is applied in a plural society, which is impossible to avoid transaction fees. The impact of the rule of law is one of the musts that can provide legal certainty and maintain a sense of social justice in society. These rules can be in the form of contracts and arrangements regarding the limits of ownership and property rights directed at achieving social welfare. This view is based on the proposition that a person who has struggled to pour all his abilities or expertise to create something is naturally entitled to his efforts. This approach is derived from Kant and Hegel’s writings which state that individual property rights are crucial in providing a sense of satisfaction in some human needs. This approach is based on the proportion that property rights in general and intellectual property rights in particular, can and should be established to help promote the achievement of justice and attractive culture.

The development of IPR, one of which is the Brand, until now has not been encouraging, for example, seen from the rampant violations, especially against well-known Brands. Explanation of the Brand is certainly inseparable from goods and services in commodity trading. Commodity trading characterized by the existence of a Brand certainly has a selling value that economically can help the income of the community, individuals, or legal entities in obtaining profit. Traded brands have a variety of shapes and advantages to attract consumers interested in buying them.

The establishment of IPR law, especially the Brand is sought to remain oriented to the interests of the national IPR, although the provisions of Trade-Related Aspects of Intellectual Property Rights (TRIPs) cannot be ignored. TRIPs are an instrument of international law, although TRIPs are not the starting point for the concept of intellectual property rights. Various International Conventions have long been born, and have been changed several times. The main and also significant basis of the concept of Industrial Property is the Paris Convention for the Protection of Industrial Property (Paris Convention).

TRIPs contain four groups of settings. First, that associates Intellectual Property Rights with the concept of international trade. Second, which requires member states to comply with the Paris Convention. Third, set your own rules or conditions. Fourth, which is a provision for things that generally include law enforcement efforts contained in the legislation of member states. Indonesia’s newest Brand Law, namely Law Number 20 of 2016 on Brand and Geographical Indications as a modifier of the old Brand Law (Law Number 19 of 1992 on Brands amended into Law Number 14 of 1997 on Brands then changed again to Law Number 15 of 2001 on Brands) has adopted the provisions of trips. The provisions of trips as outlined in the contents of Law Number 20 of 2016 on Brand and Geographical Indications are as follows:

1. **Scope:** The brand includes brands and geographical indications (article 2 paragraph (1)), which are protected consisting of signs in the form of images, logos, names, words, letters, numbers, color arrangements, in the form of two dimensions and/or 3 (three) dimensions, sounds, holograms, or a combination of two or more elements to distinguish goods and/or services produced by people or legal entities in the activities of trading goods and/or services (article 2 paragraph (3)). The brand is used to mark the resulting goods to indicate the origin of the goods (indication of origin). A brand may be regarded as a stamp, mark, spirit, for an item or service. A trademark is any mark or combination of marks capable of distinguishing goods or services from one entity to another. These marks include words, including individual names, letters, numbers, figurative elements, and color combinations, as well as combinations of marks.

Member states may establish registrations based on differences through use if such signs do not sufficiently cause discrepancies in certain goods or services. Even member states can require that the signs be “virtually perceptible”. This provision makes it possible to register shapes (shapes), even smells (smells) as Brand.

2. **Actual Use:** The State may assign registrations
based on actual use, but the actual use of the Brand should not be used as a condition for registration submissions, in other words, the application for registration should not be rejected solely because the planned use is not carried out before the expiration of the three years from the date of application. This is the basis of national regulation, including Indonesia regarding the right to the Brand to be abolished if not used three years continuously.

3. **Nature of Goods**: The nature of the goods or services should not be the reason for the rejection of the registration of the Brand.

4. **Announcement**: The State regulates that before registration, brands are published or announced in advance (article 14) to provide opportunities for other parties wishing to submit objections (disclaimer) to the application for registration of the Trademark as set out in article 16. This provision is the implementation of the principle of openness, as a balance of exclusive rights enjoyed by rights holders.

5. **Rights Granted**: As in other areas of intellectual property rights, the owner of the Brand has exclusive rights to prevent others, without his permission to use identical (identical) or similar (similar) Brands for trade purposes, and in such case, a likelihood confusion shall be presumed, so the key is identical, similar, and likelihood of confusion.

6. **Application Requirements for Obtaining a Brand Certificate**: Each party may apply for an official passage of a registered Brand certificate by paying a fee. In the case that the issued Brand certificate is not taken by the owner of the Brand or its Agent within a period of not later than 18 (eighteen) months from the date of issuance of the certificate, the registered Brand shall be deemed withdrawn and abolished.

7. **Transfer and License**: The right to registered Brand may be transferred or transferred due to inheritance, wills, endowments, grants, agreements, or other reasons justified by law (article 41 paragraph (1)). Registered Brand Owners may grant Licenses to other parties to use the Brand either in part or all types of goods and/or services (article 42). Registered Trademark Owners who have granted licenses to other parties as referred to in Article 42 paragraph (1) may still use themselves or grant licenses to third parties to use the Brand unless otherwise promised.

The State may set the terms of Trademark transfer and the licensor shall be requested to register it with the Minister at a cost. Mandatory licensing has occurred in the United States in the case of Rea Lemon about business competition policy. Defendant company is a company that owns a well-known Brand and controls 75% of the market for the goods. Parodying with a mandatory license on patents, and to achieve healthy competition in the field of lemon juice order, the Federal Trade Commission (FTC) requires the company to give the Rea Lemon Brand for ten years to others with an open offer to interested parties. The FTC sets royalty at 11½%. Apart from this mandatory license, the WTO does not accept the concept.

8. **Brand Registration**: The Brand cannot be registered if: contrary to state ideology, legislation, morality, religion, decency, or public order; similar to, relating to, or simply mentioning the goods and/or services requested for registration; contains elements that may mislead the public about the origin, quality, type, size, sort, the purpose of use of goods and/or services requested for registration or is the name of protected plant varieties for similar goods and/or services; contain information that is not following the quality, benefits, or efficacy of the goods and/or services produced; has no differentiating power; and/or; and is a common name and/or publicly owned emblem.

Constitutive principles (important elements) required the registration of a brand for a person or legal entity to obtain legal protection and recognition of the rights to the brand. Registration is carried out at the Directorate General of Intellectual Property Rights through the examination stage until it arrives at the stage of granting rights to the brand in the form of issuance of brand certificates (registered in the General List of Brands). However, the registration of this brand does not escape the possibility of registration without rights made by certain parties who have bad intentions (bad).

Unlicensed registration often occurs in well-known brands because well-known brands are usually attached to a reputation that makes certain parties with bad intentions try to make a profit by dosing or tarnishing the reputation of a well-known brand. This reputation even though intangible is a valuable asset for brand owners as well as for the law so it needs protection.

The registration of this bad-faith brand is often followed by the filing of a lawsuit in the form of
cancellation of the registration of the brand by the owner of the rights to the original brand. The existence of poor-faith registration and claims of brand cancellation by the original brand owner became the basis for the need to research to see the suitability of the application of the procedure of granting rights to the brand in the Directorate General of Intellectual Property Rights with the brand law governing it.

As it is known that in the business world the main goal is to make a profit, then many industries that do not understand the importance of the relationship between entrepreneurs, consumers, and society will behave profit-oriented solely regardless of other aspects but more concerned with their interests regardless of the interests of the other parties and who encourage them to do so is the availability of consumers who use their products.

Businesses that see it as one of the business opportunities will try to profit through unworthy shortcuts by creating or marketing goods or products by counterfeiting or imitating well-known brands and for consumers is a prestige when using such well-known brands.

Pseudo prestige factor from consumers who feel proud to use well-known brands, especially products from abroad (label minded) is also very affecting and at the same time beneficial for counterfeiting brands, because it gets the opportunity to satisfy the desire of the public through original but fake brands or brands similar to well-known brands, by producing products that are often deliberately tailored to the purchasing power of consumers who want to wear well-known brands but cannot buy them so that they buy original but fake brands as long as they can still prestige. This triggered businesses to make a reputation for selling goods with well-known brands.

The regulation regarding passing off (passing off) in Law Number 20 of 2016 on Brand and Geographical Indication is not yet visible. This is because in Indonesia’s literature previously the act of passing off is not widely known either the definition or in detail the description of the form of action. While this is concluded is that passing off is an act of hitchhiking on a well-known brand. In contrast to the common law system countries, such as the United States, United Kingdom, Singapore, Malaysia, or former colonies of the British empire has first known and regulated what is meant by passing off as a form of unfair completion (unfair completion) in the field of trade.

In accommodating the passing off of well-known brands in Indonesia, it is necessary to protect well-known brand rights holders in Indonesia. Such protections are in the form of regulation of laws banning monopoly and unhealthy business competition or antitrust laws or more specifically in the law on brands by the Government of Indonesia. Unfortunately, in Law Number 5 of 1999 on Prohibition of Monopoly and Unhealthy Business Competition the rules on passing off have not yet appeared and are regulated rigidly. The regulation in Law Number 5 of 1999 concerning Prohibition of Monopoly and Unhealthy Business Competition, implies the main point that the existence of antitrust regulations is intended only to ensure that there are adequate clauses on business competition in the market openly or closed on goods or services and prevent a business entity from becoming strong through monopoly practices, monopsony, market mastery, and conspiracy. Therefore, it is necessary to note for the Government of Indonesia in the future so that passing off is regulated also in it.

Related to the act of passing off of a well-known brand is illegal and if the brand that carried out the defection is registered with the Director-General of Intellectual Property will also be rejected because it is considered as a brand that has similarities in essence. The basis of its rejection is contained in Law Number 20 of 2016 on Brand and Geographical Indications, Article 21 paragraph (1), plus paragraph (3) if the registration is done in bad faith

Furthermore, it is also necessary to add to existing laws, among others, philosophical elements at the time of the registration process. The philosophical element is given as the intent of resistance from bad faith. Businesses should be able to give a sign labeling a product as a representation of the reputation of the product. This is done considering that giving a brand name to a product is not easy. Especially when giving a brand name to the creation of his work made with energy, time, mind, and capital that is not a little. Another consideration is that a brand is not allowed to have a multi-interpretation of the understanding of a well-known brand and similarities in essence or its entirety. The law on brand and geographical indications in the future should be able to provide certainty to the Judge about the extent to which a person can provide proof of public knowledge, vigorous promotion of the
brand, evidenced by anything and not providing a period of limitation of proof of brand registration.

The provisions of Article 21 above actually implied almost the same meaning as the act of passing off on a brand by a business person or business entity. The act of passing off itself is an act that undermines the reputation of a well-known brand. This is because well-known brands are already known to the general public for goods and services. Therefore the act of passing off can be analogized as an equality clause in essence. In the old law, this was regulated but clarified again in Law Number 20 of 2016 on Brand and Geographical Indications. However, the law is still unclear in explaining the passing off. Therefore it is expected that the upcoming brand laws regarding the elements of passing off actions, philosophical elements, and the existence of multi-interpretation of well-known brands and similarities in essence or whole can be detailed in detail and clearly.

The use of products with certain brands in addition to the goodwill owned by the brand itself in addition to the fanatical nature of consumers towards the brand is considered to have the advantages or advantages of other brands. The fanatical nature of consumers is not only to meet the needs, but there is also a priority of prestige and gives the impression of the wearer so that by using their perception is a “symbol” that will give rise to a new lifestyle.

There are differences in perceptions in society about brands giving rise to various interpretations, but even so means that the actions of people who produce an item by taking the fame of others can not be justified just like that, because by allowing irresponsible actions it indirectly produces and justifies someone to deceive and enrich themselves dishonestly. The act of using well-known brands owned by others, as a whole is not only detrimental to the owner or holder of the brand itself as well as the consumers but the broader impact is detrimental to the national economy and more broadly also harms international economic relations.

**Conclusion**

A drug is an ingredient or alloy of ingredients, including biological products used to influence or investigate the physiological system or state of pathology in the determination of diagnosis, prevention, healing, recovery, improvement of health, and contraceptives for humans. Drug brands in Indonesia are protected by Law Number 20 of 2016 on Brand and Geographical Indications as a modifier of the old Brand Law (Law Number 19 of 1992 on Brands which was amended into Law Number 14 of 1997 on Brands then changed again to Law Number 15 of 2001 on Brands) has adopted the provisions of TRIPs. Brand laws include brand scope, actual use, nature of goods, announcements, rights granted, application requirements for obtaining brand certificates, transfer and licensing, and brand registration. The politics of the protection of well-known drug brands in the future, that in accommodating the passing off of well-known drug brands in Indonesia, it is necessary to protect holders of well-known brand rights in Indonesia. Such protections are in the form of regulation of laws banning monopoly and unhealthy business competition or antitrust laws or more specifically in the law on brands by the Government of Indonesia. Furthermore, it is also necessary to add to existing laws, among others, philosophical elements at the time of the registration process.

**Ethical Clearance:** Yes.

**Conflict of Interest:** No

**Source of Funding:** Authors

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Factors Associated with Disaster Response Competency of Nursing Students in Graduation Years

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Abstract

Background: This study was conducted to provide the basis for the disaster nursing curriculum through grasping the degree of disaster preparedness attitude and disaster response competency of the senior nursing student.

Method: Data was collected through a questionnaire for senior nursing students from five universities in South Korea. A total of 168 data were analyzed through the IBM SPSS 25.0 program.

Finding: Disaster response competency were most strongly predicted by “satisfied” major satisfaction, followed by “average” major satisfaction, “realization of good deeds” motivation, “yes” experience of disaster education. The explanatory power by these variables was 19.7%.

Conclusion: The results of this study suggested that the experience of disaster education is important to improve the disaster response competency of nursing students. In preparation for disasters that are unpredictable and lead to serious resource shortages, nursing colleges will have to make efforts to provide sufficient education and training.

Keywords: Disaster, Graduation, Nursing students, Preparedness attitude, Response competency.

Introduction

Disasters result in numerous human and property loss, and even extreme stress and health problems for contemporaries who experience them indirectly¹. In Korea, the establishment of a national disaster management system since 1995 has led to a multi-disciplinary interest in disaster-related research, which is no exception in the field of nursing², ³. Disaster education in Korean nursing began in 2005 at the Armed Forces Nursing Academy, and disaster nursing is also operated with a large proportion⁴. There are also survey items on disaster management in the certification assessment standards of medical institutions, and we strive to improve nurses’ disaster nursing competency by conducting regular disaster training and training on our own⁵. However, disaster preparedness education for nurses is partially conducted, and disaster preparedness education for nursing colleges is insufficient⁶. Disaster nursing is the systematic use of professional knowledge and skills to provide the nursing activities required by the subject to reduce the risk of life and health caused by the disaster⁷. In the event of a disaster, the need for medical workforce increases, so there should be a vast and diverse workforce suitable for the response system according to the magnitude of the damage⁸. In this respect, nurses should have attitudes and competency to various possible disasters. In order for nurses to be able to prepare for disaster situations, the nursing curriculum needs to include disaster competency training⁹, but most universities still address disaster nursing partially in
some subjects such as emergency care and community care.

Nurses play a very important role as severity classification and first aid providers, care providers and mental health counselors at a time when there is a growing demand for health care due to many patients in the event of a disaster. However, nurses were reported to have insufficient experience in disaster-related education and low disaster response competency. Because disasters occur unexpectedly and cannot be learned directly from experience, disaster response competency requires systematic education and training in advance, which is necessary from nursing students when basic education begins.

Therefore, this study aims to provide basic data for the development of disaster nursing education courses and programs by identifying disaster preparedness attitude and disaster response competency for the senior nursing students and identifying factors affecting disaster preparedness.

**Method**

**Study Design:** This study is a correlation survey study attempted to identify the disaster preparedness attitude and competency of the senior nursing student and to identify the factors affecting the disaster response complication.

**Participants:** The subjects of this study were students in the fourth grade (graduation grade) who were attending the nursing department of five domestic universities. The number of samples was calculated as significant level .05, power .95, effect size 0.15 and predictors 8, referring to the preceding study of disaster experience and disaster preparedness of nursing students. Using the G*power 3.1.9 program, the minimum number of samples required for regression was 160.

**Measurements:** The disaster preparedness attitude was measured by a tool developed by Moabi. This tool consists of a total of 11 items, and four negatives were reversed. The higher the score on the Likert 5-point scale, the better disaster preparedness attitude. The time of tool development, the reliability of Cronbach’s α was .82 and the reliability of the instrument as assessed by Cronbach’s alpha was .78 in the study. The disaster response competency was measured by Huh as well as the contents provided in ICN Disaster Nursing Capacity Framework and the nurse’s disaster response tool developed by An et al. The tool consists of four sub-regions: disaster prevention (6items), disaster response (7items), disaster copy (10items), and disaster rehabilitation and recovery (3items) total 26 items. The higher score on the Likert 5-point scale, the higher the disaster response competency. In Hu’s study, the reliability of Cronbach’s α was .92, and in this study the reliability of Cronbach’s α was .96.

**Data Collection:** Data were selected from September 10 through October 15, 2020. For data collection, the purpose, procedures and method of this study were first explained to the director of the nursing college and then the survey was approved. Using the online questionnaire, we explained the purpose and method of the study and collected data from those who agreed to participate in the study. Online questionnaires were distributed in the form of access URLs via SNS of senior nursing students from five universities who had obtained consent to the survey. An anonymous questionnaire was used that did not include identifiable personal information.

**Statistical Analysis:** The data was analyzed using IBM SPSS 25.0. Of the 177 questionnaires returned, 9 questionnaires were excluded for having missing data. General characteristics, disaster preparedness attitude and competency were analyzed using frequency, percentage, mean, and standard deviation. The differences in disaster response competency according to characteristics were analyzed using independent t-tests or one-way ANOVA with Scheffé test for post-hoc analysis. The correlations between disaster preparedness attitude and disaster response competency were analyzed using Pearson’s correlation coefficient. The factors associated with disaster response competency were analyzed using a step-wise multiple regression analysis.

**Results**

**Characteristics and disaster response competency of nursing students in graduation years**

Female students accounted for 87.5% and 79.8% of those under the age of 25, with 96.4% showing more than average major satisfaction. Because of the good employment, nursing was the most common choice of department, and 69.0% said they were healthy. 85.7% had experience in disaster education, and most (97.0%) were aware of the need for disaster education (Table 1).

Disaster response competency has been found to be significantly high for those who show satisfaction with
their majors (F=14.12, p<0.001), those who have chosen nursing for their Realization of good needs (F=3.29, p=0.013), those who have experience in disaster education (t=2.80; p=0.006), and those requiring disaster education (t=2.45, p=0.016).

Table 1: Characteristics and disaster response competency of participants (n=168)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Categories</th>
<th>n (%)</th>
<th>Disaster response competency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>M ± SD</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>21 (12.5)</td>
<td>76.24±24.11</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>147 (87.5)</td>
<td>85.95±15.09</td>
</tr>
<tr>
<td>Age (yr)</td>
<td>&lt;25</td>
<td>134 (79.8)</td>
<td>86.14±14.41</td>
</tr>
<tr>
<td></td>
<td>≥25</td>
<td>34 (20.2)</td>
<td>79.18±23.13</td>
</tr>
<tr>
<td>Major satisfaction</td>
<td>Unsatisfied a</td>
<td>6 (3.6)</td>
<td>54.33±22.60</td>
</tr>
<tr>
<td></td>
<td>Average b</td>
<td>54 (32.1)</td>
<td>82.24±15.47</td>
</tr>
<tr>
<td></td>
<td>Satisfied c</td>
<td>108 (64.3)</td>
<td>87.67±15.15</td>
</tr>
<tr>
<td>Motivation for choosing</td>
<td>High school grades a</td>
<td>13 (7.7)</td>
<td>75.00±20.40</td>
</tr>
<tr>
<td>the department of nursing</td>
<td>Aptitude b</td>
<td>41 (24.4)</td>
<td>83.93±14.05</td>
</tr>
<tr>
<td></td>
<td>Accessible job c</td>
<td>75 (44.6)</td>
<td>85.59±14.48</td>
</tr>
<tr>
<td></td>
<td>Recommendation d</td>
<td>27 (16.1)</td>
<td>82.48±20.09</td>
</tr>
<tr>
<td></td>
<td>Realization of good deeds c</td>
<td>12 (7.1)</td>
<td>97.75±19.60</td>
</tr>
<tr>
<td>Health status</td>
<td>Good</td>
<td>116 (69.0)</td>
<td>84.96±17.34</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>45 (26.8)</td>
<td>84.16±15.53</td>
</tr>
<tr>
<td></td>
<td>Bad</td>
<td>7 (4.2)</td>
<td>84.57±15.21</td>
</tr>
<tr>
<td>Experience of disaster</td>
<td>Yes</td>
<td>114 (85.7)</td>
<td>86.17±16.98</td>
</tr>
<tr>
<td>education</td>
<td>No</td>
<td>24 (14.3)</td>
<td>76.08±11.91</td>
</tr>
<tr>
<td>Need for disaster</td>
<td>Yes</td>
<td>163 (97.0)</td>
<td>85.28±16.56</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>5 (3.0)</td>
<td>67.00±11.66</td>
</tr>
</tbody>
</table>

* Scheffé post hoc

**Disaster preparedness attitude and disaster response competency of participants:** The disaster preparedness attitude of the graduate nursing college student was confirmed to be 38.77±3.95 points on average on a scale of 44 points. The disaster response competency averaged 84.73±16.70 points on a total score of 130 points. In the lower section, the competency for disaster rehabilitation and recovery was found to be the highest level (Table 2).

Table 2: Disaster preparedness attitude and disaster response competency of participants (n=168)

<table>
<thead>
<tr>
<th>Scale items</th>
<th>Number of items</th>
<th>Possible score range</th>
<th>Mean±SD</th>
<th>Mean±SD Number of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disaster preparedness attitude</td>
<td>11</td>
<td>11-44</td>
<td>38.77±3.95</td>
<td>3.52±0.36</td>
</tr>
<tr>
<td>Disaster response competency</td>
<td>26</td>
<td>26-130</td>
<td>84.73±16.70</td>
<td>3.26±0.64</td>
</tr>
<tr>
<td>Prevention</td>
<td>6</td>
<td>6-30</td>
<td>19.57±4.36</td>
<td>3.26±0.73</td>
</tr>
<tr>
<td>Preparedness</td>
<td>7</td>
<td>7-35</td>
<td>22.89±4.94</td>
<td>3.27±0.71</td>
</tr>
<tr>
<td>Cope</td>
<td>10</td>
<td>10-50</td>
<td>32.07±6.72</td>
<td>3.21±0.67</td>
</tr>
<tr>
<td>Rehabilitation and recovery</td>
<td>3</td>
<td>3-15</td>
<td>10.20±2.31</td>
<td>3.40±0.77</td>
</tr>
</tbody>
</table>

**Correlations between disaster preparedness attitude and disaster response competency:** The higher level of disaster preparedness attitude of participants, the higher level of ability related to disaster prevention and recovery (r=0.20, p=0.011; r=.19, p=0.012). Therefore, disaster preparedness has a significant amount of correlation with total disaster response competency (r=6.12, p=6.02).
Table 3: Correlations between disaster preparedness attitude and disaster response competency (n=168)

<table>
<thead>
<tr>
<th></th>
<th>Disaster prevention</th>
<th>Disaster preparedness</th>
<th>Disaster cope</th>
<th>Disaster rehabilitation and recovery</th>
<th>Disaster response competency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disaster preparedness attitude</td>
<td>0.07 (0.354)</td>
<td>0.20 (0.011)</td>
<td>0.13 (0.084)</td>
<td>0.19 (0.012)</td>
<td>0.16 (0.042)</td>
</tr>
</tbody>
</table>

Factors associated with disaster response competency: In order to identify the factors influencing the disaster response competency of the senior nursing student, multiple regression analysis was conducted by injecting significant variables among the characteristics of the target and disaster preparedness attitude. The variables for Major satisfaction, motivation for choosing the department of nursing (motivation), experience of disaster education, need for disaster education, and need for disaster education were converted to dummy variables and statistical analysis was conducted. There were no problems with the autocorrelation (Durbin-Watson=1.742) and the multicollinearity (tolerance=0.15–0.99; VIF=1.01–6.82) in the implementation of multi-recursive analysis.

The regression model was significant (F=11.29, p<0.001), and average to satisfied major satisfaction, choosing nursing major for realization of good deeds, experience of disaster education were found to be significant predictors of disaster response competency. The adjusted R2, indicating the model’s explanatory power, was 19.7%. Disaster response competency were most strongly predicted by “satisfied” major satisfaction (β=0.97), followed by “average” satisfaction (β=0.77), “realization of good deeds” motivation (β=0.18), “yes” experience of disaster education (β=0.18) (Table 4).

Table 4: Factors associated with disaster response competency (n=168)

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>SD</th>
<th>β</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major satisfaction_satisfied*</td>
<td>31.85</td>
<td>6.29</td>
<td>0.97</td>
<td>5.06</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Major satisfaction_average*</td>
<td>27.57</td>
<td>6.45</td>
<td>0.77</td>
<td>4.28</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Motivation_realization of good deeds*</td>
<td>11.90</td>
<td>4.50</td>
<td>0.18</td>
<td>2.65</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Experience of disaster education*</td>
<td>8.77</td>
<td>3.33</td>
<td>0.18</td>
<td>2.64</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>R²/Adjusted R²</td>
<td>.216</td>
<td>.197</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F (p)</td>
<td>11.29</td>
<td>(&lt;.001)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Dummy variable; Major satisfaction (0=Unsatisfied), Motivation (0=High school grades), Experience of disaster education (0=No)

Discussion

In this study, in order to provide basic data on disaster preparedness, the disaster response competency and disaster preparedness attitude of the senior nursing student were identified and the influencing factors were presented. As participants in this study were fourth-grade nursing students ahead of graduation, their experience in disaster nursing education was confirmed by 85.7% who were higher than the preceding studies. In addition, most (97%) of those surveyed were aware of the need for disaster education. This is believed to be COVID-19, reflecting the present time in the infectious disaster situation, and to have shown a higher perception than the preceding studies.

In this study, the disaster response competency according to general characteristics was found to be significantly higher if disaster education experience was present, if disaster education was required. In the preceding study, disaster response competency was high if disaster-related education was received. Therefore, in order to enhance competency, it will be necessary to continuously provide disaster education.

In the disaster response competency of the senior nursing student, the competency for disaster rehabilitation and recovery was identified as the highest level in the sub-item. The study by Ann & Kim said that in order to demonstrate disaster preparedness, one needs to be confident about one’s ability through professional and
specific education. A study by Huh & Park suggested the need for various aspects of education in disaster nursing subjects, including trauma treatment, severity classification, and the use of protective equipment. Therefore, the training of disaster response competency will require more enhanced training for those areas by first identifying insufficient capabilities. The higher the level of disaster preparedness attitude of the senior nursing student, the higher the level of disaster response competency. This supports the results of a prior study that presents factors affecting the ability to perform disaster nursing as a perception of disaster.

Finally, Disaster response competency were most strongly predicted by “satisfied” major satisfaction, followed by “average” average, “realization of good deeds” motivation, “yes” experience of disaster education. This is consistent with the presentation of the need for disaster education in many preceding studies to enhance disaster response competency. Based on the research results, it can be suggested that disaster education be implemented as a realization of good needs through active participation and experience in nursing curriculum.

Although this study is meaningful in that it presents factors for improving disaster response competency, it is limited in generalizing the results because it involves limited participants. Further research is also required to verify additional variables affecting the disaster response competency, with the explanatory power of the variables identified in this study being low at 19.7%.

Conclusion and Recommendations

This study is meaningful in that it identifies the attitude and competency of the senior nursing student to prepare for disasters and presents the factors that affect the disaster response competency. Based on the results, I propose an integrated education program of theory and practice that can improve the disaster response competency of nursing college students. It also suggests attempts for qualitative research about the awareness, demand and satisfaction of disaster education of nursing students.

Ethical Clearance: Not required

Source of Funding: This study was supported by Changshin University Research Fund of Changshin-2020-023.

Conflicts of Interest: None

References


The Implementation of *Hypnobirthing* Effect on Pain Relief in the Intrapartum Period at Klinik Pratama Rakyat Hospital Makassar

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**Abstract**

The pain of childbirth is one of the factors that causes a mother to become anxious even to the point of despair, so mothers tend to choose a shortcut to speed up their childbirth, either by requesting an operation, or by taking a remedy to relieve the pain by taking an analgesic drug, whereas pain caused during childbirth is pathological because of the effects of changing uterus that creates pathways or openings.

The type of research is experimental quantitative research using *Quasi Experimental* method, namely experimental design with the observation design (measurement pain intensity) before and after treatment (*Hypnobirthing treatment*) which consists of the two group, namely the intervention group (*Hypnobirthing*) and the control group. Sampling was taken from June to August 2020 with the number of samplings intervention group (*Hypnobirthing*) as many as 20 respondents and the control group as 20 respondents. Data analysis method uses Univariate and Bivariate with t-test using SPSS Computer Program.

The results were obtained with the average of pain intensity in childbirth after being given *Hypnobirthing* had a decrease in pain while the control class was upgraded. The results of statistical test are presented *ρ valua* by 0.000 at the mistaken rate of (α) 5% or 0.05 (trust 95%) so value is ρ < α. The data indicated that there was a significant (apparent) of *Hypnobirthing* treatment in childbirth relief. The conclusion of this research was that there was a significant *Hypnobirthing* effect on the treatment of childbirth at Klinik Pratama Rakyat Hospital. That was expected for midwife duty at Klinik Pratama Rakyat Hospital to adopt the method of *Hypnobirthing* to assist the mothers with normal childbirth.

**Keyword:** Pain, Normal Childbirth, Intrapartum, Hypnobirthing.

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**Introduction**

The delivery process is a series of events that begins with the expulsion of the baby at term or near term, accompanied by removal of the placenta and fetal membranes from the birth canal. Problems that occur in the process of childbearing often have an impact on the death of both mother and fetus. The Maternal Mortality Rate is an indicator to see the degree of women’s welfare and the target set in the Millennium Development Goals (MDGs) development goal 5, namely improving maternal health, which targets to be achieved by 2015. The number of maternal deaths or 102/100,000 births life, therefore efforts to achieve these targets still require commitment and continuous hard effort¹,²,³,⁴.

In the process of childbirth, of course, many things happen to the mother’s body and to the fetus’s body, one of which happens during childbirth is the pain that is felt...
by the mother, this is a normal or natural occurrence but many mothers do not understand that pain is good during childbirth, this is due to changes in the body, especially in the uterus, due to the influence of hormonal work that occurs during childbirth. There are many things that can be done by mothers to cope with feelings of pain during childbirth, including by adjusting the breathing patterns that are often taught during ANC but recently there are relaxation methods that can be done by mothers to overcome pain, one of which is “Hypnobirthing”\(^5,6,7\)

This childbirth relaxation method called “Hypnobirthing” was developed by a midwife named Lanny Kuswandi through Fr. Jacson in Australia who made her realize that women are very special human beings and in Indonesia this method began to spread. Hypnobirthing is a therapeutic method that uses hypnosis as a means to reach the client’s subconscious mind, so that the client can be directed to thoughts that are guided by the person who hypnotized them, so that the pain felt by the client can be channeled through a pleasant imagination and will reduce feelings pain that is being experienced. Pain during the intranatal period/delivery period is physiological pain or normal pain because the pain felt by the mother is pain caused by widening the birth canal or cervix, this is very necessary in the delivery process\(^8,9,10,11\)

**Material and Method**

The research design was a quasi experiment with a pretest design with a control class. In this design, the research was conducted 2x, namely before the experiment (pretest) and after the experiment (posttest). The sample in this study were 40 people, 20 intervention groups and 20 control groups. In the experimental group, a pre-test was carried out, then hypnotherapy was carried out then a post-test was carried out. Whereas in the control class only IEC was given to overcome labor pain without being given hypnotherapy and carried out a post tes

**Information:**

O 1: Measurement of labor pain before hypnotherapy
X: Hypnotherapy measures to reduce labor pain
O 2: Measurement of labor pain after hypnotherapy

**Result**

**Table 1: Distribution of Respondents based on Mother’s Gravid Intranatal with Normal Delivery**

<table>
<thead>
<tr>
<th>Mother gravid</th>
<th>Class Intervensi (Hyonobirthing)</th>
<th>Control class</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Multi</td>
<td>15</td>
<td>75,0</td>
<td>12</td>
</tr>
<tr>
<td>Primi</td>
<td>5</td>
<td>25,0</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100%</td>
<td>20</td>
</tr>
</tbody>
</table>

Based on table 1 the intervention group who had a birth history of more than one birth (Multi) were 15 people (75%) and the control group was 12 people (60%) and for mothers who had a first-time history of labor (Primi) as many as 5 people (25.0%) and the control group as many as 8 (40%).

**Table 2: Distribution of Respondents Based on the Level of Pain Experienced by Pretest Intrapartum Mothers in the Respondent Group**

<table>
<thead>
<tr>
<th>Pre test</th>
<th>Group responden</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intervention</td>
<td>Control</td>
</tr>
<tr>
<td>Moderate Pain</td>
<td>Count</td>
<td>6</td>
</tr>
<tr>
<td>Group responden</td>
<td>30,0%</td>
<td>5,0%</td>
</tr>
<tr>
<td>Severe Pain</td>
<td>Count</td>
<td>14</td>
</tr>
<tr>
<td>Group responden</td>
<td>70,0%</td>
<td>95,0%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>20</td>
</tr>
<tr>
<td>Group responden</td>
<td>100,0%</td>
<td>100,0%</td>
</tr>
</tbody>
</table>
Based on table 2, the results of the analysis of the level of pain before the intervention were carried out on the intervention group and the control group as many as 40 groups, who experienced moderate pain levels for the intervention group as many as 6 people (30%) and the control group 1 people (5.0%), while the group of mothers who experienced severe illness level were 14 people (70%) and from the control group were 19 people (95.0%).

Table 3: Distribution of Respondents Based on the Level of Pain Experienced by the Mother Intrapartum

<table>
<thead>
<tr>
<th></th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Post test</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate pain</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>Group responden</td>
<td>60%</td>
<td>20%</td>
</tr>
<tr>
<td>Severe pain</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>Group responden</td>
<td>40%</td>
<td>80%</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Group responden</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Based on table 3, the results of the analysis of the level of pain after the intervention were carried out. The intervention was carried out on the intervention group and the control group as many as 40 groups, who experienced moderate pain levels for the intervention group as many as 12 people (60%) and the control group 4 people (20%), while the group of mothers who experienced severe illness level were 8 people (40%) and from the control group were 16 people (80.0%).

Table 4: Results of Normality Test for the Intervention Group (Hypnobirthing) and the Control Group

<table>
<thead>
<tr>
<th>Variabel</th>
<th>Kelompok</th>
<th>Intervensi (Hypnobirthing)</th>
<th>Kontrol (Pemberian elusan)</th>
<th>Level of Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre test</td>
<td>Post Test</td>
<td>Ket.</td>
<td>Pre test</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0,168</td>
<td>0,147</td>
<td>Normal</td>
<td>0,164</td>
</tr>
</tbody>
</table>

Based on table 4 above, the results of the normality test using the one sample method above show that the sig. (2-tailed)> level of significance = 0.05 for both the intervention group and the control group, before and after the pre and post test.

Table 5: Results of T-Test Pre and Post Hypnobirthing Intervention Group and the Control Group on pain management intrapartum at the hospital. Primary People’s Clinic

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Intensitas Nyeri (Mea+ SD)</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>Perbedaan</td>
<td></td>
</tr>
<tr>
<td>Intervensi</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Hypnobirthing) Pre Test</td>
<td>20</td>
<td>7,25</td>
<td>1,118</td>
<td>4,723</td>
</tr>
<tr>
<td>Post test</td>
<td></td>
<td>6,35</td>
<td>.875</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre Test</td>
<td>20</td>
<td>8,00</td>
<td>858</td>
<td>2,979</td>
</tr>
<tr>
<td>Post test</td>
<td></td>
<td>7,45</td>
<td>1,146</td>
<td></td>
</tr>
</tbody>
</table>
The pain experienced by the mother during childbirth is due to changes in the physiology of the birth canal, where the uterus undergoes changes that occur in its muscles, especially the cervical area, which was originally thickened at the bottom of the cervix to become thin or begins to open, the muscles of the uterus, namely the upper and lower segments of the uterus are quite clear but with the effect of the contraction, the corpus and the service eventually change, namely the opening of the cervix which causes pain. The literature that supports this theory is the opinion that labor pain is caused by the process of cervical dilation, uterine ischemia and stretching of the lower uterine segment and compression of the nerves in the cervix\textsuperscript{12,13,14}.

That pain depends on the work and the large and small nerves that are in the root of the dorsal ganglion. The stimulation of the large nerves will increase the mechanism of the activity of the substance gelatinosa which results in the closing of the door of the mechanism so that T cell activity is inhibited and causes the delivery of stimuli to be obstructed. Stimulation of small fibers will inhibit the activity of the substance gelatinosa and open the door to the mechanism, thereby stimulating T cell activity which in turn will deliver pain stimuli\textsuperscript{15,16}.

In this study, the pain intensity of the respondents varied both in the intervention group with hypnobirthing and in the control group that was given counseling, meaning that hypnobirthing was not done. Based on table 5.1 above, in this study before hypnobirthing was carried out, respondents who experienced moderate pain and severe pain were aged respondents, it was found that respondents with age <20 years were the intervention group, namely 2 (10%) respondents while the control group was 0 (0%) respondents with 20-30 years of age in the Intervention group were 17 people (85.0%) and the control group were 20 people (100%) and from the age group over 30 years the intervention group was 1 person (2.5,%). produced in Magfiroh’s (2012) research in Adam and Umboh (2015) that the age of mothers who are <25 years old feels more severe pain than those aged 25-35 years. This is because a young person does not have enough experience with labor and pain, so they perceive pain to be heavier than older people. In addition, young people have a more intense pain sensory than mothers who have an older age. Youth tends to be associated with an unstable psychological condition that triggers fear and anxiety so that the pain you feel is getting stronger. Age is also used as a factor in determining tolerance to pain,\textsuperscript{5,9,12,17}

The hypnobirthing method is an attempt to naturally instill positive thoughts or give psychological suggestions or subconscious thoughts during childbirth and preparation for labor based on the belief that every woman has the potential to undergo a normal, calm and comfortable birth process. The basis of hypnosis is the use of our ability to directly access the subconscious. Usually we are only aware of the thoughts that are in our conscious mind. We are consciously focused. to something in front of our eyes, we consciously speak and say words, or consciously we try to remember what we have done. But when doing these things, the conscious mind collaborates with the subconscious, our thoughts are carried or directed by a thought guide who performs Hypnosis in women who experience pain when facing childbirth by diverting thoughts (Kartasis) until they want to follow the commands direct it\textsuperscript{8,9,11,15}.

Measurement of pain intensity in labor begins during the active period, namely starting the IV opening and is assigned as a pre test. Hypnobirthing treatment was carried out at the VII opening and every time the mother felt pain until the VIII opening and was determined as a post test. For the control group the pain scale was measured before and after the mother was given counseling/IEC\textsuperscript{8,11,14}.

The hope of the Mother of Surakarta, that the majority of maternal pain levels before being given hypnobirthing (pretest) were severe pain as much as 70.0% and after being given hypnobirthing (post test) the level of maternal pain was moderate pain as much as 90%. Test results with. Based on the explanation above, it can be concluded that the use of the hypnobirthing method can reduce the intensity of pain during labor\textsuperscript{18,19}. There is a decrease in labor pain after hypnobirthing is done because this method brings respondents to integrate with the natural body movements and rhythms during childbirth, allowing the body and mind to work, Wilcoxon obtained a value of $\rho$ value = 0,000.

**Conclusion**

Hypnobirthing techniques can minimize labor pain because with hypnobirthing, mothers are required to achieve a very relaxed and comfortable condition during labor. The influence of the hypnobirthing method on pain management during childbirth is because this method teaches natural relaxation techniques, so that the body
can work with all nerves in harmony and with penu cooperation.

**Source of Funding:** Self-funding

**Conflict of Interest:** None of the authors has competing interests

**Ethical Clearance:** Taken from Comitee ethical ClearanceUniversitas Muslim of Indonesia Makassar

**References**


Loss of Value *Bundo Kanduang* in the Attention of Parents Who Affect Stress in Young Stunting

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**Abstract**

Research goals to know the stress and stress risk factors of a parent’s attention to the loss of value *Bundo Kanduang*. Sampling techniques by purposive sampling. Data collection is conducted in the in-depth interview, observation of participation, and secondary data. The Number of subjects 5 people. The research was conducted in March 2020. The subject of youth research stunting Padang. The attention of parents is the dominant factor in causing stress. Based on the results of qualitative research of 5 informants. If parents’ attention is good then low child stress levels For example children can control emotions, control themselves, be calmer when facing problems, easily socialize with the surrounding environment as well as vice versa. The loss of the value of *Bundo Kanduang* in the attention of parents greatly affects the stress experienced by teenagers. From qualitative analysis, 5 informants say the parents’ attention to risk factors related to stress.

**Keywords:** Stress, attention of parents, family, stunting, padang.

**Introduction**

Teenagers are the ages at which someone wants to try new things. So everything about the Internet can attract attention. With a big interest, then the desire to explore itself will be great too. The desire to be known and noticed by many people through the Internet. This can lead to negative behaviours. For example, writing something that belongs to someone else’s privacy, uploading someone else’s inappropriate images, can even make fun of your friends in social media. Dismissive behaviour, insult, or misled someone on the internet is included in cyberbullying or violence in cyberspace (Internet)¹.

Technology contributes to adolescent mental health. The use of social media is one cause of stress in teenagers. The prevalence of stress and depression continues to increase among adolescent generations. The prevalence of emotional mental disorders in teenagers over 15 years old amounted to 9.8%. This figure increased compared to 2013 by 6%. In West Sumatera Province, 4.5% of adolescents experienced emotional mental disorders. Emotional disorders occur in the form of stress, anxiety, and depression. As many as 25% of teenagers experience mild depression and 7% of teenagers with growing depression have attempted suicide attempts².

Poor mental development such as easy stress on teenagers is exacerbated by stunting. Nationally, the stunting prevalence of 2018 years of stunting in Indonesian adolescents decreased to 25.7% (7.2% very short and 18.5% short) in groups of aged 13–15 years and 26.9% (4.5% is very short and 22.4% short) in groups of age 16–18 year. The prevalence of stunting in adolescents in West Sumatra in 2018 the prevalence of stunting is almost equal to the national number of 25.6% (very short 7.2% and short 18.4%) In the age group of 13–15 years and 26.8% (very short 3.7% and short 23.1%) In the age group of 16–18 years³.

Young stunting is more stress-prone than not stunting. Stunting sufferers are significantly less happy, depressed, and frustrated. Stunting has associations with...
Increased cortisol concentrations. According to study in Jamaica in children aged 8–10 years showed that the concentration of saliva cortisol was higher than that of normal children. Family roles and support are crucial in overcoming stress. If teenagers don’t get the attention of parents, a problem is easy, because there is no telling of the youth.

Many factors are causing stress on adolescents, one of which is a factor of parental attention. Pressure in the family is one source of the stress of teenagers. The need for parent and adolescent cooperation in assisting the youth faced by teenagers, parents’ attention is very main in addressing adolescents’ problems especially stressing the quality Improvement Program of education through the improvement of high intensity–enriched curriculum, longer formal learning period, more school assignments and the necessity of becoming a leading centre has been stressful among adolescents. Young people suggest that they experience stress due to the lack of attention to parents. Research is conducted to find out the stress and stress risk factors in the family in stunting adolescents.

Method

Research is done to 5 informants. Data retrieval was conducted in March 2020. The scope of research is included in the youth health sphere. This research is a qualitative study with a descriptive approach. Qualitative method can make it easier for researchers to describe the parents’ attention factors affecting young stunting stress. This research sample is the teenage stunting of Padang City which meets the criteria of inclusion. The study subject chosen by the Purposive sampling method chosen is not random but is based on a particular consideration made by the researcher himself, i.e. by the criteria of the inclusion of the established researchers. The number of subjects is 5 informants, students, parents, teachers, psychologists, and Bundo Kanduang. The free variables in this study are stressful. The Variables tied in this study are the concern of parents. Variables of parents’ attention are obtained through a direct interview in-depth interviews with the informant. Each informant is interviewed from a validated researcher’s question. Data analysis is done along with the data collection process. The data analysis process begins with collecting all the interviews and observation data directly.

Results

Qualitative analysis results are aimed at knowing the parental attention factor as a risk factor for adolescent stress. Qualitative data collection is done with an in-depth interview with some informants. In this qualitative study obtained the total informant of 5 persons in Table 1 below.

<table>
<thead>
<tr>
<th>Code of Informant</th>
<th>Gender</th>
<th>Position</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inf. 1</td>
<td>Female</td>
<td>High school students</td>
<td>16 years old</td>
</tr>
<tr>
<td>Inf. 2</td>
<td>Female</td>
<td>Parents’ student</td>
<td>47 years old</td>
</tr>
<tr>
<td>Inf. 3</td>
<td>Female</td>
<td>SMK Teacher</td>
<td>50 years old</td>
</tr>
<tr>
<td>Inf 4</td>
<td>Male</td>
<td>Psychologist</td>
<td>30 years old</td>
</tr>
<tr>
<td>Inf 5</td>
<td>Female</td>
<td>Bundo Kanduang</td>
<td>66 years old</td>
</tr>
</tbody>
</table>

Source: Data analysis, 2020.

The attention of parents is the most dominant factor in causing stress based on qualitative research results. If parents’ attention is good then the child’s stress levels are low for example the child can control emotions, control themselves, be calmer when facing problems, not alone, easily socialize with friends and surroundings. Likewise, conversely if parents’ attention less then the stress of a high child that means children are difficult to hang out like to be alone, often cry, do not concentrate on learning, easy emotions, often daydream, feel worthless, and so forth.

Based on information from students it is known that the attention of less or too excessive parents can cause stress such as the following statements “But yes, sometimes there is good and not good. Too much attention is also not good, to the point that when I want to take an exam I am told to study continuously, sometimes I get tired myself, I want to take a break first. But it’s better to do it so that the enthusiasm for learning. It’s a pity for those whose parents are too ignorant, but it’s good to be in the middle (in terms of parental attention), who are just doing it. Being watched but not restrained (Inf-1)”.

Table 1: Characteristics of qualitative research informant
The same information is also stated by parents that the child’s attention should be reasonable and not excessive, by the following statements “Attention is important. Sometimes these mothers pay attention too much or are sarcastic, but that includes that attention, more like organizing it also includes attention. It’s just that later the children won’t be independent, that’s all they need attention. It needs that attention to a reasonable degree (Inf-2)”.

The same is stated by teachers that parents’ attention affects the child’s learning process, such as the following statement “There’s no way a child can get good grades if the parents don’t pay attention to the learning process ... indeed a child gets attention from parents, then their parents’ background also has the education, then their economy is stable, the child is better (Inf-3)”.

The attention that parents give to their children must be sufficient and reasonable. Excessive attention makes the child depressed and unnoticed to make the child feel uncherished. It by the statements of students and parents as follows “In my opinion, the attention is sufficient, not excessive and insufficient. Also not restrain so the child feels depressed. Parents must know the nature of their respective children, right? So, just adjust how the attention is (Inf-2)”.

Teenagers are the time of transition from children towards adults up to their young people as a story of telling them, the attention of good parents will make the child feel comfortable and open to tell his problems. The children are not guided in patience not by being haunted or divided with problems that occur. It suits the following statements “Parents have time for their children, not too busy just to work because children also have problems that cannot be solved by themselves. Parents pay attention, not in the form of yelling, but what guides the child to better understand what the parents mean (Inf-1)”.

At the Minangkabau community, the attention of a good mother is closely associated with the values and the role of the Bundo Kanduang. Minang people are not familiar with the figure of Bundo Kanduang as the first Madrasah child in the family than the father figure. Bundo Kanduang is a figure of educators and observers in the family even broadly for his people according to the following statements “Bundo Kanduang is closely related to women. The role of Bundo Kanduang in the family is of course inseparable from how to educate children, even to the extent of educating their families. Not only their biological children, to their families too. In a brief sense, Bundo Kanduang is a mother figure who not only educates her children but can also educate her people (Inf-3). “The values adhered to by Bundo Kanduang are like guiding children with love (Inf-4)”.

Bundo Kanduang is a symbol of indigenous women in Minangkabau. Bundo Kanduang is a designation for the mature Minangkabau woman and understands the customs. The following are the opinions regarding the Bundo Kanduang according to the following statement “If there are mothers who are considered to be able to protect, not from their families, usually, it is determined from the community, it is agreed by the community who becomes Bundo Kanduang who can solve problems, who can be asked for advice (Inf-2)”.

Now the role of Bundo Kanduang is necessary for educating the child, the attention of good parents according to the teachings of the Bundo Kanduang according to the following statement “Women as direction/advisors, women become the upstream and estuary of the problems of their people. Because this principle states that parents are a place for everything, a place to ask questions, to tell stories and to educate and guide children (Inf-5)”.

Bundo Kanduang plays an important role in educating the child, but not just the mother in the house but has an important role in the community, but the role and values of this Bundo Kanduang Bundo have begun to disappear. Today mothers are busy working and leaving cultural values that should be retained according to the following statement “Parents are sometimes busy alone, children too. No more communication (Inf-2)”.

Every Minang woman has the role of being a Bundo Kanduang in educating the child. In addition to mothers, children can be educated by their grandmother and challenge who also know the sublime values of Bundo Kanduang. In ancient times children lived in large families so much attention was received, but at present, there was only a core family consisting of mother and father alone. So the less attention of parents will be very influential to the child’s stress. This corresponds to the following statement “Previously, the name of educating children was inseparable from the mother alone, there were her grandmothers, grandparents, her mother. If now they have lived alone (Inf-3)”.
Here is the opinion of the informant to revive the role of the *Bundo Kanduang* in addressing the child’s problem, according to the following statement “The concept of Bundo Kanduang has been running for a long time and has been implemented in West Sumatra P2TP2A, PUSPAGA and other educational organizations. This concept should also be applied in PAUD schools, kindergartens and other formal schools (Inf-4)”.

Based on information from students it is known that the attention of less or too excessive parents can cause stress. The same information is also stated by parents that attention to the child should be appropriate and not excessive. The same is stated by teachers that parents’ attention affects the learning process of children. Adolescent depression can be triggered by events that are often associated with family problems and conflicts. Stressful events and lack of social support from peers and family can also trigger the emergence of depressive conditions in adolescents.

The presence of social support, especially from parents, will provide physical and psychological comfort for children. Families can act as social support providers that help individuals when a problem arises. Individuals who gain high social support will be more optimistic and more able to adapt to stress. The support that families can provide can be emotional, award support, tool support, and informative support. This research is in line with research as the effect of the parent’s attention towards student stress levels that there is a parental concern with a student stress level of 2017 with a P-value of 0.000 and a correlation value of coefficient 0.549 included in the moderate relationship level.

As a parent should pay attention to his children, such as preparing breakfast, providing learning facilities, giving motivation, giving guidance to the child because in the childhood children began to grow and the child began to seek his identity, then the need for support and motivation from parents. Busy parents tend to be more concerned with the work than to gather with their children and do not give more attention to their children then the child will feel uncared for. As young children desperately need the attention and affection of their parents, it makes them more meaningful and more confident to actualize themselves. From interviews with teachers and parents it is known that attention is important and needed by the child, but because the condition of a busy parent with work makes parents’ attention to the child become not optimal. Interviews with teenagers are also known that they need parents’ attention to encourage them to learn.

The attention of parents is good then low child stress levels For example children can control emotions, control themselves, be calmer while facing problems, not alone, easily socialize with friends and surroundings. And vice versa if the attention of parents less then the stress of a high child that means children are difficult to hang out like to be alone, cry, do not concentrate on learning, emotions, often daydream, feel worthless and so forth.

The attention of parents in terms of the *Bundo Kanduang* is greatly reduced, because of the current aspects of the *Bundo Kanduang* administration, its nature to help guide the child in the Minangkabau region. So, it’s the attention of parents is also reduced because of the teachings of the *Bundo Kanduang* that do not cling anymore to parents. The interview results from 5 informants, especially in terms of the role of *Bundo Kanduang*, have been greatly applied outside the home or inside the house, especially when teenagers are now influenced by modern culture and the use of gadgets and the world of the internet.

**Conclusions**

Qualitative analysis obtained statements from 5 informant says that the risk factors of parental attention are related to stress.

**Acknowledgements:** The author says with a big thank you to the intellectual association “Bundo Kanduang” Padang City who has appointed me as the team leader and provided assistance in the research of “Loss of value *Bundo Kanduang* in the attention of parents who affect stress in young Stunting”.

**Ethical Clearance** is taken from the institutional ethical committee of Andalas University–Indonesia as per rules.

**Source of Funding:** Self

**Conflict of Interest:** Nil

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The Effect of Family-Based Empowerment on Adolescent’s Nutritional Status in Tana Toraja

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Abstract

Adolescent’s nutritional status is one of the problems of public health nutrition. Adolescents or teenagers are a group that is sensitive to nutrition which has an impact on increasing the prevalence of degenerative diseases due to excess nutrition. This study aimed to analyze the effect of family-based empowerment on the teenager’s nutrition status in Tana Toraja. The research design used a quasy-experiment with a pre-test and post-test design with a control group design. It was carried out on 64 overweight students consisting of 32 intervention groups and 32 control groups as well as simple random sampling and data analysis using Hotelling’s T² test. The results showed that family-based empowerment was significant in reducing overweight case due to adolescent’s nutritional status against obesity prevention with a value of p = 0.000 <0.05. The conclusion of this study is that there is an effect of family-based empowerment on the adolescent’s nutritional status in Tana Toraja. It can be a reflection for teenagers who have experienced an overweight nutritional status so they can adopt a healthy diet. This study shall performed further in public nutritional status.

Keywords: Nutritional Status; Adolescent; Empowerment; Family.

Introduction

The increased prevalence of obesity in adolescents is placed as a risk factor for degenerative diseases among youth. Risk factors for obesity include an energy-dense diet, high consumption of sugary drinks, a diet such as snacking and high sedentary behavior level. The case are also worse with the number of low physical activity level intake, especially in daily basis. Research reports show that obesity is associated with a high intake of energy dense, low in foods such as soft drinks, savory chips, sweet biscuits and sweets, and also an increase in the time spent in their association(1). Based on the 2013 South African National Health Report and Screening Survey (SANHANES-1), the number of participants who aged 18-24 were reported to be inactive and over-nourished (50.2%)(2).

WHO warns that obesity and overweight cases are the fifth leading risks of global death (3). Cardiometabolic risk factors in obese adolescents in Kuwait have a poor quality of life and health compared to adolescents with healthy weight, this can be seen in cultural differences between western and Kuwait societies (4). The increasing occurrence of obesity has also reported in developing countries such as Indonesia. Basic Health Research or Riset Kesehatan Dasar (Risksdas) Indonesia in 2013 shows that nationally the prevalence of fat among adolescents aged 13-15 years in Indonesia is 10.8%, consisting of 8.3% overweight and 2.5% obesity. The province with the highest prevalence of overweight and obesity was DKI Jakarta (4.2%) and the lowest was West Sulawesi (0.6%) (5).
South Sulawesi Province is one of 16 provinces whose population experiences less activity above the national prevalence, namely 49.1% (<150 minutes per week) and eating less fruits and vegetables 93.7% (<5 servings per day)\(^6\). The same thing happened to Riskesdas (2013), namely the less active activity of the age group ≥10 years by 31%, exceeding the Indonesian average value of 26.1%. Based on Riskesdas (2013) in numbers, the prevalence of overweight in South Sulawesi province according to BMI/U age 13-15 years is 6.8% fat and 2.4% obese, and in Tana Toraja Regency as much as 10.5% fat and 2.3% obesity \(^5\).

Changes in dietary habits in adolescents, based on previous research, if not attempted to improve it will bring the influence of the quality of society towards. As one of death factor, this research focused on the occurrence of overweight and obesity in adolescent in Indonesia. The recent cases of obesity has a put the problems of obesity in the next generation afterwards. Otherwise, it is necessary to seek information and treatment in a form of intervention regarding adolescent obesity through family-based empowerment models \(^7\).

The findings about the incidence of overnutrition are the result of unhealthy eating behavior and less physical activity, therefore it is necessary to improve behavior and increase the physical activity of adolescents so as to reduce prevalence and prevent excess complications and obesity. With empowerment based on family nutrition education, it is used to improve diet so that it can reduce the nutritional status of overweight adolescents to normal. The purpose of this study was to analyze the effect of family-based empowerment on the nutritional status of adolescents in Tana Toraja.

**Material and Method**

**Research Design:** A method to be used in this study was taken to quasi-experiment approach. As the research design, pretest and post-test with control group design was elaborated to determine before and after treatment. The study group in this study was divided into 2 (two) groups consisting of 1 (one) treatment group and 1 (one) control group. The first group was given intervention in a form of health education through family empowerment with modules, the second group (control) was given health education with modules and family mentoring without role playing.

**Population and Sample:** The population and sample in this study were some of the parents and overweight adolescents in grades 7 and 8 at the Junior High School in Tana Toraja. The sampling technique in this study was simple random sampling method, namely selecting a sample among the population by drawing lots. The samples number was 32 for the treatment group and 32 for the control group. The number of 32 obtained in the calculation of the sample size above is obtained by entering the data on the number of populations, the expected error rate, the range of the level of accuracy/accuracy and the desired level of confidence into the Sample Size Determination (SSD) in Health Studies.

**Data Collecting:** The anthropometric assessment of adolescents was carried out using the Camry brand digital scale as a measuring tool for children’s body weight with an accuracy of 0.1 kg and a capacity of 150 kg and Microtoise as a measuring device for height with an accuracy of 0.1 cm and a capacity of 200 cm. Then the anthropometric index used was body mass index per age (BMI/A) WHO Anthropus software 2007 reference standard for school age children 5-18 years and nutritional behavior was assessed by a questionnaire consisting of 15 question items.

**Data Analysis:** Analysis we have done was taken into the determination of test significance as well as the determination of the difference in the mean of research variables. The data was collecting between before and after the intervention. If the data distribution was normally distributed, the independent t-test or paired t-test was used based on the group, while the non-normal distribution used the Mann-Whitney non-parametric test and multivariate analysis by using Hoteling’s T² test to see the difference between the two test groups (treatment group and control group). Each of which contains at least two or more variables and will be analyzed simultaneously together.

**Results**

**Adolescent’s Characteristics:** The location of this research was Makale City Junior High School, Tana Toraja Regency, South Sulawesi Province. The data is processed and analyzed according to the research objectives. Data results analysis are presented in tabular form equipped with the following explanation. The distribution of adolescent’s nutritional status can be seen in Table 1.
Table 1. Distribution of Adolescent’s Nutritional Status

<table>
<thead>
<tr>
<th>Nutritional Status</th>
<th>Pretest</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Treatment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overweight</td>
<td>32</td>
<td>100.0</td>
</tr>
<tr>
<td>Normal</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overweight</td>
<td>32</td>
<td>100.0</td>
</tr>
<tr>
<td>Normal</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Table 1 shows that all adolescent’s nutritional status of research measurement during the pre-test had overweight nutritional status. After the post-test, 16 adolescents (50%) had normal nutritional status in the treatment group and 21 adolescents (65.6%) had also normal nutritional status. The differences then were analyzed by Mann-Whitney test.

Changes in Adolescent’s Nutritional Status:

Table 2. Changes in Adolescent’s Nutritional Status Before and After Intervention or Treatment

<table>
<thead>
<tr>
<th>Nutritional Status</th>
<th>Pretest</th>
<th>Post-test</th>
<th>Difference</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>24.25</td>
<td>23.31</td>
<td>0.94</td>
<td>0.000*</td>
</tr>
<tr>
<td>Control</td>
<td>23.95</td>
<td>23.43</td>
<td>0.52</td>
<td>0.000*</td>
</tr>
</tbody>
</table>

*Mann-Whitney

Table 2 shows that the results of the Mann-Whitney test. It shows that the change in respondents’ nutritional status (BMI) were recorded at post-test. The difference was quite significant compared to pre-test. This shows that there is a difference in BMI in the pre-test and post-test in both the treatment and control groups. The decrease in BMI was more significant (higher in number) in the treatment group than in the control group.

Multivariate Analysis Results:

Table 3. Multivariate Analysis Results on Nutritional Status Difference through Family-Based Empowerment

<table>
<thead>
<tr>
<th>Family-Based Empowerment</th>
<th>Value</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hotelling’s Trace Analysis Results of Nutritional Status</td>
<td>0.721</td>
<td>8.472</td>
<td>0.000*</td>
</tr>
</tbody>
</table>

*Hotelling’s T

Table 3 shows that the results of statistical tests with Hotelling’s T test. It was obtained that the value of $F = 8.472$ and $p = 0.000$ ($p < 0.05$). This means that there are differences in the nutritional status of adolescents who receive family-based empowerment. Family-based empowerment affected nutritional status of adolescents as family members ($p < 0.05$).

Discussion

In line with the existence of a high-calorie diet, the low frequency of physical activity and lots of free time activities have contributed to an increase in the prevalence of overweight and obesity among adolescents as the research objective in this study. The results showed that the results of the Mann Whitney
test showed that there was a change in nutritional status during the post-test compared to the pretest. This shows that there is a difference in body mass index (BMI) in the pretest and post-test in both the treatment and control groups. The decrease in body mass index (BMI) was higher in the treatment group than in the control group. For counterfeit analysis, the research of Tuah et al. (2011) that the use of the Stage of Change (SOC) on Transtheoretical Model (TTM) in maintaining the obesity weight management programs supported our findings. The supported sideway was taken as if the SOC was effective for weight loss in adolescents(8).Johnson et al. (2008) has conducted the research related to adult obesity. The research focused on respondents with BMI ranged from 25-39.9. The number of respondents in the research were 1277. Under multiple behavior interventions, this study shows the patterns on results due to ability of TTM. TTM tends to be effective in improving healthy eating patterns, holding exercise schedule of respondents, managing emotional distress, changing behavior and maintaining body weight (9). Multiple behavior interventions have been proven to elaborate the impact in this research. In this study, we found that the results were three times better than single behavior interventions. Health promotion in the proper community agenda or obesity prevention programs held by formal health practitioners together with the government and/or mentors are quite effective. The results from previous study found that health promotion was able to prevent an increase in BMI. In addition, it can also lead to reducing snacks intake by respondents, cutting soft drinks consumption off or limiting respondents from eating desserts after meal course so that the improvement can be achieved(10).

Multicomponent intervention, according to Foster, is also significant to uphold. The method whatsoever is proven to prevent the development of obesity cases, especially in children in grades 4-6 located in urban elementary schools (11). Based on need-based analysis, community-based partnership have been provoking to integrate health, education, environment, government and business services altogether. Golan & Weizman (2001) developed the research model in the form of family-based conceptual model. It emphasizes two main points, namely healthy lifestyle and weight loss (12). According to Watson in Potter (2005) to improve health is to return the client to his healthy condition and prevent pain(13). Furthermore, parental caring behavior will bring the influence as if it is very important in preventing the effect of the certain diseases on children and in this study children who are overweight and obese are being the main focus. A program to hold and uprise African American students’ awareness on obesity and overweight cases. It was conducted to preserve the risk of heart disease and diabetes towards(14). Jones et al (2010) revealed the beneficial sides of the health information technology (IT) and health literacy (HL) programs. The effectiveness of the two health promotion methods was determined to raise awareness about the health risks of obesity among African American students (15).

The regular measurement conducted in this study found various changes in body mass index (BMI) in respondents. Both groups experienced a decrease in BMI at the sixth month based on pretest and post-test measurement. The decrease number of BMI in the treatment group was 90.3%. The result number was higher than the control group that was only getting into 21.2% of threshold value. Balanced healthy menu based on age was given as one of interventions. The other interventions given were one-hour physical activity on a daily basis and the maintained children’s healthy behavior. The interventions in our study adopted and developed from Barlow (2007). The research done by Barlow has been recommending children and families to maintain food intake, physical activity and relaxing habits; or in this case is sedentary behavior. Mushtaq et al. (2011) found two of independent predictors of obesity of school-aged children in Pakistan were physical activity and daily lifestyle. Daily lifestyle included watching television, working on computers and playing video games. The three parameters showed a significant association with a high BMI and the risk of being overweight and at risk of health disease with the OR score of 1.60 in children without normal BMI. Based on the nutritional status of adolescents we elaborated in this study, there were reported that overweight adolescents the treatment group tend to have normal nutritional status after the intervention. This study proves that family-based empowerment played a huge role as health intervention as it greatly affected adolescent’s BMI reduction. It also influenced the changes in better and normal adolescent nutritional status. Due to deep analysis in pilot study comparison, the module content we developed is equipped with information on healthy lifestyles and youth monitoring sheets. It can help families to be the role of culture care repatterning so that they can control the family member’s physical activity and food intake afterwards. Families also believe that they are able to carry out a healthy lifestyle in children with good family self-efficacy.
Changes in BMI in adolescents are motivation for adolescents to change their lifestyle into healthy behaviors. The way and steps they spend per day in losing weight motivation in adolescents is the key to success as it turns to be motivation to shape the confidence in public appearance. This is because school-age children begin to gain the ability to sequence a number of events and actions, children become physically mature, children became curious and asked a lot about health\(^{16}\). Thus, the role of the family in controlling the lifestyle of adolescents by doing good physical activity as many as 32 adolescents has an impact on changes in adolescent BMI, which decreased by 31 (97.3%) in the treatment group. This can be happened after the implementation of family-based empowerment.

The decrease in BMI in the treatment group showed an increase in knowledge, attitudes, behavior, family culture, physical activity of adolescents from month to month accompanied by adequate calorie intake of children along with the decrease of sedentary activities. Thus, the family is able to control overweight adolescents which has an impact on decreasing the body mass index (BMI) of adolescents. The change in BMI has an impact on the psychosocial development of adolescents according to Erickson in Wong (2009) that if adolescents cannot resolve conflicts or problems, they will become inferior. A decreased BMI will have a positive impact on adolescents, namely adolescents are more confident with their body size. A decrease in BMI in adolescents is a change in the positive energy balance to a negative energy balance through biochemical changes, physiological changes, and anatomical changes. Positive energy balance is excessive intake and under exercise in overweight adolescents before the intervention. After the application of the family-based empowerment model, there was a change in BMI, namely a decrease in BMI in the treatment group. This decrease in BMI is the result of a process of anatomical changes that can be measured through anthropometry including adolescent nutritional status based on BMI and adolescent age.

Research by Nayak and Bhat (2010) in which multicomponent intervention was given for one month to 269 children, an amount of 13 (4.8%) were overweight and 7 (2.6%) were obese \(^{17}\). Sedentary activity after school hours such as watching television for a longer duration on Sundays and weekdays, decreased physical activity, skipping meals, the influence of the media in choosing food, parents offering food as gifts, frequent consumption of fried and junk food, and frequent drinking carbonated drinks is an important factor in influencing the incidence of overweight and obesity \(^{18}\). There was a significant reduction in the body mass index (BMI) of the intervention group at the end of the fourth week.

**Conclusion**

Family-based empowerment has an effect on decreasing body mass index of adolescent family member (BMI) or adolescent’s nutritional status. There was a decrease in the BMI of adolescents in the treatment group but there was an increase in the BMI of adolescents in the control group. We need to monitor adolescent’s nutritional status and provide counseling to adolescents regarding healthy eating patterns from an early age.

**Ethical Clearance:** The results of this study found that eating culture in the local area can affect eating patterns due to geographic conditions, thus impacting on food and energy use so that it affects changes in weight of obese teenagers.

**Acknowledgement:** The authors thank all the Public Health students who helped in the collection of the data. Tana Toraja Regency Government, Health Service, Head of Community Health Center who has granted research permit. Respondents who have been willing to spend time in the interview process.

**Research Funding:** Funds used during this research came from private funds.

**Conflict of Interest:** The author(s) declare that they have no conflict of interest.

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Protection of Public Interests in the Process of the Indonesian Proprietary

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Abstract

Protection of public interests in the bankruptcy process is regulated in the Indonesian Bankruptcy Law. However, the implementation of this provision raises problems both in the concept design of the public interest itself and in its protection mechanisms. The bankruptcy law provides at least three concepts of public interest, each of which can be identified with the interests of the wider community as creditors, the interest in the stability of the financial services sector, and the interests of state finances. The three concepts of public interest are protected with exclusive and prerogative powers on the regulators and supervisors as the authority of each field. Such protection mechanisms have so far only blocked the path of creditors and debtors, and provided immunity to special debtors, as the majority of authorities do not want to file bankruptcy requests and prefer to exercise their public powers.

Keywords: Bankruptcy, public interest, legal protection.

Introduction

Bankruptcy institutions are needed as a special debt settlement mechanism. When debtors experience problems in completing their obligations to creditors, it can be generally assumed that the debtors are experiencing financial difficulties. This situation can encourage each creditor to try in various ways to get payment for assets that are assumed to be far below the value of all liabilities (common pool problem). If this situation is not properly facilitated, the resolution will result in problems leading to injustice, both for the debtor itself and the creditors. Some creditors may receive payment, even full payment while other creditors may get nothing. The position of debtors is getting more difficult because in addition to facing financial difficulties, debtors are also faced with claims from creditors who each want their receivables to be paid in full and prioritized over other creditors.

Bankrupt institutions cannot only be seen narrowly as a mechanism for settling debts and receivables between debtors and creditors. The complexity of transactions and the number of parties related to their interests, either directly or indirectly, also influence the dynamics and development of the bankruptcy institution. The various interests involved in a debt settlement process demand that bankruptcy institutions be encouraged to take into account other interests affected by the bankruptcy process. Both creditors and debtors are not only bound by one legal relationship. As an economic being as well as a social being, both creditors and debtors certainly have rights and obligations to other parties or other roles in the social system of society. If the settlement of these debts and receivables is not carried out properly, it can be ascertained that both third parties and the wider community will more or less be affected. If one of the creditors does not get payment, it is possible that the creditor cannot pay the salaries of his employees or even has to close his business, so that it will impact on the family welfare of the employees. Likewise, if it turns out that the debtor’s business sector is urgently needed by the community, unstructured collections that unilaterally only pursue the settlement of accounts receivable can result in cessation of meeting the needs of the community, which was originally only supplied...
by the debtor's business. It must be acknowledged that in certain situations the bankruptcy process and decision has an impact and influence on the interests of other parties and society in general, either directly or indirectly. The interests of other parties are directly harmed if the bankruptcy process results in the cessation of fulfilling the interests of that party, including if a bankruptcy decision is imposed on an entity/company whose products or services are used by the wider community. The bankruptcy process and decision can also harm the interests of other parties, indirectly, if the bankruptcy process affects and or hinders the fulfillment of the interests of the party, which, among other things, if the bankruptcy process causes anxiety and panic in the community.

This paper is based on nondoctrinal legal research that uses the standpoint of participants with inductive reasoning that empirically conceptualize law. This research examines social realities in the form of the behavior of parties related to the protection mechanism of the public interest in bankruptcy and the relationship between these various symptoms as real legal manifestations. The paradigm used is the post-positivism paradigm which ontologically sees that the reality of the public interest does exist but can never be fully understood (critical realism). Likewise, the public interest protection mechanism as outlined in legislation as a set of norms imposed on society, its enforcement will be greatly influenced by other factors (law as it is in society).

Public Interest in the Indonesian Bankruptcy Law: The settlement of accounts payable in the bankruptcy process is essentially taken over and controlled by the state through a panel of judges in the Commercial Court and curators. There are at least two possible purposes for the state’s presence in the bankruptcy process. The first objective is to ensure that the settlement of accounts payable between debtors and creditors is carried out fairly. The next objective is to ensure that the settlement of debt and credit problems between creditors and debtors is not detrimental to wider interests. This is because the state in its position as administrator of the public interest also has an interest so that the settlement of rights and obligations between the debtor and its creditors does not interfere with the bigger interest. Thus, it is natural that the interests of the state in safeguarding the public interest are also considered in the process of settling these debts and receivables so that bankruptcy institutions not only protect the interests of debtors and creditors but also protect public interests.

The Indonesian bankruptcy law regulates several bankruptcy mechanisms which are intended to protect interests outside the interests of debtors and creditors. Various interests outside the rights and obligations between creditors and debtors are protected in the bankruptcy process through public policy and authority and are given priority over individual interests, the authors assume, as the public interest. This special mechanism gives authority to the Attorney General’s Office, the Ministry of Finance and the Financial Services Authority (OJK) in submitting bankruptcy statements against certain debtors. Article 2 paragraph (2) of the Bankruptcy Law authorizes the prosecutor (public prosecutor) to file a bankruptcy application in the public interest when the requirements as referred to in Article 2 paragraph (1) have been met and no application for bankruptcy has been filed by another party. The concept of public interest in the explanation of these provisions is the interests of the nation and the State and or the interests of the wider community. This interest can arise when the debtor is not cooperative, embezzles assets or runs away. The public interest also arises when the debtor’s debt is a fund that comes directly or indirectly from the wider community and/or SOES. The AGO has discretionary power in assessing the existence of other public interests. The public interest is essentially the main concept that underlies the birth of every statutory regulation. Likewise, the bankruptcy law carries the concept of public interest which is tried to be protected in the bankruptcy process. There are at least three concepts of public interest presented in the bankruptcy law. The public interest regarding the authority of the prosecutor’s office in bankruptcy is the accumulation of the interests of many creditors. This is because the prosecutor’s position is only as a substitute for creditors in filing a bankruptcy statement.

Public Interest Protection Mechanism in the Bankruptcy Law: Based on the provisions in the Bankruptcy Law mentioned above, it can be concluded that there are 2 types of bankruptcy mechanisms, namely bankruptcy in general and bankruptcy with restrictions on the rights of debtors and creditors to apply for a bankruptcy statement. The differentiation of the bankruptcy mechanism is based on the type of interest being protected. A special mechanism in the form of limiting the rights of debtors and creditors to apply for a bankruptcy statement is provided to protect the public interest by taking into account the characteristics of the
debtor who is filed for bankruptcy\textsuperscript{8,9,10}. Based on their characteristics, debtors are grouped into three groups, namely debtors in general, debtors who are SOEs, and Debtors who are banks, insurance companies, reinsurance companies and pension funds, securities companies, stock exchanges, clearing and guarantee institutions, depository and settlement institutions.

This limitation is used as a counterweight considering the bankruptcy requirements based on the provisions of Article 2 paragraph (1) of the Bankruptcy Law are very simple and only require debt to two creditors, where the debt is due and can be collected, the debtor can be easily bankrupt through the trial process and brief evidence without the insolvency test. Such loose bankruptcy provisions are considered to be very dangerous to the interests of the wider community, especially if the debtors who are bankrupt are financial institutions and SOES. On the basis of these considerations, limiting Creditors’ rights to file bankruptcy applications against specific debtors is considered a necessity to protect the larger public interest\textsuperscript{8,9,10}. The concept of the Constitution states that such restrictions on rights can be established by law, on the condition that the limitation, although it looks as if it is imbalanced, but fulfills a rational balance. The fulfillment of the principle of balance in question is that the limitation is intended to protect the greater interest. In addition, for the party affected by the restriction, there are other alternative legal remedies that allow the party to fight for their rights.

Protection of public interest in bankruptcy has rational grounds and objectives. However, the concept and operationalization of the protection of public interests in bankruptcy still raises several fundamental issues, especially in relation to the concept of public interest which is the object of protection, whether the interest is an interest in bankruptcy or an interest outside bankruptcy, whether these interests are interests that already exist, do not exist, or only possible interests. This limitation of the concept of public interest is important because it becomes the basis of legitimacy for its protection efforts. Without clear evidence that there is a public interest there, there is no need for special protection measures that override the bankruptcy mechanism in general. Moreover, the Indonesian bankruptcy law has used an authoritative instrument in the form of restricting (revoking) the right to apply for a bankruptcy statement as a form of protection for the public interest.

The Indonesian bankruptcy law has used an authoritative instrument in the form of restrictions on who can file applications as a form of protection for the public interest. Limitation of this right can be interpreted as revocation of rights because in fact it has made the party that should have the right to apply for it not entitled to apply. Although the limited rights related to protection for the public interest are the rights of creditors in the field of formal law (procedural law) and on the other hand, the civil rights of creditors in the form of claims are legally recognized, guaranteed, and protected, however the construction of bankruptcy with this special mechanism is very different from the initial concept of bankruptcy as a debt settlement institution that gives creditor and debtor authority as parties who have rights and interests based on a civil law relationship\textsuperscript{15}. The Minister of Finance and OJK as the authorities may have more adequate data and knowledge regarding the impact of bankruptcy status on financial institutions and SOEs so that they can take more appropriate policies and steps, but both basically have no interest and right to apply for a bankruptcy statement.

The number of requests for bankruptcy statements, submissions for judicial review to the Constitutional Court and the reluctance of the authorities given the authority to submit requests for bankruptcy statements are evidence that the protection system for public interest in bankruptcy with restrictions on the rights to file bankruptcy statements has not been a fair and effective solution. The resolution of the issue of protection of the public interest in bankruptcy cannot be done only by limiting the right to file a bankruptcy statement. If all issues of protecting the public interest in bankruptcy are carried out with restrictions on the right to apply for a bankruptcy statement, then it can be ascertained that the right to apply for a bankruptcy statement against all debtors will be with public institutions because aspects of the public interest will arise in all fields along with the increasing number and level of dependency society towards certain products and services.

Conclusion

The public and private dichotomy may have begun to fade as a result of the domination of the role of the state in all aspects of life. The role and interests of the state in bankruptcy to protect public interests cannot be avoided. However, the concept of public interest given by the bankruptcy law still raises several problems. Likewise, the exclusive and prerogative protection
mechanism removes control over the use of this power by public institutions. Both resulted in unclear protection of interests in the private area and on the other hand created moral hazard from debtors who indirectly received immunity from bankruptcy. Along with the development of guarantee institutions for both public savings and policy guarantee institutions (which will soon follow), an evaluation of the authority of public institutions in filing a bankruptcy statement needs to be carried out to assess its urgency and minimize conflicts of interest between the interests of these public institutions as regulatory and supervisory authorities and interests. as the only party authorized to apply for a bankruptcy statement.

**Conflict of Interest:** There is no conflict of interest.

**Source of Funding:** This research was funded by the Diponegoro University Faculty of Law Research Grant Fund for the 2020 Fiscal Year.

**Ethical Clearance:** Ethical clearance from the institutional ethical committee obtained for the study.

**References**

How Cultural Competency of Community Health Care Providers Reflects Multicultural Education: A Case Study on Nursing Majors

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Abstract

In the current global era, multicultural education is a requisite for those who attain higher education, such as nursing majors working in a community with people from a variety of cultural backgrounds. This study aimed to explore the effect of multicultural education by identifying cultural competency (CC) and multicultural acceptance (MA) among two groups of students and professionals who majored in nursing.

A series of surveys was conducted targeting nursing students and clinical professionals. Out of 189 participants, data from 98 participants with experience of multicultural education and 91 participants without experience of multicultural education was analyzed. Independent t-tests, correlation tests, and regression analysis were conducted to examine the effect of multicultural education, and to identify the correlation between CC and MA and the factors influencing them through the comparison of data from each group. The results demonstrated two major points. First, multicultural education was shown to enhance CC and MA of the participants. Second, cultural knowledge and cultural experience were important factors influencing MA.

These results can be used to provide educational direction regarding cultural competency and multicultural acceptance, ultimately leading to provision of better healthcare services in multicultural communities.

Keyword: Competency, healthcare, cultural competency, culture, diversity.

Introduction

In the current global era, people with diverse cultural backgrounds reside in merged communities and live and work together. Thus, a certain level of cultural competency is required for highly educated groups of adults, such as students and professionals who majored in nursing, to deal with them. Nursing majors are one group of healthcare providers in the community who are generally highly educated. As such, it is necessary to strengthen their vocational abilities to deal effectively with people from diverse cultural backgrounds to whom they provide healthcare services. Knowledge and experience of cultural differences, such as health-associated cultural traits, play a key role in promoting effectiveness of healthcare services1,2. Research literature has labeled these abilities as cultural competency (CC) and multicultural acceptance (MA)1-6. Recent studies on CC and MA have emphasized that multicultural education that provides cultural knowledge, or an experience of various cultures have a positive effect on enhancing these competencies2,5-7. Therefore, there have been attempts to design effective educational programs to enhance these competencies, and many studies have been conducted to examine these competencies and identify the factors which influence the promotion of these competencies2,4-6. In this context, CC is defined as an ability to possess awareness and knowledge of each culture, cultural experience and sensitivity, and cultural
skills. It is also considered a practical skill, including a recognition of the unique characteristics of each culture, such as health-related beliefs\textsuperscript{2-4}, and an imperative ability to understand the sensitivity level of people from diverse cultural backgrounds. These skills are necessary for nursing majors when they provide healthcare services, especially to build therapeutic credibility\textsuperscript{2}. Meanwhile, MA is defined as the ability to understand and accept diverse cultural backgrounds of members who have migrated and settled into the local community. It refers to a universal ability covering cultural awareness and open-minded attitudes toward different cultures, social coexistence, and supporting community members with different cultural backgrounds\textsuperscript{5,6}. This competency is important for nursing majors not only in their role as a global citizen but also as a community member. However, a recent study indicated that multicultural education for nursing majors as well as other groups of highly educated adults is partially stagnant, and identified the need for a plan to improve multicultural education and individualize competency consolidation to reflect group characteristics\textsuperscript{6,7}. Studies on CC and MA have delineated that it is necessary to develop an educational program that reflects the characteristics of each group and employs measures to strengthen those competencies in order to increase the educational effect\textsuperscript{2,6,8-10}. Particularly, they have emphasized the need for educational programs by academic level for nursing college students and clinical professionals, and noted that continuous research through repetitive capacity measurement within each group and between groups is needed to develop effective educational programs\textsuperscript{2,9-11}. For this purpose, some recent studies on CC and MA have consistently conducted research on the factors that affect each competency, and found that acquiring cultural knowledge through regular classes in school, exposure to multicultural information through mass media, personal experiences through contact with other cultures, and educational experiences in other cultures create a positive effect\textsuperscript{11,12}. In contrast, other studies argued that educational programs designed to acquire knowledge regarding different cultures are insufficient to strengthen CC or MA\textsuperscript{2,5,13}, and that frequency of contact with other cultures has no significant effect on either competency\textsuperscript{14}. Therefore, further research on multicultural acceptance as well as cultural competency based on cultural knowledge and experience with CC and MA is extremely necessary. One point of view is that CC and MA are similar concepts in terms of definition. In contrast, another view is that, while CC is considered as a required competency for healthcare workers, MA is a required competency for members of the general society. In recent years, there has been a steady interest in CC and MA of healthcare students and clinical professionals, and related factors which affect these competencies\textsuperscript{15}; however, most studies have been focused on CC and few studies have examined the degree of MA and the correlation between the two competencies from the perspective that both clinical professionals and healthcare students are members of the general society too. Therefore, this study aimed to suggest an educational direction that can strengthen CC and MA of healthcare providers by identifying the effect of multicultural education on nursing majors. The study examined CC and MA in individuals involved in the healthcare field and explored the correlations between the two competencies as well as the factors which influence both competencies. Further, the study identified differences in the factors which effect CC and MA between two groups of participants with and without experience of multicultural education.

The research objectives were as follows.

**Hypothesis 1:** The level and perception of CC and MA of nursing majors and the degree of retention of each competency are different depending on whether or not they have had an experience of multicultural educational.

**Hypothesis 2:** There is a correlation between the CC and MA level.

**Hypothesis 3:** Multicultural educational experience for CC has a positive effect on increasing MA.

**Materials and Method**

**Study Design:** This study employed a comparative survey design to identify the degree of CC and MA, the correlation between the two competencies, and the factors influencing the two competencies in nursing students and clinical professionals based on their experience of multicultural education.

**Subjects:** The number of samples to be surveyed was calculated as 100, with an effect size of 0.90 and \(p<0.05\) using G*power version 3.0; however, the sample size was doubled to obtain universal validity of the study results. A total of 189 valid survey results were obtained out of 200 distributed questionnaires, after excluding incomplete questionnaires. Subsequently, 98 participants
were placed in the group with multicultural education and 91 participants in the group without multicultural education. All participants were Korean nationals; participants included college students enrolled in a 4-year program (N=110), graduates who currently work as a nurse (N=70), clinical professionals (N=8), and an unemployed nurse (N=1). Age-wise, 169 participants were in their twenties, 16 in their thirties, and 4 were aged over forty. The sample comprised individuals who were nursing majors, since they are required to have the ability to recognize and utilize health-related cultural characteristics of healthcare recipients from diverse cultural backgrounds in different communities.

**Data Collection and Analysis:** Copies of self-report questionnaires were distributed to the participants, and the results were collected between June and December 2019. The appropriate measurement tools for the study were selected by the researcher through a literature review between February and May 2019. These tools included a scale for measuring CC by Chae⁴, a scale to measure CC developed by Han¹⁶, and a scale for measuring MA for community members by Ahn et al.⁶ were used. Each instrument used a 6-point Likert scale with possible responses of “strongly agree” (6 points), “agree” (5 points), “slightly agree” (4 points), “slightly disagree” (3 points), “disagree” (2 points), and “strongly disagree” (1 point) for all items. All participants completed the questionnaires after the researcher had distributed them one by one. The SPSS WIN version 24.0 was used to test the validity of the three measurement tools. A series of independent t-tests, correlation tests, and multiple regression analysis were conducted to examine the degree of CC and MA. Further, the factors influencing the two competencies were identified.

**Cultural Competency:** Both, the CC measurement tool for nurses (CCN) developed by Chae⁴ and the CC measurement tool for nursing students (CCNS) developed by Han¹⁶, were used in this study. The CCN targets clinical professionals and includes 33 questions regarding cultural awareness, cultural knowledge, cultural sensitivity, and cultural skills. The CCNS targets nursing students and consists of 27 questions that add cultural experience to the CCN⁴¹⁶. The reliability analysis conducted on the two tools showed a Cronbach’s α value of 0.789 for the CCN and Cronbach’s α value of 0.915 for the CCNS, for the sample group with multicultural educational experience. For the group without multicultural educational experience, Cronbach’s α was 0.818 for the CCN and 0.842 for the CCNS. Therefore, both analyses showed high reliability.

**Multicultural Acceptance:** The MA measurement tool developed by Ahn et al.⁶ was used in this study to assess MA of healthcare workers as general members of society. The MA includes 35 questions regarding perspectives toward culture, national identity, fixed-prejudice and discrimination, expectations of one-sided assimilation, sentiment of rejection and avoidance, willingness to act on interpersonal exchange, underlying evaluation and willingness to act as a global citizen. The reliability analysis of the tool was high, with a Cronbach’s α of 0.861 for the group with multicultural educational experience and 0.879 for the group without multicultural educational experience.

**Results**

**Demographic Characteristics:** The frequency analysis of the participants’ general characteristics is presented in Table 1. 87 participants of the experienced group and 23 participants of the unexperienced groups were college students, and most of all participants were female as seen in Table 1.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group according to experience of Multicultural Education</td>
</tr>
<tr>
<td></td>
<td>Experiecned (N=98)</td>
</tr>
<tr>
<td>Age (years)</td>
<td>% (N)</td>
</tr>
<tr>
<td>20–30</td>
<td>87.76 (85)</td>
</tr>
<tr>
<td>30–40</td>
<td>12.24 (12)</td>
</tr>
<tr>
<td>over 40</td>
<td>1 (1)</td>
</tr>
</tbody>
</table>
The Degree of Awareness Regarding Cultural Competency and Multicultural Acceptance between Groups According To Educational Experience: An independent sample t-test was conducted to identify the degree of awareness regarding cultural competency and multicultural acceptance between the groups according to educational experience. The group with experience in multicultural education was found to have higher awareness as seen in Table 2.

Table 2: Independent t-test results between groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>t (p value)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Experienced (N=98)</td>
<td>Unexperienced (N=91)</td>
</tr>
<tr>
<td>Perception of CCN, CCNS and MA</td>
<td>3.95±0.093</td>
<td>3.41±0.911</td>
</tr>
<tr>
<td>Level of CCN</td>
<td>4.90±1.20</td>
<td>4.38±0.62</td>
</tr>
<tr>
<td>Level of CCNS</td>
<td>4.83±0.55</td>
<td>4.17±0.69</td>
</tr>
<tr>
<td>Level of MA</td>
<td>4.51±0.52</td>
<td>4.17±0.35</td>
</tr>
</tbody>
</table>

*p<0.05, **p<0.01, ***p<0.001

Cultural competency and the competency of multicultural acceptance according to experience in multicultural education: An independent sample t-test and correlation analysis were conducted between the two groups on cultural competency and multicultural acceptance. The group with educational experience had higher cultural competency and multicultural acceptance, and significant differences between the groups were detected in the degree of each competency, as seen in Table 2. In addition, there was no significant correlation between cultural competency and multicultural acceptance in the cultural competency tool by Chae in either groups. Conversely, ‘cultural experience’ showed a positive correlation with ‘open perspectives towards culture’ (r=.203, p=.045) in the tool developed by Han for the group with educational experience, and ‘cultural knowledge’ and ‘cultural experience’ showed a negative correlation with the willingness to act as a global citizen, which is a factor for multicultural acceptance (r=-.249, -.223 p=.017, .024).
Table 3: Correlation test results of CCNS and MA between groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Variable</th>
<th>MA item</th>
<th>CCNS item</th>
<th>r (p value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experienced (N=98)</td>
<td>Open perspectives toward cultures</td>
<td>Cultural Experience</td>
<td>0.203 (0.045)*</td>
<td></td>
</tr>
<tr>
<td>Unexperienced (N=91)</td>
<td>Willingness to act as a global citizen</td>
<td>Cultural Knowledge</td>
<td>-0.249 (0.017)*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cultural Experience</td>
<td>-0.223 (0.034)*</td>
<td></td>
</tr>
</tbody>
</table>

*p<0.05, **p<0.0, ***p<0.001

Next, based on Table 3, multiple regression analysis was conducted to identify the influencing factors between cultural competence and multicultural acceptance. ‘Cultural experience’ was found to have an effect on multicultural acceptance (‘open perspectives towards cultures’) in the multicultural education group, with an overall explanatory power of 28.5%, as shown in Table 4. However, regression analysis of the group without multicultural educational experience showed ‘cultural experience’ and ‘cultural knowledge’ as factors influencing MA (‘willingness to act as a global citizen’). The overall explanatory power was 24.7%, as shown in Table 4.

Table 4: Multiple Regression test results of influencing factors of CCNS on MA between groups (N=Number of participants)

<table>
<thead>
<tr>
<th>Group</th>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>t</th>
<th>F (p value)</th>
<th>r²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experienced group (N=98)</td>
<td>(Constant)</td>
<td>5.101</td>
<td>0.648</td>
<td>-0.534</td>
<td>2.659</td>
<td>3.592 (0.000)***</td>
<td>0.285</td>
</tr>
<tr>
<td></td>
<td>‘Cultural experience’ of CCNS toward ‘Open perspectives toward cultures’ of MA</td>
<td>-0.364</td>
<td>0.166</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unexperienced Group (N=91)</td>
<td>(Constant)</td>
<td>5.101</td>
<td>0.648</td>
<td>-0.621</td>
<td>2.768</td>
<td>2.412 (0.012)*</td>
<td>0.247</td>
</tr>
<tr>
<td></td>
<td>‘Cultural knowledge’ of CCNS toward ‘Willingness to act as a global citizen’ of MA</td>
<td>-0.488</td>
<td>0.176</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>‘Cultural experience’ of CCNS toward ‘Willingness to act as a global citizen’ of MA</td>
<td>-0.364</td>
<td>0.166</td>
<td>-0.534</td>
<td>-2.195</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<.05, **p<.01, ***p<.001

Discussion

This study aimed to prove the significance and necessity of multicultural education by identifying the level of CC and MA awareness, the degree of the two competencies, and the correlation between the two competencies as well as factors influencing CC and MA in two groups of participants according to their experience of multicultural education. First, participants showed significant differences in their degree of awareness regarding CC and MA according to their multicultural educational experience (Tables 2). The group with multicultural education had a higher awareness of CC and MA than the group that did not have such education (Table 2). Upon examining the degree of CC and MA between groups according to their multicultural educational experience, the CCN, the CCNS, and the MA measurement tool all outlined significant differences between the groups (Table 2). The level of MA among participants in this study was higher than the average score (4.07/6) in a group of highly educated clinical professionals surveyed by Kim et al. Moreover, the CC in the multicultural education group was higher than the 4.14 ± 0.45 score obtained by Choi and Kim, and the 3.9 ± 0.46 score in Han (Table 2). Furthermore, the scores detecting cultural experience as part of the CCNS between the groups with or without multicultural educational experience were higher than the score of 3.85±0.72 points in Choi and Kim and 3.05±0.79 points in Han. The score in the group without multicultural education was also higher than the 3.34±0.70 points in Choi and Kim and 2.54±0.22...
points in Han. These results identifying the differences between the groups with and without multicultural educational experience appear to be meaningful, based on comparison with previous studies. Thus, multicultural educational experience is effective in enhancing CC and MA, and more opportunities to receive multicultural education should be provided to those pursuing higher education, including nursing majors, to enhance CC and MA.

Second, on examining the correlations and factors influencing CC and MA, it was found that among the subcomponents of CC, ‘cultural experience’ and ‘cultural knowledge’ showed a significant correlation with MA (Table 3). In addition, according to the results of the multiple regression analysis, ‘cultural experience’ influenced MA in the multicultural education group, and ‘cultural experience’ and ‘cultural knowledge’ influenced MA in the group with multicultural education (Table 4). These results support the findings of Cho and Sok, which state that the degree of multicultural awareness and degree of CC affect MA. Therefore, education that raises awareness of CC is necessary for nursing majors and clinical professionals to enhance MA. However, cultural experience such as an experience in providing medical services to foreign patients, and cultural knowledge gained in the classroom such as introduction to and explanation of various cultures were identified to have greater impacts on MA. The results of this study are different from results of previous studies that showed that contact with foreigners and exposure to multicultural information through media such as television broadcasts, Internet, and newspapers positively influenced MA. In contrast, in this study, contact with foreigners and exposure to multicultural environments were found to have a negative impact by hindering open perspectives toward people from diverse cultural backgrounds, for the group with multicultural education. This difference in the results was further evident in the group without multicultural education, as such contact and exposure can diminish social support for healthcare recipients by forming a rigid manner of thinking. However, as interest in CC and MA is consistently increasing among healthcare workers, including nursing majors, providing academic or professional level-specific educations is an effective method to enhance CC and MA. In conclusion, multicultural education can enhance CC by considering cultural knowledge and cultural exposure, such as teaching the unique health beliefs of the recipients’ culture; such education may have more effect on groups with multicultural educational experience to enhance the competencies necessary for healthcare providers, as suggested by Chae et al. and Byun and Park. In addition, providing education about multicultural policies in local communities and providing training for healthcare skills tailored for recipients from multicultural backgrounds, as well as providing education to enhance empathy and human rights sensitivity as suggested by Han and Ahn and Noh, is also needed.

**Conclusion**

In this study, the following results were obtained through a comparative analysis of CC and MA between two groups of nursing majors according to their educational experience. First, the degree of awareness of CC and MA varied depending on the experience of multicultural education. Second, CC affected the degree of MA. Specifically, it was confirmed that in the group with experience of multicultural education, cultural experience acted as the main influencing factor for MA, and in the group without multicultural education, cultural experience and cultural knowledge were the main factors influencing MA. Third, the components of multicultural education should be different depending on healthcare providers’ educational experience. Job skills training that utilizes knowledge of each individual’s own culture may be more effective in groups with multicultural educational experience than exposure to information through mass media and contact with foreigners and other cultures. Last but not least, the components of multicultural education must be different depending on the educational experience. For those who have received multicultural education, job skills training based on specific information to provide differentiated services in consideration of the cultural characteristics of recipients from different cultural backgrounds, may be effective. Whereas, for those who have not experienced multicultural education, it is necessary to provide education to improve policy toward foreigners in the community, increase empathy for foreigners, and sensitivity to human rights. However, as this study specifically targeted healthcare providers who majored in nursing, there are limitations to extensively applying the results on broader spectrums, and therefore, follow-up studies are required.

**Funding:** This research received no external funding.

**Conflicts of interest:** There is no conflict of interest.
Ethical Clearance: None. This study was exempt from the Ethical committee as the clinical research results were irrelevant in this study. However, ethical aspects were considered by explaining the research objectives, the content, and the rights of the participant.

References


Emergency Obstetric Protocol and its Effect on Practices of Interns Nursing Students

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Abstract

Background: Obstetric emergencies are life threatening medical condition that occurs during pregnancy, labor, or the postpartum period. Moreover, internships offer carefully planned, monitored work experience which allow the opportunity to apply knowledge and skills in a professional setting.

Study Aim: to evaluate the effect of emergency obstetric protocol on the practices of interns nursing students.

Methodology: A quasi experimental study conducted in technical institute of nursing faculty of nursing and in emergency department, intensive care unit and labor unit of maternity hospital Ain- Shams University. A convenient sample of one hundred of all female interns nursing students in the technical institute of nursing faculty of nursing Ain- Shams University from period (October 2019 to March 2020). Tools of data collection: Obstetric triage observational checklist used for assessment of intern nurses’ practices related to triage of obstetric emergencies cases and observational checklists tool for assessment of intern nurses’ practices related nursing management of common obstetrics emergencies pre and post protocol implementation.

Results: Showed statistically significant improvements in intern nurses’ practical skills related to triage process and nursing care of common obstetric emergencies immediately post intervention and in follow up phase.

Conclusion: Implementing emergency obstetric protocol had a positive effect on the practices of interns nursing students.

Keywords: Emergency Obstetric Protocol, Practices, Interns Nursing Students.

Introduction

Obstetric emergencies are life threatening medical condition that occurs during pregnancy, labor, or the postpartum period. Every day around the world, approximately 830 women die from preventable causes related to pregnancy and childbirth (1).

Additionally, there are a variety of obstetric emergencies that can threaten the well-being of both mother and child as, ectopic or tubal pregnancy, abruptio placenta, placenta previa, sever preeclampsia & eclampsia or pregnancy induced hypertension, premature rupture of membranes, amniotic fluid embolism, inversion or rupture of uterus, placenta accreta, prolapsed umbilical cord, shoulder dystocia, postpartum hemorrhage, obstetric shock and postpartum infection (1).

The triage process for women with common obstetric emergencies requires gathering relevant patient information, performing a focused assessment, determining an acuity level, and prioritizing the needs of the women seeking emergency care, all in a time-sensitive manner. Accuracy in problem identification is a crucial component of clinical decision making, especially in the triage encounter, and requires the nurse to establish boundaries of physiological and psychological stability as well as predict the potential trajectory of the patient’s condition (2).
Meanwhile, reducing maternal mortality is a major public health concern and arrived at the top of the health and development agendas and also one of Millennium Development Goals. So, multiple strategies are required to reduce the maternal mortality, one of these strategies is to make emergency obstetric care acceptable, accessible, and available to women and their families(3).

Also, creating protocols regarding obstetric emergencies including triage process are very important to provide the highest quality less cost efficient nursing care and increase satisfaction of clients. Moreover, nurse interns should be highly knowledgeable and well-trained caregivers for the overall safety and wellbeing of women. Building knowledge and practical skills are considered as a powerful tool for performance improvement and to maintain the efficiency of any health care organization(4).

Meanwhile, the mission of nursing education is to produce qualified nurses with the requisite knowledge, attitudes and skills. Moreover, internships offer carefully planned, monitored work experience which allow students the opportunity to apply their knowledge and skills in a professional setting (5).

Also, interns can earn academic credits from their college. During this period nurse interns should acquire the values, attitudes, increases confidence in knowledge and assessment skills, improves clinical skills, decision making, clinical judgment and critical thinking (6).

Materials and Method:

Research design: A quasi-experimental design was utilized to conduct this study.

Setting: The study was conducted in study classes, teaching rooms and in lab of the technical institute of nursing faculty of nursing Ain-Shams University and in emergency unit, intensive care unit and labor unit of maternity hospital Ain-Shams University

Subject:

Type of sample and size: Convenient sample was obtained. All female interns nursing students (100) in the technical institute of nursing, faculty of nursing Ain-Shams University in the period from (October 2019 to March 2020).

Tools of Data Collection: First Tool: Obstetric triage observational checklist. The researcher developed tool after reviewing the current related literature. It consists of nine sentences and it was used to assess intern nurse's practical skills for triage common obstetrics emergencies pre & post-interve

Scoring System: The checklist items was scored (3) for done each step correctly while (2) score was given for done incomplete correctly and (1) score for incorrect or not done. The scores of total practice were considered as ≥ 60% competent practice and < 60% incompetent practice.

Second Tool: Observational checklist developed by researcher after reviewing the current related literature. It consisted of nursing procedures and techniques for clinical practice based on published evidence for management of obstetric emergencies. The observational checklist used to assess and evaluate practical skills of interns nursing students regarding nursing management of obstetric emergencies pre & immediately post intervention and in follow up phase.

Scoring System: The total practice was scored as ≥ 60% was considered competent practice while total practice scored as < 60% was considered incompetent practice. Each item in the checklist was scored as complete correct practice scored as (3), incomplete correct practice scored as (2) and incorrect practice or note done scored as (1).

Data Analysis: The appropriate statistical method and tests were used. Data were analyzed using Statistical Program for Social Science (SPSS) version 21.0. The following tests were done: Chi-square (X2) test, Pearson Correlation (R) and Alpha cronbach reliability analysis of used tools.

Results

Table (1): Distribution of studied intern nurses according to their general characteristic study sample (N=100)

<table>
<thead>
<tr>
<th>Items</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean±SD</td>
<td>20.3±.48</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>20-21 years</td>
<td></td>
</tr>
<tr>
<td>Residence:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban.</td>
<td>50</td>
<td>50.0</td>
</tr>
<tr>
<td>Rural.</td>
<td>50</td>
<td>50.0</td>
</tr>
<tr>
<td>Marital status:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single.</td>
<td>94</td>
<td>94.0</td>
</tr>
<tr>
<td>Married</td>
<td>6</td>
<td>6.0</td>
</tr>
</tbody>
</table>
Table (1): Shows that the age of intern nurse ranged from 20 to 21 years with mean of (20.3 years). It also shows that (94%) of them were single. In addition (18.0 %) of studied intern nurses had work experience. Moreover (23%) of them were attended training course.

Figure (1): Percentage distribution of the studied intern nurses according to their total practice scores related to obstetric triage pre and post protocol intervention (n= 100).

Figure (2): Percentage distribution of the studied intern nurses according to their total practice scores related to emergency obstetric care pre and post protocol intervention (n= 100).
This figure demonstrates that (74%) of studied intern nurses had incompetent practice regarding obstetric emergencies pre implementation of the protocol. However, (92%) had competent practice immediately post and follow up implementation of the protocol.

Table (2): Relation between studied intern nurses’ practice related to obstetric triage, emergency obstetric and their qualifications post emergency obstetric protocol (n=100).

<table>
<thead>
<tr>
<th>Intern nurses’ qualifications</th>
<th>Intern nurses’ practice of obstetric triage post intervention</th>
<th>Intern nurses’ practice of obstetric emergencies Post intervention</th>
<th>x²</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Done correct</td>
<td>Done incomplete Correct</td>
<td>Done incorrect</td>
<td>Done correct</td>
</tr>
<tr>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Previous experience about emergency obstetric care:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>17</td>
<td>96.0</td>
<td>1</td>
<td>4.0</td>
</tr>
<tr>
<td>No</td>
<td>49</td>
<td>60.0</td>
<td>26</td>
<td>31.0</td>
</tr>
<tr>
<td>Training course about emergency obstetric care:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>21</td>
<td>91.0</td>
<td>2</td>
<td>9.0</td>
</tr>
<tr>
<td>No</td>
<td>41</td>
<td>54.0</td>
<td>34</td>
<td>44.0</td>
</tr>
</tbody>
</table>

P < 0.05 significant (S) *

This table shows that there was statistically significance differences relation between intern nurses’ practice related to obstetric triage, practice related to emergency obstetric post intervention and their qualifications (previous experience & and training program).

Discussion

Regarding practice of obstetric triage; results of the present study revealed that, nearly three quarters of the studied intern nurses had incompetent practice regarding obstetric triage before protocols implementation. Moreover, the present study revealed improvement in intern nurses’ practice of obstetric triage as the majority of studied intern nurses had competent practice related to obstetric triage after protocol implementation and at follow up slightly increase.

The result pre protocol implementation could be explained by intern nurses lack of knowledge regarding triage cases with obstetric emergencies, lack of training courses and workshop about emergency obstetric skills and obstetric triage that affect on their practice.

So this incompetent level of practice before intervention showed the importance of continuous education, teaching protocols and regular updating clinical courses for intern nurses and importance of internship program and focusing on weak points during training to promote knowledge and practice. Therefore, it is important and essential that intern nurses should be well trained and educated on obstetric emergencies and obstetric triage as they have the vital role to play as nurses are primary anchorperson in emergency department and should have proper decision making then begin the initial assessment, triage then offer nursing management of such cases.

This result agrees with (7) who study effect of triage education on nurses’ performance in Diverse in emergency department of obstetrics and pediatric gavernate hospital in Beni Suef, who stated that the studied nurses’ practices related to triage improved throughout the education guideline implementation phases as most of them don’t practice triaging before the guideline implementation. Then this deficient practice greatly improved to reach the majority of them had correct practice immediately after program implementation and at their follow up evaluation.

Also, in accordance with current study findings (8) who conducted study of assessment of staff nurse’s knowledge and performance regarding triage in emergency department of Nasr institute hospital, who mentioned that more than three-quarters of nurses had inadequate performance regarding triage before intervention.
In the researcher point of view, this similarity may be attributed to lack of nurses’ knowledge which reflected on their performance and lack of qualifications.

Furthermore, on investigating practical skills of intern nurses during caring of obstetrics emergencies cases, results of the present study revealed that slightly less than three quarters of the studied intern nurses had incompetent practice regarding management of obstetric emergencies before protocol implementation. Meanwhile, after implementation of the protocol the most of them had competent practice related to obstetrical emergencies.

These above findings are consistent with (3) who illustrated that slightly more than three quarter of nurses had unsatisfactory practices toward emergency obstetrics care before intervention of the nursing management protocol related to EMOC. Meanwhile, after intervention the most of them had satisfactory practices regarding obstetric emergencies.

The current study findings were also in accordance with (9) who mentioned that there was a relation between the availability of guidelines for the management of obstetric emergencies and the higher competency among primary healthcare workers in Mali.

Furthermore, this result is supported by (10) who indicated that regular training of nursing personnel will improve and enhance quality of health care, who made mixed-method study in fourteen Bangladesh government healthcare facilities.

Additionally, this result agrees with (11) who studied the effect of educational program for nurses about pregnancy induced hypertension on their knowledge and practice in Port Said hospitals, who founded that the majority of nurses before training had incorrect practice regarding EMOC and improved post training.

Also, the present study finding showed that there was significant improvement in practice related to EMOC post intervention compared to pre-intervention. The finding of the current study was in agreement with (8) who studied the effect of maternity nursing logbook on internship students’ skills at woman’s health hospital, Assiut Governorate and stated that there was a significant difference between pre and post training related the total score of internship nursing student’s practical skills.

Additionally, this result was consistent with (3) who found that there was significant improvement of nurses’ practice after protocols application compared to before it.

Also, results of the present study revealed that there was statistically significant difference between studied intern nurses’ total practices score related to obstetric triage, EMOC, and their qualifications post intervention.

The current study findings confirmed by (7) who studied assessment of cardiotocography versus intermittent auscultation of fetal heart on admission to labor ward for assessment of fetal wellbeing, who found that there was a highly statistically significant relation between nurses’ performance & their qualifications.

The current study findings confirmed by a study done by (3) who found that there was positive statistically significant correlation between practices related to obstetric emergencies after nursing management protocol and years of experience.

Additionally, this was similar with the finding of with (12) who reported that there was a significant relationship between practice, interpretation of CTG and qualification and work experience of studied sample.

Meanwhile, this result disagrees with who (13) studies assessment of emergency nursing care offered at labor ward in Ain Sham maternity hospital. Who found that there was no statistically significant difference between nurses’ performance and their qualifications. Also, these results disagree with (12) who stated that there was insignificant relation between nurses’ practice and their experiences year and personal characteristics.

In the researcher point of view, the dissimilarity may be related to study subject in second study (nurses) spending a lot of times working in the same department and absence of training program in that time and state of unrefreshment.

Conclusion
Implementing emergency obstetric protocol had a positive effect on the practices of interns nursing students.

Recommendations: Dissemination of emergency obstetric protocol for all internship nursing students in faculties of nursing and nursing institutions this will be effective in improving their practical skills about obstetric emergencies.
Further Researches: Replication of the study on large sample size and in other different institutions for generalizing the findings.

Source of Funding: Self funded “author”

Conflict of Interest: Non to declare.

Ethical Clearance: All experimental protocols were sssapproved under the collage of Nursing – Ain Shams University Cairo. Egypt and all experiments were carried out in accordance with approved guidelines.

Reference
Estimation of Stature from Foot Dimensions from Female Population of Rajasthan

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Abstract

Background: Analyzing and identifying evidences found at crime scene plays a crucial role in apprehending the offenders and putting them behind bars. Stature Estimation has a significant importance when it comes to narrowing down the list of suspects. At various instances footprints are left behind at the crime scenes as vital evidence and can be utilised for generating the stature of the individual/s connected with the crime scene.

Method: The present study focuses on female population belonging to Rajasthan. Major objective is to determine relation between foot dimensions and stature (n=111). Foot dimensions, mainly foot length and breadth were calculated using standard measurements method. The samples were statistically analyzed; regression equations were generated for length and width of left and right foot.

Conclusion: The predicted R-squared values showed quite significant value of left foot being (0.09) and right foot being (0.04). SEE was calibrated through the regression equations. Width of both the left and right foot were found to be more significant measurements for estimating stature in Rajasthan Population.

Keywords: Forensic science, Anthropometry, Foot length and breadth, Stature estimation, Regression analysis.

Introduction

The application of Anthropology in the field of forensic science is to yield answers to questions that arise due to legal and public concerns. Numerous cases have been reported in the past where, skeletal remains were recovered and identification had to be made. Forensic Anthropometry which was initiated by Alphonse Bertillon back in 1800s was used to record the data of the individuals who were suspects or criminals by taking various body measurements. It still plays an extremely vital role in identifying and reconstructing such events where the death is in question.It becomes even more necessary when we encounter natural calamities such as earthquake, tsunami or a disaster like bomb blasts, air plane crash, where numbers of deceased are uncertain. Countless researches have been utilized in deciphering the gender, ethnicity, age at the time of death and the physical make up or the stature from the recovered fragmented cadaver.

Stature Estimation has been conducted by numerous scholars over the time, the records dates back to 1899; K. Pearson suggested various parameters and equations for evaluating the height and the correlation found among bones and stature. In his memoir it has been mentioned that one equation or a parameter cannot be used to decipher stature of every population that have a different ethnic and ancestral background.

Estimating stature through bones has been accomplished but few studies focus on determining the same using foot dimensions. Being a crucial part of
anthropology they play a decisive role in crime scene investigations. The possibility of their occurrence at a crime scene is uncanny. They can be found in numerous forms, latent, patent as well as plastic impressions. Once located if they are carefully lifted or recorded with correct measurements they can be used to determine the height of the person that was involved at the crime scene. Each print holds great evidentiary value and thus can be aided in narrowing down the investigation. Determining the stature with foot, hand length and breadth was conducted in Turkey on volunteers and the equation derived using foot dimensions yielded more accurate results. Similar studies have been reported in the subcontinent of India, the selected population group being small and restricted to states. Height was estimated using foot measurements in Gujrat Region, Kori Population of Kanpur (U.P) were analyzed on similar body measurement parameters such as full arm length, foot length and breadth, knee length, the accurate measurements were yielded by the foot dimensions. Study conducted on tribal males of Udaipur district of Rajasthan yielded high core relation between the left and right foot length and the stature of the individuals under study. In the present study, the focus is drawn towards stature estimation and determination through human foot of the young females hailing from Rajasthan.

**Materials and Methodology**

Sample collection was conducted at Mody University of Science and Technology, Laxmangarh, Rajasthan. Females who originally hail from the state of Rajasthan were the key targets. A total of 111 samples were collected with the age between 17-23 years, height was calculated using standard measurement criteria; the measuring scale was drawn on a straight wall. The foot prints were taken on plane A4 size sheets. Consent was taken from each individual for maintaining the anonymity and that the data is being collected for the sole purpose of research. Stature was calculated by asking the individual to take off shoes and socks and was made told to stand straight in front of the measuring scale; using a ruler the accurate distance was measured. The foot impressions were drawn with the help of the pen aligning the edge of the skin on an A4 sheet with the support of the flat tile surface. Both the foot were drawn on two different sheets. The length was the foot was taken from the heel to the apex of the toe represented as LFL for Left Foot Length and RFL for Right Foot Length. The breadth was measured from either side of the metatarsals represented as LFW for Left Foot Width and RFW for Right Foot Width. These measurements were brought about on the drawn images of the foot on the piece of paper. (Figure 1)

![Figure 1: Measurements taken of right foot LENGTH (a) and Width (b) of the foot.](image)

**Descriptive Statistics:** Statistical analysis was brought about on the acquired samples. Descriptive statistics result as shown in Table 1. The measurements of the stature of individuals under study had a range between 145-177cms. In order to yield a better correlation between the parameters and the stature, value of p<0.001 was considered. A significant correlation was obtained between stature estimation and Right Foot Width having the value of R=0.02 and Left Foot Width with the value of R=0.03.
Table 1: Descriptive Statistics conducted for Stature estimation and Foot Measurements.

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Stature</th>
<th>LFL</th>
<th>RFL</th>
<th>LFW</th>
<th>RFW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median</td>
<td>160.000</td>
<td>24.600</td>
<td>24.900</td>
<td>9.700</td>
<td>9.600</td>
</tr>
<tr>
<td>Mode</td>
<td>159.0</td>
<td>24.1</td>
<td>24.9</td>
<td>9.5</td>
<td>9.7</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>5.9843</td>
<td>1.0282</td>
<td>1.1108</td>
<td>0.5019</td>
<td>0.4676</td>
</tr>
<tr>
<td>SEM</td>
<td>0.5680</td>
<td>0.0976</td>
<td>0.1054</td>
<td>0.0476</td>
<td>0.0444</td>
</tr>
</tbody>
</table>

Table 2 determines the value obtained after conduction of simple linear regression analysis. The table shows Standard Error Estimation (SEE), the predicted correlation values (R) and the percentage of variance (R²) thus calculated.

Table 2: Simple Linear Regression Analysis Output.

<table>
<thead>
<tr>
<th>SEE</th>
<th>Value of r</th>
<th>Value of r²</th>
</tr>
</thead>
<tbody>
<tr>
<td>LFL</td>
<td>5.29</td>
<td>0.46904</td>
</tr>
<tr>
<td>LFW</td>
<td>5.72</td>
<td>0.3</td>
</tr>
<tr>
<td>RFL</td>
<td>5.11</td>
<td>0.5196</td>
</tr>
<tr>
<td>RFW</td>
<td>5.88</td>
<td>0.2</td>
</tr>
</tbody>
</table>

Table 3 determines the Simple Linear Regression equations generated for the defined variables; extremely less error rate was obtained by using foot measurements of the females specifically using the width of both the left and right foot.

Table 3

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Linear Regression Equations</th>
</tr>
</thead>
<tbody>
<tr>
<td>LFL</td>
<td>S = 92.46+2.76(LFL)</td>
</tr>
<tr>
<td>LFW</td>
<td>S = 125.48+3.62(LFW)</td>
</tr>
<tr>
<td>RFL</td>
<td>S = 90.04+2.83(RFL)</td>
</tr>
<tr>
<td>RFW</td>
<td>S = 135.98+2.56(RFW)</td>
</tr>
</tbody>
</table>

ANOVA conducted on the sample yielded a significant value of 0.03 for estimating stature using RFW.

<table>
<thead>
<tr>
<th>ANOVA</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>Significance F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>1</td>
<td>158.7317</td>
<td>158.7317</td>
<td>4.576455</td>
<td>0.034645878</td>
</tr>
<tr>
<td>Residual</td>
<td>109</td>
<td>3780.602</td>
<td>34.68442</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>110</td>
<td>3939.334</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coefficients</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>135.9884458</td>
<td>11.49764</td>
<td>11.82751</td>
<td>2.9E-21</td>
<td>113.2005009</td>
</tr>
<tr>
<td>RFW</td>
<td>2.568747659</td>
<td>1.200762</td>
<td>2.139265</td>
<td>0.034646</td>
<td>0.188877026</td>
</tr>
</tbody>
</table>
Discussion

Numerous studies have been conducted in estimating the stature or height using various body measurements. A significant amount of research reveals that yielding equations using foot dimensions can be extensively used for estimating the stature of various individuals. Literary works conducted nationally as well internationally clearly mention that one single formula and equation cannot be utilized in determining the stature at universal level. Thus every population, tribe, community, locations where people have been living are key research hot spots for conducting these studies. Taneja et al.⁶ in their study of stature estimation of the males of Udaipur, Rajasthan using foot measurements obtained a correlation coefficient between stature and dimensions of the right foot of 0.184 and 0.186 of the left foot. One more study was conducted on KORI population of Kanpur with various body measurements of both males and females.⁵ Thus derived regression equation for estimating the stature of the said population yields a highly significant value while determining stature using foot measurements.

Similar research using foot dimensions for estimating the stature of Gujarat Population was conducted.⁴ They obtained significant values of correlation coefficient between stature and foot length of both male and female. The obtained significant value for male was 0.65 and female was 0.80. Another study was conducted in Mahakauschal region of Madhya Pradesh.⁷ In their study they determined the height from foot dimension, the width and the length being the key parameters and were found to be extremely correlated with stature.

Ozaslan et al.³ conducted the research on Turkish Population for estimating stature using both hand and foot dimensions. In their study they reported that length measurements yield more accurate results as compared to breadth results. Foot dimensions in male yielded a value of r=0.696 and females reported r=0.496. Concurringly hand dimensions in male gave a significant value of r=0.578 contrary to females with r=0.309 value. Moorthy & Khan ⁸ conducted their research on Bidayuhs in east Malaysia using regression equation for estimating stature using footprints. Apart from dimensions they also incorporated gender as an indicator in stature estimating. The result showed that dimension dependent values were found to be more significant than the one that had gender as a parameter in the pooled sample population.

Giles & Vallandigham⁹ used anthropometric measurements on human anatomy for determining the height on Igbo inhabitants of Imo state in Nigeria. Their findings report that foot lengths are more accurate and have high predictability rate as compared to width. Right foot showed accuracy of 50.26% in males and 44.05% in females.

Numerous scholars have predicted various measures of stature estimation that have various parameters involved after from just length and breadth dimensions. The present study conducted on females of Rajasthan population show a more significant role of width in height estimation than length. Analysis conducted on Right foot width produced a value of 0.04 which is extremely significant and on contrary Left foot width produced a significant value of 0.09. Thus it can be concluded that the obtained regression equations can be utilized in estimating the stature from footprints of Rajasthan female population.

Conclusion

Stature estimation or height determination plays extensive role in forensic science. Its extent stretches from narrowing down the suspect list to identifying the individual. India is a large country with diverse communities thus generating a universal equation for stature estimation is not feasible. Thus research conducted on communities sharing ancestral history of location can be brought about for correct estimation of height. These collections can at a large become a database that could be used for identification purpose. Our study conducted on Rajasthan population of females achieved a significant result of equations, where both foot widths are showing highly accurate result for estimating the stature.

Conflict of Interest: Faray Jamal, Rishu Agarwal, Aditi Mishra and Ulhas Gondhalidclare that they have no conflict of interest.

Source of Funding: Self funding.

Ethical Clearance: This study was approved by the Institutional Ethical Committee of the Raksha Shakti University.

Acknowledgement: We want to acknowledge administration of Mody University of Science and Technology for providing us the facility for conducting of this research work Estimation of stature from foot dimensions from female population of Rajasthan
References

Common Hemoglobinopathies for Couples Premarital Individual and its Influence on Hemostasis and Immune State

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¹,²Medical Laboratory Technology Department, Bilad Al-Rafidain University College,
³Consultant Doctors, Baqubah Teaching Hospital, Diala Health Directorate, Iraq

Abstract

Before marriage, couples are screened through a procedure known as premarital screening for different genetic, infectious or bloodborne diseases that can be passed from them to their offspring. The aim of our research was to assessment the premarital screening of couples for hemoglobinopathies and undiagnosed cases with suggestive findings of thalassemia or its variants. and evaluation hematology parameters among common Hb hemoglobinopathy. This study contains 228 individuals with hemoglobinopathy, the participants were couples attending primary health centers for regular premarital inquiries in Baquba teaching hospitals, Iraq. α-thalassemia was enrolled in 3 (1.3%) from all hemoglobinopathy individuals, β-thalassemia was enrolled in 255 (98.8%), which include β-thalassemia minor in 226 individuals 88.6%, while β thalassemia intermediate in 5 individuals 2.2% from all individuals with hemoglobinopathy. Others thalassemia was recorded 3 Hb-E 1.1%, 1 Hb-S 0.39, 10 Hb-D 3.92, 13 Hb-C 5.09. Pre-marital examinations are important to determine hemoglobinopathy and limit transmission to offspring, as well as blood tests are important to identify people with haemoglobinopathy and its influence.

Keywords: Hemoglobinopathies, Premarital Individual, hemostasis, immune state.

Introduction

Before marriage, couples are screened through a procedure known as premarital screening for different genetic, infectious or bloodborne diseases that can be passed from them to their offspring(1). Among the most common autosomal recessive disorders affecting humans, haemoglobinopathies are assessed and are characterized by the existence of qualitative and/or quantitative anomalies affecting the globin chains (2).

The most common qualitative anomalies are haemoglobin (Hb)S, which causes Hb-C or Hb-D disease of the sickle cell (SCD) and others, and the most common quantitative anomalies with decreased or absent alpha- or β-globin chain synthesis lead to alpha- and β-thalassemias, respectively(3, 4). These are the world’s most common single gene disorders, particularly in the Eastern Mediterranean Region, including Iraq(5). Premarital screening for thalassemia and sickle cell anemia was required in 2004 by the Third Royal Decree. According to this decree, couples getting married must receive a certificate specifying their thalassemia and sickle cell anemia status from the approved health centers after being checked. Another essential role of this initiative is the therapy of couples at risk (6).

This study aimed to assess the premarital screening of couples for hemoglobinopathies and undiagnosed cases with suggestive findings of thalassemia or its variants, and evaluation hematology parameters among common Hb hemoglobinopathy.

Material and Method

This study contains 228 individuals with hemoglobinopathy. The participants were couples attending primary health centers for regular premarital inquiries in Baquba teaching hospitals, Iraq. By using standard laboratory procedures the hemoglobin electrophoresis on cellulose acetate (at pH 8.6) was
carried out on all (228) samples. The HbA2 level was calculated by alkaline denaturation using elution from cellulose acetate and HbF(7).

β-thalassemia minor was diagnosed by an elevated HbA2, while β-thalassemia major was diagnosed by an elevated Hb-F, and others (Hb-E, Hb-S, Hb-D, Hb-S) trait by a positive test confirmed by Hb band on electrophoresis. α-thalassemia trait was diagnosed by an absence of Hb variants or any increases in Hb A2 or HbF(8), table 1.

**Table 1: Normal haemoglobins in Fetus and adult blood**

<table>
<thead>
<tr>
<th>Hemoglobin</th>
<th>Globin chains</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fetus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hb F</td>
<td>α2 γ2</td>
<td>85%</td>
</tr>
<tr>
<td>Hb A</td>
<td>α2 β2</td>
<td>5–10%</td>
</tr>
<tr>
<td>Adult</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hb A</td>
<td>α2 β2</td>
<td>96 – 98%</td>
</tr>
<tr>
<td>Hb A 2</td>
<td>α2 δ2</td>
<td>0.5 – 3.2%</td>
</tr>
<tr>
<td>Hb F</td>
<td>α2 γ2</td>
<td>0.5 – 0.8%</td>
</tr>
</tbody>
</table>

**Statistical Analysis:** Statistical analysis was achieved by using SPSS 20.0 software (SPSS, Inc., Chicago, IL, USA). Continuous variables were expressed as the mean ± standard error. Dichotomous variables were expressed as percentages. ANOVA was achieved to estimate the differences in continuous variables between the common hemoglobinopathies groups. P < 0.05 was considered to indicate a statistically significant difference.

**Results**

α-thalassemia was enrolled in 3 (1.3%) from all hemoglobinopathy individuals, β-thalassemia was enrolled in 255 (98.8%), which include β-thalassemia minor in 226 individuals 88.6%, while β-thalassemia intermediate in 5 individuals 2.2% from all individuals with hemoglobinopathy Figure 1 and 2. Others thalassemia was recorded 3 Hb-E 1.1%, 1 Hb-S 0.39, 10 Hb-D 3.92, 13Hb-C 5.09 Figure 3.

![Figure 1: The percentage of β- and α-thalassemia](image-url)
Table 2 illustrated Hb electrophoresis, the mean Hb A0, A1c, A2, F level in α-thalassemia patients was (70.5 %, 9.9%, 1.7 %, 25.3% respectively). And in β-thalassemia minor patients was (80.32%, 5.0%, 4.9%, 6.6% respectively). While in β-thalassemia intermediate patients was (48.8%, 5.1%, 6.8%, 30.1% respectively). Others hemoglobinopathies the mean Hb A0, A1c, A2, F level in Hb E beta thalassemia patients was (64.43%, 4.8%, 25.6%, 0.9% respectively), Hb Sickle disease patients was (58.5%, 5.4%, 3.4%, < 0.8% respectively), Hb D beta thalassemia patients was (54.47%, 5.05%, 5.05%, < 0.8% respectively), and Hb C disease patients was (56.39%, 4.93%, 3.2%, <0.8% respectively).

Table 2: Mean Hb Electrophoresis Results in Various Hemoglobinopathies

<table>
<thead>
<tr>
<th>Hemoglobinopathy</th>
<th>A0 %</th>
<th>A1c %</th>
<th>A2 %</th>
<th>F %</th>
</tr>
</thead>
<tbody>
<tr>
<td>α-thalassemia</td>
<td>70.5</td>
<td>9.9</td>
<td>1.7</td>
<td>25.3</td>
</tr>
<tr>
<td>β-thalassemia minor</td>
<td>80.32</td>
<td>5.0</td>
<td>4.9</td>
<td>6.6</td>
</tr>
<tr>
<td>β-thalassemia intermediate</td>
<td>48.8</td>
<td>5.1</td>
<td>6.8</td>
<td>30.1</td>
</tr>
<tr>
<td>Hb E beta thalassemia</td>
<td>64.43</td>
<td>4.8</td>
<td>25.6</td>
<td>0.9</td>
</tr>
<tr>
<td>Hb Sickle disease</td>
<td>58.5</td>
<td>5.4</td>
<td>3.4</td>
<td>&lt; 0.8</td>
</tr>
<tr>
<td>Hb D beta thalassemia</td>
<td>54.47</td>
<td>5.05</td>
<td>5.05</td>
<td>&lt; 0.8</td>
</tr>
<tr>
<td>Hb C disease</td>
<td>56.39</td>
<td>4.93</td>
<td>3.2</td>
<td>&lt;0.8</td>
</tr>
</tbody>
</table>
Table 3 illustrated hematological parameters in common hemoglobinopathies the white blood cells showed increased significantly in β-thalassemia intermediate and decrease significantly in Hb E beta thalassemia when compared with others groups. As well as the platelets showed decrease significantly in β-thalassemia intermediate and increased significantly in Hb E beta thalassemia when compared with others groups.

### Table 3: Hematological Parameters in Common Hemoglobinopathies

<table>
<thead>
<tr>
<th>Hemoglobinopathy</th>
<th>WBC  M ± SE</th>
<th>RBC  M ± SE</th>
<th>PLT  M ± SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>α-thalassemia</td>
<td>8.70 ±1.29</td>
<td>5.15 ± 0.13</td>
<td>154.00 ± 0.00</td>
</tr>
<tr>
<td>β-thalassemia minor</td>
<td>10.27 ± 0.81</td>
<td>6.15 ± 0.30</td>
<td>305.55 ± 40.02</td>
</tr>
<tr>
<td>β-thalassemia intermediate</td>
<td>14.33 ±0.00</td>
<td>5.15 ± 0.00</td>
<td>153.00 ± 0.00</td>
</tr>
<tr>
<td>Hb E beta thalassemia</td>
<td>5.65 ± 0.78</td>
<td>5.22 ± 0.02</td>
<td>374.00 ± 0.00</td>
</tr>
<tr>
<td>Hb Sickle disease</td>
<td>7.80 ± 0.00</td>
<td>4.43 ± 0.00</td>
<td>357.00 ± 0.00</td>
</tr>
<tr>
<td>Hb D beta thalassemia</td>
<td>11.42 ± 0.98</td>
<td>4.97 ± 0.21</td>
<td>283.25 ±57.24</td>
</tr>
<tr>
<td>Hb C disease</td>
<td>9.38 ± 0.68</td>
<td>5.67 ± 0.14</td>
<td>274.91 ± 35.99</td>
</tr>
</tbody>
</table>

### Discussion

The premarital screening program is essential for genetic disorders as it dictates the prevalence and potential transmission of these disorders to the offspring.

The most prevalent abnormal finding observed in our study was β-thalassemia minor (88.6%), while the α-thalassemia reached (1.3%). Studies performed in Jeddah (West) and Al-Hassa (East) found that 4.69 percent and 3.4 percent of individuals had β-thalassemia trait(9,10). With an average prevalence of carriers of about 4 percent and an estimated 15,000 registered major/intermediate thalassemia patients throughout the region, β-thalassemia is a common inherited hematological disorder in Iraq. The sickle cells were found in (0.39%) individuals in the studied population. This result is contradictory to the findings of other studies where the recorded prevalence of sickle cell trait β thalassemia is 3.4% and 3.3%(11,12). Hemoglobin E (1.1 %) was found to be a small proportion of the studied population. In Jeddah, the prevalence of hemoglobin E recorded was 0.85% these percentage is low when compared with our result(13).

In our study the platelets showed decrease significantly in β-thalassemia intermediate and increased significantly in in Hb E beta thalassemia when compared with others groups, platelets are activated by free radical from hemoglobin(14,15), RBC phospholipids, thrombin(16), and microparticles(17). Then, after their activation, platelets bind to proteins S and C(11). Release thromboxane A2 (TXA2)(18), and form microparticles of platelets(17). Simultaneously, iron overload is also present in β-thalassemia.] Vitamin C is decreased due to this iron overload, which may result in platelet defect(19).

Several immunological defects can be found in patients with thalassemia, among which the impairment of neutrophils and macrophage phagocytic and killing functions. In our study the white blood cells showed increased significantly in β-thalassemia intermediate and decrease significantly in Hb E beta thalassemia when compared with others groups. In β-thalassemia, The white blood cells defect in thalassemic patients may result from dysregulation of the apoptotic cells death pathway(20).

### Conclusion

Pre-marital examinations are important to determine hemoglobinopathy and limit transmission to offspring, as well as blood tests are important to identify people with haemoglobinopathy and its influence.

**Source of Funding:** Self fund.

**Conflict of Interest:** No conflict of interest

**Ethic Statement:** The researchers already have ethical clearance from all required institution and laboratories.
References


5. Al Allawi NA, Al Dousky AA. Frequency of haemoglobinopathies at premarital health screening in Dohuk, Iraq: implications for a regional prevention programme. 2010;


Assessment on Level of Knowledge Regarding Child Sexual Abuse among School Children at Kattankulathur High School

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\textsuperscript{1}Assistant Prof., SRM College of Nursing, \textsuperscript{2}Professor, SRM College of Nursing, \textsuperscript{3}Professor, SRM College of Nursing, \textsuperscript{4}Associate Professor, SRM College of Nursing, \textsuperscript{5}Assistant Professor, SRM College of Nursing

Abstract

Child sexual abuse (CSA) is a serious and widespread problem in India as it is in many parts of the world today. Objective: The aim of this study was assess the knowledge on child sexual abuse among school children at Kattankulathur High School and to associate the knowledge on child sexual abuse among school children at Kattankulathur High School with their demographic variables.

Method: Quantitative approach and non-experimental descriptive research design was used. The data collection included two parts. Part A: Demographic variables, Part B: A Structured questionnaire to assess knowledge on child sexual abuse among school children. 180 school children who fulfilled the inclusion criteria were selected as samples using non probability convenient sampling technique. The study was conducted at Kattankulathur High School, Kancheepuram dt.

Results: The data were analyzed and interpreted based on the objectives using descriptive and inferential statistics. Among 180 school children 90.6% of them had Moderately adequate Knowledge, 9.4% of them had Inadequate knowledge and None of them had adequate knowledge. The p-values are not significant since they are not less than 0.05 hence we can say that there is no significant association between the demographic variables and the knowledge on Child Sexual Abuse at 5% level. Conclusion: child sexual abuse is an important contributor to psychological and emotional disorders, that some children and adolescents may never overcome.

Keywords: Child sexual abuse, school children.

Introduction

Child sexual abuse (CSA) is defined as the misuse of power and authority, combined with force or coercion, which leads to the exploitation of children in situations where adults, or children sufficiently older than the victim to have greater. Child sexual abuse (CSA) is a serious and widespread problem in India as it is in many parts of the world today. The trauma associated with sexual abuse can contribute to arrested development, as well as a host of psychological and emotional disorders, that some children and adolescents may never overcome. When sexual abuse goes unreported and children are not given the protective and therapeutic assistance they need, they are left to suffer in silence\textsuperscript{(1)}.

Child sexual abuse, also called child molestation, is a form of child abuse in which an adult or older adolescent uses a child for sexual stimulation Forms of child sexual abuse include engaging in sexual activities with a child (whether by asking or pressuring, or by other means), indecent exposure (of the genitals, female nipples, etc.), child grooming, child sexual exploitation or using a child to produce child pornography\textsuperscript{(2)}.

Child sexual abuse can occur in a variety of settings, including home, school, or work (in places where child labor is common). Child marriage is one of the main forms of child sexual abuse; UNICEF has stated that child marriage “represents perhaps the most prevalent form of sexual abuse and exploitation of girls”. The effects of child sexual abuse can include depression, post-traumatic stress disorder, anxiety, complex post-traumatic stress disorder, propensity to further victimization in adulthood, and physical injury to the child, among other problems. Sexual abuse by a family member is a form of incest and can result in more serious
and long-term psychological trauma, especially in the case of parental incest(3).

The global prevalence of child sexual abuse has been estimated at 19.7% for females and 7.9% for males. Most sexual abuse offenders are acquainted with their victims; approximately 30% are relatives of the child, most often brothers, fathers, uncles, or cousins; around 60% are other acquaintances, such as “friends” of the family, babysitters, or neighbors; strangers are the offenders in approximately 10% of child sexual abuse cases. Most child sexual abuse is committed by men; studies on female child molesters show that women commit 14% to 40% of offenses reported against boys and 6% of offenses reported against girls(4).

The Magnitude of the Problem:

Global Level: In 2017, the WHO estimated that up to 1 billion minors between the ages of 2 and 17 years of age have endured violence either physical, emotional, or sexual. Sexual abuse (from groping to rape), according to some UNICEF estimates from 2014, affected over 120 million children, representing the highest number of victims. In 2017, the same UN organization reported that in 38 low and middle income countries, almost 17 million adult women admitted having a forced sexual relationship during their childhood(5).

According to the report on crimes in India for 2016, released by Indian Home Minister Rajnath Singh in Delhi, 106,958 cases of crimes against children were recorded in 2016. Of these, 36,022 cases were recorded under Pocso (Protection of Children from Sexual Offences) Act(6).

Unfortunately, many people feel that talking about childhood sexual abuse is taboo, even though we know it happens and know that it’s a crime. Some survivors are cut off from supports like family, friends and community members when they talk about their experiences(7).

Nurses should educate children and young people about healthy relationships and how to stay safe online. These foundations can be laid from a young age. Simple way to teach younger children how to stay safe from abuse may help to prevent them from sexual abuse.

Method and Materials

Quantitative approach and non-experimental descriptive research design was used. A total of 180 school children who fulfilled the inclusion criteria were selected as samples using non probability convenient sampling technique. The study was conducted at kattankulathur High School, Kancheepuram dt. The data collection included two parts. Part A: Demographic variables, Part B: A structured questionnaire to assess knowledge on child sexual abuse among school children. The Study variable was knowledge among school children on child sexual abuse and the Demographic variable were Age, education, mother education, father education, mothers occupation, fathers occupation, Type of family, Number of Children in the Family, other maids in the house and another family member living/always visiting your house.

Ethical Consideration: Formal approval was obtained from the Institutional Review Board and Institutional Ethical Committee of SRM IST, Head of the Department of Obstetrics and Gynaecology, SRM General Hospital, Kattankulathur. In addition, the participants were informed of their right to withdraw anytime during the study.

Instruments: The Demographic and the Structured Questionnaire was developed by the investigator based on the review of literature, discussion with experts and investigators personal experience. The tool consists of 2 sections. Part -A deals with demographic Variables and Part-B consisted of 15 questions to assess the knowledge on child sexual abuse among school children.

Scoring Key: Each question was given 4 options. Each correct answer was awarded score 1. Each incorrect answer was awarded score “0”.

Scoring Interpretation:

<table>
<thead>
<tr>
<th>Level of knowledge</th>
<th>Score</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inadequate knowledge</td>
<td>1 to 5</td>
<td>1 to 33</td>
</tr>
<tr>
<td>Moderately adequate knowledge</td>
<td>6 to 10</td>
<td>34 to 67</td>
</tr>
<tr>
<td>Adequate knowledge</td>
<td>11 to 15</td>
<td>68 to 100</td>
</tr>
</tbody>
</table>

Method of Data Collection: The formal permission was obtained from the head of the kattankulathur High School. The investigator explained the objectives and method of data collection to the school children. Verbal concern was obtained from the samples. The samples was chosen through non probability Convenient sampling technique. A total number of 180 school children who met the inclusion criteria were selected. The investigator explained the purpose of conducting
the study and reassured the client that the collection will be kept confidential.

On selection of the subject, a self introduction was given. Consent was obtained and confidentiality of the response was assured. The investigator assessed the Knowledge of child sexual abuse and it was assessed by Structured Questionnaire. In case of any doubts the investigators clarified the doubts.

The investigator collected information regarding section-A [demographic data] and section-B [knowledge assessment tools] and the responses marked simultaneously. It took around 15 minutes from each sample to obtain the necessary data. The investigator thanked the participants for extending their fullest cooperation.

### Statistical Analysis:
The information collected from the study participants was scored and tabulated. The data were entered into the master coding sheet and saved in Microsoft Excel. Statistical analysis was conducted using Statistical Package for Social Sciences-16. Mean, percentage, and standard deviation were used to explain the demographic variables, and Chi-square test was used to associate the demographic variables with level of knowledge on child sexual abuse among school children.

### Results

#### Table 1: Frequency and percentage distribution of level of knowledge on child sexual abuse among school children N=180

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Knowledge level</th>
<th>No. of Students</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Inadequate knowledge</td>
<td>17</td>
<td>9.4%</td>
</tr>
<tr>
<td>2</td>
<td>Moderately adequate knowledge</td>
<td>163</td>
<td>90.6%</td>
</tr>
<tr>
<td>3</td>
<td>Adequate knowledge</td>
<td>0</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

#### Table 2: Association of level of knowledge of school children antenatal mother regarding Anemia with their demographic Variables N=180

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Demographic Variables</th>
<th>Class</th>
<th>Level of Knowledge</th>
<th>Chi-Square Value</th>
<th>Degrees of freedom</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inadequate knowledge</td>
<td>Moderately Adequate Knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Age</td>
<td>5-10 years</td>
<td>1</td>
<td>13</td>
<td>2.245</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11-15 years</td>
<td>13</td>
<td>133</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>16-18 years</td>
<td>2</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt;18 Years</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Education</td>
<td>1-5 STD</td>
<td>1</td>
<td>13</td>
<td>2.245</td>
<td>3</td>
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<tr>
<td></td>
<td></td>
<td>6-8 STD</td>
<td>13</td>
<td>133</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>9-10 STD</td>
<td>2</td>
<td>15</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>11-12 STD</td>
<td>1</td>
<td>2</td>
<td></td>
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<tr>
<td>3</td>
<td>Mother’s Education</td>
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<td>0</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Primary education</td>
<td>8</td>
<td>48</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Middle education</td>
<td>2</td>
<td>42</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Higher secondary</td>
<td>3</td>
<td>36</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>High graduate</td>
<td>4</td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post graduate</td>
<td>0</td>
<td>5</td>
<td></td>
<td></td>
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<tr>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>S.No.</td>
<td>Demographic Variables</td>
<td>Class</td>
<td>Level of Knowledge</td>
<td>Chi-Square Value</td>
<td>Degrees of freedom</td>
<td>P-value</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------</td>
<td>-------</td>
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<td>--------------------</td>
<td>---------</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inadequate knowledge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Moderately Adequate Knowledge</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4</td>
<td>Father’s Education</td>
<td>Primary education</td>
<td>3</td>
<td>20</td>
<td>2.663</td>
<td>4</td>
</tr>
<tr>
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<td></td>
<td>Middle education</td>
<td>4</td>
<td>23</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Higher secondary</td>
<td>1</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>High graduate</td>
<td>6</td>
<td>85</td>
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<td>Post graduate</td>
<td>3</td>
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<td>5</td>
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<td>6</td>
<td>1.107</td>
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<td></td>
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<td>10</td>
<td>84</td>
<td></td>
<td></td>
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<td></td>
<td>Business</td>
<td>0</td>
<td>3</td>
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</tr>
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<td></td>
<td></td>
<td>House wife</td>
<td>7</td>
<td>70</td>
<td></td>
<td></td>
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<tr>
<td>6</td>
<td>Fathers occupation</td>
<td>Government</td>
<td>1</td>
<td>9</td>
<td>2.150</td>
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<td></td>
<td></td>
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<td>11</td>
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<td></td>
<td></td>
<td>Coolie</td>
<td>1</td>
<td>2</td>
<td></td>
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</tr>
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<td></td>
<td>Any others</td>
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<td></td>
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</tr>
<tr>
<td>7</td>
<td>Types of family</td>
<td>Nuclear</td>
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<td>83</td>
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<td></td>
<td>Joint</td>
<td>9</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Number of children in the family</td>
<td>1-2 Children</td>
<td>13</td>
<td>136</td>
<td>0.524</td>
<td>1</td>
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<tr>
<td></td>
<td></td>
<td>3-4 Children</td>
<td>4</td>
<td>27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Do you have other maids in the house?</td>
<td>Yes</td>
<td>1</td>
<td>10</td>
<td>0.002</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>16</td>
<td>153</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Is there another family member living/always visiting your house?</td>
<td>Yes</td>
<td></td>
<td></td>
<td>Cannot compute</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>17</td>
<td>163</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at 5% level, **Significant at 1% level

**Result**

The p-values from the above table are not significant since they are not less than 0.05 hence we can say that there is no significant association between the demographic variables and the knowledge on Child Sexual Abuse at 5% level.

**Discussion**

The major consequences of Sexual abuse in childhood is known to be a major risk factor in the development of long-term psychological and social adjustment problems that can carry over into adulthood and affect married life and parenthood. The most common effects of sexual abuse in children are symptoms of post-traumatic stress disorder, psychological distress and inappropriate sexual behaviour.

El khoury c et al assessed the prevalence and correlates of experiences of child and post-childhood sexual violence among young MSM residing in Beirut, Lebanon. In total, 226 MSM, aged 18 to 29, were recruited with long-chain peer referrals and administered a survey that included questions on history of being pressured to have sex, as well as specific forms of sexual harassment and abuse, in addition to measures of psychosocial functioning and sexual behavior. Logistic regression analysis was used to examine correlates of child sex abuse and experiences of sexual violence post-childhood; 17.3% experienced sexual abuse as a child (below age 13), while 63.3% experienced any form of sexual violence post-childhood-furthermore, 48.7% had experienced being forced or pressured to have sex during their lifetime, including 32.3% prior to age 18. These findings reveal a high prevalence of sexual
violence among MSM in Beirut, both in childhood and post-childhood(8).

McWhorter KLe et al conducted a study on Traumatic childhood experiences and multiple dimensions of poor sleep among adult women. A large cohort of US women, 35-74 years old, enrolled in the Sister Study from 2003 to 2009. Among 40 082 women, 55% reported a TCE, with 82% reporting betrayal trauma. TCEs were associated with poor sleep in women with greater impact when the perpetrator was regarded as close. More research is warranted to better understand pathways between childhood trauma and sleep health in adulthood to develop effective interventions(9).

**Conclusion**

Child sexual abuse (CSA) is a serious and widespread problem in India as it is in many parts of the world today. Child sexual abuse exploits and degrades children and can cause serious damage to cognitive, social, and emotional development of a child. Society have a collective responsibility to prevent child sexual abuse. To accomplish this, must initiate and support services and policies that enhance children’s development, health and safety and we must advocate for policies and programs to help meet the basic needs of children and families and must also promote research, training, and public education to strengthen protective factors that buffer risk factors for sexual abuse while also directly addressing those risk factors.

**Conflict of Interest:** Mrs. G. Sangeetha Jagdish, Dr. Abirami.P, Dr. Jayabharathi, Mrs. Deenajothy, and Mrs. Bhuvaneswari declares that no conflict of interest.

In addition, this study was not funded.

**Source of Funding:** There is no funding agencies were involved. It is fully self financed.

**References**

A Study to Assess the Knowledge Regarding Gestational Diabetes Mellitus among Pregnant Mothers and Self Care Practice of Gestational Diabetes Mellitus Management among Mothers with Diabetes in Pregnancy Attending Selected Hospitals of Kottayam District

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Abstract

The study was conducted to assess the knowledge regarding Gestational Diabetes Mellitus among pregnant mothers and self care practice of Gestational Diabetes Mellitus management among mothers with diabetes in pregnancy attending selected hospitals of Kottayam District. The objectives were to assess the level of knowledge regarding Gestational Diabetes Mellitus among pregnant mothers, to assess the self care practice of Gestational Diabetes Mellitus management among mothers with diabetes in pregnancy, to find association between level of knowledge regarding Gestational Diabetes Mellitus and selected demographic variables, to find correlation between knowledge and self care practice of Gestational Diabetes Mellitus management among mothers with diabetes in pregnancy. The research design used in the present study is non experimental descriptive design. The study was conducted among 60 antenatal mothers and 15 mothers with gestational diabetes mellitus by using non probability convenient sampling technique. In the present study it was found that 33.3% mothers had poor knowledge, 33.3% had average knowledge and 33.3% had good knowledge regarding Gestational diabetes mellitus. When comes to practice t 46.7% had satisfactory practices and 53.3% had good practice. There is a positive correlation between knowledge and practice (p=0.04).

Keywords: Gestational diabetes mellitus, Knowledge, Practice.

Introduction

Pregnancy is one of the wonderful and noble services imposed by nature which no women can shrink. It is a period of happiness, excitement, expectancy, anxiety and fear.¹ Some common maternal health condition or problems a women may experience during pregnancy are Anemia, UTI, Mental health condition, Hypertension, Gestational Diabetes mellitus, Obesity and Weight gain, Infection, Hyper emesis gravidarum.²

Diabetes Mellitus is a metabolic disorder that affects carbohydrate, fat and protein metabolism.³ Today the majority of the women have Type 2 diabetes or diabetes during pregnancy. International Diabetes Federation says that the prevalence of high blood glucose in pregnancy increase rapidly with age and is highest in women of 45 in 2017.³

The main cause and risk factor of Gestational Diabetes Mellitus are age > 25 years, pre-gestational obesity or excessive weight gain during pregnancy, family history of diabetes, personal history of poor obstetric outcome such as polyhydramnios, macrosomia, pre-eclampsia, fetal malformation of an ethnic group with a high risk prevalence of diabetes and history of Diabetes Mellitus in previous pregnancy.⁴

Diabetes during pregnancy has been associated with increased perinatal mortality, an increased rate of caesarean sections, significant risk of macrosomia, and other neonatal morbidities, including serious birth
-trauma, hypoglycemia, hypocalcemia, polycythemia and hyperbilirubinemia. Management is therefore directed toward reducing perinatal mortality and morbidity, a goal that may be achieved by maintaining close surveillance of the mother and fetus and stringent glucose control.  

**Need for Study:** Diabetes is a metabolic disorder characterized by resistance to the action of insulin, insufficient insulin secretion or both. Diabetic Mellitus is the most common metabolic disorder that complicates 3-5% of all pregnancies and is a major cause of perinatal morbidity and mortality as well as maternal morbidity.

As the incidence of both obesity and Diabetes Mellitus among women of child-bearing age continue to raise well, so as the prevalence of hyperglycemia in pregnancy. Gestational Diabetes Mellitus develops in 1 in 25 pregnancies worldwide. According to American Diabetic Association, Gestational Diabetes Mellitus is a common condition affecting 7% of all pregnancies. Depending on the population sample and diagnostic criteria, prevalence range from 1-14%.

It is the most common metabolic disorder in pregnant women, associated with serious maternal and neonatal complications. This phenomenon is initially diagnosed during late pregnancy. It is predicted that the number of diabetic patients is projected to double by 2030, which will also affect pregnant women.

A prospective study on the prevalence of carbohydrate intolerance of varying degree in pregnant woman in western India (Maharashtra). On 2005-2007 the sample size were 1225 woman with average age of 25 to 40 years. The result shows that the prevalence of Gestational Diabetes Mellitus was 21.6% and concluded that Gestational Diabetes Mellitus affect one fifth of pregnant female from western India.

From the above studies, it clearly shows that Gestational Diabetes Mellitus drastically increasing year by year now it is a serious complication during gestational period which affect both mother and child. Gestational Diabetes Mellitus is an intense field of research study. It shows that prevalence of Gestational Diabetes Mellitus increases by 45% but still knowledge regarding Gestational Diabetes Mellitus and self care management is very low. Hence the investigator felt that this study would help the antenatal woman to enhance their knowledge regarding Gestational Diabetes Mellitus and self care practice of Gestational Diabetes Mellitus management which in turn would help to prevent complication during pregnancy.

**Statement of the Problem:** “A study to assess the knowledge regarding Gestational Diabetes Mellitus among pregnant mothers and self care practice of Gestational Diabetes Mellitus management among mothers with diabetes in pregnancy in selected hospitals of Kottayam District.

**Objectives of the Study:**

1. To assess the level of knowledge regarding Gestational Diabetes Mellitus among pregnant mothers
2. To assess the self care practice of Gestational Diabetes Mellitus management among mothers with diabetes in pregnancy.
3. To find correlation between knowledge and self care practice of Gestational Diabetes Mellitus management among mothers with diabetes in pregnancy.

**Hypothesis:**

H1: There is a significant correlation between knowledge and self care practice of Gestational Diabetes Mellitus management among mothers with diabetes in pregnancy.

**Methodology:**

**Research Approach:** Non experimental descriptive design

**Research Design:** Descriptive research design

**Variables:** Study variables are knowledge and practice

**Setting:** The study was conducted in Carmel Medical centre, Pala, Marian medical centre Palai.

**Sample:** Sample include 60 antenatal mothers and 15 mothers with gestational diabetes in selected hospitals in kottayam.

**Sampling Technique:** Non probability purposive sampling

**Tool and Technique:** Structured questionnaire is prepared with the help of review of literature, personal experience and discussion with experts. The questionnaire is categorized into 3 sections.
Section 1: Consists of socio demographic data which include age monthly income, education, occupation, religion, previous history of Gestational Diabetes Mellitus etc.

Section 2: It consists of question regarding knowledge regarding Gestational Diabetes Mellitus.

Section 3: It contains questions regarding self care practice of Gestational Diabetes Mellitus management.

Method of Data Collection: The formal permission for data collection was obtained from concerned authority. The actual study was conducted on 11/09/2019 to 11/10/2019. By purposive sampling technique, the investigator identified 60 antenatal mothers and 15 mothers with gestational diabetes based upon inclusion and exclusion criteria. Prior to data collection, purpose of study was explained to the subjects to gain co operation. The written consent was obtained and the investigator requested to to read the instruction on the questionnaire and fill it. The data was collected and was then compiled for analysis.

Table 1: Knowledge regarding GDM among pregnant mothers n=60

<table>
<thead>
<tr>
<th>Knowledge range</th>
<th>Range percentage</th>
<th>Categories</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-7</td>
<td>0-50%</td>
<td>Below average</td>
<td>20</td>
<td>33.3%</td>
</tr>
<tr>
<td>8-10.5</td>
<td>51-75%</td>
<td>Average</td>
<td>20</td>
<td>33.3%</td>
</tr>
<tr>
<td>10.6-14</td>
<td>76-100%</td>
<td>Below average</td>
<td>20</td>
<td>33.3%</td>
</tr>
</tbody>
</table>

Table 2: Self care practice of Gestational Diabetes Mellitus management among Gestational Diabetic mothers n=15

<table>
<thead>
<tr>
<th>Practice range</th>
<th>Range percentage</th>
<th>Categories</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-16.5</td>
<td>0-50%</td>
<td>Poor</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>16.6-25.5</td>
<td>51-75%</td>
<td>Satisfactory</td>
<td>7</td>
<td>46.7%</td>
</tr>
<tr>
<td>24.6-33</td>
<td>76-100%</td>
<td>Good</td>
<td>8</td>
<td>53.3%</td>
</tr>
</tbody>
</table>

Table 3: Relationship between knowledge and practice n=15

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Correlation</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>9.60</td>
<td>2.58</td>
<td>0.043</td>
<td>0.880</td>
</tr>
<tr>
<td>Practice</td>
<td>23.80</td>
<td>3.09</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table shows the calculated correlation coefficient(r) was 0.880 which indicate that there was a positive correlation between knowledge and practice.

Discussion

In the present study, 73.3% of pregnant women belong to the age group of 20-30 years and 26.7% belongs to the age group of 30-40 years. 41.67% of mothers were Hindus, 41.67% were Christians and 16.6% were Muslims. In the present study it was found that 33.3% mothers had poor knowledge, 33.3% had average knowledge and 33.3% had good knowledge regarding gestational diabetes mellitus. The above findings can be supported by a study conducted among 30 mothers attending antenatal clinics of Mangalore to assess the level of knowledge regarding gestational diabetes mellitus and self care management. The results showed that 26.60% of women had poor knowledge and 20% had good knowledge.10

In the present study 46.7% had satisfactory practices and 53.3% had good practice. The results of this study is contradictory to the study conducted among Diabetes Patients in Dhaka City, Bangladesh in the year 2016 which showed that majority of patients reported regular routine follow up diet and exercise etc. for controlling DM. However, glycemic control was poor among 46.67% of respondents and 62.38% patients never performed self-blood sugar test due to lack of knowledge or lack of the feeling of necessity to do it.11 The present study
shows that there is positive correlation (p=0.04) between knowledge and self care practice of gestational diabetes mellitus management among mothers with diabetes in pregnancy.

**Recommendations:**

1. Similar study can be replicated with large sample in different settings.
2. A cross sectional study can be done to test the effectiveness of the instructional module.

**Conclusion**

Pregnancy is a period of great change for the women in both physiological and psychological aspects. The women should adapt with these changes for the successful outcome of the pregnancy. From the present study the result showed that 33.3% had above average knowledge, 33.3% had average knowledge and 33.3% had below average knowledge regarding the gestational diabetes mellitus and the self care management. The present study shows that 46.7% had satisfactory practices and 53.3% had good practice. There is a positive correlation between knowledge and practice (p=0.04).

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Consideration:** Ethical clearance was obtained from ethical committee, Govt. Medical College, Kottayam. Informed written consent was taken on the selection of the subjects. Full confidentiality was maintained throughout the study.

**References**

9. Skian E, Reece EA. The impact of self monitoring glucose self efficacy and pregnancy outcome, the diabetes education. JOGI. 2014.28(3)433-444
Studying and Evaluating the Immune System in Urticaria, Asthma and Rhinitis

Ghanyia Jasim Shanyoor¹, Rawaa Abdul-ameer Abdul-jabbar², Ekhlass N. Ali¹

¹Ass. Prof., ²Lecturer, Biology Department, College of Science, Mustansiriya University, Baghdad, Iraq

Abstract

Background: Diseases related with allergy such as urticaria, asthma, and rhinitis have an effect on autoimmune system.

Objectives: This study was planned and carried out to assess how the immunity affected in patients with allergy and urticaria, asthma, and rhinitis through measuring the total IgE and IL-33.

Materials and Method: A collection of females and males (74 patients) with urticaria, asthma, and rhinitis were chosen in this research, 24 with urticaria, 26 with asthma, and 24 with rhinitis their ages were ranged from 30 to 45 years while their weight ranged from 69 to 92 kg, using immuno sorbent assay (ELISA), the IL-33 and IgE were calculated and evaluated respectively in the patients and the collected data were compared with healthy individuals (control).

Results: The data that was gathered from the blood serum of urticaria, asthma, and rhinitis patients indicates considerable differences in levels of IL-33 which were tolerated from 172 to 185 Ng/l, while the IgE ranged from 321 to 397 Ng/l comparing with healthy individuals (control). Also results of specific IgE signify a existence for one or more inhalant allergens in urticaria, asthma, and rhinitis, especially in rhinitis patients, precisely in Weeds allergens (w6, w9), Tree allergens (t2, t3, t4, t7), and Grasse’s allergens (g6, g12) and it was lower in females than males.

Conclusion: The considerable changes in the IL-33, and IgE in the patients affect the immunity system in the patients due to the chronic inflammatory diseases (urticaria, asthma, and rhinitis) and it will increased in patients with inhalant allergy.

Keywords: Urticaria, Asthma, Rhinitis, immunity, inhalant allergy.

Introduction

Allergens, which commonly are in urban communities as well as in modern societies, are certain materials or animals that cause a certain symptoms in respiratory system and in eyes; the signs may appears in lungs, noise, and eyes. It may also appear in the skin as eczema or red spots, and it affects the blood. Diseases that appear due to allergens such as urticaria, asthma, and rhinitis may cause high sensitivity and disorder which affect the IL-33 and IgE percentages in blood and considered as pathogenic to allergic disease (1-3).

IL-33 (Interleukin-33), associated with the molecular damage and is considered as immune system alert to allergens and usually considered as a IL-1 family member, thus it is an extracellular cytokine, therefore it is support endothelial cell against inflammation, and this enable the scientists and the researcher to consider it as a key factor to discover and characterize the diseases that related to allergy and this could be due to the activation of the immune cells (Th2)(4-6).

IgE (immunoglobulin E) is a protein (antibody) by
which the plasma cells are responsible to synthesize it and it is considered as allergy indicator in the body and used by the immune system in the duration of the defense against some syndrome\(^\text{7, 8}\).

Recent studies assured the relationship and the link between allergy that caused by allergens substances and the level of IgE in the serum, this principle can be applied on urticaria, asthma, and rhinitis patients who suffered from these chronic diseases\(^\text{9, 10}\).

The goal of the current study is to assess how the immunity affected in patients with allergy from certain materials and the patients who have urticaria, asthma, and rhinitis through examining the level of IgE and IL-33 in blood serum.

### Materials and Method

74 patients were chosen in this study, half of them were females while the other 37 were males, and they were classified according to their diseases ((24 Urticaria, 24 Rhinitis, and 26 Asthma). The sera were isolated from the blood samples, and were kept at -70 °C. Healthy 28 individuals’ half females and 14 were males, and they were included in the current study and used their sera for comparison with the 74 patients. Patients and healthy individuals were diagnosed by the special physicians in Allergic Specialized Center/Baghdad.

Immuno sorbent assay (ELISA), were carried out to indicate the levels of IL-33 and IgE and were calculated and evaluated respectively in the patients. The collected data were compared with healthy individuals (control).

Statistical analyses were also carried out using Minitab software for statistics, version 13. The P-value was also calculated using ANOVA.

### Result and Discussion

Levels of IL-33 and IgE that appears from ELISA test were listed in table 1.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Patients with Asthma Mean±SD</th>
<th>Patients with Urticaria Mean±SD</th>
<th>Patients with Rhinitis Mean±SD</th>
<th>Control (28) Mean±SD</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>31.20±7.28</td>
<td>32.84±11.64</td>
<td>30.19±12.17</td>
<td>30.10±9.11</td>
<td>-</td>
</tr>
<tr>
<td>Weight</td>
<td>78.93±14.73</td>
<td>74.15±9.78</td>
<td>72.09±13.11</td>
<td>70.03±15.89</td>
<td>-</td>
</tr>
<tr>
<td>IgE Ng/l</td>
<td>395.70±129.80</td>
<td>319.90±136.58</td>
<td>339.49±16.87</td>
<td>37.87±27.61</td>
<td>0.000</td>
</tr>
<tr>
<td>IL-33 Ng/l</td>
<td>175.49±39.76</td>
<td>173.69±40.01</td>
<td>179.98±49.27</td>
<td>115.58±14.11</td>
<td>0.000</td>
</tr>
</tbody>
</table>

From table 1 it was found that all the patients shows a significant increasing in the level of IgE comparing with control (healthy group), but patients with asthma have higher level of IgE than patients with urticaria, and rhinitis, the age and the weight of the patients doesn’t shows and correlation with the level of IgE.

Table 2 represent the calculated data from inhalant allergies that caused by certain compounds to patients with allergy and urticaria, asthma, and rhinitis.

Results in table 2 indicate the correlation between the allergy that caused by inhalant and the three groups of patients (urticaria, asthma, and rhinitis), as towards animal, the results shows a high correlation between and the highest level IgE and the gender, females shows high inhalant allergy than males, while males affected with weed more than the females\(^\text{11}\).

Many studies confirm the correlation between the allergy toward animal and mite, precisely for urticaria patients, these studies indicates atopic allergies (dermal and respiratory) such as eczema, rhinitis and asthma\(^\text{12, 13}\). Grass and tree allergies are higher in males than females, this conclusion was confirmed also by Cayrol and her team coworkers in 2014 \(^\text{14}\), while for mold the females shows more inhalant allergy than males\(^\text{11}\).

Studies confirm the relationship between the level of IL-33 in patient serum and allergy, the data that were obtained in the current study (represented by table 1, and 2) shows a continuous changes in IL-33 structure due to the activation of many pathways signs as well as the inflammatory cells in asthma patients, this elevation depends on the typep of allergy, type of cellular damage and cellular stress production.
Table 2: Estimation of serum level of specific IgE that caused by inhalant compounds

<table>
<thead>
<tr>
<th>Series</th>
<th>Allergens</th>
<th>Gender</th>
<th>Urticaria</th>
<th></th>
<th></th>
<th>Rhinitis</th>
<th></th>
<th></th>
<th>Asthma</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Animal</td>
<td>F</td>
<td>2</td>
<td>8.30</td>
<td>5</td>
<td>20.80</td>
<td>4</td>
<td>15.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>3</td>
<td>12.50</td>
<td>2</td>
<td>8.30</td>
<td>3</td>
<td>11.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>5</td>
<td>20.80</td>
<td>7</td>
<td>29.10</td>
<td>7</td>
<td>26.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Weeds</td>
<td>F</td>
<td>3</td>
<td>12.50</td>
<td>5</td>
<td>19.20</td>
<td>0</td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>6</td>
<td>25.00</td>
<td>5</td>
<td>19.20</td>
<td>0</td>
<td>0.00</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Total</td>
<td>9</td>
<td>37.50</td>
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<td>38.40</td>
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<td>0.00</td>
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<td></td>
</tr>
<tr>
<td>3</td>
<td>Mite</td>
<td>F</td>
<td>5</td>
<td>20.80</td>
<td>3</td>
<td>11.50</td>
<td>3</td>
<td>12.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>2</td>
<td>8.30</td>
<td>4</td>
<td>15.40</td>
<td>2</td>
<td>8.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>7</td>
<td>29.10</td>
<td>7</td>
<td>26.90</td>
<td>5</td>
<td>20.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Tree</td>
<td>F</td>
<td>5</td>
<td>20.80</td>
<td>10</td>
<td>38.50</td>
<td>2</td>
<td>8.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>10</td>
<td>41.7</td>
<td>4</td>
<td>15.40</td>
<td>1</td>
<td>4.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>15</td>
<td>62.5</td>
<td>14</td>
<td>53.90</td>
<td>3</td>
<td>12.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Grasses</td>
<td>F</td>
<td>4</td>
<td>15.40</td>
<td>7</td>
<td>26.90</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>6</td>
<td>25.00</td>
<td>4</td>
<td>15.40</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>10</td>
<td>40.40</td>
<td>11</td>
<td>42.30</td>
<td>0</td>
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<td></td>
</tr>
<tr>
<td>6</td>
<td>Mold</td>
<td>F</td>
<td>3</td>
<td>12.50</td>
<td>1</td>
<td>3.80</td>
<td>2</td>
<td>8.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>0</td>
<td>0.00</td>
<td>1</td>
<td>3.80</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>3</td>
<td>12.90</td>
<td>2</td>
<td>7.60</td>
<td>2</td>
<td>8.30</td>
<td></td>
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</tr>
</tbody>
</table>

Source of Funding: Self fund.

Conflict of Interest: No conflict of interest

Ethic Statement: The researchers already have ethical clearance from all required institution and laboratories.

References


Atrial Fibrillation One of Hidden Causes of Subclinical Stroke: Case-Control Study

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Abstract

Background: Silent cerebral infarction is frequently encountered on various imaging modalities of brain in individuals with atrial fibrillation, its exact relation with atrial fibrillation is still debated.

Objectives: The study was carried out to estimate the link between silent cerebral infarcts with atrial fibrillation, both paroxysmal and persistent types.

Materials and Method: A random sample of 150 were included in the study, 100 with atrial fibrillation 50 case with paroxysmal, 50 case with persistent type, and 50 control, for both cases and control a questionnaire was constructed, physical examination, neurological examination, and magnetic resonance imaging were done.

Results: Mean age was 64.6667. Of the total sample there was 96 males and 54 females. 89 individual of the total sample had silent cerebral lesion while 61 had no lesion. Of those who had lesions, 38 individuals had paroxysmal atrial fibrillation, 41 had persistent atrial fibrillation, and only 10 individuals belong to control group. There was high statistically significant difference between group of cases with atrial fibrillation and group of control in sinus rhythm where p value is 0.0001.

Conclusion: Both paroxysmal and persistent atrial fibrillation is associated with heightened hazard of silent cerebral infarctions.

Keywords: Paroxysmal atrial fibrillation, persistent atrial fibrillation, silent cerebral infarctions.

Introduction

Atrial fibrillation is customarily happened arrhythmic heart disorders in clinical ground [1]. It is think about to be the most continual arrhythmia in older age individuals [2]. World wide its prevalence and incidence is get higher [3], with almost one percent prevalence over the world [4]. Atrial fibrillation is a hazard for recruitment of cardiac failure, health facility consumption, uprising morbidity burden, and fatality [1]. “Paroxysmal atrial fibrillation is defined as an episode of atrial fibrillation that terminate spontaneously or with intervention in less than seven days”[13]. “Persistent atrial fibrillation is defined as atrial fibrillation that fails to terminate within seven days”[13]. Worldwide stroke listed as the second most frequent cause for fatality and the third habitual cause for disability [5]. Stroke is remarkably catastrophic danger in Asia and its danger of death in Asia is more than western nations [6]. Atrial fibrillation is a noteworthy predisposing condition for ischemic stroke by mechanism of thromboembolization and the stroke that is attended by atrial fibrillation is more dangerous, with worse sequelae, greater disablement, higher fatality and massive infarct size than those without atrial fibrillation [7]. Atrial fibrillation heighten the hazard of embolic stroke by five times and the hazard is alternating from one to fifteen percent every year dependent on attendance of comorbid disorders [8]. Atrial fibrillation is not only give rise to symptomatic

DOI Number: 10.37506/mlu.v21i2.2740
Medico-legal Update, April-June 2021, Vol. 21, No. 2

stroke but also asymptomatic one that is brain ischemia in individuals with atrial fibrillation wandering from clinically asymptomatic to catastrophic\textsuperscript{[9]}. Silent cerebral infarction is referred to existing of brain infarction without parallel complaints \textsuperscript{[10]}. Silent cerebral infarction happened in both individuals with atrial fibrillation and those without, but nearly most of studies stated that it is happened with raised occurrence in clients with atrial fibrillation \textsuperscript{[4]}. The prevalence in general public fluctuates correlating to the imaging method implemented, the prevalence of silent cerebral infarction discovered by magnetic resonant imaging in most estimations falling in range of eight to twenty-eight percent, while is approximately forty percent in patients with atrial fibrillation \textsuperscript{[9]}. Silent cerebral infarction is well-recognized to advance to symptomatic stroke \textsuperscript{[4]}, it is not considered silent and harmless as it is linked with indistinct neurological defect, cognitive impairment, psychological abnormalities, clinically manifest stroke, and early fatality \textsuperscript{[4]}. A number of risk conditions are correlated with growing happiness of silent cerebral infarction, the most prominent of which is elevated blood pressure and increasing age \textsuperscript{[10]}. Owing to sophisticated advancement of neuroimaging, greater number of patients with atrial fibrillation ascertained to have tiny ischemic brain lesions, that is because of its higher prevalence in individuals with atrial fibrillation and its greater danger to advance to clinically overt neurological defects it should be considered appreciably while physician assess individuals with atrial fibrillation \textsuperscript{[4]}. Investigators perceives that silent infarctions often confined to cerebral cortex and cerebellum are commonly discovered in patients with atrial fibrillation for which cardiac origin is of paramount role \textsuperscript{[11]}.

**Methodology**

Type of study: this is a case control study.

The study had been long lasting from the beginning of first week of February 2018 to the end of the last week of April 2019.

**Study Population:** The study population comprises an admitted patient in cardiac care unit in Al-Hussein teaching hospital in Al-Nasiriya city. The diagnosis of cases rely on any accessible tests or reports in case file of patients or diagnosed on interview. Total number of patients that were included in the study was (150), with (50) case with paroxysmal atrial fibrillation, (50) case with persistent atrial fibrillation, and (50) controls.

**Inclusion Criteria:** Any case with atrial fibrillation with any predisposing factors whether paroxysmal or persistent was included in the study.

**Exclusion Criteria:**

1. Any patient with implantable heart device had been inserted or any other contraindication to magnetic resonance imaging.
2. Any patients with existing or antecedent clinical confirmation of transient ischemic attack or cerebrovascular accident.
3. Any recognized case of intracranial injury, space lesions, autoimmune, or inflammatory insults of brain that interfere with precise interpretation of radio imaging.
5. Any case of atrial fibrillation due to valve disorder.
6. Any patient with significant carotid artery stenosis more than seventy percent detected by carotid Doppler sonorographic study.

**Sample Size:** was convenient restricted by accessibility of patients and time span of study, but sampling task for control, systematized random sampling procedure was done to collect control.

**Ethical Issue:** An ethical consensus was acquired from Al-Hussein teaching hospital administration. An informed consents also were extracted from all participants.

**Study Appliances:**

**The Questionnaire:** Distinct design of questionnaire was formulated to assemble data and it was revised and reviewed by three subjects matter experts (of community medicine and physician) for examining the validness and the enrichment of questionnaire. The questionnaire is consisted of two sections:

**First Section:** Involve questions regarding identity information, Second section: questions related to past medical history comprising chronic medical diseases, medication history, type and number of medications have been determined for every individual in the sample (cases and control).

**Diagnostic Procedures:** Atrial fibrillation is diagnosed by electrocardiogram. “Atrial fibrillation is
characterized by the replacement of consistent P wave by rapid oscillation or fibrillatory waves that vary in amplitude, shape, timing associated with an irregular frequently rapid ventricular response when (AV) conduction is intact[12]. CHA2DS2-VASc score for stroke risk estimation in atrial fibrillation was calculated for all individuals suffered from atrial fibrillation [14]. Atrial fibrillation type and time span were delineated. A comprehensive physical examination was carried out for all patients, neurological examination was carried out in agreement with Coma Neurological Check [15]. All patients undergone carotid artery Doppler sonographic study to preclude significant carotid artery stenosis greater than seventy percent in agreement with North American symptomatic carotid endarterectomy study ECST, or peak systolic velocity greater than 130 cm/s [16]. All participants were exposed to magnetic resonance imaging (MRI) study. All magnetic resonant imaging reports were interpreted by two expert radiologist senior make unmindful to clinical informations. The image protocols constitute of sagittal T2 weighted-spin-echo sequence, an axial T2-fluid attenuated inversion recovery (FLAIR) sequence, and a diffusion weighted sequence. Most studies defined silent cerebral ischemia as centerpiece, crisply delineated abnormality greater than three millimeter which is hyperintense on T2 weighted image, a small of number of studies implement ancillary specifications to discriminate silent cerebral infarctions from the quite tiny lesion called leukoaraiosis which is hardly to be categorized as silent infarction, the most pivotal of these specifications is size greater than three millimeters [9]. All control individuals with sinus rhythm are gender, age, educational level, and risk factors matched and exposed to preconstructed inquiry sheet of questionnaire comprised of identity informations as for cases, past medical history and chronic medical illnesses including cardiovascular disorders, drug history including antithrombotic. All control subjects are exposed to physical and neurological examination with magnetic resonance imaging. Anatomical locality, laterality and number of lesions on magnetic resonant imaging were predetermined for all cases and controls.

Statistical analysis: statistical package for social sciences (SPSS) version 25 had been used for data assessment, descriptive statistics, frequencies, percentages, associations, tests of significance (chi-square, Fischer exact test, T-test, ANOVA test) had been utilized for interpretation of categorical variables, means, and standard deviation were utilized to present data of continuous variables. A p value less than 0.05 was set as statistically significant.

Results:

A total of 150 individuals engaged with in the study, dispersed evenly in three categories (paroxysmal, persistent atrial fibrillation patients and control group) they exhibit no significant statistical difference in their bio-demographic characters, where P value estimated by ANOVA and chi-square to be greater than 0.05, in all categories of comparability as expressed in table 1 and 2.

Table 1: Age parameters of the studied population

<table>
<thead>
<tr>
<th>Age by years</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>95% Confidence Interval for Mean</th>
<th>ANOVA P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower Bound</td>
<td>Upper Bound</td>
</tr>
<tr>
<td>Paroxysmal AF</td>
<td>50</td>
<td>66.0200</td>
<td>15.27769</td>
<td>61.6781</td>
<td>70.3619</td>
</tr>
<tr>
<td>Persistent AF</td>
<td>50</td>
<td>64.4200</td>
<td>15.57875</td>
<td>59.9926</td>
<td>68.8474</td>
</tr>
<tr>
<td>Control</td>
<td>50</td>
<td>63.5600</td>
<td>13.66832</td>
<td>59.6755</td>
<td>67.4445</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
<td>64.6667</td>
<td>14.80054</td>
<td>62.2787</td>
<td>67.0546</td>
</tr>
</tbody>
</table>

Anticoagulant * type
There was significant statistical difference with in the studied group, where Pearson Chi-Square= 42.948 P value=0.0001. As shown in figure 5.
Figure 3: Relationship between locations of stroke with type of studied population

There was significant statistical association between the cases and control and the location of stroke.

<table>
<thead>
<tr>
<th>Location</th>
<th>Type</th>
<th>Total</th>
<th>Chi-Square Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Paroxysmal AF</td>
<td>Persistent AF</td>
<td>Control</td>
</tr>
<tr>
<td>Not affected</td>
<td>No.</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>% - location</td>
<td></td>
<td>19.7%</td>
<td>14.8%</td>
</tr>
<tr>
<td>Frontal</td>
<td>No.</td>
<td>17</td>
<td>22</td>
</tr>
<tr>
<td>% - location</td>
<td></td>
<td>39.5%</td>
<td>51.2%</td>
</tr>
<tr>
<td>Parietal</td>
<td>No.</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>% - location</td>
<td></td>
<td>44.4%</td>
<td>37.0%</td>
</tr>
<tr>
<td>Parieto-Temporal</td>
<td>No.</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>% - location</td>
<td></td>
<td>47.4%</td>
<td>47.4%</td>
</tr>
<tr>
<td>Total</td>
<td>No.</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>%</td>
<td></td>
<td>33.3%</td>
<td>33.3%</td>
</tr>
</tbody>
</table>

Discussion

In our study we establish high percentage of silent cerebral ischemia in the analyzed specimen, 59.3% of all persons engaged in the study were affected by the lesion, 76% of paroxysmal atrial fibrillation, 82% of persistent atrial fibrillation while only 20% of controls were affected by lesions with significant statistical difference between both cases of paroxysmal and persistent atrial fibrillation with control where P value 0.0001. Shadi et al^[9] metaanalysis states that silent cerebral lesions are habitually catch by magnetic resonant imaging in individuals with atrial fibrillation. In current study, Two-sided lesions were observed in 60.5% of cases with persistent atrial fibrillation while they were observed in 31.6% of cases with paroxysmal atrial fibrillation. Control subjects have the least percent of two-sided lesions (3%). Our findings are in accordance with Fiorenzo et al^[18] that demonstrate silent cerebral ischemia is more predominant in cases of atrial fibrillation than in non-atrial fibrillation persons (p value 0.001) and
persistent atrial fibrillation have had greater percentage of lesions and more bilateral lesions than paroxysmal type. The higher percentage of silent cerebral lesion (46%) in the control group found by Fiorenzo et al[18] in comparability of 20% in our study probably linked to difference in the baseline properties of control side in the two studies. But this detection is in accordance with Jonathon et al[19] a population-obtained studies that displayed prevalence of these lesions of ten to twenty percents. Our study implying that atrial fibrillation is a crucial hazard for silent cerebral ischemia as a cardinal detection, according to Shadi et al[9] atrial fibrillation is accompanied by double fold heighten hazard of silent cerebral infarction. In our study the persistent atrial fibrillation have their lesions located more in frontal lobe bilaterally. This major detection in our study is in line of Fiorenzo et al[18] study and highlight the method of cardio embolization that is accountable for higher prevalence of silent cerebral infarction in atrial fibrillation which is quite tiny, widely distributed bilaterally principally in frontal lobe[20]. Regarding bio demographic characters of the study cases and controls were crossly fit to keep away from selection bias so there was no significant statistical association between cases and controls with bio demographic properties. Though there is significant statistical difference between cases and controls regarding anticoagulant use and Fiorenzo et al[18] determine identical finding P value <0.01), but there is inadequate usage of anticoagulant among cases in our sample, 47% of paroxysmal atrial fibrillation cases and 44 % of cases with persistent type are mandatory to use anticoagulants according to CHA2DS2VASc score, while only 37% of paroxysmal and 21% of persistent atrial fibrillation are undergone anticoagulation, preceding studies point to decreased utilization of warfarin[17].

**Conclusion**

Atrial fibrillation is associated with heightened hazard of subclinical cerebral infarction.

**Conflict of Interest:** None

**Funding:** Self

**Ethical Clearance:** Not required

**References**


Perceptions and Attitudes of Men towards their Wives’ Menopausal Transition Period

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¹Faculty of Nursing, Al-Ahliyya Amman University, AlSult, Jordan

Abstract

Background: Menopause is a natural process that occurs in women’s life as a part of normal aging. Recognition of women’s needs during menopause is considered important and required to maintain good quality of life.

Objective: This study aims at exploring the perceptions and attitudes of men towards their wives during menopause in Jordan.

Method: This study used the descriptive approach. 104 men were randomly chosen, for data collection, the Attitude towards Menopause was adopted in this study.

Results: Study results concluded that the men’s perceptions and attitudes toward their wives experiencing menopause in Jordan, ranged from (1.83– 1.30), where the whole dimension scored a total mean of (1.55), which is of a medium level. The study also concluded that there is no relationship at level of (0.05) between men’s perceptions and attitudes toward their wives experiencing menopause in Jordan and age, nationality, educational level and marry year. And the results showed that there are no statistically significant differences in the men’s perceptions and attitudes according to the age, and nationality in Jordan. While, there are statistically significant differences in their perceptions and attitudes with the Marry year in favor of 1-10-year category.

Conclusion: Advising men to engage in various activities with his wife during menopause can positively affect their attitudes, improve their body image.

Keywords: Attitudes of men, Experience, Menopause, Perceptions, Transition period, Wives.

Introduction

Menopause is a natural process that occurs in women’s life as a part of normal aging. The average age of menopause is between 51 and 52 years, and most of women live about one third of their life after menopause[1]. And the majority may experience hot flushes and night sweating. For some women, the climacteric symptoms are troublesome, therefore a varying percentage of women look for medical advice due to symptoms related to the menopausal transition period.

It is a challenging duty for health care providers to improve management of menopausal women[2]. Hormone therapy has been considered as a safe and well-established treatment of menopausal symptoms[3]. Since the 1960s, hormone therapy has been established as a treatment of menopausal women and has been used by women. The usage of hormone therapy has increased for around 7% in the 1980s among 53 to 54 years old women to more than 40 % in 2017[1].

The increase of hormone therapy use was probably justified by the confidence in the results from several
observational studies in 1980s and 2017s which reported beneficial effects of continuing hormone therapy use. Results from several large-scale randomized clinical trials published after 1998 did not find proof for those long-term benefits of hormone therapy, and these new results attracted attention from media, and hence appeared to have a major impact. The new results headed to a dramatic change in the treatment guidelines, and in the use of hormone therapy among women\[4, 5\].

Mental perception is a reflection of things or indicators or events that a person has already realized. It is a psychological and mental skill that can be acquired and learned. Perception can be further considered as an outcome of mental processing and a rational source that codes a person’s brain in order to respond according to this programming process. The perception mechanism depends on retrieving past experiences of things, events, or manifestation [6].

Recognition of women’s needs during menopause is considered important and required to maintain good quality of life. Studies looking at men’s conception and perception toward menopause revealed that men form a critical source of support in helping their women to cope with menopausal changes and challenges [7]. Understanding of men for the changes experienced by menopausal women fosters the development of a better emotional support for their wives that help to improve the quality of marital relations [8]. This study aims at exploring the perceptions and attitudes of men towards their wives during menopause in Jordan.

**Literature Review:** Revision of previous studies related to menopause highlighted that with increased age women in general are exposed to significant physiologic changes during menopausal period which reflected on social, psychological and emotional changes. Women spend nearly 1/3 of their lives in menopause and the period after menopause due to prolonged life span. In this period, women live a lot of change in their family, work and social lives besides some roles and responsibilities as wife, mother, business woman, grandmother and friend [9].

One study by Parish, et al. (2019) aimed to assess the men’s awareness and their understanding of their partner’s menopausal transition. Results showed that men are aware of their partner’s menopausal transition and may influence decisions relating to symptom management such as, difficulty sleeping, and lack of energy. Most men in the same study reported they were negatively impacted by the previous symptoms. They engaged in discussions with their wives regarding menopausal symptoms and believed they were influential in their wives decision to seek treatment [10].

Furthermore, Santoro, Epperson & Mathews (2015) aimed in their study to identify menopause in both women and men, as well as the social, psychological and health consequences of menopause on women and men and how to face the negative effects of it. The study used the descriptive approach in which focus groups where employed. The researcher interviewed six groups of women at menopause stage to ask them about this stage [11]. The researchers further required information about the women’s husbands who entered the stage of menopause and what implications this had on them. It concluded to a number of results which included social, psychological and health effects of menopause. The most significant social effects of menopause included: a change occurred in the quality of the overall life (e.g., social disturbances, loneliness, absence of active role, and the distance from social and recreational activities). The psychological negative effects covered depression, anxiety, mood swings, insomnia and nervousness. The health effects comprised a number of symptoms like hot flushes, night sweats, osteoporosis, fatigue and general tiredness, decreased libido, concentration and memory problems, and other symptoms [11].

Santoro, et al. (2015) study offered several recommendations, the most important of which are: seeking the doctor or psychologist consultation and support to overcome the causes that may lead to disorders and help achieve psychological and social compatibility [11]. The findings suggested that both spouses should take into account the psychological condition they both experience. The spouses experiencing menopause are advised to develop social networking instead of leaving oneself to social isolation and introversion which is assumed to help them achieve the psychological balance and increase their self-confidence. The spouses further are guided to continue giving others and participating actively in social gatherings that can assist them mingle with people. The results finally recommended conducting seminars to educate men and women about menopause stage and how to cope with its different effects [11].

Ibraheem, Oyewole and Olaseha (2015) investigated the experiences and perceptions of women in menopause,
85% of participants had never heard about menopause and the participants’ major source of information was close relatives. The mean knowledge score for menopause was low with 2.8 ±1.0. And only 28.0% of the participants could state at least one symptom of menopause. 54% who scored above the mean knowledge score had positive attitude towards menopause. 70% of participants had the certainty that sexual intercourse causes sickness for menopausal women. About 60.8% of the participants believed that women should not tell anyone about their menopausal experiences. 83% had experienced at least one symptom out of the 19 common symptoms of menopause. Uncomfortable experiences attributed to menopause included dryness of the vagina, pain during intercourse, and joint pains. Actions that had been taken by participants included self-medication, and adoption of sexual abstinence.

Marahatta’s (2012) study was designed to examine the major health problems in the females’ mid-life, the age of menopause, frequency of menopausal symptoms, and what menopausal symptoms are common among Nepalese women. The results showed that the mean age of menopause found to be 49.9% with urinary tract infection being the major clinical diagnosis and physical menopausal symptoms being the commonest.

Another study done by Rodolpho, et al. (2016) explored men’s perceptions and attitudes toward their wives in menopause. Four themes of experiences were categorized, such as: 1) misconceptions about overcoming menopause through coexistence and recognition of women’s perspectives; 2) recognition of women’s needs and efforts to provide support; 3) coping with changes in marital relations and need to start a new life; and 4) existence of several needs as husbands of women experiencing menopause.

The researchers concluded that a better understanding of the changing experienced by menopausal women can foster the development of a better emotional support for wivesby husbands, which consequently improves the quality of marital interactions. To date worldwide, few surveys have targeted women’s husbands to assess their perception of menopause, and they have been limited in scope. And in Jordan no studies targeted toward women’s husbands therefore, the perception and attitudes of menopause shared by men are still mostly unknown; however, men may influence how their wives cope with and manage their menopausal transition period.

**Objectives of the Study:** This study is designed to examine men’s perceptions and attitudes toward their wives who experience menopause in Jordan. And to explore the difference between men’s perceptions and attitudes toward their wives who experience menopause and some of the demographic information.

**Research Questions:**

1. What is a level of men’s perceptions and attitudes toward their wives who experience menopause in Jordan?
2. Is there a significant difference at level of (0.05) between men’s perceptions and attitudes toward their wives who experience menopause in Jordan and some of the demographic information?

**Materials and Method**

This study used the descriptive approach to suit its purpose that deals with Men’s perceptions and Attitudes toward their Wives Experiencing Menopause in Jordan. The study population consists of Men whose wives experiencing menopause in Jordan. The sample size of (100) participants was estimated for this study using G power analysis computer program developed by Faul and Erdfelder (1992), with a medium effect size 0.15, power of 0.8, and α (the risk of Type I error) at 0.05. Yet, 130 participants were selected to produce better power and more reliable findings and to compensate for uncompleted questionnaires.

**Data Collection:** The research was conducted after institutional review board approval at the university where the researchers work in. Research sample will be recruited from the private out patients’ gynecology clinics. Researchers explained the process of participation in the study and the need to read and approve the informed consent prior completing the designated questionnaires. Study participation was volunteered; the confidentiality and anonymity were assured.

**Study tool (the questionnaire):** The questionnaire used for the study is the Attitude towards Menopause (ATM) which developed by Neugarten et al (1963) and modified later in 2005 by Huffman et al. For this study the adopted ATM is forward and backward translated to Arabic. The goal of this method is that the two scales, the original and the one adapted for the new culture, will attain equivalence of meanings. The translated ATM consists of two sections, which are:
Section One: Demographic Variables including: nationality, educational level, husband work, marital status, wife work, marry year, number of children, chronic disease, husband age, and wife age.

Section Two: Mean’s Perceptions and Attitudes toward their Wives Experiencing Menopause in Jordan, it contains statements (1-19)

In order to verify the validity and reliability of Arabic version of the questionnaire, the researcher has distributed it to academic reviewers and other experts in the psychology field, to take their opinions, and rewording of some paragraphs, and make the required modifications to measure the content validity.

And to verify the reliability of the questionnaire, the researcher used the equation of internal consistency using Cronbach’s alpha test for all statements of the survey, as the value of Cronbach’s alpha was (0.824) and its higher than (0.60).

The research type scale included two Likert scale as follows:

- The Low degree from 1.00- 1.33.
- The Medium degree from 1.34 – 1.67.
- The High degree from 1.68 – 2.00.

Data Analysis: In order to answer the study questions which were formulated, a Statistical Package for Social Sciences (SPSS) (Version- 22) was used to analyze the collected data. The following statistical techniques and tests were used in data analysis: Frequencies and percentages to describe demographical variables. Cronbach’s Alpha reliability (α) to measure strength of the correlation and coherence between questionnaire items. Means and Standard Deviations. These techniques were used to illustrate respondent’s level. Pearson Correlation test was used to illustrate the relationship between the variables. Independent Sample T-test, One Way ANOVA and LSD tests to measurement the study hypothesis.

Results

The researcher distributed (130) questionnaires to Men, (120) of which were retrieved, while (16) questionnaires were excluded from the analysis due to incomplete information, leading to (104) questionnaires valid for statistical analysis, showing the response rate of (80%). (79.8%) of the participants were Jordanian, (96%) were below 50 years old. Majority of the participants’ education was BSC with (35%). Almost (95%) of the participants were working. In addition, (96%) were married. (74 %) of the participants were married for 20 years and above. Majority (47%) had also 4-7 children. Of all participant only (41.3%) had wives with chronic diseases.

Descriptive Analysis of Study Variables:

Q1: What is a level of Men’s Perceptions and Attitudes toward their Wives Experiencing Menopause in Jordan?

The researcher used the arithmetic mean, standard deviation, item importance and importance level to show the level of men’s perceptions and attitudes toward their wives experiencing menopause in Jordan, as shown in Table (2).

<table>
<thead>
<tr>
<th>Statements</th>
<th>Idea</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Importance</th>
<th>Importance Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 A woman’s body may change in menopause but otherwise she doesn’t change much.</td>
<td>Bod.Ch</td>
<td>1.83</td>
<td>0.38</td>
<td>1</td>
<td>High</td>
</tr>
<tr>
<td>2 A woman is concerned about how her husband will feel about her after menopause.</td>
<td>Concern</td>
<td>1.82</td>
<td>1.38</td>
<td>2</td>
<td>High</td>
</tr>
<tr>
<td>3 Women should expect some troubles during Menopause.</td>
<td>Trouble</td>
<td>1.78</td>
<td>0.42</td>
<td>3</td>
<td>High</td>
</tr>
<tr>
<td>4 Changes inside the body that women cannot control cause all the trouble at menopause.</td>
<td>Uncont</td>
<td>1.72</td>
<td>0.45</td>
<td>4</td>
<td>High</td>
</tr>
<tr>
<td>5 A woman should see a doctor at menopause.</td>
<td>See.Dr</td>
<td>1.65</td>
<td>0.48</td>
<td>5</td>
<td>Medium</td>
</tr>
<tr>
<td>Statements</td>
<td>Idea</td>
<td>Mean</td>
<td>Std. Deviation</td>
<td>Importance</td>
<td>Importance Level</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>--------</td>
<td>------</td>
<td>----------------</td>
<td>------------</td>
<td>------------------</td>
</tr>
<tr>
<td>The only difference between a woman who has been through menopause and one who has not is that one menstruates and the other doesn’t</td>
<td>Menses</td>
<td>1.64</td>
<td>0.48</td>
<td>6</td>
<td>Medium</td>
</tr>
<tr>
<td>Menopause is an unpleasant experience.</td>
<td>Unpleased</td>
<td>1.63</td>
<td>0.49</td>
<td>7</td>
<td>Medium</td>
</tr>
<tr>
<td>Menopause is one of the biggest changes that happens in a woman’s life.</td>
<td>Biggest</td>
<td>1.61</td>
<td>0.53</td>
<td>8</td>
<td>Medium</td>
</tr>
<tr>
<td>Menopause is a disturbing thing that women generally dread.</td>
<td>Dread</td>
<td>1.59</td>
<td>0.49</td>
<td>9</td>
<td>Medium</td>
</tr>
<tr>
<td>Life is more interesting for a woman after menopause.</td>
<td>Interest</td>
<td>1.57</td>
<td>0.50</td>
<td>10</td>
<td>Medium</td>
</tr>
<tr>
<td>Women usually feel “down in the dumps” at the time of menopause.</td>
<td>Dump</td>
<td>1.51</td>
<td>0.50</td>
<td>11</td>
<td>Medium</td>
</tr>
<tr>
<td>Frankly speaking, just about every woman is depressed about menopause.</td>
<td>Depress</td>
<td>1.49</td>
<td>0.50</td>
<td>12</td>
<td>Medium</td>
</tr>
<tr>
<td>Women are generally calmer and happier after menopause.</td>
<td>Calm</td>
<td>1.48</td>
<td>0.50</td>
<td>13</td>
<td>Medium</td>
</tr>
<tr>
<td>A woman gets more confidence in herself after menopause.</td>
<td>Confide</td>
<td>1.45</td>
<td>0.50</td>
<td>14</td>
<td>Medium</td>
</tr>
<tr>
<td>Going Through menopause really does not change a woman in any important way.</td>
<td>Change</td>
<td>1.44</td>
<td>0.50</td>
<td>15</td>
<td>Medium</td>
</tr>
<tr>
<td>Women think of menopause as the beginning of the end.</td>
<td>Beg. End</td>
<td>1.36</td>
<td>0.48</td>
<td>16</td>
<td>Medium</td>
</tr>
<tr>
<td>After menopause a woman feels freer to do things for Herself.</td>
<td>Freedom</td>
<td>1.34</td>
<td>0.47</td>
<td>17</td>
<td>Medium</td>
</tr>
<tr>
<td>After menopause, women do not consider themselves “real women”</td>
<td>Real</td>
<td>1.31</td>
<td>0.46</td>
<td>18</td>
<td>Low</td>
</tr>
<tr>
<td>Women generally feel better after menopause.</td>
<td>Feel</td>
<td>1.30</td>
<td>0.46</td>
<td>19</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>1.55</strong></td>
<td><strong>0.16</strong></td>
<td></td>
<td><strong>Medium</strong></td>
</tr>
</tbody>
</table>

As shown in Table (1) that the means values of (Men’s Perceptions and Attitudes toward their Wives Experiencing Menopause in Jordan), ranged from (1.83–1.30), where the whole dimension scored a total mean of (1.55), which is of a medium level. (A woman’s body may change in menopause but otherwise she doesn’t change much) ranked first with a mean of (1.83), and standard deviation of (0.38), which is of a high level, and (A woman is concerned about how her husband will feel about her after menopause) ranked second with a mean of (1.82) and standard deviation of (1.38), which is of a high level. (Women generally feel better after menopause) ranked last with a mean of (1.30), and standard deviation of (0.46), which is of a low level.

Q2: Is there significant relationship at level of (0.05) between Men’s Perceptions and Attitudes toward their Wives Experiencing Menopause in Jordan and some of the demographic information?

The study used Pearson Correlation test to illustrate the relationship between Men’s Perceptions and Attitudes and some of the demographic information as shown in table (2).
Table (2) Pearson Correlation test

<table>
<thead>
<tr>
<th>Men’s Perceptions and Attitudes toward their Wives Experiencing Menopause</th>
<th>Age</th>
<th>Nationality</th>
<th>Education</th>
<th>Marry</th>
<th>No. Child</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>-.137</td>
<td>-.036</td>
<td>-.094</td>
<td>.074</td>
<td>.329**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.166</td>
<td>.714</td>
<td>.342</td>
<td>.458</td>
<td>.001</td>
</tr>
<tr>
<td>N</td>
<td>104</td>
<td>104</td>
<td>104</td>
<td>104</td>
<td>104</td>
</tr>
</tbody>
</table>

Table (2) showed that there is no relationship at level of (0.05) between the mean score of men’s perceptions and attitudes toward their wives experiencing menopause and the mean scores of age, nationality, educational level and marry year. Pearson Correlation values were (-0.137, -0.036, -0.094 and 0.074) and it’s not significant at level of (0.05). On the other hand, the results showed that there is a positive relationship between men’s perceptions and attitudes and number of children, Pearson Correlation value was (0.329) and it’s significant at level of (0.01).

Study hypotheses test:

H0: There are no statistically significant differences in the men’s perceptions and attitudes toward their wives experiencing menopause in Jordan according to the age, nationality, educational level, and marry year.

Age: The study used Independent Sample T-test to identify the statistically significant differences in the men’s perceptions and attitudes toward their wives experiencing menopause in Jordan according to the age as shown in table (3).

Table (3) Independent Sample T-test

<table>
<thead>
<tr>
<th>Source</th>
<th>Age</th>
<th>N</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>T value</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men’s Perceptions and Attitudes toward their Wives Experiencing Menopause</td>
<td>50-60</td>
<td>77</td>
<td>1.57</td>
<td>.16</td>
<td>1.394</td>
<td>102</td>
<td>.166</td>
</tr>
<tr>
<td></td>
<td>61-70</td>
<td>27</td>
<td>1.52</td>
<td>.13</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significance at level of (0.05)

The results showed that there are no statistically significant differences in the Men’s Perceptions and Attitudes according to the age in Jordan, mean value for (50-60) category was of (1.57) with standard deviation of (0.16) “medium level”, and mean value for (61-70) category was of (1.52) with standard deviation of (0.13) “medium level”, (t) value = (1.394) and the variance between means values not significant at level of (0.05).

Nationality: The study used Independent Sample T-test to identify the statistically significant differences in in the men’s perceptions and attitudes toward their wives according to the nationality as shown in table (4). The results showed that there are no statistically significant differences in the men’s perceptions and attitudes according to the nationality in Jordan, mean value for (Jordanian) category was of (1.56) with standard deviation of (0.16) “medium level”, and mean value for (Non-Jordanian) category was of (1.54) with standard deviation of (0.16) “medium level” also, (t) value = (0.367) and the variance between means values not significant at level of (0.05).

Table (4) Independent Sample T-test

<table>
<thead>
<tr>
<th>Source</th>
<th>Nationality</th>
<th>N</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>T value</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men’s Perceptions and Attitudes toward their Wives Experiencing Menopause</td>
<td>Jordanian</td>
<td>83</td>
<td>1.56</td>
<td>.16</td>
<td>0.367</td>
<td>102</td>
<td>.714</td>
</tr>
<tr>
<td></td>
<td>Non-Jordanian</td>
<td>21</td>
<td>1.54</td>
<td>.16</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significance at level of (0.05)
**Marry Year:** The study used One Way ANOVA test to identify the statistically significant differences in the men’s perceptions and attitudes according to the marry year as shown in table (5):

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>0.218</td>
<td>2</td>
<td>0.109</td>
<td>4.744</td>
<td>0.011*</td>
</tr>
<tr>
<td>Within Groups</td>
<td>2.32</td>
<td>101</td>
<td>0.023</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2.537</td>
<td>103</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at level of (0.05)

The results showed that there are statistically significant differences in the men’s perceptions and attitudes according to the marry year; least significant difference (LSD-post hoc) test for multiple comparisons was used to illustrate the source of variance as shown in table (6).

<table>
<thead>
<tr>
<th>(I) Marry</th>
<th>(J) Marry</th>
<th>Difference (I-J)</th>
<th>Mean Interval</th>
<th>95 % confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-10</td>
<td>10-20</td>
<td>.14561*</td>
<td>.05869</td>
<td>.015</td>
</tr>
<tr>
<td>&gt;20</td>
<td>10-20</td>
<td>.01990</td>
<td>.04703</td>
<td>.687</td>
</tr>
<tr>
<td>10-20</td>
<td>1-10</td>
<td>-.14561*</td>
<td>.05869</td>
<td>.015</td>
</tr>
<tr>
<td>&gt;20</td>
<td>1-10</td>
<td>.12659*</td>
<td>.04277</td>
<td>.004</td>
</tr>
<tr>
<td>&gt;20</td>
<td>10-20</td>
<td>-.01902</td>
<td>.04703</td>
<td>.687</td>
</tr>
</tbody>
</table>

*The mean difference is significant at the 0.05 level.

LSD test result in table (6) showed that the variance in the men’s perceptions and attitudes was in favor of marry year category (1-10 year) then the variance was in favor of (>20 year).

**Discussion**

This study aims to explore the perceptions and attitudes of men towards their wives during menopause in Jordan. The study found that the men’s perception and attitude was medium in level with a mean of (1.55). Many studies revealed that men were aware and understand of their partner’s menopausal transition and showed a positive and medium level of perception toward menopause. Nevertheless, Erbil (2018) study which showed negative perception toward menopause, in addition to other many studies. A woman’s body may change in menopause but otherwise she doesn’t change much which ranked as the highest in importance may due to men’s wives negative perception of menopause, and generally the women’s thoughts about body image and how much it is important for her to stay attractive for her husband so he will be satisfied in his marriage, and this can be assured by the second highest ranked item which is a woman is concerned about how her husband will feel about her after menopause. In addition, many women according to their culture and raising process they think about what other people feel about her forgetting her self-satisfaction and her feel about herself. This is consistent with other studies, women generally feel better after menopause, which considered less important to men and this can be explained by previous paragraph and support the women thought about their husbands feelings and perception toward menopause. Also the constructivist view of the learning process assumes that the individuals build their own knowledge on the base of the knowledge they already have, and therefore, see the world in ways that are acceptable and useful to them from their point of view. In building process of this knowledge, influenced by previous social and scientific experiences, individuals begin to form different types of beliefs that appear in the form of alternative perceptions of some real concepts.
Each cognitive activity is designed to explore, activate the perceptions stored in memory. Through a content that depicts the man in the menopause, the man looks at the mirror according to his social and cognitive perceptions, results of this study is consistent with study of Rodolpho, et al. (2016)7.

There is no relationship noticed between men’s perceptions and attitudes toward their wives experiencing menopause in Jordan and age, nationality, educational level, and marry year. Same results showed by Parish, et al.10 except for educational level which was positively correlated to men’s perception of menopause. On the other hand, the results showed that there is a positive relationship between men’s perceptions and attitudes and number of children. This result was consistent with other studies 21. This study result may due to increase males’ involvement in family matters and health concern when they have more children since they have to help the mothers in caring of children and decision making. In Arab culture the males are considered the gatekeeper for all important decisions related to family health and they have a direct effect on their wives and children health. Also the bond between husband and wife increase with the number of children so this will lead to increase male involvement.

The results showed that there are no statistically significant differences in the men’s perceptions and attitudes toward their wives experiencing menopause in Jordan according to the age, and nationality in Jordan. While, there are statistically significant differences in the men’s perceptions and attitudes toward their wives experiencing menopause in Jordan according to the marry year in favor of 1-10-year category. This result is logical because when two marrying couple spend more years to gather they will develop more acceptance and understanding to each other physiological and psychological wellbeing, also sense of support to each other will increased.

Limitations of the study: The findings of the current study should be generalized with caution due to the following limitations: the study focuses only on men’s perceptions and attitudes toward their wives, and geographical limitation.

Conclusion

This analysis described men’s perception and attitude of their wives menopause. Men are aware of changes experienced by their wives during their menopause. To create a more positive attitude towards menopause, men need positive information from health professionals. Advising men to engage in various activities with his wife during menopause can positively affect their attitudes, improve their body image. Further research needed about the role of women’s husband in easing the menopause transition period for their wives and how they can support them in this period.

Ethical Clearance: Ethical Approval was taken from the Ethical committee in the university where the researchers work in, and the administrative department in the private clinics where the participants were recruited.

Conflict of Interest: The authors declare no conflicts of interest.

Source of Funding: This research received no specific grant from any funding agency, commercial entity, or not-for-profit organization.

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A Randomized Case-controlled Clinical Trial of the Effect of Preemptive Etoricoxib, Prednisolone and a Control Group on of Postoperative Sequelae after Surgical Removal of Impacted Mandibular Third Molars

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Abstract

Background: The aim of this study was to compare the anti-inflammatory effects of prednisolone and etoricoxib after third molar extraction.

Method: A prospective, controlled study was conducted on 39 volunteers were allocated in three different groups, to receive either 120 mg etoricoxib or 10mg prednisolone 30 minutes prior to the procedure, and also a controlled group who didn’t receive any medication pre-operatively. Baseline measurements were obtained preoperatively, and subsequent assessments were made on immediate postoperative, at 48 hours and 7 days after surgery to measure postoperative facial swelling by use of linear measurements, interincisal mouth opening width and visual analog scale score for pain. The amount of analgesics consumed was recorded. Descriptive statistics were used to compare the two groups at \( P < 0.05 \).

Conclusion: Considering the results that were obtained upon the efficacy of different pre-emptive medication, Etoricoxib showed statistically significant values in terms of pain reduction and restriction in mouth opening, in the other hand prednisolone showed significance results in terms of edema reduction.

Keywords: Corticosteroids, COX-2 selective, third-molar surgery.

Introduction

Removal of impacted third molars is a common procedure in the field of oral and maxillofacial surgery (1). The most important step in removal of impacted mandibular third molars is achieving an appropriate mucoperiosteal flap that provides enough access to the tooth. An envelope flap with or without releasing is the common flap design (2).

Pain generated following third molar surgery has got short duration and moderate intensity that peaks in short time after the procedure and drives the patients into taking some analgesic medications(3).

Limitation of mouth opening is one of the problems which occurs following this surgery; this could be related to the inflammation of masticatory muscles. The medial pterygoid muscle is usually involved because of being inadvertently penetrated by the needle during inferior alveolar nerve block injection. This complication is not often severe and it will improve in 10–14 days(4).

Glucocorticoid agents and NSAIDs are generally used in managing some post-operation difficulties. Inhibiting the cyclooxygenase path is the mechanism of action of NSAIDS while glucocorticoids restrain production of acid arachidonic by inhibiting the phospholipase A2 enzyme(5). COX-2 is considered as the main isoenzyme in producing pro-inflammatory prostaglandins(3). Although some side effects such

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as cardiovascular risks, GI bleeding and acute renal failure should be kept in mind (6), some recent studies showed that there is no relationship between celecoxib consumption and mentioned risks (7, 8). The aim of this study was to compare the efficacy of prednisolone with celecoxib on maximum mouth opening (MMO) and pain relief following impacted mandibular third molar surgery.

Materials and Method

Subject: Patients requiring surgical removal of impacted 3rd molar.

Materials: Etoricoxib 120 mg preoperatively on group 1.

Prednisolone 10 mg preoperatively on group 2.

No medication preoperatively on group 3.

All 3 groups were subjected to take the following tablets postoperatively: paracetamol 500 mg on need, Augmentin 1000 mg bid and Metronidazole 500 mg tid.

Sample Size: 39 patients aged between 18-40 years.

Procedure/Intervention: The medications were given 30 minutes before the procedure on each group. follow up was conducted on 48 hours, and 1 week to check for the criteria of interincisal mouth opening distance by using a digital caliper, pain by using visual analog scale, and 2 lines to record inflammation: the first line is the distance from corner of mouth to attachment of ear lobe and the second line is the distance from outer canthus of eye to angle of mandible.

Removal of the desired tooth according to Pell and Gregory classification was recorded. And all the procedures will be conducted by same surgeon. Patients were distributed into 3 groups of 13 patients each and received either etoricoxib, prednisolone or no medication group.

Time was calculated on all procedures assist difficulty.

All surgical flaps were conventional ones with a releasing flap in the mesial side of second molar and then sutured by silk 3-0.

Timetable: One year started from February 2020 until the end of July 2020.

Results

Note: patients were allocated on 3 groups Etoricoxib group (group A), Prednisolone group (group B) and placebo control group (group C).

Age and Gender:

![Figure 1: Distribution of study patients by age](image-url)
Figure 2: Distribution of study patients by gender

In comparison between study groups by age and gender, we found that there were no significant differences in age (P= 0.495) and gender (P= 0.899) between the groups.

Table 1: Comparison between study groups by age

<table>
<thead>
<tr>
<th>Age (Years)</th>
<th>Study Groups</th>
<th>F</th>
<th>P- Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group A Mean ± SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Group B Mean ± SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Group C Mean ± SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26.1 ± 4.69</td>
<td>24.69 ± 4.42</td>
<td>24.1 ± 3.80</td>
<td>0.718</td>
</tr>
</tbody>
</table>

Table 2: Comparison between study groups by gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>Study Groups</th>
<th>Total (%) n= 39</th>
<th>X²</th>
<th>P- Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group A n= 13</td>
<td>Group B n= 13</td>
<td>Group C n= 13</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>6 (37.4)</td>
<td>5 (31.3)</td>
<td>5 (31.3)</td>
<td>16 (41.0)</td>
</tr>
<tr>
<td>Female</td>
<td>7 (30.4)</td>
<td>8 (34.8)</td>
<td>8 (34.8)</td>
<td>23 (59.0)</td>
</tr>
</tbody>
</table>

Clinical information: The comparison between study groups by certain clinical parameters of extraction showed that there were no significant differences (P > 0.05) in all these parameters between the groups, as shown in table (3).

Table 3: Comparison between study groups by clinical parameters of extraction

<table>
<thead>
<tr>
<th>Clinical Parameters</th>
<th>Study Groups</th>
<th>Total (%) n= 39</th>
<th>X²</th>
<th>P- Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group A n= 13</td>
<td>Group B n= 13</td>
<td>Group C n= 13</td>
<td></td>
</tr>
<tr>
<td>Surgical time (Min.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 30</td>
<td>4 (33.3)</td>
<td>5 (41.7)</td>
<td>3 (25)</td>
<td>12 (30.8)</td>
</tr>
<tr>
<td>≥ 30</td>
<td>9 (33.3)</td>
<td>8 (29.6)</td>
<td>10 (37)</td>
<td>27 (69.2)</td>
</tr>
<tr>
<td>Class</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>6 (31.6)</td>
<td>8 (42.1)</td>
<td>5 (26.3)</td>
<td>19 (48.7)</td>
</tr>
<tr>
<td>II</td>
<td>7 (35.0)</td>
<td>5 (25.0)</td>
<td>8 (40.0)</td>
<td>20 (51.3)</td>
</tr>
</tbody>
</table>
**Clinical Parameters**

<table>
<thead>
<tr>
<th>Clinical Parameters</th>
<th>Study Groups</th>
<th>Total (%) n= 39</th>
<th>X²</th>
<th>P- Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Angulation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disoangular</td>
<td>2 (50.0)</td>
<td>1 (25.0)</td>
<td>1 (25.0)</td>
<td>4 (10.3)</td>
</tr>
<tr>
<td>Horizontal</td>
<td>2 (28.6)</td>
<td>2 (28.6)</td>
<td>3 (42.8)</td>
<td>7 (17.9)</td>
</tr>
<tr>
<td>Mesioangular</td>
<td>6 (30.0)</td>
<td>7 (35.0)</td>
<td>7 (35.0)</td>
<td>20 (51.3)</td>
</tr>
<tr>
<td>Vertical</td>
<td>3 (37.5)</td>
<td>3 (37.5)</td>
<td>2 (25.0)</td>
<td>8 (20.5)</td>
</tr>
<tr>
<td><strong>Number of Roots</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One</td>
<td>6 (33.3)</td>
<td>5 (27.8)</td>
<td>7 (38.9)</td>
<td>18 (46.2)</td>
</tr>
<tr>
<td>Two</td>
<td>7 (33.3)</td>
<td>8 (38.1)</td>
<td>6 (28.6)</td>
<td>21 (53.8)</td>
</tr>
</tbody>
</table>

**Postoperative Pain:** In comparison between the three groups by pain score for seven days, means of pain score in the 2nd and 3rd postoperative days were significantly lower in patients of group A than that in group B and group C (5.9 versus 6.9 and 7.6, P= 0.001; and 4.6 versus 5.9 and 6.9, P=0.001, respectively). No statistically significant differences (P > 0.05) were found between the three groups regarding pain in the 1st and from the 4th to the 7th postoperative days as shown in table (4).

**Table 4: Comparison between study group by pain score for seven postoperative days**

<table>
<thead>
<tr>
<th>Postoperative Pain</th>
<th>Study Group</th>
<th>F</th>
<th>P- Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group A</td>
<td>Group B</td>
<td>Group C</td>
</tr>
<tr>
<td></td>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
</tr>
<tr>
<td>Day One</td>
<td>5.7 ± 0.5</td>
<td>6.3 ± 1.03</td>
<td>5.6 ± 0.75</td>
</tr>
<tr>
<td>Day Two</td>
<td>5.9 ± 1.03</td>
<td>6.9 ± 1.03</td>
<td>7.6 ± 0.86</td>
</tr>
<tr>
<td>Day Three</td>
<td>4.6 ± 1.12</td>
<td>5.9 ± 0.95</td>
<td>6.9 ± 0.95</td>
</tr>
<tr>
<td>Day Four</td>
<td>3.6 ± 0.85</td>
<td>4.1 ± 1.41</td>
<td>4.5 ± 0.87</td>
</tr>
<tr>
<td>Day Five</td>
<td>1.8 ± 0.68</td>
<td>2 ± 0.81</td>
<td>2.3 ± 0.94</td>
</tr>
<tr>
<td>Day Six</td>
<td>0.84 ± 0.80</td>
<td>1.07 ± 0.75</td>
<td>0.84 ± 0.80</td>
</tr>
<tr>
<td>Day Seven</td>
<td>0.46 ± 0.51</td>
<td>0.61 ± 0.50</td>
<td>0.53 ± 0.66</td>
</tr>
</tbody>
</table>

**Follow Up: Mouth Opening**

**Percentage of change between the groups:** Percentage of change in mouth opening was compared between study group in the 1st and 2nd postoperative follow up, as shown in table (5). In the 1st postoperative follow up, means of degree of mouth opening were significantly different between the three groups (-12.9% in group A, -14.5% in group B, and -24.5% in group C, P= 0.001).

No statistical significant difference between study groups (P= 0.42) in the 2nd follow up.

**Table 5: Comparison in percentage of change in mouth opening between study groups in first and second follow up**

<table>
<thead>
<tr>
<th>Change in Mouth Opening (%)</th>
<th>Study Groups</th>
<th>F</th>
<th>P- Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group A</td>
<td>Group B</td>
<td>Group C</td>
</tr>
<tr>
<td></td>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
</tr>
<tr>
<td>1st follow up</td>
<td>-12.9 ± 3.10</td>
<td>-14.5 ± 4.65</td>
<td>-24.5 ± 4.98</td>
</tr>
<tr>
<td>2nd follow up</td>
<td>-2.7 ± 3.34</td>
<td>-1.5 ± 1.84</td>
<td>-1.99 ± 1.56</td>
</tr>
</tbody>
</table>
Swelling:

Note: Facial swelling was performed by measuring the distance distance from corner of mouth to attachment of ear lobe (line A) the second line is the distance from outer canthus of eye to angle of mandible (line B).

Percentage of change in facial swelling was compared between study group in the 1st and 2nd postoperative follow up. In the 1st postoperative follow up, means of degree of facial swelling were significantly different (P=0.002) between the three groups (in both line A and line B).

No statistical significant difference between study groups (P= 0.172 & 0.561) in the 2nd follow up, as shown in table (6).

Table 6: Comparison in change of line B between study groups in 1st and 2nd follow up

<table>
<thead>
<tr>
<th>Study Groups</th>
<th>Change in Line A (%)</th>
<th>F</th>
<th>P- Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A Mean ± SD</td>
<td>Group B Mean ± SD</td>
<td>Group C Mean ± SD</td>
<td></td>
</tr>
<tr>
<td>1st follow up</td>
<td>7.34 ± 3.27</td>
<td>7.31 ± 2.70</td>
<td>12.52 ± 5.51</td>
</tr>
<tr>
<td>2nd follow up</td>
<td>0.32 ± 1.08</td>
<td>0.32 ± 0.67</td>
<td>0.99 ± 1.42</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Study Groups</th>
<th>Change in Line B (%)</th>
<th>F</th>
<th>P- Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A Mean ± SD</td>
<td>Group B Mean ± SD</td>
<td>Group C Mean ± SD</td>
<td></td>
</tr>
<tr>
<td>1st follow up</td>
<td>7.21 ± 4.24</td>
<td>6.05 ± 1.83</td>
<td>12.14 ± 5.11</td>
</tr>
<tr>
<td>2nd follow up</td>
<td>0.47 ± 1.0</td>
<td>0.71 ± 1.14</td>
<td>1.15 ± 2.33</td>
</tr>
</tbody>
</table>

Discussion

There have been many surveys investigating the influence of administration of NSAIDs or glucocorticoid drugs on post-operative inflammation, but as a result of differences in inflammation assessment, prescriptive drugs, patterns of administration and provided dose, the comparison between the results is rather difficult. (9)

Age, sex between the three groups: Patients in the age range between (20-30) represent the highest percentage in this study which is in keeping with Breik and Grubor (10), in 2008, Hashemipour et al. (11), in 2013 who found that most patients in their study were in the third decade of life.

This may be related to the fact that problem associated with impacted third molar started at the time of eruption that indicate their removal, as the prevalence of third molar impaction decreased with increasing age due to extraction of impacted teeth (12).

The majority of patients in this study were between (20-30) and it corresponds with the studies mentioned earlier, and 56.4% was in age range (≤25) and 43.6% (>25) years.

The data of this study revealed that the percentage of female patient was (59%) and the percentage of male patients was (41%) and there was no significant difference in distribution of males and females in study and control groups.

The higher occurrence in female may be the result of growth difference between male and female. Female growth usually stops with time of eruption of third molar, while in male jaws growth persists during third molar eruption, providing more space for eruption (13).

Angulation, classification, favorability and no. of roots and side of impacted lower third molars.

In the present study, mesioangular impaction was the most common (51.3%) followed by vertical (20.5%), horizontal (17.9%), and distoangular (10.3%).

Mesioangular impactions may be the most common type and this probably due to their late development and maturation, path of eruption and lack of space in mandible at later age. This finding was reported by many other studies (14,15).
However, this result disagreed with the different studies(16, 17, 18) who reported the vertical angulation is the commonest one. This could be due to the fact that a different method of classifying angulation was used in these studies.

The findings of the present study were in agreement with a large number of reports that show most impacted third molars were at Class II position, Almendros-Marques et al., in 2006(17) reported Class IIB as the most common position of mandibular third molar.

Duration of operation: There was no significant difference between study and placebo control groups regarding time of operation as p-value equal to 0.907. This may be due to the type of impacted teeth where the teeth selected in same position, position B, and all the surgical operations were performed by the same operator. So the time of operation had no effect on the results of this study. As previously suggested that there may be a close association between time of operation and postoperative morbidities(18).

Pain and trismus: Numeric rating scale was utilized in this study to rate the intensity of pain that felt after surgical removal of the wisdom teeth, as it is easy to be understood by patient and does not need language translation. The data that have been gained by VAS are interpreted and documented in simple manner and parametric tests can be used for analyzing its result(19).

The results of this study showed that the highest level of pain for all three groups was seen in the 2nd day of operation, after that the pain score tended to decline with time till the seventh day and a significant difference between the days within each group confirming that the maximum pain intensity occur within first 24 hrs after operation. Since pain starts with the termination of local anesthesia with peak level in (6-12) hrs after surgical operation(20), and it persists for about two to three days, then its intensity gradually decreases till the 7th postoperative day(21), so in this study the pain was measured from the first day of operation throughout 7 days.

The results of this study also revealed the most significant decrease in pain scores in the Etoricoxib group followed by predisolone group then with placebo control group, that reached a significant level on the 2nd and 3rd day which was in favor of the etoricoxib followed by prednisolone then the placebo control group, while it was non-significant in the 4th, 5th, 6th and 7th days between the placebo control and study groups, this may be due to analgesic effects of prednisolone and etoricoxib.

Limitation in mouth opening reaches its maximum intensity in the second postoperative day then the symptoms gradually improved and get better at theseventh postoperative day(22), so in this study the trismus is measured at the 2nd and 7th postoperative days.

In this study: It was noticed that the significant reduction of the mouth opening (p value 0.001) was seen in placebo control group (-24.5%) in the 1st follow up appointment. The least reduction of the mouth opening was seen in Etoricoxib (-12.9%) followed by prednisolone group (-14.5%).

There is was insignificant value between study and control groups in the 2nd follow up (p value 0.42).

The finding of this study is inconsistent with Carrieches et al (23) who compared the efficacy of methylprednisolone (glucocorticoid) versus diclofenac (NSAID) upon inflammation and trismus after removal of impacted mandibular teeth. They did not find any significant difference between groups.

This study was comparatively consistent with Claseman et al(24) assessed the analgesic efficacy of preemptive ketorolac and dexamethasone for third molar surgery. According to their results, the pain and the amount of having extra analgesics reported by patients receiving 8 mg IV dexamethasone did not have significant difference with patients receiving 30 mg IV Ketorolac. In this study, celecoxib had better effects on pain relief in 24 h after surgery; this difference may be related to different routes of drug administration.

Moore et al(25) evaluated the effects of rofecoxib and dexamethasone on pain and trismus after third molar surgery. In their study, MMO of patients receiving dexamethasone had a reduction of 24.1 % from the base limit while the rofecoxib group had 43.3 %. Reported pain did not show any significant differences and both groups had moderate pain perception. These differences may be contributed to the type of rescue dose given to patients which was 400 mg ibuprofen. Ibuprofen is a NSAID type of drug and can add on anti-inflammatory response and effects of rofecoxib or dexamethasone.

Whereas Baxendale et al.(26) observed the
elimination of analgesic intake by administering preoperative dexamethasone while trismus was not affected.

This effect can be related to the role of prostaglandins in local pain and their inhibition by NSAIDs will result in pain relief. Glucocorticoids are effective in each step of inflammation process and subsequent decrease in capillary dilation, circulating lymphocytes, fibroblast proliferation and prostaglandin and leukotriene inhibition. Most single dose glucocorticoid drugs used in oral surgeries are not effective for more than 24 h, so for maintaining their anti-inflammatory effects they should be taken for a minimum of 3 and maximum of 5 days for gaining the maximum efficiency and minimum risk of delayed healing and suppression of HPA axis (27).

**Swelling:** Facial measurement was performed by measuring the distance distance from corner of mouth to attachment of ear lobe (line A) the second line is the distance from outer canthus of eye to angle of mandible (line B) Preoperative measurement was used as baseline record as of Amin and Laskin methodology (28).

In this study the effect of study drugs showed significant difference in A and B lines of inflammation in comparison with placebo control group in the 1st follow up (p value 0.002). However there was insignificant difference in the 2nd follow up between study and control groups.

The significance was in favor of prednisolone 10 mg as in compare with placebo control group. However, there was slight difference between the study groups but it was insignificant.

Costa et al. (29) analyzed the preemptive effect of etoricoxib (120 mg) and placebo on inflammatory events after the removal of third molars and found no significant difference in facial measurements between groups at any evaluation time.

Sotto-Maior et al. (30) compared the anti-inflammatory effects of etoricoxib (120 mg) and dexamethasone (4 mg) administered orally one hour prior to the procedure and found no significant differences in postoperative swelling.

Mojsa et al. (31) evaluated the submucosal injection of dexamethasone and found that peak swelling in patients who received placebo occurred on the third day and these patients had significantly larger facial measurements.

Antunes et al. (32) compared the administration of dexamethasone intramuscularly (masseter muscle), orally and a placebo and found that the control group had the greatest swelling.

**Conclusions**

1. Etoricoxib 120mg showed a significant effect on reduction of pain following surgical removal of impacted 3rd molar.
2. Etoricoxib 120mg showed a significant effect on reduction of trismus following surgical removal of impacted 3rd molar.
3. Prednisolone 10mg showed a significant effect on reduction of facial swelling following removal of impacted 3rd molar as in compare with other two groups, however the result showed no significant difference as in compare with Etoricoxib 120 mg.
4. The effect of etoricoxib was significant in the short-term effect (48hrs) and was insignificant in one week follow ups in comparison with placebo control group.

**Acknowledgment:** The study was self-funded.

**Conflicts of interest:** None of the authors have any competing interests in the manuscript.

**Ethical Clearance:** This research has exemption as it a routine treatment (no new materials were used).

**References**


25. Moore PA, Brar P, Smiga ER, Costello BJ. Preemptive rofecoxib and dexamethasone for


The Relationship of Some Immediate Chemo-Chemical Variables after the Aerobic Physical Increasing Effort for Football Players

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1The General Directorate of Education in Anbar Province/The Open Educational College/Department of Physical Education and Sports Sciences, 2The General Directorate of Education in Anbar Province/The Open Educational College/Department of Physical Education and Sports Sciences

Abstract

In order to study some biochemical variables on the increasing aerobic physical stress-test, the researchers selected a sample of individuals represented by the Anbar University football team of 16 players who underwent this study. The researchers used the descriptive approach in their research. The research experiment included taking blood samples before and after the escalating physical exertion on the Treadmill device in order to know the effect of this effort on some biochemical variables (cholesterol, white blood cells, lactic acid). They conducted aerobic increasing physical effort stress-test on a Treadmill device which has an impact on the targeted Chemo-chemical variables and the existence of correlative relationships between those variables. The researchers concluded that there are significant changes in these variables in favor of the post-test measurements, as well as obtaining significant correlation coefficients between these three biochemical variables. Then the researchers recommended the necessity of conducting studies in the same regard to the rest of the other difference games and the need to study other variables and recognize the correlations between those variables. To design curricula Modern training according to scientific foundations to enhance the positive correlation between the variables that were discussed and reduce the relative difference between the variables whose relations have gone in the negative direction and that negatively affects the physical achievement.

Keywords: Chemo-Chemical Variables, Aerobic Physical.

Introduction

In recent years, the world has seen considerable progress in various fields. Physical education has had a significant share of that progress, as demonstrated by the results, achievements, and record subjects of various sports and events, both individual and team. It is through continuous research and proper recruitment, and the aim of that research for the service of achievement and its upgrading. The training process is a difficult and complex process that needs a lot of data and information from the game to give the trainer a clear picture of that player, which in turn will make it easier for the trainer to develop appropriate training curricula that are compatible with the capabilities and capabilities of each player. The blood variables from the internal variables that are to be studied deeply reflect a clear picture of the inner environment of the player’s body during and after the performance because “blood forms the inner perimeter of the body”[1]. The concentration or level of these variables is directly related to performance, as the rise of some of them supports performance and increases its quality, while the reduction of some of them negatively affects performance. As a result, there are many changes in their work, such as the respiratory system, the heart, and the circulatory system, the nervous system, the neuro system, the hormonal, enzymological system and other devices Internal to the training load on the player and in a way that serves performance and achievement.
This is why a football player is exposed to the fatigue that can occur because of these chemical changes in the internal environment of the body, which may affect negatively on his physical, professional, plan, and psychological performance, which has led us to research of some of his body Biochemical changes caused by increased physical activity and the study of the quality of relational relationships between these variables.

It is important to study the current changes in some blood variables due to an increasing aerobic physical effort and therefore to know the relationships between these variables, which in turn gives us a clear picture of the nature of these changes and how they affect the level of performance of the player, whether negative or positive, especially given that knowledge The nature of relational relationships between these variables will allow the trainer to reinforce the positive and minimize the negative results.

The research problem was the effectiveness of football match that requires a major physical effort that lasts for (90min), The problem of research is the need to know and study these changes and to know the nature and level of these changes by the coach and even by players and their effects on performance, especially given that knowledge. The nature of relational relationships between these variables will allow the trainer to reinforce the positive and minimize the negative results.

The research problem was the effectiveness of football match that requires a major physical effort that lasts for (90min), The problem of research is the need to know and study these changes and to know the nature and level of these changes by the coach and even by players and their effects on performance, especially given that knowledge. The nature of relational relationships between these variables will allow the trainer to reinforce the positive and minimize the negative results.

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The method and procedures

The researchers used the Descriptive study, which studies of some blood variables and their impact on an increased physical effort and the relational relationships between those variables. The aims of the research were:

1. Recognize the impact of increased physical effort on some blood chemical variables (white blood cells, lactic acid, and cholesterol).
2. Identify the level of the relational relationship between the Chemo-chemical variables under study.

The sample of the research was 16 players of Al Anbar University participate in the reconnaissance experiment. The Experiment location was the main stadium of Al Anbar University and the Faculty of Science laboratories in the university. And the temporal domain was (5/9/2018 to 26/9/2018). The Research means and tools were used the TREDEME 4 of the same type and origin and special blood-preservation tubes containing anticoagrotic, medical injection, and gauze. Survey experience Research procedure the researcher uses to organize and arrange his field research work, identify obstacles and problems that may arise for the researcher when initiating his main experience, distribute tasks and roles for the assistant staff, identify their capabilities and capabilities to carry out their assigned tasks and ensure the safety of the equipment and tools used in the research.

The assistant staff performed the pre-test measurements of the Chemo-chemical variables on the sample members for research, as these variables were measured by the changes of white blood cells, lactic acid, and cholesterol at 4:00 p.m. on Thursday, 09/13/2018 in Al Anbar University, where blood samples are taken from the sample individuals, and by a quantity of (5 ccs). The test is a very good way to get the test to be used, and the test is a good way to get the test done another influential is the physical practice or any physical effort.

The assistant staff conducted the Tread-Mill physical Stress-Test upon completion of the blood sample sampling of the research samples and represented the test with the physical Stress-Test. The procedure for this test is as follows:

The player sample warmed up for (10 minutes) on the device by walking on the Tread-Mill with speed (3.5 hours/miles) and with inclination angel (0%) and after the warm-up, the testing begins on the Tread-Mill, as the player runs on the device with speed (7 hours/miles) (2 minutes), inclination (0%), and after two minutes, theinclination increases to (2.5%) after every (2 minutes) until the end of the test, and it is known that the test time is (12 minutes) continuous and continuous without any interruption[2].

The assistant staff performed the following measurements of the research sample blood-blood variants by venous blood draw from the sample, and by the fact that two blood clouds were immediately upon the sample descent from the device and by (5 cc) to measure the changes of white blood pellets and cholesterol and the second five minutes after they have completed an upward physical effort as post-test (5 cc) also, to measure lactic acid variant after withdrawal, blood samples were placed in special blood-preservation tubes prepared for this implantation, transferred to the laboratory and analyzed to see all changes due to the increased physical effort.

Because of this research method, the researchers developed the following research questions:
1. Is an increasing physical effort having clear and significant effects on blood Chemo-chemical Variables?

2. Are there any relationships between the blood Chemo-chemical variables after increased physical effort?

Results

The following measurement of the biochemical variables in blood was handled between the pre and post results with used the SPSS Statistical Package. It was presented by researchers in the following tables (1 and 2), and they were provided with analyzes and attached, strengthened by scientific sources and references.

Table (1): Mean, standard deviations, Mean difference, standard deviations of differences, and the calculated (T-test) value to measure the white blood cell variables, Lactic acid, and cholesterol

<table>
<thead>
<tr>
<th>Variables</th>
<th>Measuring unit</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>MD.</th>
<th>SD.</th>
<th>Calculated value (T)</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>White blood cells</td>
<td>Cell/mL 3</td>
<td>5914.55 625.43</td>
<td>8225.13 852.11</td>
<td>2615.78</td>
<td>727.18</td>
<td>10.16</td>
<td>Sig.</td>
</tr>
<tr>
<td>Lactic acid</td>
<td>Mg/100 milliliters</td>
<td>10.2 0.461</td>
<td>22.7 0.366</td>
<td>43.1</td>
<td>465.0</td>
<td>254.19</td>
<td>Sig.</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>Mg/100ml</td>
<td>185.33 18.19</td>
<td>198.34 23.06</td>
<td>17.22</td>
<td>11.19</td>
<td>4.45</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

The tabulated T-value (2.947) at the degree of freedom (16-1=15) and the level of Significance (0.01), Relative confidence 99%.

Discussions

We find out from Table(1), which includes the statistical parameters, that there are differences between the post and pretest results of the variables, and for the benefit of the post-tests. The researchers attribute these differences to the increased physical effort of the sample research, which has had a direct impact on the target Chemo-chemical variables, and it is known that a physical effort with an inclination would increase the alert status of the body’s internal environment and all its organs and clearest, making it work faster, stronger, and more to confront the requirements of that work.

The increase in the rate of blood pressure in the arteries and the roses that pass through them affects blood components in general and blood cells, the white blood is especially so as indicate that there are a large number of white blood cells that are adjacent to the walls of blood vessels that the blood passes through during the rest time, and these pellets are pushed with blood when performing a physical effort, as these cells are left on the walls of blood vessels to get into the bloodstream[3]. The higher the level of physical effort increases the number of white cells. The longer and more physical effort, the more white blood cells, and this view are reached after a series of research, concluding that these white cells have increased their number by a certain percentage after a runaway race (200) meters this percentage of white cells increased further after the race at two (800) meter runners and the increase was significantly higher, but this increase was more apparent after the previous (1500) meters[3]. Which indicates that exercise and athletic performance of physical efforts increase blood components in general as both red and white blood cells and hemoglobin increase in size due to the exigencies of performing physical work[4].

The researchers attributed the differences in lactic acid variant between the pre and post-tests that were in favor of the post-test to the fact that the increased physical effort means the difficulty and severity of the sample during the performance was the increasing degree of the device’s inclination after every two minutes, which makes it difficult. The intensity gradually increases as the performance progresses and this increasing continuously elevate heart pulses, making more effort on the player gradually increase, and it is known that increasing performance leads to more metabolic processes and energy release to match that intensity and work requirements, causing the formation of metabolic residues, including acid The lactic action is one of the most important causes of fatigue. A physical effort of maximum or lesser intensity increases the amount of lactic acid that causes muscle fatigue and this acid gradually increases the performance intensity, i.e. the higher the performance the acid build-up. Studies
have suggested that lactic acid not only increased muscle to non-oxygenated exercises or efforts but also even in oxygen training and efforts, it appears because of adrenaline hormone but less.[5]

We explain the results of the differences between the pre and post-tests of the cholesterol variant that was in favor of the post-test, to the direct effect of the increased physical effort on the sample, as this step-by-step effort by increasing the device’s inclination degree after every two minutes increased the frequency of metabolic operations. The increased need for energy production is the result of the muscular work produced during this effort, resulting in the accumulation of many unfinished substances in the blood after the severe physical effort, which is part of the substances. The period immediately following “intense work performance” is the blood on non-combustion substances such as lactate acid, pesticides, and ketones. All of these materials are burned when oxygen is taken in the break-in period following intense work.”[6]

The exercise of physical activity would provoke the body’s hormone system, which would make it responsive and work to create a state of internal balance. This makes it increase during the performance period and it is known that increasing the proportion of this hormone in the blood directly affects the percentage of fatty acids, which makes them increase further and which can be used as a source of energy[11]. The growth hormone is more susceptible to increase as physical activity increases, its importance appears to be in its ability to metabolize and consume fat as a source of energy, and it also plays an active role in metabolizing fatty acids and converting them from fatty tissue to the energy, and it also plays an active role in metabolizing fatty acids and converting them from fatty tissue to the energy, and it also plays an active role in metabolizing fatty acids and converting them from fatty tissue to the energy, and it also plays an active role in metabolizing fatty acids and converting them from fatty tissue to

Table (2): Shows the values of multiple correlation relationships between Chemo-chemical variables

<table>
<thead>
<tr>
<th>Variables (A)</th>
<th>White blood cells</th>
<th>Cholesterol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lactic acid</td>
<td>0.601</td>
<td></td>
</tr>
</tbody>
</table>

The tabulated Person-value (0.497) at the degree of freedom (16-2=14) and the level of Significance (0.05), Relative confidence 95%.

Discussions

The table above shows the statistical multiple correlation values that show the relationship between the research variables, white blood cells, lactic acid, and cholesterol. The multiple correlation values between the 3 Variables (0.601) is significant, and there relative confidence 95%. The researchers attribute that the physical effort of subjects has caused a state of alert in the internal environment of the body, which is, of course, a result of the degree of performance or work due to the increased of the device inclination, which has made it more difficult to work requirements and has led to a cardiac arousing and blood pumping circuit for the common muscles in the work to continue. In energy liberalization, this has made the circulatory system heartbeats increase its frequency. Which directly affected the number of white cells and made them go out in more numbers than their natural numbers and go into the brain stream. The topic of the effects of training on white blood cells and the quality of training related to the type of cells that increase the number of short-range anaerobic training increases the number of lymph white blood cells (Lymphocyte), long-term aerobic training affects the equivalent white blood cells (nitro Ville), which make up a large proportion of the total number of white blood cells, reaching approximately 60%-70% of the total number of cells and appears and their added value in being the first line of defense[8]. The increased exposure of the research sample to the increased intensity of the search also increased the of lactic acid concentration that caused a rise in an acidic grade of the center or the internal environment (blood) due to the hydrogen ions that are free from lactic acid and which in turn reduced the pH value. The longer the exercise lasts, the more the time the production of lactic acid[9], increases and the increase in the central acid caused by the decrease in phages, confirmed by[10]. The increase in lactic acid in the blood is seen as contributing to the reduction of pH[11].
From the above, it becomes clear to us that the relationship between the increased physical effort and white blood cells is a significant correlation, so with the increase in the physical effort, the level of these blood cells rises, as well as the relationship between the physical effort and lactic acid as well as a positive relationship, its increases the level of lactic acid and this increase is caused by the increase in the frequency of oxidation processes as a result of the physical load to which the research sample was exposed, so by increasing the level of oxidation processes (the oxidative) that accompanies the implementation of the physical load, the level of each level of both lactic acid and white blood cells rises, and this is confirmed by James, Bosch, and Aldred. As this research team found through a field study conducted at the College of Medical Sciences and Dentistry at the University of Birmingham in Britain that the practice of strong physical exercises would increase the oxidative stress in the internal tissues and blood, which leads to a high level of white cells and that this rise is caused by the high level of the adrenaline hormone, which increases with the progress of the effort, which in turn reduces the adhesion of white cells on the one hand and increases their release from the lining the blood vessels in which the blood passes, and some of its stores in the spleen and lungs, on the other hand.

Aqeel believes that the increase in the level of physical load would increase the level of concentration of growth hormone and that increasing this hormone increases the concentration of fatty acids in the blood, and that this increase in the level of fatty acids contributes directly to the increase in the level of cholesterol, which is the main carrier of these acids as indicated previously, which he refers to Fadel, in that he has an important role during the exercise of physical exertion and exercise. He pointed out that all fats, with all their varieties and types, which exist in different proportions in the human body, including cholesterol, play an important and major role in supplying the body with the energy needed when needed, especially for the practice of continuous and relatively long physical load and this is what it makes us conclude that the correlation between each of the physical exacerbations and the intensity of cholesterol is a direct relationship, so with increasing load intensity or performance, the concentration of cholesterol increases. If we address the level of the relationship between physical exacerbation and intensity of lactic acid, we find that the increased demand for the body’s need for more energy to continue working as a result of the exacerbated physical exertion led to an increase in the speed of metabolic processes that produce lactic acid.

The increase in the intensity of performance contributes to the increase in metabolic activity, which in turn leads to the accumulation of lactic acid as a by-product of this activity.[13]

We conclude that a positive relationship between physical stress and increasing intensity and cholesterol is a direct relationship. The increase in the level of physical effort with increasing intensity is offset by an increase in the concentration of cholesterol, as it becomes clear to us that the correlation between the physical increased effort and lactic acid is also a positive relationship, that is, the increase in physical load work. It is accompanied by an increase in the concentration of lactic acid and this leads us to say that the correlation between both cholesterol and lactic acid is a positive relationship and this is confirmed by[14], as they see that the physical effort contributes to increasing the outputs of the metabolic processes that are represented by the production of fatty acids as a result of lipolysis as well. The production of lactic acid that releases hydrogen ions that cause the pH value to drop[14].

**Conclusion**

Based on the discussions discussed in Tables 1 and 2 on the results of Chemo-chemical tests before and after the increasing effort stress-test of the football players sample, we came to summarize the conclusions as follows:

- We conclude that the aerobic increased Physical stress-test on the treadmill device significantly affects the Chemo-chemical variables of blood, such as white blood cells (leukocytes), cholesterol, and lactic acid. Thus, the assumption of the first research question was answered.

- We conclude that the three Chemo-chemical research variables have significant internal multiple correlations, which are white blood cells (leukocytes), cholesterol, and lactic acid. With this result, we were able to answer the second research question.

**Recommendations:**

- An increasing physical effort having clear and significant effects on blood Chemo-chemical Variables such as white blood cells (leukocytes),
cholesterol, and lactic acid, therefore, these results should be taken into account well in training programs for various sports and endurance activities in particular.

- The relationships between the blood Chemo-chemical variables after aerobic increased physical effort stress-test, those results should be paid attention to studying other variables of the circulatory system and blood because of its importance in the general health of athletes in general and the effects of training units in particular.

Acknowledgment: The researcher’s thanks to the Iraqi education Ministry and Anbar University stadium and the science college’s laboratories, and a football team for the facilities provided to the researchers.

Ethical Clearance: This article does not contain any studies with human participants or animals performed by any of the authors.

Source of Funding: Self-funded by the authors.

The Conflict of Interest Statement: All authors have no conflicts of interest.

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Role of Retinol-binding Protein 4 as an Early Biomarker for Diabetic Nephropathy in Type 2 Diabetic Patients

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Abstract

Assess the relationship and diagnostic performance of retinol-binding protein 4 (RBP-4) as a biomarker of diabetic nephropathy (DN) at different levels of albuminuria (normo-, micro- and macro-albuminuria). A case-control study that involved 185 participants, 47 were healthy control, and 138 diabetic patients (46 were normoalbuminuric patients [NA], 48 patients were microalbuminuria [MiA], and 44 patients were macroalbuminuria [MaA]). All diabetic patients were treated with antidiabetic medication (metformin and/or oral sulfonylureas), all the participants were interviewed by the researcher, and full medical (history of liver, kidney, lung, and other diseases), and sociodemographic data taken from them and recorded in the questionnaire. In the present study, RBP-4 was 14.08±1.82 ng/ml in the control group, 15.98±3.74 ng/ml in the normoalbuminuria (NA) group, 30.38±6.02 ng/ml in the micro-albuminuria (MiA), and 41.01±5.78 ng/ml for macro-albuminuria (MaA), there was a significant difference between all their groups compared to control (p-value <0.001), and between each other (p-value <0.001) except that no significant difference found between control and normoalbuminuria. In conclusion, RBP4 is an excellent predictor of both microalbuminuria and microalbuminuria, there was an inverse relationship between RBP4 with GFR, which indicate it is a good predictor for the progression of diabetic kidney impairment.

Keywords: Albuminuria, renal impairment, RBP4, microalbuminuria, macroalbuminuria, diabetic nephropathy.

Introduction

The term diabetes mellitus describes diseases of abnormal carbohydrate metabolism that are characterized by hyperglycemia. It is associated with a relative or absolute impairment in insulin secretion, along with varying degrees of peripheral resistance to the action of insulin. Type 2 diabetes accounts for over 90 percent of cases of diabetes in the United States, Canada, and Europe; type 1 diabetes accounts for another 5 to 10 percent, with the remainder due to other causes¹.

The term “diabetic nephropathy” was historically defined by the presence of albuminuria accompanied by retinopathy in patients with type 1 diabetes². The presence of albuminuria was considered to be an early sign of classical diabetic glomerulopathy, which is characterized by glomerular basement membrane thickening, endothelial damage, mesangial expansion and nodules, and podocytes loss. Diabetic nephropathy was further subdivided into “overt nephropathy” by “macroalbuminuria” and “incipient nephropathy” by “microalbuminuria.” These albuminuria distinctions were proposed to reflect a disease spectrum from mild to severe ². Retinol binding protein 4 (RBP4) It is a specific transporter for vitamin A in the blood, and it is produced from either the liver or adipocytes, which was later proven to be associated with insulin resistance in type II DM. It was shown that increased of RBP-4 will cause reduction in insulin-dependent glucose uptake in muscular tissues³.

The current work aimed to assess the relationship between the studied biomarker and the different levels of albuminuria (normo, micro and macroalbuminuria), and

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the relationship between the serum levels of the RBP-4 with glomerular filtration rate (calculated GFR).

**Method**

**Study Design:** A case control study (a diagnostic accuracy study [67]), that involved 185 participants, 47 were healthy control, and 138 diabetic patients (46 were normoalbuminic patients [NA], 48 patients were microalbuminuria [MiA], and 44 patients were macroalbuminuria [MaA]).

**Study Settings:** The study carried out in private laboratory in Al-Nasiriyah, Iraq, the participants were recruited from the Diabetes Mellitus at Diabetic and Endocrine Center in Al-. Nasiriyah City. The recruitment started in October 2019 and ended in February 2020.

**Participants:** All diabetic patients were treated with antidiabetic medication (metformin and/or oral sulfonylureas), all the participants were interviewed by the researcher and full medical (history of liver, kidney, lung, and other diseases), and sociodemographic data taken from them and recorded in the questionnaire.

Inclusion criteria: Type II diabetic patients diagnosed by physician based on the 2010 American Diabetes Association guidelines (which is briefly as fasting blood sugar [FBS] above 126 mg/dL, or random blood sugar above 200 mg/dL) \(^4\), or HbA1c above 6.5% \(^5\).

Exclusion criteria: pregnant women., Patients on insulin therapy, Patients with other metabolic disorders, Patients with cardiovascular disease, Patients providing incomplete information during completion of the questionnaire also will be excluded from the study, End stage kidney and liver disease, and eGFR below 60 ml/min (stage III or higher).

**Statistical Analysis:** Chi square test used for assessing the statistical significance between categorical variables, while independent t-test used for assessing the degree of significance between two continuous variables, in case of assessing the difference between four continuous variables one way ANOVA was used.

Linear regression analysis was used to assess the relationship between eGFR and various markers, negative sign indicate inverse relationship while positive sign indicate direct relationship. Receiver operator curve (ROC) used to assess the diagnostic performance of various biomarkers for predicting nephropathies. All analysis carried out using SPSS 24.1 (Chicago, IL), MedCalc Statistical Software version 14.9.2 software package, p-value is significant if less than 0.05.

**Results**

**Table 1: Assessment of sociodemographic variables**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Control</th>
<th>DM</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>48</td>
<td>138</td>
<td>-</td>
</tr>
<tr>
<td>Age (years), mean ± SD</td>
<td>43.7 ± 6.3</td>
<td>43.9 ± 7.8</td>
<td>0.826</td>
</tr>
<tr>
<td>Gender, n (%)</td>
<td></td>
<td></td>
<td>0.003</td>
</tr>
<tr>
<td>Female</td>
<td>9 (19.1 %)</td>
<td>60 (43.5 %)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>38 (80.9 %)</td>
<td>78 (56.5 %)</td>
<td></td>
</tr>
<tr>
<td>Occupation, n (%)</td>
<td></td>
<td>0.363</td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>36 (76.6 %)</td>
<td>114 (82.6 %)</td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>11 (23.4 %)</td>
<td>24 (17.4 %)</td>
<td></td>
</tr>
<tr>
<td>Education level, n (%)</td>
<td></td>
<td>0.646</td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>13 (27.7 %)</td>
<td>47 (34.1 %)</td>
<td></td>
</tr>
<tr>
<td>High school</td>
<td>18 (38.3 %)</td>
<td>44 (31.9 %)</td>
<td></td>
</tr>
<tr>
<td>College</td>
<td>16 (34.0 %)</td>
<td>47 (34.1 %)</td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td>0.840</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>21 (44.7 %)</td>
<td>64 (46.4 %)</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>26 (55.3 %)</td>
<td>74 (53.6 %)</td>
<td></td>
</tr>
</tbody>
</table>
Mean RBP-4 was higher in 4 in comparison to group 3, 2, and 1, also it was higher in group 3 in comparison to group 2 and 1, while no significant difference between group 1 and 2 was found see table 2 and figure 1.

Table 2: Assessment of RBP and various factors according to study groups

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>Group 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>47</td>
<td>46</td>
<td>48</td>
<td>44</td>
</tr>
<tr>
<td>eGFR (ml/min), mean ± SD</td>
<td>100.66±10.83</td>
<td>98.59±11.46</td>
<td>83.85±9.11</td>
<td>72.64±5.64</td>
</tr>
<tr>
<td>Duration of DM (y), mean ± SD</td>
<td>-</td>
<td>10.22±4.36</td>
<td>9.54±3.94</td>
<td>13.20±2.06</td>
</tr>
<tr>
<td>RBP4 (ng/mL)</td>
<td>14.08±1.82</td>
<td>15.98±3.74</td>
<td>30.38±6.02</td>
<td>41.01±5.78</td>
</tr>
</tbody>
</table>

Group 1: control, group 2: Normo-albuminuria, group 3: Microalbuminuria, group 4: Macroalbuminuria

There was inverse moderate relationship between eGFR with RBP-4 as illustrated in figure 2.

RBP-4 showed excellent sensitivity and specificity to similar extent, with 96.3% accuracy, with an optimal cut–off above 22 ng/ml, as illustrated in table 3 and figure 3.
Table 3: diagnostic performance of various markers for the prediction of microalbuminuria from normo-albuminuria

<table>
<thead>
<tr>
<th>Variables</th>
<th>AUC</th>
<th>p-value</th>
<th>Cut-off</th>
<th>SN</th>
<th>SP</th>
<th>AC</th>
<th>PPV</th>
<th>NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>RBP4 (ng/mL)</td>
<td>0.993</td>
<td>&lt;0.001</td>
<td>&gt;22</td>
<td>93.8</td>
<td>99</td>
<td>96.3</td>
<td>99</td>
<td>93.9</td>
</tr>
</tbody>
</table>

AUC: Area under the curve, CI: confidence interval, LH: likelihood ratio, SN: sensitivity, SP: specificity, AC: accuracy, PPV: positive predictive value, NPV: negative predictive value

Figure 3: ROC curve of RBP-4 for the prediction of microalbuminuria from normo-albuminuria

Discussion

It is an adipokine marker that was initially examined as a marker for vitamin A (since its bind to vitamin A)\(^3\), the primary production site is the liver and adipocyte\(^6\). Many studies had correlated RBP-4 to some of the aspects of diabetic including obesity and insulin resistance\(^7\).

In the present study RBP-4 was 14.08±1.82 ng/ml in the control group, 15.98±3.74 ng/ml in the normo-albuminuria (NA) group, 30.38±6.02 ng/ml in the microalbuminuria (MiA), and 41.01±5.78 ng/ml for macroalbuminuria (MaA), there was significant difference between all these groups compared to control (p-value <0.001), and between each other (p-value <0.001) except that no significant difference found between control and normo-albuminuria.

Our findings was in agreement with previous studies; in a Saudi study Mahfouz et al 2016 examined RBP-4 in the same setting like our study (200 participants divided into four groups each with 50 patients), they found that like us serum RBP-4 was significantly higher MaA
compared to MiA, NA and healthy control (39.4 ± 7.7, 28.9 ± 8.26, 17.5 ± 4.2, and 14.4 ± 1.95 ng/mL) 8.

In Raila et al study 2007, was in agreement with our work in which RBP-4 was significantly higher in the MiA compared to both NA and control (2.22, 1.75, and 1.59 μmmol/l, p-value <0.05) 9.

In Chang et al 2008 study similar findings to our study was observed in which was significantly higher in MaA, MiA compared to both NA diabetic and healthy control (64.7 ± 27.6, 57.3 ± 24.2, 43.4 ± 14.9, and 32.6 ± 10.0 respectively), while there was significant difference between MiA and MaA 10. All these studies showed an important observation as the diabetic nephropathy progress it is directly associated with increase in RBP-4 levels, since there was inverse relationship between RBP-4 with eGFR (r = - 0.694, p-value <0.001).

The kidneys play central role in the control of normal homeostasis of the body 11, since GFR give us an estimation about the functionality of the kidneys so any deterioration will be associated with decline in GFR, and inability to perfume the reabsorption process of many materials including RBP-4 in the PCT 11.

Our observation of the inverse relationship was also noted in other studies like Mahfouz et al 2016, (r = -0.306, p-value = 0.002) 8, thus increase the accumulation of RBP-4 in the body.

Several other factor can also increase RBP-4 which included increase excretion of transthyretin (the protein that bound and transport RBP-4 in the blood) thus increase the accumulation of RBP-4 12. In addition elevation in RBP-4 is associated with increased risk of hypertensive, abnormal lipid profile, and deterioration in GFR 13.

In the present study RBP-4 showed excellent ability to predict MiA from NA diabetic patient since the area under the curve (AUC) = 0.993, in addition the positive likelihood ratio was 58.0 which indicate it had 45% increased posterior probability to confirm the MiA when used as conformation test, while its negative likelihood was 0.001 which indicate it increase the exclusion of disease by 45%. In term of diagnostic performance RBP-4 value above 22 ng/ml has 99.0% specificity and 99.0% sensitivity and 99% accuracy. This indicate the overall value of this marker is to both confirm and exclude the disease MaA to similar degree.

Our findings were in agreement with Mahfouz et al 2016 in which RBP-4 showed excellent ability (AUC = 0.912) to predict nephropathy from those diabetic patients without nephropathy in which they found that the optimal cut – off was >24.5 ng/ml with 84% sensitivity, 90% specificity and 86% accuracy which comparable but somewhat lower than our findings, this could be attributed to differences in studied population since Mahfouz et al involved Saudi subjects while in ours involved Iraq patients 8.

The kidney play central role for RBP-4 homeostasis, since its metabolic degradation is dysregulated in chronic renal impairment (CRI) patients. A possible explanation that diabetic patients are exposed to increased risk of oxidative stress which in turn lead to endothelial damage. In addition RBP-4 enhance oxidative stress, so its accumulation will lead to further enhancement of kidney impairment in diabetic patients 14. RBP-4 elevation thus is most likely to be related to kidney dysfunction rather than diabetic itself 15, which will lead to MiA and MaA. Which indicate its usefulness for predicting diabetic nephropathy rather than diabetic.

These observations is interesting since it suggest we could use RBP-4 as target for treatment by reducing its circulatory level will be proven to reduce the risk of kidney impairment progression, especially those related PCT damage 8. In adipose-Glut4-knockout mice, therapy with anti-diabetic (rosiglitazone) will invert insulin resistance and stop RBP-4 elevation 16. While treating obese mice with fenretinide will enhanced RBP4 renal elimination thus return RBP-4 to its normal values 16.

**Conclusion**

Retinol binding protein – 4 is an excellent predictor of both microalbuminuria and microalbuminuria, and there was inverse relationship between Retinol binding
protein – 4 with GFR, which indicate it is good predictor for the progression of diabetic kidney impairment.

**Ethical Clearance:** The approval taken from ethical committee of College of Pharmacy, Baghdad University and was done in accordance with Declaration of Helsinki1975 and its later amendments.

**Source of Funding:** Self

**Conflict of Interest:** Nil

**References**


Molecular Study of MDR Bacteria Contaminated Hospital Environment

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Abstract

Some isolates of bacteria were taken from various places inside the hospital, including operating theaters, corridors, ventilation areas, floors, and other samples were taken from patients suffering from antibiotic resistance.

The study aims to discover the multiple resistant bacteria present in the hospital environment, to discover the extent of their resistance, and to detect the gene NDM-1, NDM-2, which when they are present, the bacteria are highly resistant.

When a patient is infected with multiple resistant bacteria, he suffers from all antibiotic resistance and may lead to death, which is the biggest problem in the world today.

Keywords: MDR, NDM-1, NDM-2, Nosocomial Infection.

Introduction

Multi Drug Resistance (MDR) is resistance to more than one antimicrobial. "To date, no standard definition has been agreed upon in the medical community. Multiple definitions are used to describe patterns of multiple drug resistance in Gram-positive and Gram-negative organisms" ¹,². The lack of specific definitions of MDR in clinical study protocols creates data that are difficult to compare. The authors and relevant authorities are used to characterize organisms as MDR. And that depends on their sensitivity to the antibiotics applied to the organisms in the laboratory. "Resistant to multiple agents, classes, or subclasses of antimicrobial agents" ³. The most commonly used definition of Gram-positive and Gram-negative bacteria is “it means that any bacteria that are resistant to 3 or more antagonists are An overview of the diversity of these definitions is provided in a comprehensive review of MDR resistance in P. aeruginosa and A. baumannii by ⁴. The authors note that a large number of studies do not suggest any specific definitions of MDRs, but most define MDR as “resistance to three or more classes Another method used to characterize bacteria as MDR is when they are “resistant to a major antimicrobial agent” ⁵. These bacterial isolates may have general health significance due to their resistance to only one major antimicrobial agent, but they often exhibit common or shared resistance to multiple classes of antimicrobials, making them Creating an acronym for a bacterium based on its resistance to a major antimicrobial agent (such as methicillin resistance in S. aureus, i.e. MRSA) immediately highlights its epidemiological importance ². The advantage of using this approach for monitoring purposes is that it can be applied easily ⁶.

The aim of the study: The present study aimed to determine the prevalence of multi drug resistant bacteria among clinical and environmental samples collected from hospitals in the Najaf province.

Method

Extraction of DNA from Gram-positive, Gram-negative bacteria The DNA extraction method presented
in this paper is an improved method of the standard phenol/chloroform method.

We eliminated the lysis step that uses SDS/lysozyme or proteinase K, and lysed cells directly by phenol. To extract the DNA from Gram negative or Gram-positive bacteria, 1 ml cell suspension was centrifuged at 8000g for 2 min, except for K. pneumoniae where 13 000g for 10 min was used to pellet cells. After removing the supernatant, the cells were washed with 400 ll STE Buffer (100 mM NaCl, 10 mM Tris/HCl, 1 mM EDTA, pH 8.0) twice. Then the cells were centrifuged at 8000g for 2 min, except for K. pneumoniae (13 000g for 10 min). The pellets were resuspended in 200 ll TE buffer (10 mM Tris/HCl, 1 mM EDTA, pH 8.0). For yeasts, 50 mg of 425–600 lm size-fractionated glass beads (Sigma) were added to the cell suspension. Then 100 ll Tris-saturated phenol (pH 8.0) was added to these tubes, followed by a vortex-mixing step of 60 s for bacteria, 120–200 s for yeasts, to lyse cells. The samples were subsequently centrifuged at 13 000g for 5 min at 4 C to separate the aqueous phase from the organic phase. 160 ll upper aqueous phase was transferred to a clean 1.5 ml tube. 40 ll TE buffer was added to make 200 ll and mixed with 100 ll chloroform and centrifuged for 5 min at 13 000g at 4 C. Lysate was purified by chloroform extraction until a white interface was no longer present; this procedure might have to be repeated two to three times. 160 ll upper aqueous phase was transferred to a clean 1.5 ml tube. 40 ll TE and 5 ll RNAse (at 10 mg/ml) were added and incubated at 37 C for 10 min to digest RNA. Then 100 ll chloroform was added to the tube, mixed well and centrifuged for 5 min at 13 000g at 4 C. 150 ll upper aqueous phase was transferred to a clean 1.5 ml tube. The aqueous phase contained purified DNA and was directly used for the subsequent experiments or stored at -20 C. The purity and yield of the DNA were assessed spectrophotometrically by calculating the A260/A280 ratios and the A260 values to determine protein impurities and DNA concentrations. PCR Condition no stage

### Primers:

<table>
<thead>
<tr>
<th>Gene</th>
<th>Primer Sequence</th>
<th>Product size (bp)</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>bla NDM-1</td>
<td>F ‘5-GATTGCGACCTTATGCAATG-3’</td>
<td>189</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>R 5’TGGATCCCAACGGTGATATT-3’</td>
<td></td>
<td></td>
</tr>
<tr>
<td>bla NDM-2</td>
<td>F ‘5-CACCTCATG TTTGAATTC GCC-3’</td>
<td>500</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>R 5’-CTC TGT CAC ATC GAAATCGC-3’</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Result

**NDM-1:** Successful PCR amplification was confirmed by agarose gel electrophoresis. Agarose gel was prepared by dissolving 1.6 gm of agarose powder in 80ml of TBE buffer (pH:8) in concentration 0.02 in boiling microwave, allowed to cool to 50oC and ethidium bromide at the concentration of 0.5mg/ml was added. The comb was fixed at one end of the tray for making wells used for loading DNA sample. The agarose was poured gently into the tray, and allowed to solidify at room temperature for 30 min. The comb was then removed gently from the tray. The tray was fixed in an electrophoresis chamber filled with TBE buffer that covered the surface of the gel, 5µl of DNA sample was transferred into the wells in agarose gel, and in one well we put the 5µl DNA ladder mixed with 1µl of loading buffer. This result in agreement with

| 43 | Staphylococcus aureus |
| 99 | E.coliFecales        |
| 82 | E.coli               |
| 94 | E.coli               |
| 3  | Klebsiella           |
| 9  | E.coli               |
| 97 | Staphylococcus Haemolyticus |
| 5  | Staphylococcus aureus |
| 86 | E.coli               |
| 59 | Pantoea              |
| 103| E.coli               |
| 88 | Staphylococcus Hemolytic |
| 53 | Streptococcus        |
| 18 | Escherichia coli     |
| 73 | Pseudomonas          |
|     | Ladder               |
The above figure(1) shows the PCR result of the NDM1 gene, which was tested for its absence in 15 samples of which 14 showed positive samples containing the NDM-1 gene. The electric current was allowed at 100 volt for 60min. UV transilluminater was used for the observation of DNA bands, and gel was photographed using a digital camera. This result in agreement with

NDM-2: Successful PCR amplification was confirmed by agarose gel electrophoresis. Agarose gel was prepared by dissolving 0.8 gm of agarose powder in 80ml of TBE buffer (pH:8) in concentration 0.01 in boiling microwave, allowed to cool to 50°C and ethidium bromide at the concentration of 0.5mg/ml was added. The comb was fixed at one end of the tray for making wells used for loading DNA sample. The agarose was poured gently into the tray, and allowed to solidify at room temperature for 30 min. The comb was then removed gently from the tray. The tray was fixed in an electrophoresis chamber filled with TBE buffer that covered the surface of the gel, 5µl of DNA sample was transferred into the wells in agarose gel, and in one well we put the 5µl DNA ladder mixed with 1µl of loading buffer.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Organism</th>
</tr>
</thead>
<tbody>
<tr>
<td>59</td>
<td>Pantoea</td>
</tr>
<tr>
<td>5</td>
<td>Staphylococcus aureus</td>
</tr>
<tr>
<td>9</td>
<td>E.coli</td>
</tr>
<tr>
<td>94</td>
<td>E.coli</td>
</tr>
<tr>
<td>103</td>
<td>E.coli</td>
</tr>
<tr>
<td>43</td>
<td>Staphylococcus aureus</td>
</tr>
<tr>
<td>86</td>
<td>E.coli</td>
</tr>
<tr>
<td>53</td>
<td>Streptococcus</td>
</tr>
<tr>
<td>97</td>
<td>Staphylococcus Haemolyticus</td>
</tr>
<tr>
<td>82</td>
<td>E.coli</td>
</tr>
<tr>
<td>88</td>
<td>Staphylococcus Hemolytic</td>
</tr>
<tr>
<td>3</td>
<td>Klebsiella</td>
</tr>
<tr>
<td>18</td>
<td>E.coli</td>
</tr>
<tr>
<td>73</td>
<td>Pseudomonas</td>
</tr>
<tr>
<td>99</td>
<td>E.coli Fecales</td>
</tr>
<tr>
<td></td>
<td>Ladder</td>
</tr>
</tbody>
</table>
The above figure(2) shows the PCR result of the NDM-2 gene, which was tested for its absence in 15 samples of which 14 showed positive samples containing the NDM-2 gene. The electric current was allowed at 80 volt for 70min. UV transilluminater was used for the observation of DNA bands, and gel was photographed using a digital camera. This result in agreement with.\(^3\)

**Funding:** None

**Conflict of Interest:** All authors in this work have approved it for publication in your journal.

**Date:** All data were analyzed during this work are included in the manuscript.

**Ethics Statement:** The work dose note contain any study with animals performed or human participant by any of the author.

**References**


Effect of Child-to-Child Approach on Practices of Primary School Children Regarding Epileptic Seizures First Aids

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Abstract

Background: Many studies showed that epileptic seizures occur more commonly in childhood stage. Most children epileptic seizures occur, during the school day. During this seizure, the child requires immediate first aid for an epileptic seizure. **Aim:** The study aimed to evaluate the effect of Child-to-Child Approach of Primary School Children Regarding Epileptic Seizures First Aids. **Design:** A quasi – experimental design (one group pre and posttest) was used in this study. **Setting:** This study was conducted at six governmental primary schools at Ismailia city. **Sample:** A multi-stage random sample was used in this study, the total number of children was 180 (both male & female) divided into two groups. Trained children group (12 child) and intervention group (168 child). **Tools:** Two tools were used. **First tool:** Interviewing questionnaire was developed by the researcher and included three parts: Socio demographic data, knowledge about epileptic seizure and its first aid measures, Students’ attitudes toward epileptic seizures. **Second tool:** Practical Checklist: it was used to assess the practice of student’s in relation of first aids of epileptic seizures based on the Camfield et al., (2019).

**The Results:** Showed that there were statistically significant increases in mean scores of knowledge of studying sample about epileptic seizure. And showed that there were highly statistically significant increases in mean scores of practices. The results showed that there were statistically significant increases in mean scores of positive attitudes as well as the total score.

**Conclusion:** The knowledge, practice, and attitude of primary school children about first aid of epileptic seizure were improved post implementation of the program compared to pre implementation of the program.

**Recommendation:** Continuous Child-to-Child Approach for Primary School Children about first aid of epileptic seizure.

**Keywords:** Epilepsy, First aid, primary school children, Child to Child (CtC) approach.

Introduction

Children during their primary education are initial stage of learning process will take up all the new things in the way of fast track¹. So, if they express any purposeful messages, the people especially their parents and relatives never neglect them instead, accept them and of their full aspirations of speech.²

Children at this stage are provided with new knowledge, skills and information in order to make the growing buds to spread health-related messages to the community in preventing many health problems³. There are different effectiveness types of educational programs was implemented to engaged children during this stage to improve knowledge of toward some health problems such as child to child approach⁴.

Child to Child (CtC) is an approach in which

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children rely on their knowledge of health problems and motivate them to participate in the community through training them in various activities to prevent diseases and instill healthy habits, which leads to the promotion of health and community development led by children.

Even though we take more actions to maintain health in schools, some health problems are still prominent, such as infectious and nutritional diseases, accidents, poisoning, etc. In addition, many children experience seizures during the school day because of developing epilepsy.

Epilepsy is a neurological condition that affects the brain and nervous system, in which a person develops seizures that start from the brain that contains millions of neurons that use electrical signals to control various body functions, but when these functions are impaired, they cause an epileptic seizure.

Most children epileptic seizures occur, during the school day. The child in epileptic seizure suddenly falls with unconsciousness, his body hardens, and vibrations cause him to lose control of himself. During this seizure, the child requires immediate first aid for an epileptic seizure.

The school authorities lacked knowledge how to deal with child during epileptic seizures. During picnic and educational tour, children are exposed to life threatening emergencies from epileptic seizure. Immediate first aid measures to be given to prevent complications and save the life of the children and adult, children also must have enough knowledge about emergency measures to be taken in emergency.

Health education to primary school children is the most effective way to improve knowledge about epilepsy and low level of epilepsy-related social isolation and educational performance. Children in primary education stage are more accepted changes in ideas related to health problems, because the child in this wishes to be successful in order to obtain information to communicate to his family and his friends, which leads to the subsequent promotion of children to health and prevention of diseases.

Numerous studies have proven that schools are the most appropriate places for proper education in first aid.

Significance of the problem: Globally, 50 million of people in different age stages suffering from epilepsy and most of them in developing countries as about 4.7 million epilepsy cases are in the Eastern Mediterranean Region. The prevalence of epilepsy in Kingdom of Saudi Arabia was about 7 cases out of 1000 children while the prevalence of epilepsy in Egypt was 6.98/1,000.

Children aged 7-12 are an ideal target group for an epilepsy educational program through child to child approach. At this age they are learning to think logically about happenings around them and they are becoming aware of other people’s perspectives. Based on this and results from afore mention studies.

Aim of the study: The study aimed to evaluate the effect of Child-to-Child Approach of Primary School Children Regarding Epileptic Seizures First Aids through:

1. Assessing knowledge, practice, and attitude of primary school children about epileptic seizure and its first aid.
2. Implementation and evaluating child to child approach for primary school children about epileptic seizure first aid.

Hypotheses:

To fulfill the aim of the study, the following hypotheses were formulated:

H1: Child to child approach will improve knowledge and practice regarding epileptic seizure first aids management among primary school children

H2: Child to child approach will reduce negative attitudes toward epileptic seizure first aids management among primary school children

II. Subjects and Method:

1. Technical design:

Study Design: A Quasi–experimental design (one group pre and posttest) was utilized to conduct the current study.

Study Setting: This study was conducted at six governmental primary schools at Ismailia city (North Ismailia administration); that named as following: (Atef Barakat, Omar Ibn El-Khatab, Garden City, and Al-Nahda, Al-sheikh Zayed, and Al Salaam)

Sampling: A multi-stage random sample was used in this study, according to the following stages:
**First Stage:** The total number of governmental primary schools in North Ismailia educational administration at Ismailia city is sixty eight, six schools were chosen randomly for the conduction of the study, Atef Barakat, Omar Ben El-Khatab, Al-Nahda and Garden City, Al-sheikh Zayed and Al Salaam.

**Second Stage:** One class from sixth grade was selected randomly from each school.

**Third Stage:** All school children in the selected classrooms were taken; total classes included in the study were six classes. Each class was contained 30 to 40 children. The total number of children were 180 (both male & female) divided into two groups:

**Group I:** Peer review group (trained children) for training by researchers to apply child to child approach with the following inclusion criteria: Both genders, their aged ranged between 11-13 years, high score in pretest assessment and the verbal consent were taken from children and their parents to participate in the study.

**Group II:** Intervention group will be provided intervention by peer review group and post evaluation to determine the effect of child to child approach on knowledge and practices regarding epileptic seizure first aid.

**Tools for data collection:**

**Tool (I): interviewing Questionnaire:** An interview questionnaire was designed by the researchers to collect the required data after reviewing related literature. It was written in simple Arabic language and it consisted of three parts.

**Part I: (Socio-demographic data):** Covered the studied children’s socio-demographic characteristics, such as: Age, gender, parent’s education, parent’s occupation, and school grade.

**Part (II):** Entails questions about children’s knowledge about epileptic seizure and its first aid measures it included meaning, symptoms, onset age of epilepsy, and prevention, and aim epileptic seizure first aids based on Minicucci et al[14].

**Part (III):** Students’ attitudes toward epileptic seizures to assess students’ attitudes about first aids epileptic seizures. It included the best action to take when see some students in the class when your colleague at the school is suffering from an epileptic fits.

**Scoring system for knowledge:** Knowledge obtained from the children was checked with a model key answer. A correct answer was scored one, and an incorrect answer was scored zero. For each area of knowledge, the scored elements were summed up. The total score of knowledge was (15) points. The student’s score less than 50% was considered poor. <50% was considered poor, 50-< 75% was considered fair and -75% was considered good.

**Scoring system for attitude:** The total scores of all questions categorized into two levels as follow: Agree for positive direction answer was scored one, and disagree for negative direction answer was scored zero. Total positive direction seven statements and negative direction five statement.

**Second tool practical check list:** Entails questions about children’s practices about epileptic seizure, filled in by the researchers, it was used to assess children practices regarding epileptic seizure to assess students’ assess the practice of student’s in relation of first aids of epileptic seizures based on the Camfield et al[15] and included the following nine steps. 1) Stay calm - remain with the person during the seizure. 2) Protect from injury - remove any hard objects from the area. 3) Protect head place something soft under their head and 4) loosen any tight clothing. 5) Gently roll the person on their side as soon as it is possible to do so and firmly push the angle of the jaw forward to assist with breathing. A person cannot ‘swallow their tongue’ but the tongue can move back to cause a serious block to breathing. 6) Stay with the person until the seizure ends naturally and 7) calmly talk to the person until the regain consciousness, usually within a few minutes. 8) Reassure the person that they are safe and will stay with them while they recover. 9) Requesting ambulance if the seizure lasts more than five minutes.

**Scoring system for practice:** Scoring system: done step was scored one and not done step was scored zero. The total scored of first aids epileptic seizure was (16) point. The student’s score 50% or more was considered satisfied and less than 50% unsatisfied poor.

**Operational Design:**

**A. Preparatory Phase:** It included reviewing of literature, different studies and theoretical knowledge related to epileptic seizure and its first aid using books, articles, internet, periodicals and magazines.
**B. Content Validity:** The study tools were presented to five experts specialized in the field of community health nursing, to ensure the suitability of the tools chosen to carry out the study and achieving its goal.

**C. Reliability:** All tools used in the present study showed good to very good reliability as follows: was done by applying the questionnaire to ten students using test-retest and Pearson Coefficient Factor was 90.8%. The scale was applied on them and retested after 2 weeks. The degree of Spearman’s rank Correlation coefficient test was (0.82).

**D. Pilot Study:** The pilot study was applied on twenty-one children excluded from study sample to test the clarity and arrangement of the items and time needed for each sheet. The final form was achieved through rearrangement, and modification of the tools’ item based on the findings of the pilot study. Some questions and items were omitted, added, or rephrased, and then the final form was developed.

**F. Field Work:**

- The study was conducted over a period of 6 months started from 15th of October 2018 to 15th of April 2019, where the researchers were available in the study setting three times/week from 9.00 a.m. to 12.00 mid-day. The researchers started by introducing themselves to the studied children and a verbal consent was obtained from each child studied and their parents.

- The studied children were fully informed about the aim of the study prior to the completion of questionnaire in convenient time, which was not interfering with their class schedule.

**Application of child to child approach through four steps:**

**Assessment Phase:**

- During first month from study distributed pretest for children understudy from selected schools. The researchers interviewed with children separately, and the answers were marked by the researchers, about 20 minutes was needed to complete the questionnaire.

- Analysis pretest results and select two children with satisfactory scores in pretest from selected schools. Demonstrate names of selected children on their teachers to take opinions and approval

**Planning Phase:**

- Determine the topics, which were organized according to priority of selected children needs among the study participants. The content included meaning of epileptic seizure, why do children get epilepsy, and its first aid measures.

- Design teaching material and booklet with Arabic simple sentences and colorful pictures regarding first aid for epileptic seizures. This booklet containing systematically organized information about epileptic seizure and its first aid measures to cover the child’s deficit in knowledge and practices.

- Establishing a schedule for training the selected children in each school and giving training sessions two times per week during the school activity hour, and the session period is 45 minutes. Total numbers of sessions for each child eight sessions.

**Implementation Phase:**

- Researchers provided training sessions to trained children on first aid procedures for epileptic seizures using PowerPoint lectures, animated videos, and role-plays. Researchers use the feedback method to make sure trained children understand.

- The trained children’s knowledge and practices were assessed by making them to do rehearsal to the researchers and the same questionnaire was given to determine their adequate level of knowledge and practices on the next day. If the knowledge was average or poor and the practice score inadequate, then the trained children were encouraged to do the rehearsal again, under the supervision of the researchers, until the knowledge and practice scores were good and adequate.

- Trained children start to be training another group of children (163) were divided into 6 groups and each group consisted of 15 - 20 children under supervision the researchers.

- Trained children distribute booklet to each child in first session and used power point lecture and role play as teaching method under supervision the researchers. The researchers take feedback from children after every session.

- Posttest was done next day after finished training sessions by same questionnaire.

**Evaluation Phase:** It involved a post-test done, using the same formats of the pre-test to determine change
in knowledge level and practice regarding epileptic seizures

3. Administrative Design: The current study was conducted after obtaining the approval of the educational administration after clarifying the purpose of the study. The principals of the selected schools are notified of the approval of the educational department to collect data, goal and expected results of the study are clearly explained.

Ethical Consideration: Approval of the Educational Administration in North Ismailia to apply the study in their primary schools. Children and their parents consent to participate in the study orally. Participants confirmed the information from them will be treated confidentially. It is used for research purpose only. Participants’ Anonymity, confidentiality, privacy, safety, and protection are secured. The intervention had no adverse effect on the participants. The studied children were informed about their rights to refuse or withdraw at any time without giving reasons and without consequences.

4. Statistical Design: Data were fed to the computer and analyzed using IBM SPSS software package version 20.0. (Armonk, NY: IBM Corp) Qualitative data were described using number and percent. Quantitative data were described using range (minimum and maximum), mean, and standard deviation. The significance of the obtained results was judged at the 5% level. The used tests were 1 ANOVA with repeated measures: For normally distributed quantitative variables, to compare between more than two periods or stages 2 Friedman test: For abnormally distributed quantitative variables, to compare between more than two periods or stages.

Results

Socio Demographic characteristics: The current study was 45.8% boys and 54.2% girls. Mean age was 12.93±0.83. Only 7.4% of children resident in rural area. As regards father’s education level 60% had secondary education, and 51.21% were workers. Regarding mother’s education level, 57.56% had secondary education and 63.90% were working, while 20.2% were housewives’ mothers. The study showed also only 20.20% of studied children taken first aids training.

Knowledge and practices regarding epileptic seizure first aids among peer children: from the present it is observed that, improvement in the total knowledge and practices of studied children regarding epileptic seizure first aid after application of CtC approach compared to before implementation.

Figure (1) Distribution of knowledge regarding epileptic seizure among peer children.
Knowledge of the studied children regarding epileptic seizure: From present study observed that there was statistically significant different (p≤0.01) improvement in the mean score of knowledge regarding epileptic seizure among studied children after application of child to child approach.

Table (1): Statistical Difference between knowledge scores before and after application of child to child approach (n=168).

<table>
<thead>
<tr>
<th>Items</th>
<th>Before application</th>
<th>After application</th>
<th>t-test</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meaning of epileptic seizure</td>
<td>Mean: 62.26</td>
<td>Mean: 64.34</td>
<td>6.35</td>
<td>0.00000</td>
</tr>
<tr>
<td>Why do children get epilepsy?</td>
<td>Mean: 48.74</td>
<td>Mean: 51.82</td>
<td>7.86</td>
<td>0.00000</td>
</tr>
<tr>
<td>How do we know that he has epilepsy seizure?</td>
<td>Mean: 4.29</td>
<td>Mean: 28.25</td>
<td>2.40</td>
<td>0.01728</td>
</tr>
<tr>
<td>How is epilepsy cured</td>
<td>Mean: -20.84</td>
<td>Mean: 1.85</td>
<td>12.21</td>
<td>0.00000</td>
</tr>
</tbody>
</table>

Epileptic seizure first aids practices among studied children: Study reveals the results of difference between practice scores before and after application of the child to child approach. The results showed that there were statistically significant increases in mean scores of all items as well as the total score.

Table (2): Statistical difference between epileptic seizure first aids practice scores before and after application of child to child approach (n=168).

<table>
<thead>
<tr>
<th>Items</th>
<th>Before application</th>
<th>After application</th>
<th>t-test</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stay calm - remain with the person during time the seizure</td>
<td>M: 18.45 SD: 8.25</td>
<td>M: 82.81 SD: 9.09</td>
<td>6.17</td>
<td>0.00000</td>
</tr>
<tr>
<td>Protect from injury - remove any hard objects from the area</td>
<td>M: 23.8 SD: 15.02</td>
<td>M: 74.88 SD: 13.99</td>
<td>8.71</td>
<td>0.00000</td>
</tr>
<tr>
<td>Protect head place something soft under their head and loosen any tight clothing</td>
<td>M: 29.17 SD: 7.97</td>
<td>M: 57.42 SD: 24.22</td>
<td>5.23</td>
<td>0.00000</td>
</tr>
<tr>
<td>loosen any tight clothing</td>
<td>M: 52.61 SD: 15.48</td>
<td>M: 54.45 SD: 18.89</td>
<td>22.7</td>
<td>0.00000</td>
</tr>
<tr>
<td>Gently roll the person on their side</td>
<td>M: 28.82 SD: 15.30</td>
<td>M: 40.96 SD: 16.36</td>
<td>-8.50</td>
<td>0.00000</td>
</tr>
<tr>
<td>Stay with the person until the seizure ends naturally</td>
<td>M: 40.54 SD: 12.00</td>
<td>M: 36.71 SD: 15.44</td>
<td>13.75</td>
<td>0.00000</td>
</tr>
<tr>
<td>calmly talk to the person until the regain consciousness, usually within a few minutes</td>
<td>M: 36.58 SD: 14.51</td>
<td>M: 74.83 SD: 8.39</td>
<td>12.21</td>
<td>0.00000</td>
</tr>
<tr>
<td>Reassure the person that they are safe and that you will stay with them while they recover</td>
<td>M: 33.09 SD: 9.46</td>
<td>M: 63.31 SD: 13.18</td>
<td>15.73</td>
<td>0.00000</td>
</tr>
<tr>
<td>Requesting ambulance if the seizure lasts more than five minutes</td>
<td>M: 38.02 SD: 25.21</td>
<td>M: 67.22 SD: 9.24</td>
<td>-17.41</td>
<td>0.00000</td>
</tr>
</tbody>
</table>
Attitude of the studied children regarding epileptic seizure: the present study reveals the results of change between attitude scores before and after application of the child to child approach.

Discussion

The epileptic seizure appears in the age group from 8 to 12 years, and since the primary education stage represents one fifth of the population in most of the world. An epileptic seizure exposes the child to risks during the seizure, along with the stigma and shame of other children due to lack Knowledge and delay in first aid during a seizure. Child to child approach has the potential effect to bring visible improvement in health and education among the children and it helps in enhancing children participation. Therefore, the aim of the current study was to measure the effect of child-to-
child educational method approach regarding epileptic seizures first aid measures among primary school children.

The study results revealed that slightly more than half of the children were in the age group of 12-13 years. This result agreed with Elewa & Saad [10] who in apply child to child approach regarding first aids in Egyptian primary schools’ children, said that most of the students under study were 11-12 years of age.

Regarding to gender, the present study result shows that more than half of studied children were girls and most of them had never previous first aids training. These results are in the same direction with those of Dasgupta et al [18] who stated that most of study sample were females and most of students had never been exposed to any first aid training before the study was undertaken. These results were in disagreement with those of Abd el Ghany et al [17] who carrying out a study in Suez Canal, Governorate, Egypt; they reported that more than three quarter of the studied students had information and training about first aid.

The current study in which peer children were selected based on their level of knowledge of the pre-test and their level of knowledge and practices was less than one-tenth with regard to knowledge about the meaning, purpose, and first aid of an epileptic seizure. After the peer children received training educational sessions by researchers, the level of knowledge of the peer children improved to a satisfactory degree. This result was in the same line with that of Farrokhmanesh et al [18] when studied application child to child in Iran who reported that selected peer children according to knowledge level in pretest. This is It may be attributed that most children think so first help can only be provided by doctors, health workers and not a commoner. Additionally, there was no educational program or any intervention about first aid in school or included in the school curriculum.

The current study, after application child to child approach, showed an improvement in more than three quarters of the children under the study sample in their knowledge about epileptic seizures. In addition, there were statistically significant improvements in children’s knowledge before and after child to child application in total knowledge. Farrokhmanesh et al., (2018) when studied in Iran who indicated improvement in knowledge level about nutrition among middle school students after applying the child-to-child method. The current study result was also supported by Elewa and Saad [18] who applied child to child approach in elementary schools at Egypt, who found that there was a significant improvement in knowledge about various first aids during implementation phase. This may be related to the effect of child to child approach as a dynamic method that encourages learning by using activity and entertainment between children. In addition, the children are equipped with new knowledge, and skills that increase health and prevent many health problems.

Regarding to the practice of studied children about epileptic seizure first aids, there were statistically significant improvements in the totalscores of practices related to epileptic seizure first aids after application of child to child approach educational method. This result was consistent with Teklehaimanot et al [19] who carried out a study in Ethiopia and found that improvement in students practices who received educational material about epileptic seizure first aid. In addition, Mohammed 2018 in Ahmedabad city in Iran when applied training program regarding first aids among secondary schools’ students reported that there was a highly statistically significant improvement in the mean score of total practice throughout his study. In addition, Abd El-Hay et al [20] in Tanta City (East & West), Elgharbia Governorate, reported that there was a highly statistically significant improvement in the mean score of total practice throughout his study. This may be attributed to an increase in knowledge among the studied children after training which led to improve their practices. Primary school students are more likely to accept epileptic seizure first aid. Training than older students, and they are motivated to learn and do so quickly and easily. Also, children during early stages of development and initial stage of learning process will take up all the new things in the way of fast track.

Hence the research hypothesis (H1) which stated that child to child approach will improve knowledge and practice regarding epileptic seizure first aids management among primary school children.

The present study revealed that there were reduce negative attitude regarding epileptic seizure after applied child to child approached. This result was consistent with that Bozkaya et al [21] who carried out a study in Ankara and found that increase positive attitude toward epileptic seizure among primary school children after application of health education program. In addition, Brabcova et al [22]
when studied effect of educational video on reduce stigma of epileptic seizure in several primary school in Czech Republic reported that reduce stigma regarding epileptic seizure after implementation educational video. Moreover, children may be much more familiar with TV media, drama and may therefore find it a more acceptable approach.

**Conclusion**

In the light of the study findings, it can be concluded that utilization of child to child approach succeeded in achieving significant improvements in the primary school children’s knowledge and practices regarding epileptic seizure first aid measures. Also, there were reducing negative attitude regarding epileptic seizure first aids.

**Conflict and Interest:** Nil

**Source of Funding:** Self-funding and no external funding.

**Ethical Clearance:** Obtained clearance from research ethical committee in Faculty of Nursing, Suez Canal university number 86.

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Mutans Streptococci Count and Salivary Histatin 5 Level in Relation to Early Childhood Caries

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²Professor, Department of Basic Science, College of Dentistry, University of Baghdad, Iraq

Abstract

Background: ECC is one of the most common chronic infectious diseases of preschool-aged children (3). Mutans Streptococci (MS) is the chief microorganism that causes ECC. Saliva is a significant factor in the development of teeth decay. Saliva have many innate defense molecules that take part in the protection of oral tissues by either direct antimicrobial effect or interference with microbial colonization. These molecules include antimicrobial peptides AMPs among the main natural antimicrobial proteins of saliva. Salivary histatine-5 (HST-5) is one of the protective factors in saliva that possess anti-bacterial properties against several types of oral bacter. This study aimed to measure the viable count of mutans streptococci and salivary histatin 5 level in relation to early childhood caries.

Materials and Method: Sixty three children with ages of 4-5 years old were enrolled in this study. They were divided into two groups; 33 children with severe type of ECC) ategory as the study group and 30 caries free child) as the control group. Unstimulated saliva sample were collected for ms count on mitis bacitracin agar and for evaluation of salivary Histatin 5 level.

Results: Statistical analysis revealed that M.S. count was higher significantly in study group compared to than control group and salivary histatin 5 was significantly higher than the control group.

Keywords: Early childhood caries, Mutans streptococci, histatin 5.

Introduction

Early childhood caries (ECC) is one of the most common chronic infectious diseases of preschool-aged children, characterized by the destruction of tooth tissues by synergistic complex effects among acids generated from the fermentation of dietary carbohydrates by bacteria and susceptible host factors, such as teeth and saliva(1). Tooth decay of primary teeth in children 71 months of age or younger was regarded to early childhood caries (ECC). In accordance to American Academy of Pediatric Dentistry, ECC is “the finding of one or more decayed (non cavitated or cavitated lesions), missing (due to caries), or filled tooth surfaces in any deciduous tooth in a child below the age of six (2). ECC is a multicausal disease that happened due to host, environment, and microorganism as the causative factors (3). Mutans Streptococci (MS) is the chief microorganism that causes ECC. In the past decade, numeral researches conducted in the relationship between the occurrence of caries and the founding of salivary MS (4). Saliva may transport the bacteria and have a role as a reservoir for the colonization of the bacteria. If the cariogenic bacteria presedant in saliva and plaque, it will raise the acids, which are made by them through the fermentation process of carbohydrate. Then will rise up the colony of the bacteria and begin creating biofilm on tooth surface(5).

One of the fundemantal factors of MS virulence is the potency to give glucan made up by glusyltransferase, which mediated microorganism attachment to the tooth surface along with other protein (6).

Numerous of studies previously have based a positive correlation between MS and ECC (7). A positive correlation was also found between severity of ECC as measured by the dmft index and high levels of MS counts, indicating that as the number of colonies increased, the number of teeth and surfaces affected by
decay also increased. Colonization with MS is thus a key event in the pathogenesis of ECC that can be targeted for caries prevention in clinical practice (8).

Increasingly more and more attention is being paid to the potential of saliva as a potent anticaries agent (9). Saliva protects the tooth against missing of calcium and phosphate ions from the enamel by creating a dental pellicle. The salivary pellicle acts as a protective barrier and helps in preventing demineralization, promoting remineralization, keeping the oral cavity pH neutral and cleaning tooth surfaces by washing away remaining food (1). The development of caries is affected by the physiochemical careteria of saliva, such as pH, salivary flow rate, buffering capacity, varying protein concentrations and other contenant of saliva. Saliva has many innate defense molecules that take part in the protection of oral tissues by either direct antimicrobial effect or interference with microbial colonization. These molecules include antimicrobial peptides AMPs (cathelicidin peptide LL-37, alpha-defensins, beta-defensins, histatins and statherin), major salivary glycoproteins (mucins, proline-rich proteins (PRPs) and immunoglobulins) and minor salivary glycoproteins (agglutinin, LF, cystatins and lysozyme). These proteins play specific functional roles in the first line of defense of the oral cavity (10).

Histatins are small cationic peptides made up of at least 12 histidine-rich basic peptides. Histatins (HST)-produced in parotid and sublingual salivary glands-are among the main natural antimicrobial proteins of saliva. The HSTgroup includes HST-1, −2, −3, −4, −5 and −6. Salivary histatine-5 (HST-5) is one of the protective factors in saliva; it is a salivary peptide that consists of 24 amino acids produced in parotid and sublingual salivary glands., salivary HST-5 was demonstrated to possess fungicidal and fungistatic properties against Candida albicans and antiviral activity against the human immunodeficiency virus (HIV), in addition to antibacterial properties against several types of oral bacteria (11, 12).

Materials and Method

Sixty three children with ages of 4-5 years old during the period from December 2019 to march 2020 were enrolled in this study. They were divided into two groups; 33 children with severe type of ECC according to Wyne (13) category as the study group and 30 caries free child according to WHO (14) as the control group. They will be selected from pediatric and preventive departments clinics/college of dentistry/Baghdad university Baghdad city.

3-5ml of unstimulated saliva was collected by drooling method (15). 1 ml from each sample for microbiological investigation and bacterial culturing then the remaining of each salivary sample was centrifuged for 10 minutes at 1000×g at 2.8°C. The supernatant which is about 1-2 ml was transported to eppendorffs tube with the same number of the child for freezing. The sample was stored at -20°C for further biomarkers detection procedure.

Microbiological Analysis: The collected salivary samples were homogenized for 1 minute using vortex mixer and then ten-fold serial dilutions were performed From dilution 10-3 of salivary samples 0.1 ml was spread microbiological on MSB agar plates. The plates were incubated anaerobically by using a gas pack supplied in an anaerobic jar at 37◦C for 48hrs, followed by aerobic incubation for 24hrs, at 37◦C.

Identification was done according to colony morphology, Gram stain reaction, Biochemical test, catalase test. Carbohydrate fermentation test for M.S and bacterial colony count was also done (16)

Biomarker Detection: The level of salivary histatin 5 was estimated by using commercially available sandwich enzyme-linked immunosorbent assay (ELISA) kit and performed as recommended in leaflet with kit (MyBiosource; USA).

Statically analysis will be carried out using statistical package for social sciences (SPSS) version 21. Descriptive statistics using: frequencies, mean and standard error in addition to the following statically test: Independent sample T test, correlation coefficient (r), chi–square.
Results and Discussion

Table 1: Mutans Streptococci count (CFU/ml×10³) in early childhood group and caries free group.

<table>
<thead>
<tr>
<th>Bacterial count</th>
<th>Early childhood Study group n=33</th>
<th>Caries free Control group n=30</th>
<th>T-test</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>111</td>
<td>31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>220</td>
<td>74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>174.545</td>
<td>50.333</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>24.102</td>
<td>13.901</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SE</td>
<td>4.195</td>
<td>2.538</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Highly significant at P≤0.001

Table 1 illustrate the viable count of M.S among E.C.C study group and healthy control group.

The results demonstrated that the viable count of M.S was higher in study group than control group with highly significant differences.

The results of this study were in agreement with other researchers who also found that MS.. is associated with E.C.C (E.C.C children had more colonies) (17)

Other researchers were also in agreement with the present study (18)(19)

Is well-known that M.S. IS the causative microorganism in the development of dental caries because they drop the plaque pH and produce acids from carbohydrates and survive in the acidic environment.(20)

M.S. constitutes about 60%of cultivable flora of dental plaque obtained from preschool children with ECC(21). Horizontal and vertical transmission of microbes can be seen. Horizontal transmission occurs between siblings and care givers (22, 23).Vertical transmission is also known as mother to child transmission (24). Poor maternal oral hygiene and sugar exposure increases chances of vertical transmission(25).

In appropriate feeding practice can prolong the exposure of teeth to fermentable carbohydrates which in turn may aggravate the chances of ECC (26). Also Bottle feeding during bedtime or sleeping (27) is the most important cause of ECC and hence also known as nursing bottle caries, baby bottle caries. Frequent exposure to sugar, frequent snacking, taking sweetened drinks to bed, sharing foods with adults, as well as maternal caries status, oral hygiene and dietary habits predispose to early S. mutans colonization and establishment of its high counts (26).

Table 2: Salivary mean level of histatin 5 in study and control groups

<table>
<thead>
<tr>
<th>Salivary histatin 5</th>
<th>Early childhood Study group n=33</th>
<th>Caries free Control group n=30</th>
<th>T-test</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>16.538</td>
<td>5.907</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>43.823</td>
<td>22.303</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>24.514</td>
<td>11.496</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>6.542</td>
<td>4.056</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SE</td>
<td>1.138</td>
<td>0.740</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Highly significant at P≤0.001

Table 2 illustrates salivary levels of histatin 5 in E.C.C. group and healthy control group, the results showed that the levels of histatin5 was higher in E.C.C. group compared with healthy control group and there were highly statistical differences between the two groups.
These results are in agreement with the results of other researchers\(^{(28),(29)}\). Increased activity of HST-5 was observed in wide pH range. However, in low pH (with presence of caries dental changes) protonation of histidine residues occurs, additionally increasing the antimicrobial force \(^{(30)}\).

Histatins are a group of small, cationic, histidine-rich peptides secreted by human salivary glands.

The increased level of histatin 5 may be explained by the fact that high-intensity caries is associated with increased levels of some salivary components (histatin-5) that possess strong bactericidal or bacteriostatic effects resulting in agglomeration of oral bacteria and their clearance from the oral cavity, \(^{(29)}\).

**Conclusion**

Salivary histatin 5 level in saliva of children can be used as diagnostic tool or marker for the prediction of caries risk.

**Conflict of Interest:** None

**Funding:** Self

**Ethical Clearance:** Not required

**References**


The Prevalence of *Pseudomonas aeruginosa* among Baghdad Hospitalised Patients

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Abstract

In order to determine the prevalence of *Pseudomonas aeruginosa* among hospitalised patients, 156 specimens were collected from hospitalized patients referring Baghdad, Iraq hospitals. Bacterial isolates were identified using conventional biochemical tests and then identification was confirmed by the locating of 16SrRNA. *Pseudomonas aeruginosa* constitutes 30.05%. In conclusion, the attention should be paid toward the infections of this opportunistic pathogen.

**Keywords:** *Pseudomonas aeruginosa*, hospital, 16SrRNA, PCR.

Introduction

*Pseudomonas aeruginosa* is a Gram-negative bacterium that is ubiquitous in different ecosystems and involves in numerous forms of relations with eukaryotic host. It is an opportunistic pathogen extensively spread in humans and animals (¹), leading to a wide range of infections in community and hospitals (², ³). Due to the extended spread of *P. aeruginosa* habitat, the control of the organism in a hospital setting is very difficult, and makes it practically impossible to prevent contamination (⁴). The major threat is the infection of immunocompromised patients or those in burns, neonatal and cancer wards (⁵). Infection of *P. aeruginosa* is still one of the main causes of death among the critically ill and patients with impaired immune systems in spite of the development of newer and stronger antibiotics (⁶).

Due to the extended spread of *P. aeruginosa* habitat, the control of the organism in a hospital setting is very difficult, and makes it practically impossible to prevent contamination. The major threat is the infection of patients who are immunocompromised or those in burns, neonatal, cancer wards, it is the main cause of morbidity and mortality in cystic fibrosis patients and one of the leading nosocomial pathogens affecting hospitalized patients (⁷).

Due to the innate capacity of resistance to antimicrobial agents, this bacterium is greatly difficult to treat. What’s more, such resistance is being progressively a problematic issue because of increasingly development of resistance to agents regarded as powerful therapeutic options (⁸).

In this study we have used a genus specific bacterial 16S PCR to investigate the prevalence and diversity of *P. aeruginosa* among Iraqi hospitalised patients.

Materials and Method

**Ethical Statement:** All participants agreed to provide the investigator with the specimens. Informed consent according to the Declaration of Helsinki was obtained from all participants.

**Pseudomonas aeruginosa isolation and identification:** One hundred and fifty-six specimens included mid-stream urine, burn swabs, wound swabs, and blood were collected from hospitalized patients referring Al-Yarmouk teaching Hospital and Baghdad Medical City in Baghdad, Iraq. All specimens were cultured on enrichment media such as blood agar and transferred onto MacConkey agar. Pale colonies on MacConkey agar (lactose non-fermenter) were assayed for the conventional morphological and biochemical characterization comprising Gram stainability was conducted alongside the activities of oxidase and
catalase. Thereafter the primarily identified P. aeruginosa isolates were submitted to molecular identification by polymerase chain reaction (PCR) technique.

**Detection of 16SrRNA**

**Extraction of Bacterial DNA:** Genomic DNA was extracted using Presto™ Mini gDNA Bacteria (Geneaid, Thailand). Upon the procedure itemized by the manufacturing company, DNA was extracted from overnight cultures of the carefully chosen staphylococcal isolates. Purified DNA concentration was measured using Biodrop (Biodrop, Canada).

**PCR:** To confirm the identification of P. aeruginosa isolates, conventional PCR technique was carried out in accordance to Spilker et al. (9) to amplify a fragment of 16SrRNA (956 bp). Two microliters of each primer PA-SS-F (5’-GGGGGATCTTCGGACCTCA-3’) and PA-SS-R (5’-TCCTTAGGTGCCCACCCG-3’), different concentrations of DNA (depending on DNA yield) extracted from each P. aeruginosa isolate and deionized D.W. were added to PCR premix tubes (Bioneer, Korea) in order to reach 20 µl as a final volume. The thermocycling conditions (Bio-Rad T100, USA) set at 94°C for 2 min, followed by 25 cycles of 94°C for 20s, 58°C for 20s, and 72°C for 40s. A final extension of 1 min at 72°C was applied. PCR products were visualized using 2% agarose gel stained with diamond nucleic acid dye (Promega, USA).

**Results**

**Isolation and identification:** A total of 52 (33.33%) isolates developed a growth on cetrimide agar, pale colonies on MacConkey agar, and succeeded to grow on nutrient agar at 42°C. Moreover, they were oxidase and catalase positive. Hence, these isolates were primarily identified as P. aeruginosa.

**DNA extraction and preparation:** After DNA extraction by Presto™ Mini gDNA Bacteria Kit, DNA concentration was between 24 and 78 ng/ml; whereas, purity was about 1.82-1.99. A ratio of 1.8 -2.0 is generally accepted as “pure” for DNA (10). Gel electrophoresis was done to confirm the integrity of extracted DNA.

**Molecular Detection:** The current results revealed that 16SrRNA was located in 50 (96.1%) out of 52 biochemically P. aeruginosa isolates. Correspondingly, two isolates were identified using traditional method as P. aeruginosa, they did not have this gene.

**Discussion**

Pseudomonas aeruginosa is an opportunistic pathogen capable of causing a wide array of life threatening acute and chronic infections particularly in patients with compromised immune defense (11). Earlier reports have shown that the antibiotic resistance of bacteria due to biofilm formation contributes to the persistence of bacterial cells and causes problems in the complete eradication of infection (12, 13).

The present work is in agreement with (14) as they found that the results of 16S rRNA showed that all P. aeruginosa isolates were resistance to gentamicin harbored this gene. Al-Derzi (15) stated that out of 8038 and 1878 clinical specimens submitted for culture in Mosul and Duhok, respectively, 180 and 21 clinically significant isolates of P. aeruginosa were isolated, resulting in a prevalence of 5.2% and 1.6%, respectively. Moreover, cultural and biochemical identification revealed that 63 P. aeruginosa isolates were recovered from 158 samples in Karbala, Iraq (16). Also Hasan et al. (17) reported that 21.6% P. aeruginosa isolates were collected form 185 swab samples in Kirkuk City, Iraq.

The variability in P. aeruginosa isolation percentage may be attributed to geographic, climatic, and hygienic factors among different areas. As well as, the high prevalence of P. aeruginosa in our community may be related to the rise of burn and wound patients than other samples in our population; which may be the result of different increased kitchen accidents, terrorist incidents, and electrical fire (18).

**Conclusion**

Pseudomonas aeruginosa was isolated in relatively considerable number; consequently, much work is needed to overcome and control this opportunistic pathogen.

**Conflict of Interest:** None

**Funding:** Self

**Ethical Clearance:** Not required

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Effect of Training Program Regarding Occupational Health Hazards on Nurse Interns’ Knowledge and Practice

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Abstract

Background: Nurse Interns face a wide range of hazards in hospitals including needle stick injuries, back injuries, latex allergy, violence, and stress.

The goal of this study: Identify the impact of training program regarding occupational health hazards on nurse interns’ knowledge, practice and attitude through: assessing nurse interns’ knowledge regarding occupational health hazards before and after the program, assessing nurse interns’ practice regarding of occupational health hazards before and after the program, assessing nurse interns’ attitude regarding of occupational health hazards before and after the program, designing and implementing the training program and measuring the effect of training program regarding occupational health hazards on nurse interns’ knowledge and practice.

Design: Quasi- experimental research design.

Subject: The study was conducted at four hospitals affiliated to Ain Shams University. The subjects of this investigation included 91 nurse interns.

Tools of data collection: Data were collected by using four tools namely: Needs assessment sheet, Self-administered Questionnaire, Observation Checklist, and attitude scale.

Results: Highly significant differences of total occupational health hazards knowledge among nurse interns throughout program phases was observed. Nurse interns’ total practice regarding occupational health hazards was markedly increased throughout program phases. Highly significant difference in total attitude towards protection from hazards throughout the program phases was noticed.

Conclusion: Implementation of the training program led to significant improvements in nurse interns’ knowledge, practice, and attitude regarding occupational health hazards.

Recommendations: providing training program for nurse interns about occupational hazards and especially on protective measures, development and dissemination of policies and guidelines of safety practices, evaluation sheet of the nurse interns should include items related to occupational health hazards and compliance ways of protection, and further investigation might include factors affect reporting of occupational hazards.

Keywords: Nurse interns, Occupational health hazards, Training program.

Introduction

Nursing is one of the hazardous occupations, in which the risks are four times higher than those in other professions¹. Health care workers are continually exposed to occupational health hazards². Nurses are
exposed to many occupational hazards that may threaten their health and safety.\(^3\)

Occupational safety at the workplace improves the employees’ health and increases their productivity. In the medical profession, Nurses constitute the largest group of healthcare workers, and experience a higher rate of working environment dangers exposure than other health services laborers.\(^4\)

Nurses and nurse interns are the most significant individuals from the medical care group, who give direct consideration to the patient are presented to various occupational dangers, for example, drugs, chemicals, infectious agents, absence of materials and ergonomic conditions, extreme working, and unreasonable outstanding burden, and furthermore they have physical (needle stick, musculoskeletal disorders and pain, and varicose veins), chemical (skin problems, latex sensitivities), biological (infectious sicknesses), and psychological (stress, burnout, psychological health problems, sleep trouble) problems.\(^5\)

Health care organization likes other high danger work environment is described by exposure to an elevated level of occupational hazards that significantly imperils the health status and life of health care workers, and occupational hazards may be the leading cause of death and mortality.\(^6\) The World Health Organization (WHO) confirms that hospitals are the primary priority in preventing workplace hazards.\(^7\)

Nursing assistants are baccalaureate understudy nurses caretakers who start the job change from senior understudy to proficient nurse though internship preparing program.\(^8\) The internship program is required for a Bachelor of Science in nursing achieving the satisfaction of year of a baccalaureate. The internship year is viewed as a period of change from undergrad nursing understudies to starting level enlisted nurses. During this year, nurture understudies ought to procure the qualities, mentalities, and essential objectives to the nursing profession. The preparation internship program advances techniques for new graduate recruitment and retention, give a chance to unite clinical nursing information in new areas of practice.\(^9\)

Nurse interns like other health care workers in the profession that have the highest risk because exposure to high rate of occupational hazards. Nurses represent the largest group of health care workers and they have directly and indirectly contact with the patients the nurses and nursing intern exposure to a higher degree of workplace hazards than other professional does in the medical field. Therefore, this occupational hazard can be reduced by implementing number of programs such as; training, and education of the nurses and nursing interns.\(^4\)

Significance of the study: Occupational health hazards are very common in developing countries where work place risks are more extreme. There are upwards of 250 million occupational injuries every year, bringing about 330000 fatalities. Every year, an expected 160 million new cases of work related ailment happen around the world, hazards in workplace affect not only the workers but also the agency itself by its effect on wage loss, medical payment workplace disruption, effect on productivity, and high absenteeism rate, low employee morale and job loss.

Nurse interns face a wide scope of perils in hospitals including needle stick wounds, back injuries, latex hypersensitivity, violence, and stress. In spite of the fact that it is conceivable to prevent or lessen nurse intern’s exposures to these hazards, nurse interns actually are experiencing large numbers of occupational hazards and illness. Rates of occupational injury to health care team have increased over the past decade.

**Aim of the study:** This study aims at identifying the effect of training program concerning occupational health hazards on nurse interns’ knowledge, practice and attitude through:

1. Assessing nurse interns’ knowledge related occupational health hazards before and after the program.
2. Assessing nurse interns’ practice regarding of occupational health hazards before and after the program.
3. Assessing nurse interns’ attitude regarding of occupational health hazards before and after the program.
4. Designing and implementing the training program.
5. Measuring the effect of training program regarding occupational health hazards on nurse interns’ knowledge and practice.

**Research Hypothesis:** Nurse Interns’ knowledge, practice and attitude regarding occupational health hazards will be improved after implementing the program.
Subjects and Method

**Research Design:** A quasi-experimental design was utilized in conducting this study.

**Setting:** This investigation was carried out at four hospitals affiliated to Ain Shams University where the nurse interns having their training, namely: Ain Shams University Hospital including (6 units) which was Cardiac Care Unit (CCU), Neurological ICU, Stroke ICU, Endemic ICU, and Kidney Dialysis Units, and Neonatal ICU, Medical ICU, Surgical Also, Academic Institution of Cardiac Surgery including (3 units) which was Adult ICU, CCU, Post Catheter Care Unit.

Setting: Cardiac Catheter OR. El-demerdash Hospital including (3 units) which was Operating room (21 rooms) and Intensive care unit and Emergency operating rooms (5 rooms). Pediatric Hospital including (4 units) which was Minor OR (1 room) ICU.

**Study Subjects:** All nurse interns having their training in the previously mentioned settings during the data collection period (academic year 2018-2019). The study sample was (91) nurse interns, 57 females and 34 males, distributed as follows: Ain Shams University Hospital (30) nurse interns, El-Demerdash Hospital (31) nurse interns, Pediatric Hospital (15) nurse interns, The Academic Institution of Cardiac Surgery (15) nurse interns.

**Data collection tools:** The data were gathered utilizing four tools namely: Needs evaluation sheet, Self-administered Questionnaire, Observation Checklist, and attitude scale.

1. **Needs assessment sheet:** developed by the researcher guided by¹⁰, to assess nurse interns’ needs regarding training program of occupational health hazards. It was used before beginning the training program. The sheet contained two parts.

   The first part: aimed to collect socio-demographic data of the study subjects like: age, department, gender, marital status, and attendance of training courses about occupational hazards.

   The second part: aimed to assess nurse interns’ needs regarding training program of occupational health hazards. It contains (10) items related to training program regarding occupational health hazards content. These items contain various topics such as: occupational health hazards, back pain and body mechanics, work related injuries, infection and nosocomial infection, disinfection and sterilization, safe handling and disposal of sharps, hand washing, personal protective equipment (PPE) in health care setting, cleaning of surgical instruments, psychological job hazards.

2. **Self-administered questionnaire:** This tool was aimed to assess knowledge of nurse interns regarding hazards facing them during internship training and the different method of protection from these hazards. This tool adopted from¹¹. The questionnaire sheet consisted of the following three parts:

   Part I: Aimed to collect socio-demographic data of study subjects like: age, gender, department, marital status, and attendance of training courses about occupational hazards.

   Part II: Aimed to collect medical and work-related data related to work hazard exposure to assess nurse interns’ actual exposures to various types of hazards during internship training, including (physical, chemical, biological, psychological, and social hazards). Through thirty-four items. These items were grouped under five questions and nurse interns select the answer (Yes or No).

   Part III: This part developed by¹¹. This part was aimed to assess nurse interns’ knowledge regarding occupational hazards. This part consisted of 25 multiple choice questions. These questions classified into ten categories.

   **Scoring system:** Knowledge items were scored (1) for the right answer and (zero) for the incorrect answer. The scores of the items were summarized and the total divided by the number of the items giving mean score of the part. These scores were changed over into a percent score. The mean and standard deviation for third part were calculated then converted into a mean percent. The maximum possible total score was (twenty-
five). Knowledge levels was considered high level of knowledge if the percent score was more than 75%, moderate if the percent score was 60-75%, low level if the percent score was less than 60%.

3. Observation Checklist: This tool aimed to assess the actual nurse interns’ practice related to safety standards, precautions, this tool adopted from. This tool was consisted of the 64 items. These items were grouped under nine categories: hand washing 15 items, gloving 10 items, eye protection 1 item, masking 2 items, personal hygiene 7 items, cleaning instruments 6 items, sharp box use 8 items, proper lifting 9 items, Safe waste disposal 6 items.

Scoring system: The scoring system ranged from done ‘(1)’ or not done ‘(0)’ or ‘not applicable ‘(not account)’. For each part, the score of the items were summed up and the total divided by the numbers of the items, then mean and standard deviation were calculated. These scores were converted into a mean percent. The practice was considered satisfactory if the percent score was 60 % or more and unsatisfactory if less than 60 %.

4. Attitude scale: This tool aimed to assess nurse interns’ attitude towards protection from hazards facing them during internship training. This tool developed by. The tool consisted of 12 positive and negative statements covering various types of hazards, in addition to the universal precautions, for example (I try to avoid infectious patients to avoid infection).

Scoring system: The scoring system was using three points likert scale Agree (2) and uncertain (1) and disagree(0). The scores of the items of each subscale were summed-up, converted into percent score, for the purpose of each presentation of each item. The nurse interns’ attitude score were considered satisfactory if the percent score is 60% or more, unsatisfactory if less than 60%.

II. Operational design: Operational design for this research included three phase’s namely pilot study, preparatory phase, and the fieldwork.

a. Preparatory phase: This phase started from January 2018 until April 2018 It contain review of the current and past literature, public and global related literature, journals concerning the different aspects of the study, using textbooks, thesis, and articles dependent on this review.

Tools validity & reliability: Tools validity: aimed at testing the validity of the evaluation tools and its components. Two kinds of validity tests were utilized: face and content validity. Face validity aimed at checking that the tool gives the appearance of measuring the concepts of occupational health hazards. Content validity was led to decide the suitability of every item to be included in the tools. The tools validity developed by.

Tools reliability: The reliability test was done to assure the consistency, determine how strongly the attributes were related to each other and to the composite score. The reliability test was used in this stage for three tools for data collection using Cronbach’s’ Alpha test. Cronbach’s alphas were (r= 0.896 0.917and 0.705) for Occupational hazards knowledge questionnaire, Occupational health hazards practice observation checklist, and Attitude scale respectively.

Pilot study: The pilot study was done on 10% of the study sample (9 nurse interns).These nine nurse interns were included in the main study sample. Data obtained from the pilot study was analyzed, and no modifications were done. The time consumed for fulfilling the study tools was 35 minutes.

Field work: The field work of the study lasted for seven months from beginning of February to the end of September 2019. The field work was done through the following phases.

Phase 1 (Assessment phase): This phase involved pre-testing of the study nurse interns’ knowledge, practice and attitude regarding occupational health hazards using the relevant data collection tools. The researcher visited each of the four hospital included in the study to explain the purpose and nature of the study to the administration and obtain their permission to carry out the study. Then, researcher met with the nurse interns, oriented them about the study aim and procedures, and invited them to participate. The needs assessment sheet was distributed to study subjects to assess their needs regarding the program. Then the researcher distributed the self –administered questionnaire form to study subjects to assess their knowledge and attitude scale regarding occupational health hazards, along with filling instructions.

The nurse interns were then observed individually by the researcher using the observation checklist to assess the actual nurse interns’ practice related to safety
standards, precautions. Each nurse intern was observed three times. The period between successive observations was two days.

**Phase II (Training program planning):** The content of the training program was developed based on review the regarding literature and based on the assessment of the knowledge questionnaire. Different instructional strategies were selected to suit the participant’s needs, and achieve the objectives and contents of the training program. It was aimed at providing trainers with much experience as possible. Within the available resources, a training program was developed by the researcher.

**Phase III (program implementation):** The training program was implemented to nurse interns working in the study setting. Nurse interns were divided into five groups. Training program consisted of 12 sessions. The training program sessions carry out four days/week (4 hours/day). It was carried out from 12:00 am to 2:00 pm, while in afternoon shift program was implementing from 3:00 pm to 5:00 pm for nurse interns in the different departments.

Time allowed for achieving the program objectives was 22 hour: 14 hour theoretical and 8 hour practical hours. Each session contain theory or practice content and including time for discussion. This phase take from beginning of April to middle of May 2019.

**Phase IV (post program evaluation):** Investigator evaluated impact of training program regarding occupational health hazards on nurse interns’ knowledge, practice and attitude. A post-test was done immediately after program implementation during May 2019. This was finished utilizing the same data collection tools and checklist as in assessment stage.

**Phase V (follow-up):** follow up test was repeated three months after post-assessment evaluation by using the same data collection tools to estimate the impact of training program related occupational health hazards on nurse interns’ knowledge, practice and attitude. This phase took four months.

**III. Administrative Design:** An official permission to conduct the study was obtained from hospital directors through letters. The letter included the aim of study and photocopy from data collection tools in order to get the permission and help for collecting data. Then the researcher met each director of the four hospitals, and demonstrates purpose of the study to obtain their cooperation and help during the study.

**Ethical Consideration:** The research approval was obtained from a scientific research ethics committee. The aim and purpose of the research were explained to each director of the four hospitals, as well as the nurse interns who were included in the study, and oral assent was gotten from every participant before the study conduction. Also, it guaranteed keeping up anonymity and confidentiality of the subject data. Nurse interns were informed that they were permitted to decide to participate or not in the study and that they had the right to pull back from the study whenever.

**Statistical Design:** Data entry was done utilizing SPSS V20 PC software package. Data were presented utilizing descriptive statistics in the form of frequencies and percentages for qualitative variables, and means ± standard deviations for quantitative variables. Qualitative variables were compared utilizing chi-square test. Moreover, paired t-test was utilized to compare two means in the same studied group pre and post intervention and between two means post intervention and during follow up stage. Pearson correlation co-efficient (r) was utilized for assessment of the inter-relationship between quantitative variables. The confidence level chosen for the study was 95%. Statistical significance was considered at p value <0.05.

**Results**

Table (1) demonstrates the socio demographic characteristics of study subject. As regard to age, 80.2% of nurse intern’s age ranged (22-23y), with mean age of 22.67±0.83. Moreover, more than half (62.6%) of them were female,(35.2%) of them had an internship training in OR in different hospitals. Also, more than half (66.7%) of them who had attend the courses was its duration was one day, and majority of nurse interns (83.4%) attend courses at time ranged (1-5 months). Also, shows the majority (80.2%) of nurse interns was not attending any of training courses. Also, clarifies that, physical hazards were at a first rank level of hazards which more than two fifth (44.0%) of nurse interns were exposed to physical hazards as perceived by them, followed by psychosocial hazards which slightly more than one quarter (29.7%) of them, while chemical hazards was at the last rank level of hazards which lowest percentage (9.9%) of nurse interns were exposed to.
Table (2) demonstrates that, at pre program phase only (4.4%) of nurse interns had high total knowledge level. As observed at post program and follow up phases the total knowledge level was improved markedly (91.2%, 80.2% respectively). Also, shows that, more than half of nurse interns (53.8%) had satisfactory practice in preprogram phase regarding gloving, while in post program phase the nurse interns’ satisfactory practice reached to (98.9%), and slightly decline (96.7%) in follow up phase. Also, minority (33.0%) of nurse interns had satisfactory practice level regarding occupational health hazards at preprogram phase. Moreover, there were highly improvement in total nurse interns’ practice during post program phases (94.5%), and slightly decline (85.7%) in follow up phase however the levels remained significantly high compared with preprogram phase. The present study finding showed that, majority of nurse interns (92.3%) had satisfactory attitude in post program and in follow up phase there was slightly decline (78.0%), while minority (8.8%) of nurse interns had satisfactory attitude in preprogram phase, with highly statistically significant difference in total attitude towards protection from hazards throughout the program phases.

Table (3) demonstrates there was a positive significance correlation among total knowledge score and total practice score related occupational health hazards among nurse interns throughout program phases. Also, shows that, there was a highly significance correlation among total attitude score and total knowledge score regarding occupational health hazards among nurse interns through post and follow up program phases. However, there was significant correlations among total attitude score and total knowledge score regarding occupational health hazards among nurse interns in preprogram phases.

### Table (1): Socio-demographic characteristics of Nurse Interns (n= 91).

<table>
<thead>
<tr>
<th>Items</th>
<th>Nurse interns (91)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
</tr>
<tr>
<td><strong>Age (in Years)</strong></td>
<td></td>
</tr>
<tr>
<td>22-&lt;24</td>
<td>73</td>
</tr>
<tr>
<td>24-25</td>
<td>18</td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>73.4 ± 0.83</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>34</td>
</tr>
<tr>
<td>Female</td>
<td>57</td>
</tr>
<tr>
<td><strong>Department</strong></td>
<td></td>
</tr>
<tr>
<td>CCU and post catheter</td>
<td>16</td>
</tr>
<tr>
<td>kidney dialysis</td>
<td>13</td>
</tr>
<tr>
<td>Neuro and stroke ICU</td>
<td>6</td>
</tr>
<tr>
<td>Endemic ICU</td>
<td>2</td>
</tr>
<tr>
<td>ICU</td>
<td>16</td>
</tr>
<tr>
<td>Neonatal ICU</td>
<td>4</td>
</tr>
<tr>
<td>OR</td>
<td>32</td>
</tr>
<tr>
<td>Emergency department</td>
<td>2</td>
</tr>
<tr>
<td><strong>Name of Attending training courses</strong></td>
<td></td>
</tr>
<tr>
<td>Infection control</td>
<td>16</td>
</tr>
<tr>
<td>Control of fire</td>
<td>2</td>
</tr>
<tr>
<td><strong>Duration of the courses</strong></td>
<td></td>
</tr>
<tr>
<td>Lecture</td>
<td>5</td>
</tr>
<tr>
<td>One day</td>
<td>12</td>
</tr>
<tr>
<td>3weeks</td>
<td>1</td>
</tr>
<tr>
<td><strong>Time attendance of courses</strong></td>
<td></td>
</tr>
<tr>
<td>&gt; One month</td>
<td>2</td>
</tr>
<tr>
<td>1-5 months</td>
<td>15</td>
</tr>
<tr>
<td>&lt; 5 months</td>
<td>1</td>
</tr>
<tr>
<td><strong>Attendance of training courses</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>18</td>
</tr>
<tr>
<td>No</td>
<td>73</td>
</tr>
<tr>
<td><strong>Actual exposures to hazards</strong></td>
<td></td>
</tr>
<tr>
<td>Physical</td>
<td>40</td>
</tr>
<tr>
<td>Chemical</td>
<td>9</td>
</tr>
<tr>
<td>Biological</td>
<td>12</td>
</tr>
<tr>
<td>Psychosocial</td>
<td>27</td>
</tr>
<tr>
<td>Social</td>
<td>16</td>
</tr>
</tbody>
</table>
**Table (2): Levels of nurse interns’ total knowledge & distribution of total practice regarding occupational health hazards and total attitude towards protection from hazards throughout program phases (n= 91).**

### Total knowledge regarding occupational health hazards

<table>
<thead>
<tr>
<th>Items</th>
<th>Levels of knowledge</th>
<th>Program phases</th>
<th>X²</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>Follow up</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td>Total knowledge regarding occupational health hazards</td>
<td>Low</td>
<td>73</td>
<td>80.2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>14</td>
<td>15.4</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>4</td>
<td>4.4</td>
<td>83</td>
</tr>
</tbody>
</table>

### Total occupational health hazards practice

<table>
<thead>
<tr>
<th>Satisfactory practice 60%+</th>
<th>Program phases</th>
<th>Pre &amp; Post (X² P-value)</th>
<th>Post &amp; follow up (X² P-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Program phases</td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>Hand washing</td>
<td></td>
<td>26</td>
<td>28.6</td>
</tr>
<tr>
<td>Gloving</td>
<td></td>
<td>49</td>
<td>53.8</td>
</tr>
<tr>
<td>Eye protection</td>
<td></td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Masking</td>
<td></td>
<td>19</td>
<td>20.9</td>
</tr>
<tr>
<td>Personal protective equipment (PPE) in health care setting</td>
<td>45</td>
<td>49.5</td>
<td>76</td>
</tr>
<tr>
<td>personal hygiene</td>
<td></td>
<td>47</td>
<td>51.6</td>
</tr>
<tr>
<td>Instruments/Equipment processing (Cleaning)</td>
<td>18</td>
<td>19.8</td>
<td>30</td>
</tr>
<tr>
<td>Use sharp container</td>
<td></td>
<td>47</td>
<td>51.6</td>
</tr>
<tr>
<td>Body mechanics (when lifting)</td>
<td></td>
<td>35</td>
<td>38.5</td>
</tr>
<tr>
<td>Safe waste disposal</td>
<td></td>
<td>45</td>
<td>49.5</td>
</tr>
<tr>
<td>Total occupational health hazards practice</td>
<td>30</td>
<td>33.0</td>
<td>86</td>
</tr>
</tbody>
</table>

### Total attitude towards protection from hazards

<table>
<thead>
<tr>
<th>Satisfactory attitude 60%+</th>
<th>Program phases</th>
<th>Pre &amp; Post (X² P-value)</th>
<th>Post &amp; follow up (X² P-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Program phases</td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>Total attitude towards protection from hazards</td>
<td>8</td>
<td>8.8</td>
<td>84</td>
</tr>
</tbody>
</table>
Table (3): Correlations between total practice score and total knowledge score regarding occupational health hazards & Correlations between total attitude score regarding protection from hazards and total knowledge score among nurse interns throughout program phases

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Total knowledge score regarding occupational health hazards</th>
<th>Pre</th>
<th>Post</th>
<th>Follow up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>R</td>
<td>P–value</td>
<td>R</td>
</tr>
<tr>
<td>Total practice score regarding occupational health hazards</td>
<td></td>
<td>0.211</td>
<td>&lt;0.05*</td>
<td>0.412</td>
</tr>
<tr>
<td>Total attitude score regarding protection from hazards</td>
<td></td>
<td>0.228</td>
<td>&lt;0.05*</td>
<td>0.247</td>
</tr>
</tbody>
</table>

**Discussion**

Nursing interns are more prone to occupational health hazards, and injuries in the course of their clinical training activities, and their day to day activities in the health care settings. Subsequently, WHO emphasizes on the primary prevention of work environment dangers, particularly because of the highest incidence of occupational injuries happens in hospitals and health care settings, in comparison with to the manufacturing industries.

Current study revealed that, physical hazards were at a first rank level of hazards which more than two fifth of nurse interns were exposed to physical hazards as perceived by them, followed by psychosocial hazards which slightly more than one quarter of them, while chemical hazards was at the last rank level of hazards which lowest percentage of nurse interns were exposed to. The study result is in congruence with a study conducted in Egypt by who decided that, attendants rank physical dangers followed by mental and social risks.

The present study finding revealed that, minority only of nurse interns’ had high level of occupational health hazards knowledge before implementing the program. It may be due to more than three fourth of nurse interns didn’t attend any training program or courses about occupational health hazards.

The findings of the present study is in congruence with that found, low knowledge and awareness level in their study among healthcare workers regarding occupational hazards in their health care settings in Malaysia. In contrary with the present study findings who reported that, respondents had an above average overall knowledge of workplace hazards and safety practices.

As observed the total high level of occupational health hazards knowledge was improved markedly throughout program phases. This finding may be due to the program was effective in improving the occupational health hazards knowledge among nurse interns. The same trend was observed by.

Moreover, slightly decline of total occupational health hazards knowledge level at follow up phase among nurse interns. This result may be due to normal phenomena of retention and forgetfulness due to the high work load. In agreements with the present study who reported that, a significant number of nurses have knowledge about occupational health hazards, although few numbers have insufficient knowledge.

Also, the result showed that, there were highly significant differences of total occupational health hazards knowledge between nurse interns all through program stages. This reflects positive influence of the health education program in enhancing occupational health hazards knowledge among nurse interns. This finding is consistent with who decided that, there were highly significant differences throughout program phases in improving nurses’ knowledge regarding total occupational health hazards knowledge.

In addition, as observed, the nurse interns gloving practice technique was improved markedly throughout program phases, with highly statistically significant differences between total practice regarding gloving throughout pre and post program phases. This finding may be due to the training program encourage the nurse interns to follow correct gloving practices and set a trend in their practical life. In the same line found that, in their study, wearing hand gloves for routine clinical system was rehearsed by almost all participants.
Moreover, as observed at post training program phases the total personal protective equipment practice (PPE) in health care setting among nurse interns was statistically significant improved markedly throughout pre and post program phases. This result may be due to educational programs for nurse intern help them in improving their knowledge and practice personal protective equipment. The same trend was observed by mentioned that, regarding application of the universal precaution revealed a significant increase in applying hand-washing, wearing gloves, and wearing face mask after the program compared with the application of the universal precautions before the program.

Moreover, there was slightly declined occur in total practice regarding personal protective equipment practice (PPE) in health care setting among nurse interns at follow up phase. This finding may be due to lack of closed supervision related to personal protective equipment practice. It may also be attributed to nursing staff shortage, work overload, and the time constrains of having to deal with a large number of patients within a limited time. Similarly, who found that, guideline recommendations for routine preventive care are not always followed, such as hand washing, wearing mask, goggles, sterile gown, and gloves 6 months after implementation.

Moreover, as observed at post program phase the total personal hygiene satisfactory practice level among nurse interns was statistically significant improved. This result may be due to instructive meetings for the staff to affect emphatically on the consistence to personal hygiene. Also, may be due to an effective infection control depends on nurse interns’ ability to advise and encourage them to keep a satisfactory practice to hygiene practice. In the same line with the study mentioned that, people that know about infection transmission are more spurred to follow cleanliness schedules and to keep up aseptic conditions than individuals that haven’t.

While, there was slightly declined of total personal hygiene satisfactory practice level in follow up phase. This result may be due to lack of supervision affects compliance to personal hygiene negatively. In the same context mentioned that, when there are gifted and committed nurses in cleanliness practice this influences the consistence to cleanliness schedules among the other staff at the ward in a positive manner.

Moreover, nurse interns’ total practice regarding instruments/equipment processing (Cleaning) increased at post program stage. Also, there were a highly significant difference in whole items of instruments/equipment processing (Cleaning) and total practice regarding cleaning in pre and post program phases. This is emphasized the necessity of updated in-service education and training about infection control measures and principles to improve the level of nurse interns’ knowledge and practices. A similar trend was observed who indicated that, large percentage of nurses had good level of practice regarding appropriate decontamination of equipment.

While, nurse interns’ total practice regarding instruments/equipment processing (Cleaning) was slightly declined at follow up phase. This finding may be due to lack of equipment and resources, lack of time, and work load were the factors impeded the nurse interns from proper instruments/equipment processing (Cleaning). This study finding is congruent with indicated that, lack of equipment and resources and lack of time were the factors impeded the nurses from proper infection control practice.

As observed, nurse interns’ practice regarding use sharp container was statistically significant improved at post program phase. This finding could be due to trainings was be useful on nurses interns’ practice and update their knowledge regarding use sharp container. Similarly, was reported in his study that, behaviors of the nurses working in the clinics changed positively as far as taking measures against sharp and needle stick wounds after the training, which is an expected.

While, nurse interns’ total practice regarding use sharp container was slightly declined at follow up phase. This finding may be due to understaffing, nurse interns’ attention deficit, and desire to finish all the work quickly. concluded that, understaffing, working conditions, absence of preparing and experience, consideration shortage, and want to complete all the work rapidly are accounted for as the elements to not used sharp container probably, and increasing the incidence of sharp and needle stick injuries.

As observed, nurse interns’ practice regarding body mechanics (when lifting) was significant improved at post program phase. This might be identified with the participation of the interventional preparing program and the accentuation on psychomotor abilities application
both during and after the program practice was effective and helpful, confirmed to the previous result\textsuperscript{30}.

While, nurse interns’ total practice regarding body mechanics (when lifting) was slightly declined at follow up phase. This finding may be due to nonattendance of nonstop supervision and direction, increment in number of patients, lack of the nurses and increment work tasks, which adversely sway their performance practice regarding body mechanics and their quality of work life. In contrary,\textsuperscript{31} concluded that, nurses’ body mechanics and ergonomics practices had highly significant satisfactory level at both following and following 3 months from program execution.

As observed, nurse interns’ practice regarding safe waste disposal was statistically significant improvement at post program phase. This finding may be due to active participation in training programs positively affected nurse interns’ practice regarding safe waste disposal. The same trend was observed by\textsuperscript{32,14}.

While, nurse interns’ total practice regarding safe waste disposal was slightly declined at follow up phase. This finding may be because of lack of clear rules and written policies, lack of personal protection tools regarding safe waste disposal. In agreements\textsuperscript{33} found that absence of all mentioned previous factors, in addition inappropriate training programs are the most factors that affecting hospital waste management system.

In addition, the present study found that, minority of nurse interns had satisfactory practice level regarding occupational health hazards at preprogram phase. This finding may be due to absence of effective execution framework, absence of data and precise records of occupational diseases and accidents, and absence basic professional training in occupational health and safety. The present study result is congruence with a study conducted at Nigeria by\textsuperscript{34} they revealed that, almost half of nurses had bad practices regarding safety practices about occupational health hazards.

The present study result showed that, nurse interns’ total practice regarding occupational health hazards throughout program phases was markedly increased. Also, there were highly statistical improvement in overall nurse interns’ practice during post program phases and slightly decline in follow up phase as compared with preprogram phase. This finding may be because of nurse interns’ participating in the education program made a significant difference on the level of knowledge and changing the practice regarding occupational health hazards.

This is congruent with the finding by\textsuperscript{22} who found a significant difference pre/post implementing nursing guidelines about hazards prevention and nurse’s practice about safety. Also,\textsuperscript{35} reported that, significant improvement in nurses self-reported compliance with the standard precautions, as well as the observed compliance scores with standard precautions after the educational intervention.

The present study result revealed that, score of nurse interns’ attitude towards protection from hazards was generally low at preprogram, while nurse interns satisfactory attitude at post program improved markedly and there was slightly declined at follow up phase, but it reminded higher than preprogram. Also, highly significant difference in total attitude towards protection from hazards throughout the program phases was observed.

This could be due to the training program advance nurse interns’ knowledge and practice skills and as a result enhance nurse interns satisfactory attitude level, also may be due to dread of occupational infections and ailments which could be terminal and life dangerous in certain instances. In agreements\textsuperscript{4} showed that, majority of nurses had positive attitude regarding safety precaution and prevention of occupational hazards. Similarly,\textsuperscript{6} mentioned that, nurses had positive attitude regarding occupational health hazards.

Moreover, current study finding reported that there was a positive highly significance correlations among total knowledge score and total practice score related to occupational health hazards among nurse interns throughout program phases. This study finding may be due to implementation of educational and awareness program to ensure occupational safety for nurse interns established safe practices to create a safe environment, identified, and minimize potential hazards. The same trend was observed by\textsuperscript{36}. Additionally the consequences of the current study demonstrated that there is positive significant correlation among change of knowledge and change of training, as knowledge improved, practice improved.

In the current investigation, there was positive impact of knowledge regarding occupational health hazards in improving nurse interns total practice score. This finding supported the hypotheses of the study,
which was there is a change in nurse interns’ knowledge and practice regarding occupational health hazards after implementing the program. These results are considered satisfactory and demonstrated the achievement of the expected results in the study. In addition proving that, practical interventions were viable, without high costs and applicable to the reality of institutions can be effective.

This finding is supported by\textsuperscript{37} found a strong positive correlation between the implementation of educational intervention and improvement of knowledge and change in preventive practices about the occupational risks by nursing professionals in the experimental group. Also,\textsuperscript{22} the study demonstrated the effect of educational intervention in improving nurses’ knowledge and practice, as it was reported that, significant difference among knowledge and practice pre/post implementing nursing guidelines about hazards prevention was observed.

Also there was highly statistically significance correlations between total attitude score and total knowledge score regarding occupational health hazards among nurse interns through post and follow up program phases. This finding may be due to implement of training programs regarding occupational hazards, promote high knowledge, and this translated to positive attitude and subsequently good behavior. In this regard,\textsuperscript{23} compared the distribution of respondents by performance on composite knowledge, attitude and practice, participant had positive attitude.

**Conclusion**

According to the study findings, it can be concluded that, there were highly significant differences of total occupational health hazards knowledge among nurse interns throughout program phases. Nurse interns’ total practice regarding occupational health hazards throughout program phases was markedly increased. There was a highly significant difference in total attitude towards protection from hazards throughout the program phases. The training program implementation led to significant improvements in nurse interns’ knowledge, practice, and attitude regarding occupational health hazards.

**Recommendations:** According to the main study findings, we can recommend.

**Education:** Providing training program for nurse interns regarding occupational hazards and especially on protective measures. Dissemination and development of policies and rules of safety practices among nurse interns, and psychological counseling and therapy should be easily accessible and available for troubled nurse interns.

**Practice:** Encourage and supervise the use of personal protective equipment by the nurse interns, perform regularly routine check-up of nurse interns to ensure occupational health, provide regular vaccination for all nurse interns to minimize liability for acquiring work related infection (to prevent biological hazards), supervise nurse interns’ safety practices and it’s need to be ameliorated through training as well as close supervision of their application, and observe and supervise nurse interns’ practices to ensure their compliance with safety regulations.

**Research:** Further studies are also recommended to investigate the relationship among nurses’ safety practices and occupational hazards training program analyze the after effect of work related injuries and illnesses on the nurse, evaluate the effect of work related injuries on the organization.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** Obtained from a scientific research ethics committee.

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Legal Liability for Euthanasia Actions in the Perspective of the Medical Code of Ethics in Indonesia

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Abstract

Introduction: Euthanasia which is done by doctors to their patients is considered as a part of the act of human rights violations, this matter would raise a dilemma for those who are pursuing a medical profession. Therefore, it is necessary to conduct research concerning legal liability related to euthanasia from the perspective of a medical code of ethics in Indonesia.

Purpose: This research aims to acknowledge and analyze the legal liability related to euthanasia from the perspective of a medical code of ethics in Indonesia.

Research Methodology: This research uses qualitative method with a normative juridical approach. The data collection technique is done through literature study.

Conclusion: Doctors must not neglect the obligation to always protect human life, as regulated in the medical code of ethics in Indonesia so that the act of euthanasia is contrary to professional and legal ethics and if it continues to be carried out, it can create criminal liability as regulated in the Criminal Code.

Keywords: Law; Euthanasia; Medical Code of Ethics.

Introduction

In Indonesia, the tools of regulating human rights have been regulated through the constitution and various laws and regulations under it as an implementing regulation. The 1945 Constitution of the Republic of Indonesia, both before and after the amendment, explicitly states that every citizen has freedom, not only freedom of association in expressing opinions in public, but also the freedom to live and embrace a religion, which is not only aimed to individualist protection but also collective. Likewise, access to freedom in the political and legal fields has been limitedly regulated through the provisions of Article 27 and Article 28 of the 1945 Constitution of the Republic of Indonesia.¹

Regarding the freedom to determine self-fortune related to euthanasia, in various international regulations, it is emphasized through various international conventions which essentially do not respond to the implementation of medical actions to end one’s life based on their request or their family request through the medical actions performed by a doctor.² In the Universal Declaration of Human Rights in the provisions of Article 3, it is stated that “Everyone has the right to life, liberty and the security of person”. This provision indicates that the right to instruct ending someone’s life is part of a violation of human rights.³

Legal liability concerning the implementation of the profession in medical procedures, including medical euthanasia, according to Anny Isfandyarie, is distinguished between the responsibility for professional provisions or medical code of ethics and the responsibility for legal provisions contained in the law.⁴

Based on the provisions of Article 344 of the Criminal Code, euthanasia is categorized as a crime.
against life. Euthanasia is legally a murder at the request of the victim, that is, the patient’s request to the doctor. Articles that can be applied to euthanasia are articles regarding murder, namely Articles 338, 340, 344, and 345 of the Criminal Code.

The experts of religion, morals, medicine, and law have not met the same agreement in facing euthanasia, especially at the person’s request of death to end their suffering. This situation raises a dilemma for the doctors, whether they have the legal rights to end a patient’s life based on their request or their family’s request, with a reason to end the patient’s long-term suffering, without the doctor faces legal consequences, which in this case, is a criminal threat as regulated in the Criminal Code. Of course, in this case, the doctor faced a conflict in their mind. Therefore, it is important to research legal liability related to euthanasia in the medical code of ethics in Indonesia.

From the previous background, the purpose of this study is to acknowledge and analyze legal liability related to euthanasia from the perspective of a medical code of ethics in Indonesia.

**Research Methodology**

This study uses a qualitative research method with a normative juridical approach. The normative juridical research method is research on the principles of positive law written in statutory regulations and aims to conceptualize law as a written method. SoerjonoSoekanto argues that only legal research carried out by examining library materials or secondary data alone can be called normative legal research. Data collection is carried out by a literature study to collect legal materials, such as laws, law books, and legal research journals related to the topic of this research.

**Discussion**

Euthanasia Study Group from Koninklijke Nederlandsche Maatschappij tot bevordering der Geneeskunst/KNMG (Dutch Medical Association) gives limitation for euthanasia, as follows: “Euthanasia deliberately does not do anything to prolong a patient’s life or deliberately does something to shorten or end a patient’s life, and all is done specifically for the patient’s benefit.” ImronHalimy defines euthanasia as an act of stopping someone’s life who is suffering from their illness, whether done sooner or later by a doctor or health team who treats them either at the request of the patient or the patient’s family to reduce the burden of suffering. According to forensic medicine, euthanasia is a form of murder, where a person is killed to end someone’s suffering, which is often found in cases of incurable cancer and the patient’s closest people decide.

Based on some of the definitions above, what is meant by euthanasia, in general, is taking action intending to shorten one’s life or end one’s life due to long-term suffering from an illness that cannot be cured by a doctor at the request concerned in these matters.

In general, euthanasia can be divided into two, which are as follows:

1. **Active Euthanasia (mercy killing):** Namely where a doctor or other medical personnel deliberately takes an action to shorten the patient’s life or end the patient’s life. It is considered as active euthanasia because the doctor took an action. Active euthanasia can occur because of request or not upon request, the meaning is as follows:

   a. **Upon request (voluntary euthanasia):** Active euthanasia on request is also called voluntary euthanasia because a patient voluntarily asks to end their life.

   b. **Without a request (involuntary euthanasia):** Active euthanasia without request is also called forced euthanasia because the action is not done at the request of the patient.

2. **Passive Euthanasia:** Namely where doctors or other medical personnel deliberately stop providing medical assistance to patients that can support their life. So, it is not by taking any action that will directly result in the end of the patient’s life.

From all the analyzes above, juridically, Euthanasia, especially active euthanasia is indeed a criminal act, but not everyone who commits a criminal act should be punished. Barder Johan Nasution stated that the existence of a medical code of ethics aims to prioritize the interests and safety of patients, ensuring that the medical profession is always carried out with noble intentions and in the right way.

Thus, society does not need to worry too much that euthanasia will very easily be carried out by a doctor, although of course doctors are also human beings who cannot possibly be free from mistakes and wrong considerations. Control is needed in addition to the right legal in terms of euthanasia.
Apart from the Indonesian Medical Code of Ethics and Article 344 of the Criminal Code, Indonesia has a legal instrument that regulates euthanasia. This regulation only formulates actions seen from the point of view of protecting the patient without threatening a clear criminal rule. This regulation is Law Number 36 of 2009 concerning Health.

The formulation of articles that regulate euthanasia is contained in Article 56 of Law Number 36 of 2009 which regulates patient protection. The article states: Every person has the right to accept or reject part or all of the aid action that will be given to him or her after receiving and understanding the complete information regarding the action. The right to accept or reject as referred to in paragraph (1) does not apply to patients of a disease whose disease can quickly spread to the wider community; the condition of an unconscious person; or severe mental disorders. Provisions regarding the right to accept or reject as referred to in paragraph (1) shall be regulated following the provisions of statutory regulations.

From the formulation of Article 56 it can be understood that although the criminal act of passive euthanasia has not been regulated in Indonesian written law, the Health Law has explained that the right to receive or refuse treatment is invalid when the patient is unconscious. So that the act of passive euthanasia cannot be justified and can be threatened with a criminal penalty because the decision to accept or refuse treatment is entirely in the hands of the patient’s family. Unlike the omission or pseudo euthanasia which cannot be punished if the patient is conscious and asks the doctor to stop all treatment for them.

The weakness from the formula in Article 344 of the Criminal Code is in the process of gaining the evidences, someone’s request made intentionally and sincerely will be very difficult to be proved because the person who requested his life to be taken is already dead and cannot be asked for their testimony or witness.

Therefore, the sincere statement should not only be done orally, but also should be done in written form and signed by several witnesses, because, in the verification, the element of the sincere statement should be able to be proved by the witnesses or other evidences, as stated in Article 184 of the Code of Criminal Procedure, that is the testimony of a witness, the testimony of an expert, a document, an indication, and the testimony of the accused. However, the existence of proof of request cannot make the action acceptable. The action can still be reached by Article 344 of the Criminal Code.

Another weakness from the formulation of Euthanasia action in Indonesia is there is no explanation that the perpetrator of the criminal action is a doctor and the victim is the patient because the element from Article 344 of the Criminal Code is only stated by “Whoever”. Therefore, the interpretation of the Article will be wider because the element is not stated clearly.

Generally, there are two kinds of ethics: general ethics and professional ethics. For the general ethics, someone who wants their family member to be quickly dead is considered unacceptable, but if the patient is having a very serious illness, for instance, having a severe illness for a long time where the condition of the body is emaciated, only bones wrapped in skin and the cancer wounds continue to expand and emit a very strong odor over a considerable distance, the people around will feel sorry for the patient and will not blame the patient’s family too much if the family “would prefer it if the patient died soon”.

The other kind of ethics is professional ethics. In this case, a doctor’s professional ethics, or a medical worker’s are pledged to the oath stated when they are initiated to be a doctor. The current doctor’s oath pronunciation is following the Decree of the Minister of Health No. 434/MENKES(SK/X/1983 dated October 28, 1983, which essentially contains a code of ethics for the medical profession and this serves as a guideline for doctor’s behavior in carrying out their profession.

The Indonesian Medical Code of Ethics regarding the obligations of doctors to sufferers in Article 11 states that every doctor must always remember his obligation to protect human life. From this ethical point of view, Euthanasia is against Indonesian medical ethics. This statement is true it is not only contradicting the medical ethics in Indonesia but also to the Hippocratic Oath which is the basis of the oath of doctors around the world. In medical ethics that is rooted in the Hippocratic Oath, it is stated that doctors will respect every human life from conception. This means that after a meeting between the egg or ovum and the sperm, the presence of the fertilized egg must be respected.

Regarding life, the doctor’s oath states that a doctor will respect life from the moment of conception. Thus, as long as there is life, that life must be respected. Even
if life is not of a healthy quality, which in this case is very painful and makes people around them feel pity for them, it still has to be respected. However, the way to respect it depends on the views held by the people around or the doctor. Some read the Yaasin, some asked what holds them so that it should be removed immediately, some gave incantations or medicines, and of course, some suggested or by the patient asked for Euthanasia. One of the most common and most confusing moral dilemmas in health care arises when moral principles concerning whether health care workers should improve the patient’s condition or respect the patient’s autonomy clashes. Doctors and other healthcare professionals are obliged to do what is beneficial to the patients and not only preventing harm to them.

The reason Euthanasia until now is considered terrible, inhuman, violating the right to life, and so on, is because it is seen from an ethical perspective, both general ethics and professional ethics. Understanding medical ethics is a demand that is seen as increasingly necessary, serious handling of medical ethics issues is quite urgent. Medical ethics discusses doctors’ ethics in carrying out their profession. Medical ethics is very noteworthy in this profession. Starting from when they were students, prospective doctors have been given bioethics course material, even not only ethics towards fellow humans or patients, but also ethics in dealing with or manipulating experimental animals and corpses used for lessons. Ethics towards fellow humans is not only ethics towards patients but also teaches how to behave towards peers, teachers, and others.

Many people easily give moral judgments on others based on that person’s outward behavior. To judge so is self-guilty. We never know how the intent and conviction of the person when they are doing something the good and the bad depends on whether he acts accordingly or not according to his consciences. The same thing also applies to a doctor’s actions, even though they have been bound by the doctor’s oath and their behavior can be seen, what they perceive cannot be seen from the outside.

Guwandi in his book called it a trilogy of medical secrets, which consists of informed consent, medical records, and medical secrecy. The regulation of medical secret matters is stated in the context of Medical Ethics and Law. Ethics and medical secrets are stated in the Hippocratic Oath which is always spoken by doctors who just graduated from their education. The original Hippocratic Oath was composed by a small group of Pythagorean medical from the island of Coss in the late fourth century BC.

The Hippocratic Oath provides instructions regarding medical ethics, namely: that it fulfills the need for an instruction and coordinated registration from a doctor. The public should be protected wherever possible from con artists who are not doctors. The doctor takes action for the benefit of the patients. Doctors must do everything in their power to provide treatment. They must not do something that they know will harm their patients. Euthanasia and abortion are prohibited. Lithotomy guidelines may also forbid performing mutilating operations such as castration. There is also a limitation that only those skilled in the art are allowed to do so. An outline of the nature of the doctor-patient relationship is provided. For example, to take advantage of this relationship is not justified. Finally, the Hippocratic Oath confirms the doctrine of Medical Secrets.

Hippocrates of Greece, Galenus, and Rome are some of the pioneers of ancient medicine who had laid the foundation for the establishment of a noble medical tradition. Together with all medical figures and organizations in international forums, they then intend to base these traditions and medical disciplines on a professional ethic. This ethic, all the time prioritizes patients who seek treatment and for the safety and interests of the sufferers. This ethic itself contains principles, namely: beneficence, non-maleficence, autonomy, and justice.

With this principle, the doctor who treats his patient must consider that his action must be useful for his patient or the principle of beneficence, if it is not useful, at least it must not harm the patient or the principle of non-maleficence which has the right of autonomy over his own body. The last, a doctor must be fair or aligned with the principle of justice.

The code of ethics stated by Mustika, as quoted by SuryaniSoepardan, is the norm that must be paid attention to by every profession in carrying out their professional duties and their lives in society. These norms contain instructions for members of the profession on how they should carry out their profession and their prohibitions, namely provisions regarding what members of the profession can and cannot do, not only in carrying out their professional duties but also regarding general behavior in daily interactions.
According to SigitLesmonojati, today’s demands call for medical practice to prioritize ethical principles. The modern ethical principles are such that is taken from Catherine Tay Swee Kian: the principle of Autonomy, the principle of Generosity, the principle of Not Hurting, the principle of Justice, the principle of Loyalty, and the principle of Honesty.18

The Indonesian Medical Code of Ethics states that a doctor has general obligations, such as19:

1. Every doctor must uphold, live, and practice the doctor’s oath.
2. Must always strive to carry out his profession according to the highest professional standards.
3. Must not be influenced by something that results in the loss of freedom and professional independence.
4. Avoid having vanity.
5. Any action or advice that may be psychologically or physically debilitating is only given for the benefit and benefit of the patient, after obtaining consent.
7. Only provide certificates and opinions that have been self-checked for the truth.
8. Provide competent medical care, technical and moral freedom, with compassion and respect for human dignity.
9. Honest in dealing with patients and colleagues, remind colleagues if there are deficiencies, fraud, and embezzlement in handling patients.
10. Respect the rights of patients, the rights of colleagues, the rights of other health workers, and must keep the patient’s trust.
11. Always remember the obligation to protect human life.
12. Paying attention to the interests of the public and paying attention to all aspects of comprehensive health services, whether physical, psychosocial and trying to be true educators and community servants.
13. In cooperation with health officials and others must respect each other.

Obligations to Patients:
1. Have a sincere attitude, use all knowledge and skills for the benefit of the patient. If unable, with the patient’s consent, refer to others who are capable.
2. Allow the patient to connect with his family and counselors in terms of religious acts and/or other problems.
3. Must keep everything they know about a patient to themselves, even after the patient has died.
4. Obliged to carry out emergency aid as a humanitarian task, unless there is someone else who is certainly willing and able.

Obligations to peers:
1. Treat peers as they would like to be treated.
2. Must not take over the patient from a peer, except with consent or based on ethical procedures.

Towards oneself:
1. Must keep being healthy, so that one can work properly.
2. Keep informed of the developments in medical/health science and technology.

Therefore, it is clear that the Indonesian Medical Code of Ethics prohibits active and passive euthanasia. In other words, doctors cannot act as a God (don’t play God). Medical ethics must be pro-life, not pro-death. A doctor is a person who saves or enhances life, not a person who determines life itself (lifesavers, not life judgers). There is no need for further explanation on how the matter of Euthanasia for the parties involved is problematic that cannot simply be solved and overcome. The implementation of Euthanasia action to terminal patients is simply an act that flows from a deep source of humanity and out of respect for the wants of others. The doctor’s emotional involvement is the only reason why he is willing to offer real help to a patient who is dying.

Thus ethically, it is not allowed for doctors to kill a dying patient. If a doctor is proven to practice Euthanasia of the patient because of pity for seeing his pain, then he has violated the Decree of the Indonesian Medical Council number 17/KKI/KEP/VIII/2006 concerning Guidelines for the Enforcement of Medical Discipline, which states that ‘every doctor is not allowed to commit an act that is aimed at ending human life, because it is not only contradicting to the Medical Oath and/or medical ethics and or the objectives of the medical profession but also it is against the rules of criminal law.’

Because ethical norms do not cover strict penalties for doctors who continue to engage in Euthanasia to their patients, they must be returned to what is regulated
by the Criminal Code regarding this matter. Article 344 of the Criminal Code states that “Whoever takes the life of another person at the request of his person, which he calls real and sincere, is sentenced to a maximum imprisonment of 12 years”. Meanwhile, Article 345 of the Criminal Code states that ‘Whoever induces another person to commit suicide, helps him in that act, or provides the means for him to do so is punishable by a maximum imprisonment of 4 years if that person commits suicide’.

Conclusion

The legal liability for euthanasia actions in the perspective of the medical code of ethics in Indonesia is that doctors must respect every human life from the moment of conception. In this case, it means that no matter how serious a patient’s illness is, every doctor must still protect and defend the patient’s life. In such circumstances, this patient may have been dying for months. However, in this relationship, the doctor must not escape from the obligation to always protect human life, as stated in his oath. Therefore, Euthanasia has no medical indication to achieve a concrete goal, except only to stop suffering from pain. Thus Euthanasia is contrary to professional and legal ethics and if it continues to be carried out, it can create criminal liability as regulated in the Criminal Code.

Ethical Clearance: Yes.

Conflict of Interest: No

Source of Funding: Authors

References

Antibacterial activity of Green Synthesis of Silver Nanoparticles from Withania Somnifera (Ashwagandha) Root Extract

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Abstract

Biosynthesis (green synthesis) of metal nanoparticles such as Silver Nanoparticles (AgNPs) has been one of the safest, most cost-effective and environmentally sustainable method in recent years. In this research, AgNPs were synthesized using Withania Somnifera (Ashwagandha roots). For the characterization of synthesized AgNPs different techniques were used, such as X-ray diffraction (XRD), Ultraviolet Visible (UV-VIS) spectroscopy, Fourier transform Infra-Red (FTIR) spectroscopy, scanning electron microscopy (SEM), Energy Dispersive X-ray (EDX) analysis, and atomic force microscope (AFM). X-ray diffraction analysis showed that the particles were crystalline, while in nature. UV-Visible absorption spectra of the reaction medium containing silver nanoparticles showed maximum in the visible region at 430 nm. FTIR analysis confirmed the reduction of Ag⁺ ions to Ag⁰ ions in synthesized silver nanoparticles. The SEM analysis the size 5 nm shape and spherical in structure. The antibacterial activity of silver nanoparticles was performed on the growth of both gram-positive and gram-negative bacteria. A bactericidal was observed through the highest zone of inhibition against the bacterial strains, with higher activity for Meropenem. The root extract of Ashwagandha quickly reduces Ag⁺ to Ag⁰ and enhances the synthesis of silver nanoparticles with highly significant antibacterial activity.

Keywords: Green Synthesis, Silver Nanoparticles, Withania Somnifera, Characterisation, Antibacterial activity.

Introduction

Nanotechnology was considered one of the most emerging fields of science and it deals with the synthesis of nanoparticles and nanomaterials, which have dimensions of 1 to 100 nanometers (¹). The most important and distinct property of nanoparticles is that they have a larger surface to volume ratio (²). The properties of nanoparticles, such as high diffusion, durability and versatile chemical and biological activities have gained importance in technological applications (³). A metal nanoparticle synthesis study has increased in number due to possible applications in nanotechnology (⁴). The nanoparticles can be synthesized by physical-chemical and biological method, but the green synthesis of silver nanoparticles has several advantages over physical and chemical method as it is cheaper, can be achieved with a single process and eco-friendly (⁵-¹⁰). Silver Nanoparticles (AgNPs) have attracted growing interest due to their unusual physical, chemical and biological properties, including high electrical and thermal conductivity, Surface-Enhanced Raman Scattering, chemical stability, catalytic activity, and nonlinear optical behavior. AgNPs have wide applications in pharmaceuticals, cosmetics, medical devices, footwear, and textile industries. It has been also AgNPs were helpful in the purification of drinking water/effluent water by efficient removal of the water-born pathogen (¹¹). The synthesis of AgNPs is speedy, cost-saving, eco-friendly and single step synthesis procedure (¹²).
The roots of *Withania Somnifera* (L.) Dunal (Family-Solanaceae)-a vital Rasayana herb is traditionally known as ‘Ashwagandha’ or winter cherry. In Ayurveda, it is called ‘Indian ginseng’. Ashwagandha is widely used in most Indian herbal drugs and nutraceuticals for the treatment of various diseases including nervous, infectious diseases, diabetes, cancer, ulcer, immunological disorders, stress, arthritis, etc[13].

*Withania Somnifera* (Ashwagandha) as Medicinal plants has therapeutic potential due to the presence of natural antioxidants functioning as reducing agents, free radical scavengers and quenchers of singlet oxygen. Majority of different medicinal plant and their antioxidant activity are due to bioactive compounds viz. flavones, isoflavones, flavonoids, anthocyanins, coumarins, lignans, catechins and isocatechins[14].

The aim of this work, Ashwagandha root extract was used for the production of AgNPs by green method. The different properties of biosynthesized AgNPs have been investigated by XRD, SEM, UV-visible, and FTIR to evaluate their shape, distribution of particle size distribution, and functional groups. The biosynthesized formulation of AgNPs was obtained to investigate the antibacterial against Gram-positive and Gram-negative bacterial strains in the inhibition zone compared to the standard antibacterial drug Meropenem.

**Materials and Method**

The plant extract used in the study was obtained from Ashwagandha root extract. In the synthesis method, Silver Nitrate (AgNO₃, purity 99.8%) was used.

**Preparations of plant extract:** The extract was prepared by the freshly Ashwagandha root extract. The root powder was weighed about (5g) and mixing with distilled water (100 ml) on a magnetic stirrer with a hot plate then the solution was boiling at 50°C for 15 minutes. The plant extract was filtered through filter paper after cooling, and the filtered extract was stored for further experiments at a temperature of 4 °C.

**Green synthesis of silver nanoparticles:** The Silver nitrate solution was freshly prepared about (0.09 g) with distilled water (100 ml) under dark conditions. Prepared root extracts were used to reduce Ag⁺ to Ag⁰ by combining it with silver nitrate solution (AgNO₃) at a ratio of 1 to 1 mol. These plant extracts and AgNO₃ mixtures have been kept under 27 °C with continuous stirring. Reduction of silver ions in solution was monitored by a visible change in the color. This indicates the initial confirmation that Ashwagandha was formed as silver nanoparticles (As-Ag Nanoparticles). Figure 1 shows the steps to prepare silver nanoparticles using Ashwagandha root extract.
The Antibacterial activity for AgNPs by well diffusion method: Antibacterial of green synthesis for AgNPs was evaluated using a well-diffusion method against bacterial strains of gram-negative (Escherichia coli) and gram-positive (Staphylococcus aureus). Microorganisms were grown at 37°C in the medium of Uti chromagar (UCA) and Mannitol salt agar (MSA). Holes of 6 mm in diameter were filled with 60 μl impregnated with equal concentrations of Ashwagandha plant extract, AgNO₃ solution, synthesized AgNPs and Meropenem, and kept at 37°C. The diameter of the growth inhibition zones was measured in millimeters (mm) after the 24-hour incubation time.

Characterization of Silver Nanoparticles: The crystal structures of AgNPs were analyzed using SHIMADZU LabX X-ray diffractometer with CuKα1 radiation at λ =1.5406 Å. While the absorbance spectra of the samples were recorded in the wavelength (190-1100 nm) using a UV-VIS (SHIMADZU1800) spectrophotometer. FTIR analysis was performed in the 400 cm⁻¹ - 4000cm⁻¹ range with (SHIMADZU 8400S) spectrophotometer device to determine which functional groups were involved in the reduction of plant extracts. Scanning electron microscopy (SEM) and Energy-dispersive X-ray analysis (EDX) was used to verify the presence of AgNPs in the elemental composition. Atomic force microscopy (AFM) used to study the surface morphology of the samples was the AFM model AA 3000 scanning probe microscope from Angstrom Advanced Inc., USA).

Results and Discussion

X-ray diffraction analysis (XRD): The XRD technique was used to confirm the crystalline nature and particle size of silver nanoparticles. The XRD pattern of green synthesized silver nanoparticles (AgNPs) that extracted from mixing AgNO₃ with Ashwagandha was analyzed as in figure (2). The sharp diffraction peaks indicate the good crystallinity of the prepared AgNPs. The intense and narrow peaks (111), (200), (220), (311), (222), (400), (331), (420) and (422) were assigned at 2θ = 38.11°, 44.27°, 64.42°, 77.47°, 81.53°, 97.88°, 110.49°, 114.92° and 134.88°, respectively. The sample indicated a face-centered cubic structure (FCC) of silver structure with the lattice constants (a = b = c = 4.086 Å). Figure (2) shows that silver nanoparticles (111) diffraction peak is the strongest ones which indicates that formed silver particles have a preferential crystallographic (111) orientation. This is due to the organic compounds which are present in the extract and responsible for silver ions reduction and stabilization of resultant nanoparticles. This observation confirms the silver nanoparticles synthesized from Ashwagandha roots were crystalline in nature. The average crystallite size (D) for synthesized silver particles was calculated according to the Debye Scherrer equation(15) and was equal to 21 nm.

![Figure (2): XRD pattern of synthesized AgNPs from Ashwagandha roots.](image-url)
**UV-Visible Spectrophotometer Analysis:** The formation of silver nanoparticles was easily monitored with color change and it is due to excitation of surface plasmon vibration of metal nanoparticles. When colorless AgNO$_3$ solution mixed with Ashwagandha roots at 0 hour time watery pale yellow color was shown. The mixed solution color at time 4 hours, 24 hours, 28 hours, 48 hours, and 72 hours, was gradually from light yellow to dark reddish-brown. The color change indicates the synthesis of AgNPs by UV–Visible spectrum analysis as shown in (Figure 3). In our result, maximum absorption was observed at 430 nm (Figure 3), the optical properties of silver nanoparticles change which depends upon the collective oscillation of free electron when particles aggregate and the conduction electrons near each particle surface become delocalized and are shared amongst neighboring particles. The resulted observe the spectrum shifts the surface plasmon resonance (SPR) to lower energies. i.e. The absorption peaks move to red shift of plasmon resonance (increases the wavelength at which plasmon resonance occurs) with wide and lower intensity spectrum towards blue shift because of the accumulation effect. The increase of color intensity and (SPR) band sharpness clearly indicates the reduction of Ag$^+$ into Ag$^0$.

![Figure (3): UV-visible spectra of Silver Nanoparticales with Ashwagandha at different time.](image)

**Fourier Transform Infrared Spectroscopy (FTIR):** FTIR measurement was used to identify the possible biomolecules responsible for capping and reducing agents for the stabilization of Silver nanoparticles synthesized from Ashwagandha root extract. The FTIR spectrum of the silver nanoparticle is shown in Figure (4). The observed main peak at 495 cm$^{-1}$ corresponds to metal confirms the formation of (Ag). The peak value at 3413 cm$^{-1}$ may arise due to the O-H stretching vibrations, indicating the presence of hydroxyl groups on the root extract surface of the maize shifted due to the interaction between the Ashwagandha root extract and the silver metal. The medium peaks of 2968 cm$^{-1}$ and 2889 cm$^{-1}$ indicate the C–H and C≡H of alkanes and alkynes, respectively. The peak at 1635 cm$^{-1}$ is a signal of N–H bond vibrations from amide groups of the proteins.
Field Emission Scanning Electron Microscope (FESEM): AgNPs was analyzed by FESEM shows in the high density AgNPs image. It was shown that AgNPs synthesized by a green method using Ashwagandha root extract. The FESEM image of AgNPs indicates the interactions between the various phytochemical molecules bound to the AgNPs. Images of biosynthesized nanoparticles in SEM show surface morphology of AgNPs were clearly indicated that AgNPs were roughly spherical in shape and uniformly distributed and agglomeration was found in AgNPs at different magnification ranges at 500 nm - 1 μm as shown in Figure (5).

Antibacterial activity of Silver Nanoparticles (AgNPs): When the inhibition zone of silver nanoparticles against both bacterial groups was greater than 6 mm is considered active. Bacterial inhibition zone measurement by well diffusion method. However, the antibacterial activity of green synthesized AgNPs...
has shown positive results against both gram-negative. Initially, the antibacterial activities of AgNPs were examined along with plant extract of Ashwagandha, AgNO$_3$ solution, AgNPs and Meropenem against bacterial cultures through well diffusion method. The results showed that AgNPs were highly effective than all other solutions for gram-negative (E.coli) bacteria while for gram-positive (S.aureus) it was more effective than Ashwagandha, AgNO$_3$, and Meropenem (Figure 6). In S. aureus bacterial cultures, AgNPs a greater maximum inhibition zone of 8 mm. In gram-negative bacteria, AgNPs highest maximum inhibition zone (17 mm for E. coli). Thus obtained results clearly indicate that prepared AgNPs were more beneficial against gram-negative bacterial growth than the gram-negative (E.coli) and gram-positive (S.aureus) bacterial pathogenic strains.

Conclusion

The bio-reduction of Ag$^+$ ions by the root extracts of Ashwagandha has been demonstrated. Probably the biomolecules present in the extract of the roots is responsible for the reduction and stabilization of silver nanoparticles. The synthesized silver nanoparticles were characterized using XRD and confirmed the FCC phase. The obtained silver nanoparticles showed significant antibacterial. We found that the green synthesis of silver nanoparticles from Ashwagandha root extract might be

![Figure (6): Antibacterial activity of AgNPs against pathogenic bacteria By well diffusion method (Ashwagandha, AgNO$_3$ solution, AgNPs, Meropenem).](image-url)
used as antibiotics in the future due to non-toxic, eco-friendly, cost-effective, and highly effective against the bacteria.

Conflict of Interest: None

Funding: Self

Ethical Clearance: Not required

References


A Clinico Microbiological Profile of Diabetic Foot Patients

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Abstract

Introduction: Diabetic foot syndrome (DFS), a complex disorder, affects diabetics. It is the unique anatomy of the foot that leads to potentially serious infection. Three cardinal aetiological factors that predispose to diabetic foot ulcers are ischaemia, neuropathy and infection. DFUs are challenging to cure as often the diagnosis is delayed; there is presence of ischaemia, infection with multidrug-resistant organism and extension of infection to the bones. This study was conducted with the aim to determine the clinical and microbiological profile of diabetic foot patients and to assess their outcome.

Methodology: Sixty five male and female patients of 18 and above age that presented with diabetic foot ulcers were enrolled over a period of 18 months.

Results: Of the 65 patients enrolled, 70.77% (n=46) were males while 29.23% (n=19) were females. Male to female ratio was 2.4:1. Diabetic foot ulcers are common in elderly population. Most commonly seen in the age group of 51 to 60 years. When we evaluated the Wagner grade of the ulcers, it was observed that majority of the patients had Wagner grade III ulcer (44.62%) followed by grade II ulcer in 24.62% of the patients. None of the patients enrolled in the present study had wagner grade I ulcer. When the risk factors presence was evaluated in the patients, 63.08% patient had suffered trauma, this was followed by peripheral neuropathy which was present in 60.00% patients. Among the patient enrolled, 36.92% were smokers. 63.08% patients had diabetes for more than 10years while 20% had diabetes of 5-10 years duration and only 16.92% patients had diabetes of less than 5 years. We observed that USG showed presence peripheral vascular disease in 41.54% patients, which is considerably high. In the present study X-ray showed presence of Charcot’s joint, osteomyelitis, fracture and osteoporosis in 10.77%, 24.62%, 3.08% and 4.62% patients respectively. We observed that in our study, anemia was present in large proportion of patients, 67.69%, in the present study. In the present study, ulcer was managed conservatively in 38.46% of the patients. I & D was performed in 35.38% of the patients. While amputation was performed in 12.31% of the patients. In the present study, the following organisms were isolated: Staphylococcus aureus, Pseudomonas Aeruginosa, Klebsiella pneumonia, Streptococcus pyogenes and Proteus Mirabilis were present in 36.92%, 9.23%, 13.85%, 18.46% and 10.77% patients, respectively. Thus the most common isolate was Staphylococcus aureus followed by Klebsiella pneumonia. We observed that 50% staphylococcus aureus isolates were resistant to methicillin, that is methicillin resistant staphylococcus aureus. However, the isolated staphylococcus did not demonstrate resistance to vancomycin or linezolid. Gram negative organisms showed no resistance to Piperacillin+tazobactum,
Imipenem and Meropenem in the present study. Amputation was performed in all the patients with Wagner grade IV and V ulcers, while it occurred in 48.15% patients with vasculopathy and 33.33% patients with neuropathy. It was also observed that in those patients with proteus infection, amputation had to be performed in 100% patients.

**Conclusion:** Diabetic foot ulcers pose a significant burden on the patients and on the health care system. The cost of disability, loss of work and lower extremity amputation extends beyond the economic impact, with regards to patient quality of life.

Proper management of diabetic infections requires appropriate antibiotic selection based on culture and antimicrobial susceptibility results; however, initial management comprises empirical antimicrobial therapy, which is often based on susceptibility data extrapolated from studies performed on general clinical isolates.

**Keywords:** Diabetic foot, diabetes, microorganisms.

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**Introduction**

**Diabetes:** Among one of the oldest known diseases is diabetes.[1] Diabetes mellitus is a metabolic disorder that is characterised by impaired carbohydrate metabolism and affects a large number of people of all social conditions throughout the world and cause of large numbers of complications; thus posing a significant threat to health resources globally. It results in complications, such as diabetic nephropathy, retinopathy and neuropathy.[2,3] Diabetes are unique group in the way they are more prone to develop infections than others.

**Epidemiology:** Around 422 million patients of diabetes exists globally.[4] By 2030 this number may double.[2] As per the International Diabetes Federation, 7.1% of the adults are affected with diabetes.[5] In the USA, around 8.3% population is diabetic.[2] It is also common in India where 8.7% diabetic population exists.[6] As of today, Aug 2019, around 72.94 million people in India have diabetes and this would worsen with time.[7] The problem is diabetes are at 10 fold higher chance of hospitalization due to various infections.[8]

**Diabetic foot ulcer:** Within increased prevalence of diabetes globally, there is increase in its complications too.[9] Diabetic foot syndrome (DFS), a complex disorder, affects diabetes.[10,11] The common estulcers site is dorsalisplantar regions followed by heel and plantar metatarsals.[12] Ulcers classification is as in the table 1 below:

<table>
<thead>
<tr>
<th>Table 1. Wagner’s Classification of Diabetic foot ulcers (Wagner, 1987).[13]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade Description</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
</tbody>
</table>

It is the unique anatomy of the foot that leads to potentially serious infection. Diabetic foot ulcers (DFUs) arise due to its two major complications:

(i) **Neuropathy**

(ii) **Vasculopathy (microas well as macro)**

Neuropathy makes the foot insensitive to chronic or acute injuries. Diabetic suffer from repeated traumas that go non-recognized. This results in development of causes callosities, cracks, fissures, and ulcer formation.
The diabetic foot ulcers are complex from other ulcers away because micro-vascular circulation is impaired due to atherosclerosis that limits the blood causing ischemia and decrease access of phagocytic cells and antibiotic to infected area.[14]

DFUs are infection prone as high blood sugar levels provide ideal media for the organisms growth. As the immune system is compromised in diabetics there is rapid and relentless growth of organism resulting in local sepsis and sometimes lifethreatening septicemia. The infection causes further ischemia by microthrombi formation that result in necrosis and gangrene. Sometimes the infection is so severe that it calls for limb amputation.[15]

DFUs are chronic in nature, requiring repeated hospitalization. The patient is sometimes exposed to several antibiotics thereby increasing risk of multidrug resistant infection development.

**Epidemiology of DFU:** India has 3.6% prevalence of diabetic foot ulcers.[6] Between 12%–25% of diabetics are at its risk.[16-18] Around 40%–80% DFUs are associated with morbidity and mortality.

**Problem Statement:** DFUs have become a source of morbidity and are a leading cause of hospitalization in diabetics to the extent that 20% of hospital admissions in diabetics are due to DFU. These can also lead to infection, gangrene, amputation and sometimes even death in the absence of necessary care.[2]

Chronic DFU is one that fails to heal within 30 days and is a precipitant of amputation.[19] Amputation of even one limb significantly increases the cardiac risk of the patients. Thus, it is utmost necessary to save limb, not only from the view point of mobility and morbidity but also the view point of cardiac safety.

To decrease the burden of DFUs and increase the awareness among the masses, a novel project ‘Step-by-Step Improving diabetes Foot care in the developing world’ has been initiated in India, it also trains people on treatment of trivial foot lesions.[20]

Three cardinal aetiological factors that predispose to diabetic foot ulcers are ischaemia, neuropathy and infection. DFUs are challenging to cure as often the diagnosis is delayed; there is presence of ischaemia, infection with multidrug-resistant organism and extension of infection to the bones. Fetid foot is combined infection involving bone and soft tissue.[21]

Proper management of diabetic foot infection is a difficult and debatable. It is necessary to isolate and identify the causative microbial flora and initiate appropriate antibiotic therapy. A multidisciplinary approach is required to manage the DFU and its infections.[21]

The infections are usually caused by polymicrobials thus requiring proper management with appropriate antibiotic selection.[15] Identification of the causative organism is must for the optimal management. Certain factors like microbes in lower limb, metabolic factors, earlier use of antibiotics and hygiene of feet play an important role in this.[12] Under some specific conditions even fungal infection of diabetic foot can occur.

Infection by multi-drug resistant organisms (MDROs) is common in diabetics and this makes them recalcitrant to healing.[22]

Pathogens such as methicillin resistant *S aureus* (MRSA) or vancomycin-resistant *Enterococci*, are commonly isolated and are usually resistant to most antimicrobial agents. [2] Presence of MDRO infection is influenced by previous use of antibiotic and the duration for which they were administered, hospitalization frequency and duration, presence of osteomyelitis and proliferative retinopathy. [2]

Predominantly the aerobes that are commonly seen in patients with infected DFUs are *Staphylococcus aureus*, coagulasenegative *staphylococci*, *Streptococcus* species, *Enterococcus* species, *Corynebacterium* species, *Enterobacteriaceae* and *Pseudomonas aeruginosa*. However, many infections are polymicrobial and sometimes even fungi may be present. [2] Fungi are common in chronic foot ulcers in elderly diabetics having high Wagener grade and poor glycemic control.

This study was conducted with the aim to determine the clinical and microbiological profile of diabetic foot patients and to assess their outcome.

**Materials and Method**

This prospective, interventional study was carried out in the General Surgery Department of Dhiraj Hospital, for one year and half year from April 2018 to September 2019. Those patients that had diabetic foot ulcers were enrolled in the study which was conducted as per Ethical guidelines and local regulatory guidelines.
Inclusion Criteria:

1. Patients of both the sexes that had an age of 18 years or older.
2. All patients who reported to surgery department with diabetic foot ulcers.
3. Patient who gave written informed consent.

Exclusion Criteria:

1. Patients who did not agree to give consent for participation in the study.

Results and Discussion

In the present study 65 patients that had diabetic foot ulcer and had presented to the general surgery department were enrolled.

1. Gender Distribution: Of the 65 patients enrolled, 70.77% (n=46) were males while 29.23% (n=19) were females. (Table 1, graph 1) Male to female ration was 2.4:1. Relatively, males spend more time outdoors exposing them to risk of trauma and subsequent ulcer, this could be one of the reasons for male preponderance. Another reason could be that our hospital receives patients from rural background who have a habit of walking barefoot, thus exposing themselves to injuries and contamination of wound.

2. Age Distribution:
Mean population age = 50.88± 16.42 years.

Patients age range = 21-80 years.

Majority of the patients were found to be of 51 to 60 years.

Diabetic foot ulcers are common in elderly population. The reasons for the same may be that skin softens with age and can easily break even with trivial trauma. The ability of the cells to proliferate decreases as age progresses, response to stress and also immune response is diminished. Also the complications of diabetes that is neuropathy, vasculopathy worsen as the duration of uncontrolled diabetes increases.

3. Wagner Grading: Majority of the patients had Wagner grade III ulcer (44.62%) followed by grade II ulcer in 24.62% of the patients. None of the patients enrolled in the present study had Wagner grade I ulcer.

4. Risk Factors: When the risk factors presence was evaluated in the patients, 63.08% patient had suffered trauma, this was followed by peripheral neuropathy which was present in 60.00% patients. Among the patient enrolled, 36.92% were smokers. Considering the risk involved, 63.08% patient had suffered trauma, this was followed by peripheral neuropathy which was present in 60.00% patients. Among the patient enrolled, 36.92% were smokers. Neuropathy is a known precursor of trauma as it makes patient unaware of the trivial traumas that occur on daily basis and thus result in ulceration.

5. Duration of Diabetes: We classified the population on the basis of duration of diabetes diagnosis it was observed that 63.08% patients had diabetes for more than 10 years. It can be seen that as the duration of diseases increases so is the incidence of the ulceration, the reason for the same could be as follows, as the duration of disease increases so is the degree/severity of neuropathy and vasculopathy and thus predisposing the patients to ulceration that are resistant to heal. Patients are exposed to repeated traumas that cause ulcers to increase in size.

Table 2: Duration of diagnosis of diabetes

<table>
<thead>
<tr>
<th>Duration of diagnosis of diabetes</th>
<th>Wagner grade</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>II</td>
<td>III</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>≤5 years</td>
<td>2</td>
<td>3.08%</td>
</tr>
<tr>
<td>&gt;5 to ≤10 years</td>
<td>3</td>
<td>4.62%</td>
</tr>
<tr>
<td>≥10 years</td>
<td>11</td>
<td>16.92%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6. **USG Findings**: USG showed presence peripheral vascular disease in 41.54% patients. Vasculopathy predisposes to ischemic changes and ulcerations and reduce reduced host response to infections.

7. **X-Ray Findings**: X-ray showed presence of Charcot’s joint, osteomyelitis, fracture and osteoporosis in 10.77%, 24.62%, 3.08% and 4.62% patients.

8. **Incidence of Anaemia**: Anaemia was present in significant proportion of patients, 67.69%, in the present study.

9. **Management of Ulcer**: Ulcer was managed conservatively in 38.46% of the patients. I & D was performed in 35.38% of the patients. While amputation was performed in 12.31% of the patients.

10. **Distribution of Bacterial Isolates**: Staphylococcus aureus, *Pseudomonas Aeruginosa*, Klebsiella pneumonia, Streptococcus pyogenes and Proteus Mirabilis was present in 36.92%, 9.23%, 13.85%, 18.46% and 10.77% patients, respectively.

<table>
<thead>
<tr>
<th>Bacterial isolates</th>
<th>Wagner grade</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>II</td>
<td>III</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>9</td>
<td>13.85%</td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>2</td>
<td>3.08%</td>
</tr>
<tr>
<td>Klebsiella pneumonia</td>
<td>2</td>
<td>3.08%</td>
</tr>
<tr>
<td>Streptococcus pyogenes</td>
<td>1</td>
<td>1.54%</td>
</tr>
<tr>
<td>Proteus mirabilis</td>
<td>1</td>
<td>1.54%</td>
</tr>
<tr>
<td>None</td>
<td>1</td>
<td>1.54%</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>24.62%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Factor</th>
<th>Total No.</th>
<th>No. undergoing Amputation</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neuropathy</td>
<td>39</td>
<td>13</td>
<td>33.33%</td>
</tr>
<tr>
<td>Vasculopathy</td>
<td>27</td>
<td>13</td>
<td>48.15%</td>
</tr>
</tbody>
</table>

**WAGNER Grade**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Total No.</th>
<th>No. undergoing Amputation</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>II</td>
<td>16</td>
<td>1</td>
<td>6.25%</td>
</tr>
<tr>
<td>III</td>
<td>29</td>
<td>2</td>
<td>6.90%</td>
</tr>
<tr>
<td>IV</td>
<td>15</td>
<td>15</td>
<td>100.00%</td>
</tr>
<tr>
<td>V</td>
<td>5</td>
<td>5</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

**Wound site infections with**

<table>
<thead>
<tr>
<th>Bacterial isolates</th>
<th>Total No.</th>
<th>No. undergoing Amputation</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staphylococcus aureus</td>
<td>24</td>
<td>3</td>
<td>12.50%</td>
</tr>
<tr>
<td><em>Pseudomonas aeruginosa</em></td>
<td>6</td>
<td>2</td>
<td>33.33%</td>
</tr>
<tr>
<td>Klebsiella pneumonia</td>
<td>9</td>
<td>4</td>
<td>44.44%</td>
</tr>
<tr>
<td>Streptococcus pyogenes</td>
<td>12</td>
<td>7</td>
<td>58.33%</td>
</tr>
<tr>
<td>Proteus mirabilis</td>
<td>7</td>
<td>7</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

11. **Association of Amputation and Comorbid Conditions**: It was observed that amputation was performed in all the patients with Wagner grade IV and V ulcers, while it occurred in 48.15% patients with vasculopathy and 33.33% patients with neuropathy. It was also observed that in those patients with proteus infection, amputation had to be performed in 100% patients.
12. **Resistance Pattern:** Resistance pattern of the gram positive organisms was as shown in the table 12. No resistance was observed to vancomycin and linezolid.

**Table 5: Resistance pattern seen in organisms that are gram positive.**

<table>
<thead>
<tr>
<th></th>
<th>Staphylococcus Aureus (n=20)</th>
<th>Streptococcus pyogenes (n=16)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Methicillin</td>
<td>10</td>
<td>50.00%</td>
</tr>
<tr>
<td>Gentamycin</td>
<td>9</td>
<td>45.00%</td>
</tr>
<tr>
<td>Amikacin</td>
<td>17</td>
<td>85.00%</td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>13</td>
<td>65.00%</td>
</tr>
<tr>
<td>Amoxy/clav</td>
<td>17</td>
<td>85.00%</td>
</tr>
<tr>
<td>Cotrimoxazole</td>
<td>19</td>
<td>95.00%</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>14</td>
<td>70.00%</td>
</tr>
<tr>
<td>Ampicillin</td>
<td>19</td>
<td>95.00%</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>19</td>
<td>95.00%</td>
</tr>
<tr>
<td>Clindamycin</td>
<td>4</td>
<td>20.00%</td>
</tr>
<tr>
<td>Erythromycin</td>
<td>8</td>
<td>40.00%</td>
</tr>
<tr>
<td>Vancomycin</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>Linezolid</td>
<td>0</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

Resistance pattern of the gram negative organisms was as shown in the table 13. No resistance was observed to Piperacillin+tazobactum, Imipenem and Meropenem.

**Table 6: Resistance pattern of the gram negative organisms**

<table>
<thead>
<tr>
<th></th>
<th>Klebsiella pneumonia</th>
<th>Pseudomonas</th>
<th>Proteus</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Gentamycin</td>
<td>7</td>
<td>78%</td>
<td>3</td>
</tr>
<tr>
<td>Amikacin</td>
<td>5</td>
<td>56%</td>
<td>3</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>5</td>
<td>56%</td>
<td>5</td>
</tr>
<tr>
<td>Ampicillin+ Clavulanic acid</td>
<td>7</td>
<td>78%</td>
<td>2</td>
</tr>
<tr>
<td>Sulphomethoxazole/Trimethoprim</td>
<td>3</td>
<td>33%</td>
<td>3</td>
</tr>
<tr>
<td>Piperacillin+tazobactum</td>
<td>0</td>
<td>0%</td>
<td>0</td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>6</td>
<td>67%</td>
<td>5</td>
</tr>
<tr>
<td>Ceftazidime</td>
<td>4</td>
<td>44%</td>
<td>5</td>
</tr>
<tr>
<td>Imipenem</td>
<td>0</td>
<td>0%</td>
<td>0</td>
</tr>
<tr>
<td>Meropenem</td>
<td>0</td>
<td>0%</td>
<td>0</td>
</tr>
</tbody>
</table>

**Ethics Committee Aprocal:** Yes form Sviec

**Source of Funding:** Nil

**Conflict of Interest:** Nil

**Conclusion**

Diabetic foot ulcers pose a significant burden on the patients and on the health care system. The cost of disability, loss of work and lower extremity amputation extends beyond the economic impact, with regards to patient quality of life.

Proper management of diabetic infections requires appropriate antibiotic selection based on culture and antimicrobial susceptibility results; however, initial
management comprises empirical antimicrobial therapy, which is often based on susceptibility data extrapolated from studies performed on general clinical isolates.

References

Human Cytomegalovirus Infection as a Risk Factor for Type 2 Diabetes Mellitus Development in a Sample of Iraqi Patients

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¹Scholar Researchers, Biology Department College of Science, University of Baghdad, Iraq

Abstract

Type 2 diabetes mellitus which abbreviate as T2DM is a complex endocrine and metabolic disorder arising from genetic and environmental factors interaction which in turn induce various degrees of insulin functional alteration on peripheral tissues. Globally, T2DM has develop into a public health problem. Therefore, The study included (75) patients(37 female and 38 males) suffering from T2DM who visit al-kadhimiya teaching hospital with age range 20-80 years and (70) as healthy controls with age range 20-70 years. All studied groups were evaluated CMV IgG by ELISA,B. urea, S. Creatinine, cholesterol and triglyceride the results showed that B.urea, S.creatinine and serum cholesterol showed a non-significant differences between studied group, While there was significant differences in concentration of triglyceride between both studied group. The seropositivity of CMV IgG was 62(82.87%) in T2DM patients with significant differences in compare to control.

Keyword: Type 2 Diabetes mellites, viral infection and Cytomegalovirus infection.

Introduction

The term T2DM derives from lack of the body ability to effectively use of insulin (¹). The risk factors for T2DM are genetic, obesity, family history for disease, sedentary lifestyle,ethnicity and other (²). On the other hand, Environmental influences may also contribute in T2DM development and progression(¹,²). Moreover, T2DM consider as a low grade chronic inflammatory disorder with differences in function of immune cells(³–⁵). The duration of diabetes is one of the strongest determinants of complication risk so, there was a positive correlation between FBS and duration of diabetes(⁶,⁷). There is some proofs refer that chronic viral infections such as hepatitis B and HIV can increase susceptibility to chronic inflammation and immuno-metabolic responses and this result in T2DM development. The association between viral infection and diabetes may reflect an increased risk of pathogenic mechanism for some chronic viruses such as HBV and HIV, resulting in insulin resistance linked to chronic inflammation (⁸). Some research also indicates that T2DM patients are more susceptible to incidence of viral infection since diabetes affects healing. Moreover, hyperglycemia frequently impairs coagulation, fibrin action, body fat and endothelium function (⁹). Cytomegalovirus like EBV since both of them belong to Herpes family can trigger autoimmunity and chronic inflammation (¹⁰). The outstanding feature of latency for CMV caused unusual expansion of the CMV-specific resting effector population of memoryCD8 + T cell and thus leads to developed chronic inflammation and disturbed the host immune mechanisms(¹¹–¹³).

Materials and Method

Samples Investigated: A total sample of (145) Iraqi volunteers (75 T2DM patients: 38 males and 37 females compared to 70 healthy control individuals: 35 females and 35 males) were enrolled in a case-control investigation during the period from November 2019 to February 2020 after obtaining the approval of Ethical Committee at the University of Baghdad, College of Sciences, Biology Department and the Iraqi Ministry of Health. The written informed consent was possessed by all volunteers. The study was accomplished in accordance with the Ethics Code of the World Medical...
Detection of CMV IgG Antibody by ELISA:
The detection of CMV IgG class of Ab in serum of human is relied on the technique of ELISA according to manufacture company human Germany.

Statistical Analysis: The data of CMV IgG serum level, age, gender, blood urea, S.creatinine, cholesterol and s. TG was analyzed for linearity, homogeneity and normal distribution using IBM SPSS statistical package version 26.0 (IBM Corp. Released 2019). The mean, standard error and the probability were calculated to determine the statistically significant differences.

Results and Discussion
One hundred forty five volunteers were incorporated in this study included seventy five T2DM patients and seventy healthy individuals considered as control group. Diabetic patients group included 38 males and 37 females’ patients who were already diagnosed by laboratory test (FBS). In contrast, control group included 35 males and 35 females’ participant. The present results showed a non-significant difference between T2DM group age mean and controls (Table 1). Also, the current study included T2DM patients with age range 20 – 80 years, the highest age group was at the 41 – 50 years age group (34.55%), followed by 51 – 60 years age group (29.1%). While the lowest age group was at 20 – 30 years (3.6%).

Table 1: Demographic aspects data of T2DM patients and control groups

<table>
<thead>
<tr>
<th>Demographic</th>
<th>T2DM group (n= 75)</th>
<th>Control group (n= 70)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Mean±SE Years)</td>
<td>52.30±1.60</td>
<td>48.88±0.64</td>
<td>0.08</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>38</td>
<td>35 (50.0)</td>
<td>1.0</td>
</tr>
<tr>
<td>Female</td>
<td>37</td>
<td>35 (50.0)</td>
<td></td>
</tr>
</tbody>
</table>

These findings were in agreement with another previous study that reported that T2DM can be detected at all age groups, So T2DM, diagnosed previously in adults, now impacts children and teenagers \(^{(14,15)}\). In contrast, some studies found an inverse relationship between age of onset of T2DM with complication risk and mortality\(^{(16,17)}\).

The reasons for age participation in Diabetes have been reported in many studies as by Maedler et al. stated that aging of human pancreatic islets is correlated with decreased proliferation and increased susceptibility to hyperglycemia-induced apoptosis, this represent one explanation for age involvement in diabetes elicition\(^{(18)}\). In respect to the gender the current study suggest that there is non-significant (P > 0.05) differences found between the two groups concerning samples distribution according the gender as shown in the table (1). The number and percentage of the female were 37, 49.1% in the patients compared with that in control 35, 50%; while of the male were 38,50.6% in the patients compared with that was in control 35, 50%. The result of this study that infer non-significant differences in gender distribution was in agreement with some studies in this domain that refer to” male and female have similar diabetes prevalence biologically”\(^{(19)}\). One of explanation for this similarity in overall prevalence in both sex that in T2DM, the deficiency of insulin sensitivity and insulin secretion is significant and identical in both gender\(^{(20)}\).

With respect for investigating kidney function in diabetic patients through determining of B. urea and S. creatinin shown in table (2) and according results of this present study there is a non-significant increase was found in levels of B.urea between two studied groups (T2 DM patients 32.10 ± 1.60control 28.52 ± 0.84). On the other hand, there is a significant differences in level of S. Creatinine between both groups (patients 0.85 ± 0.04 and control 0.71 ± 0.02), although both groups within the normal range of creatinine.
Table (2): Urea and Creatinine levels distribution among the studied groups

<table>
<thead>
<tr>
<th>Renal test</th>
<th>T2DM group (n= 75)</th>
<th>Control group (n= 70)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burea</td>
<td>32.10 ± 1.60</td>
<td>28.52 ± 0.84</td>
<td>0.057</td>
</tr>
<tr>
<td>Creatinin</td>
<td>0.85 ± 0.04</td>
<td>0.71 ± 0.02</td>
<td>0.008</td>
</tr>
</tbody>
</table>

The present study results which concern with the levels of urea was agreed and disagreed with some previous studies. Disagreed studies state that HbA1c and urea were elevated notably in T2DM patients compared to the control (21–23). Another study reported that there was a strong correlation between F.B.S, postprandial blood sugar level and HbA1c in diabetic patients and urea level(21). The covariance results of our study may be explained by Pathan et al finding who indicates that the period of initiation of T2DM and its severity is strongly associated with an imbalance in serum urea levels, but this state is not similar in case of serum creatinine(24).

With respect to serum creatinine although the control group had a higher values than patients but both group result might be with normal range (below 1.2 mg/ dl). A weaker correlation between hyperglycemia and serum creatinine levels was shown according to(22).

Table (4): Cholesterol and Triglyceride levels distribution among the studied groups

<table>
<thead>
<tr>
<th>Serum lipid</th>
<th>T2DM group (n= 75)</th>
<th>Control group (n= 70)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cholesterol</td>
<td>190.84 ± 7.20</td>
<td>193.34 ± 2.80</td>
<td>0.755</td>
</tr>
<tr>
<td>Triglyceride</td>
<td>238.62 ± 19.62</td>
<td>96.67 ± 1.40</td>
<td>4.72 x 10^-10</td>
</tr>
</tbody>
</table>

In recent decades, the mean triglyceride was risen in line with the growing epidemic of diabetes mellitus and obesity, but the mean levels of cholesterol in America was reduced(27,28).

Previous studies have indicated that serum triglyceride are positively correlated with diabetes(29,30) since abdominal obesity releases unhealthy free F.A. which are transported to the liver and pancreas contribute to insulin signaling response inhibition or insulin resistance(31).

Less data is available on the relationship between total cholesterol and diabetes. Some studies found that people with abdominal obesity, who respond abnormally to 2 h PG, associated with high total cholesterol since total cholesterol will increase the dimerization of the endothelial nitric oxide -synthase enzyme, which decreases the activity of glucokinase and thus decreases the glucose intra-cytoplasmic metabolism(32).

In addition to what was mentioned previously, CMV IgG serum level around 82.67 % of T2DM patients are positive for anti-CMV IgG antibody, while only 31.43% of control are recorded seropositivity for this viral infection, so this difference was high significant \( p < 0.01 \), as shown in figure (1).

The findings of this study suggest that anti-CMV IgG antibody may be involved in aetiopathogenesis of T2DM and these results are consistent with other studies in this field. One of these studies that reported by Schmidt et al. who indicates that among those who were cytomegalovirus-seropositive, T2DM crude odds were 47 percent higher than cytomegalovirus-seronegative, after adjusting of age and other factors, the correlation...
was greatly reduced and no longer significant, so the correlation between CMV and T2DM is clarified by age and other diabetes risk factors (33).

More frequently, nucleic acids of CMV have been found in diabetic people arterial walls relative to those without diabetes(34). In the pancreata of individuals with T2DM, CMV-RNA has also been identified by(35); However, it is unknown if the pancreatic CMV virus directly affects beta cells and impairs the release of insulin, causing diabetes, or if T2DM patients are a great extent susceptible to CMV infection(35,36).

![Figure (1): Anti-CMV antibody (IgG) in T2DM group compared to healthy control group](image)

Another potential mechanism that support finding of current study in relation to T2DM elicitation by CMV assumes that the molecules used in the structure of the envelope, such as viperin, which is necessary for extracellular budding and complete CMV virion shedding, could modify the pathways of lipid and glucose metabolism (37).

But our study has some limitation like smallest sample size, difficulty for determining if the CMV infection proceed diabetes onest or the diabetic patients are more susceptible for CMV infection because IgG does not show at what time the infection occurred (before or after the emergence of T2DM), but rather demonstrates that an infection occurred at a certain stage in the lifetime of a person(33).

**Conclusion**

The viral infection especially CMV infection may have a risk role in etiopathogenesis of T2DM.

**Conflict of Interest:** None

**Funding:** Self

**Ethical Clearance:** Not required
References


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Relationship between Socio-Economic Aspects and Education Level of Group Ages 18-25 towards Teeth-Brushing Habit

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Abstract

Background: Dental and oral health problems in the community can arise due to behavioral factors or attitudes ignoring oral and dental hygiene. The level of education and the factors that affect children’s own dental health have been presented in various studies.

Objective: To analyze the relationship between socio-economic aspects and the level of education of people aged 18-25 years towards the habit of brushing teeth in the city of Surabaya.

Method: This type of research is an observational analytic study with a design using a cross sectional study approach. In this study, related data were collected regarding the relationship between education and socioeconomic levels of the age range of 18-25 years on the habit of brushing properly taken at the same time.

Results: There was no significant relationship between education and socio-economic level with the habit of brushing teeth.

Conclusion: It was concluded that there was no significant relationship between education level with the habit of brushing teeth and the relationship of socioeconomic level with the habit of brushing teeth.

Keywords: Education, Socio-economy, teeth-brushing habit.

Introduction

Oral health is important for general health and quality of life. A healthy mouth condition is free from throat cancer, mouth infections and wounds, gum disease, tooth decay, tooth loss, and other illnesses, which can cause limiting disorders in biting, chewing, smiling, talking, and psychosocial well-being. Dental health is part of oral health, which is important. Dental caries is one of the dental health disorders. Dental caries are formed due to the presence of food scraps attached to the teeth, which then causes a decrease in tooth mineral. As a result, teeth become porous, hollow, even broken. Dental caries causes a decrease in the chewing power and disruption of digestion, which indirectly results in a child’s growth is less than optimal.

Behavior Maintaining health Oral cavity, one of which is done by regularly brushing teeth and choosing the right toothbrush. Brushing teeth is the most important thing to maintain oral health. Brushing teeth must be accustomed since childhood. The recommended method for brushing teeth is the bass method, which is by tilting the toothbrush 45 degrees brushed from the
direction the tooth root touches the edge of the gum. The toothbrush is moved back and forth within 15 seconds. In the posterior teeth, the tooth surface is brushed in the vertical direction. In addition to paying attention to how to brush your teeth, the selection of toothbrushes and toothpaste must also be considered. The shape of the toothbrush must have a surface of the bristles having a length of 2.5-3 mm and a width of 8-9.5 mm and the brush bristles evenly cut. After each use, the toothbrush must be washed with water so that no food remains are left behind. Toothbrushes must also be replaced 2-3 months.

Oral hygiene has been applied since ancient times, but brushing teeth is only done in modern times. Nowadays, various oral care products have been introduced to the public. This shows how important it is to maintain oral health. Brushing teeth has the effect of removing dental plaque in varying degrees according to the characteristics of the duration of toothbrushes and brushing. Brushing teeth can also alleviate certain oral diseases, such as periodontitis and caries, which are considered to be a public health problem.

Knowledge, attitudes, and actions of the mother will determine the dental and oral health status of children later. Parents must know how to care for their children’s teeth and must be able to teach their children how to maintain good dental health. Many parents still assume that baby teeth are only temporary and will be replaced by permanent teeth. So parents often assume that damage to baby teeth caused by poor oral hygiene is not a problem.

Based on data from the Indonesia Basic Health Survey 2018, it states that the proportion of dental and mouth problems is 57.6% and only 10.2% receive services from dental medical personnel. The percentage of people who have the right brushing behavior is only 2.8%. Dental health problems that commonly occur in Indonesia is dental caries. The treatment needed to solve these dental health problems requires high costs. Therefore, it is necessary to prevent prophylaxis against diseases of the teeth, one of which is to brush teeth properly regularly. Dental and oral health problems in the community can arise due to behavioral factors or attitudes ignoring dental and oral hygiene. There is a relationship between the level of educational background with one’s knowledge of how to brush teeth properly. The level of education and the factors that affect children’s dental health have been presented in various studies. On the other hand, similar studies have not been done in adults. With this phenomenon, the researcher aims to conduct research to determine the relationship between social economic aspects and the level of public education on knowledge about how to brush teeth properly. And to predict the relationship, researchers used sample data from Surabaya residents.

**Method**

This study was a cross-sectional observational analytic study with a research instrument in the form of a questionnaire. The sample used was 118 related to good tooth brushing habits. Analysis of the data used in this study is Bivariant Correlation with the Spearman Correlation test.

**Results**

Table 1: Teeth-brushing habit

<table>
<thead>
<tr>
<th>No.</th>
<th>Status</th>
<th>Number of Respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Good</td>
<td>104</td>
<td>88.1%</td>
</tr>
<tr>
<td>2.</td>
<td>Well</td>
<td>14</td>
<td>11.9%</td>
</tr>
<tr>
<td>3.</td>
<td>Poor</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

Table 2: Characteristics of Respondents and analysis of the relationship between educational level and social aspects with the habit of brushing teeth

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>Percentage</th>
<th>P-Value</th>
<th>Correlation Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational Background</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary School</td>
<td>0</td>
<td>0%</td>
<td>0.296</td>
<td>-0.097</td>
</tr>
<tr>
<td>Junior High School</td>
<td>0</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senior High School</td>
<td>91</td>
<td>77.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor</td>
<td>27</td>
<td>22.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Socio-economy aspect</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>93</td>
<td>78.8%</td>
<td>0.768</td>
<td>0.027</td>
</tr>
<tr>
<td>Moderate</td>
<td>15</td>
<td>12.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>10</td>
<td>8.5%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Based on the characteristics of “Educational background” shown in table 2, it can be seen that the respondents with the last elementary and junior high school education are 0 people with a percentage of 0%. Respondents with the most recent high school education were 91 people with a percentage of 77.1%, and respondents with the most recent Bachelor/diploma education were 27 people with a percentage of 22.9%.

Based on socio-economic characteristics based on the average salary received by respondents in table 2, it appears that respondents with low socio-economic status are 93 people with a percentage of 78.8%, respondents with Medium socio-economic status are 15 people with a percentage of 12.7%, and respondents with high socio-economic status as many as 10 people with a percentage of 8.5%.

Based on the table above, it can be concluded that there is no significant relationship between the level of education and the habit of brushing because Sig. 0.296, where the value is more than 0.05. Similarly, the relationship between the socio-economic level and the habit of brushing teeth has a Sig value of 0.769.

Discussion
This research was carried out around the area of Universitas Airlangga, Surabaya, East Java. This research was conducted by the method of distributing online questionnaires through social media platforms. The results of the questionnaire as many as 118 respondents were dominated by adolescents with educational background at the high school level.

The results of this study indicate that there is no significant relationship between the level of education and socio-economics with the habit of brushing teeth in people aged 18–25 years in Surabaya. These results were obtained from the analysis of the data we did using a questionnaire distributed to random samples in the Surabaya area. The results showed that 88.1% of adolescents aged 18–25 years in the Surabaya area answered the questionnaire well. The insignificant result was due to the possibility that most of the samples were taken from adolescents living in urban areas especially in the East Java area of Surabaya, with most of their socioeconomic status and high level of education and anything easily accessible.

This study shows that the high socioeconomic figures in urban areas are far higher when compared to remote areas. The higher the socioeconomic level of the community, the higher the level of education of the community, conversely if the socioeconomic level of the community is low, the lower the level of education taken14. Therefore, it can also be concluded that the level of education in urban areas has begun to be evenly distributed so that an increase in the level of socio-economics and with the presence of such education the level of knowledge is also increasing15. Public awareness will also maintain oral hygiene by brushing teeth properly and has been implemented well.

Conclusion
Based on research conducted with 118 samples ranging in age from 18-25 years in the area around Campus A, B, and C of Universitas Airlangga, Surabaya, it was concluded that there was no significant relationship between education level with toothbrushing habits as well as the relationship between socioeconomic levels and habits brushing teeth.

Conflicts of Interest: There are no conflicts of interest.

Source of Funding: Self-Funding

Ethical Clearance: Approved

References


Physical Activity and Emotional Status of College Students and Working Sector on 1 Month Lockdown

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Abstract

Introduction: Due to COVID-19 pandemic outbreak, a lot of countries are under lockdown for more than 30 days. The study is about the physical activity and emotional status of college students and the working sector for 1 month lockdown.

Aim: To check the physical and emotional status of college students and in the working sector, while the response is either positive or negative towards the health concern.

Method: A web survey was used which is based on IPAQ and PERS scales by 150 candidates.

Result: IPAQ show the physical activity perform by the 150 candidates where the maximum candidate was of low activity and PERS shows the positive and negative reactivity of the candidates where the negative reactivity was high than positive reactivity.

Conclusion: The low physical activity stimulates the negative reactivity.

Keywords: COVID-19, IPAQ AND PERS, Physical and Emotional Status.

Introduction:

As the COVID-19 has a globally pandemic effect on whole globalization. Due to which the people have to be quarantined from more than 30 days for the welfare of each person who can be treated from COVID-19. This lockdown will help to locate the people who are being symptomatic with COVID-19 and are not yet located or reported. Therefore the lockdown has an effect on one’s human body in many ways and the two factors which are more affected are physical and emotional factors. Human existence is possible if there is correlation between the neurobiological and integration of movement for the proper function of the human body and to balance this equation movement and mental health plays an important role. Due to restrictions for COVID-19 there is a great impact on the physical activity which is not properly followed by college students and the workplace. BECAUSE these two sectors are the most active groups of the society which perform vigorous to moderate types activity. The sudden lockdown may associate with sudden physical inactivity which further associate with insulin resistance in muscle tissue and even there is an decreased glucose utilization in muscle which further cause the muscle atrophy. Therefore the sudden cessation of physical inactivity can also cause the decrease in the rate of blood flow back to the heart and reduced the coronary blood pressure.

The World Health Organization (WHO) has provided some information to follow over the physical activity during this lockdown which is essential as well
as beneficial for each of us for the proper functioning of the body and even for the balance of adequate health.

The guidelines are such that an individual should engage at least

(a) 150 min/week on moderate intensity physical activity
(b) 75 min/week on vigorous/high intensity physical activity
(c) or, the combination of both moderate-vigorous/high physical activity².

DUE to prolonged time of lockdown the physical inactivity also affects the bone and joint health due to inadequate stimulation in muscles⁷. The doctors say that with such a long time period of lockdown will not only affect the physical activity but also overall and general health in mainly patients like diabetes and hypertension will also have an affect on mental status⁸. Physical inactivity also affects the mental health which can be examined by unpleasant emotions such as anger, fear, sadness, happiness, frustration, irritation etc. Psychological disorders like post traumatic stress, post traumatic depression and post traumatic confusion among people was followed by the author’s like Brooks³. The impact on emotional inactivity is much depress by the anxiety among people in days of lockdown⁶. Reports of China, about the psychological health of people over there cause fear-anxiety, increased domestic violence and babies being abandoned⁸. The effect of lockdown on mental stability is they have fear of spreading virus, about the family welfare, phobias and anxiety are prioritizing the current situation⁸. The lockdown is not providing the platform to meet loved ones with each other which is also the major cause of depression⁷. The news that are occurring can cause more anxiety and stress on people during

lockdown⁷. The alcohol consumption in this lockdown is increased due to stress and certain emotions that emerging within individuals⁷. The lockdown period is such an emotional phase for each one due to which there is an intense fear among the people which causes them panic attacks on future delaying, the health status of one wellbeing [7]. As the habit of working either physically or mentally during not lockdown or simple routine lifestyle caught into the trap of COVID-19 in bad terms. The impact of covid-19 for one month lockdown creates an impact on physical health, mental health as well as life satisfaction which is supported by Dr. ZHANG⁹. Work helps people in their wellbeing, in their state of mind through the daily routine, through some hopes and purpose in life⁹. Reports claim that during this lockdown if the sedentary lifestyle of youth is increased more than demand will be a major cause of depression and anxiety¹⁰. The impact of covid-19 is directly affecting the financial income of employees⁸. The sector are allowed to work through telecommunication². To work on these two sector with two factors. the scales are used for further reports. The scale which is used is IPAQ scale international physical activity questionnaire. the scale is used to measure the activity related that is perform within population¹¹. The scale consist of two types of activity

(a) Vigorous type activity
(b) Moderate type activity
(c) No activity

That a person does in their routine for the last 7 days. The other scale which is used to measure the emotional events during this lockdown is by PERS scale (Perth Emotional Reactivity Scale). The scale has several measurements which depend on one’s response that are based on activation, intensity, and duration questionnaire that are proposed in two ways positive and negative. The purpose of the topic is to find out the physical activity and emotional status on the college student as well as on the working sector during this one month lockdown⁶.

Method

Description: During this pandemic outbreak of covid-19. The college and all the working

The sector is locked down under the government orders. The proverb is “Prevention is better than cure” during this locked down how the physical and emotional inactivity is analyzed between these two sectors where the data is collected on the basis of web surveys.

Study Population: The population which is taken in this web survey was the population of college students and the working sector. The survey is based on physical inactivity and emotional inactivity on the population during a one month lockdown. There are 150 individuals which based their answers through the questionnaire survey.

Survey Instrument: The web survey was based on the multiple choice questions, it took approximately 10 minutes to complete the survey. The two different scales
are used for two different factors, questions explored the following:-

(a) The knowledge or concern of physical inactivity among individuals
(b) The stability of emotional status among the two sectors
(c) The impact of lockdown is positive or negative in context of physical and emotional health.

The impact of physical inactivity is checked by the IPAQ scale ‘International physical activity questionnaire’ where the questionnaire is based on 2 types of activity, vigorous activity and moderate activity in the last 7 days which is done between the age of 15-69\(^\text{12}\). The impact of emotional inactivity is checked by the PERS scale ‘Perth emotional reactivity scale’ is the questionnaire to measure the reactions of emotions at emotional events. The scale has several measurements which depend on one’s response that are based on activation, intensity, and duration questionnaire that are proposed in two ways positive and negative\(^\text{13}\).

**Statistical Analysis:** The collection of data is based on a web survey questionnaire which is formed in Google forms.

The survey consists of questionnaires which are of physical activity and emotional status.

**Physical Activity:** The physical activity data is based on the components that is determined by the IPAQ scale. The components are:

(a) No activity.
(b) Mild/low activity.
(c) Moderate activity.
(d) Vigorous/high activity.

The components give the detailed general analysis of hours and minutes that is collected by 150 respondents according to activity they performed during 1 month lockdown.

(a) **No activity:** the no activity includes (sitting for long hours). The data shows 44.2% responders sits for within 6 hours while 2.4% sits above 18 hours.
(b) **Mild activity:** The mild activity includes the activity of walking, the data and analysis represents the days, hours and minutes by the sectors(working sector and college students).

(c) **Moderate Activity:** Moderate activities refer to activities that where the oxygen uptake is moderate higher than the normal. The examples of moderate activities are carrying little loads, bicycling at a pace, or play doubles tennis which does not include walking. Therefore the data that is collected is based on the days/week, hours an minutes/day.

(d) **Vigorous/High activity:** Vigorous physical activities refer to activities that where the oxygen uptake is vigorously higher than the normal and heart cardiac output is obtained. The activities include heavy weight lifting, aerobics exercises or regime, bicycling at high pace. Therefore, the data that is collected is based on the days/week hours and minutes/day.

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Low (Frequency)</th>
<th>Moderate (Frequency)</th>
<th>High (Frequency)</th>
</tr>
</thead>
<tbody>
<tr>
<td>19-25</td>
<td>44</td>
<td>49</td>
<td>28</td>
</tr>
<tr>
<td>26-31</td>
<td>11</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>32-38</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>38-44</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>45-51</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

The low activity is slightly increased as compared to moderate activity .Therefore, the high/intense activity is decreased compared to both activity (moderate and low).

Mean & Standard deviation of low, moderate & high activity was 1547.24 & standard deviation was 1728.37

**Emotional Status:** The emotional status is measured by the PERS questionnaire; the questionnaire is based on the scale that has several measurements which depend on one’s response that are based on activation, intensity, and duration questionnaire that are proposed in two ways positive and negative.

The data is based on the negative (activation, intensity, duration) as well as on the positive (activation, intensity, duration).

- **Negative activation:** The negative activation is noted or determined when there are terms which are used like (upset, disappointed, frustrated, and negative.)
- **Negative Intensity:** The negative intensity is noted or determined when there are terms which are used like, upset, frustration, unhappy...
• Negative duration: the negative duration is noted or determined when there are terms which are used like, upset, anger, frustration, negative mood, and annoyed.

**Distribution of negative reactivity:** The mean value of negative reactivity was 2247 & standard deviation for the negative reactivity was 113.859 (overall composite score) 150 n numbers who had participated in the study
• Positive activation: The positive activation is noted or determined when there are terms which are used like, happy, positive, enthusiastic, good news
• Positive intensity: The positive intensity is noted or determined when there are terms which are used like, happiness, joyful, positive moods
• Positive duration: the positive duration is noted or determined when there are terms which are used like, happy, feeling positive, enthusiastic, pleasant news, paying compliments.

**Distribution of positive reactivity:** The mean value of positive reactivity was 2187.33 and standard deviation of positive reactivity was 7.50. N=150 who had participated in the study

**Count on for negativity vrs. positive reactivity:** It shows that count on for negative verses positive reactivity shows that overall negative reactivity is higher than the positive reactivity.

**Result**
1. The low activity is slightly increased as compared to moderate activity.
2. The negative reactivity is higher than positive reactivity from the data that is collected.
3. The intense or moderate activity performed is less than the low activity or no activity

**Discussion**

The lockdown in COVID-19 is the pandemic effect of the 21st century.

The effect of this pandemic outbreak is currently a point of discussion or a burning issue within the whole

Globalization, the scales which are used for determining the analysis for 'physical activity and emotional status’ that proposes the certain answers. The vigorous physical activity which is proposed by WHO is quite 75min/week². Therefore the data which is collected in this project determines that less than 30% of respondents have worked vigorously. The moderate physical activity which is proposed by WHO is quite

150min/week². The respondents that worked moderately physical activity are 42.8%. As the physical inactivity can cause 17% lower risk to heart, 95% confidence interval. Cardiovascular mortality can risk upto 23% and type2 diabetes can be risked upto 26% according to WHO. There should be allowance of physical outdoor activities like running, walking or any other sports where there is an adequate amount of social distance is maintained where the pandemic covid-19 lockdown causes the consequences of cardiovascular diseases².

“With about five million dead, lack of exercise is the fourth most frequent cause of death globally in 2017”¹. To check such data the ‘no activity’ analysis is a perfect response which determines that 80.3% of respondents have done no activity from the last 7 days except sitting where the data intensifies 8 hours sitting.

The sector (college student and working sector) is the age of active stage, hence, the fact is that 78% of young men and 84% of young girls are affected by the lack of exercise¹. As physical activity increases the immune system and reduces stress so the impact of physical activity is positive on each individual¹⁴. The consequences of homestay is no activity towards the healthy body are obesity, behavioral addictions disorders, exposure to sun is less (Vitamin D) and isolation from society¹⁰. The reductions in physical activity results in the emotional status which may be experienced such as negative or positive response according to events². Extended duration of indoor stay which cannot be avoided accompanied the binging time spent on watching television, playing games online through mobile and the break from socialization, that has worsen the behavioral (i.e. internet, screen, or television) addiction, disorders¹⁰. Longer the duration of lockdown increase in the PTSD symptoms¹⁴. The comparison of data with negative emotion with positive emotion. The scoring of negative emotions is well more than Positive emotions thought, physical activity affects the emotional reaction of an individual.

**Conclusion**

The resolving part is to check the physical activity
and emotional status of college students and working sector people in a 1 month lockdown. The results that we found are negative with relation to physical activity and also negative with emotional status. As the article suggests the lack of activity difference one’s mental or emotional ability. Though the data stand on this sentence. I would recommend that lack of physical activity not only affect the emotional status but also affect the cardiovascular activity, musculoskeletal activity, metabolic activity, hormonal activity. The research can further perform on old age and their physiology and psychology status. Within 1 month of span time of total lockdown in India. The data find out that there is a lot of variation in physical inactivity but not so much elevation disturbances in emotional status.

**Ethical Clearance:** It is the web survey study that is done in the institution (galgotias university) under the Department of Physiotherapy. This proposed project was placed before the Ethical Committee and has been approved as there is no objection to hold this project work.

**Conflict of Interest:** There is no conflict of interest of the author.

**Funding of the Research:** Self Funding.

**References:**


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Formulation Policy of Euthanasia Criminal Action in the Indonesian Criminal Law System

Jane Margaretha Handayani, Edy Lisdiyono, Bambang Joyo Supeno, Wahyu Satria Wana Putra Wijaya

Abstract

Introduction: Euthanasia is considered to be contradictory to the 1945 Constitution of the Republic of Indonesia, which is contained in Chapter XA, second amendment about human rights which are concerning about the right to live and the right to be protected. There are no specific laws and regulations which regulate Euthanasia in Indonesia; therefore, it is important to research the laws and regulations that have to possibility to regulate Euthanasia, especially in the Indonesian criminal law system at present time.

Purpose of Research: This research aims to acknowledge and analyze the Euthanasia criminal action formulation policy in the criminal law system at present time.

Research Methodology: This research is a normative juridical legal research with a statute approach.

Discussion: The practice of Euthanasia is prohibited by Article 344 of the Criminal Code; therefore, the regulations must be based on the court order, either the active Euthanasia which is stated real and sincere by the victim or the passive Euthanasia which is stated by other parties other than the victim.

Keywords: Formulation Policy; Criminal act; Euthanasia.

Introduction

Euthanasia is considered to be contradictory to the 1945 Constitution of the Republic of Indonesia, which is contained in Chapter XA, second amendment about human rights which give clarification and regulations that state every human being has the right to live and the right to be protected. Article 28A in the second amendment which states that “everyone has the right to live and the right to defend their life”, declares clearly that everyone has the right to live and to defend their life. In Article 281 paragraph (1) the second amendment emphasizes that “the right to life cannot be reduced into any form, and the right to live is also stated and regulated in Article 28J paragraph (1) in the second amendment which states that “everyone is obliged to respect the human rights of others in an orderly society, nation and state, including the right to life”.

Currently, the regulation concerning active euthanasia crime is regulated in Article 344 of the Criminal Code which is the act of taking the life of another person at their request which is expressed with sincerity. Article 11 Decree of the Executive Board of the Indonesian Doctors Association Number 11/ PB/A.4/02/2013 concerning the Application of the Indonesian Medical Code of Ethics, the Executive Board of the Indonesian Medical Association explained that every doctor is obliged to remember their obligation to protect other human beings’ lives because the doctor’s obligations are explained as the principle of “Aegrotisalus lex suprema”, which means patient’s safety is the highest or main law and the principle of “Sa science et sa conscience” also applies, which is science and conscience.

Law Number 36 of 2009 concerning Health does not explain Euthanasia, however it explains the definition

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of death which is stated in Article 117 concerning the
definition of death, which states that a person is declared
dead when the function of the heart and respiratory
system has stopped or the brain stem dies.

Based on these facts, Indonesia has not had the
regulations concerning passive euthanasia crime.
However, Indonesia is only using articles in the
Criminal Code as a reference for the punishment of the
perpetrators of the crime of euthanasia.

Several countries in the world have legalized the
crime of euthanasia, such as the Netherlands, Belgium,
and Switzerland, based on the laws of these countries
humans have the right to terminate their life or the right
to die. However, in Indonesia, this act is prohibited due
to several considerations, namely that it is not under
the formulation of articles in the Criminal Code and the
declare of the Indonesian Medical Oath. Therefore, it
is important to research euthanasia crime formulation
policies in the Indonesian criminal law system.

Based on the previous background, therefore the
purpose of this research is to acknowledge and analyze
the Euthanasia criminal action formulation policy in the
criminal law system at present time.

**Research Methodology**

This research is a normative juridical legal research
with a statute approach because it is conducted to
examine all the laws and regulations relevant to the
legal issues being handled, which in this case is the
issue of Euthanasia based on the policy formulation of
criminal law in Indonesia at this time.

**Discussion**

Terminologically, the word Euthanasia comes from
the Greek language, which is from the word “eu” which
means good without suffering, and “Thanatos” which
means death. Etymologically, euthanasia can be defined
as “good death”, meanwhile “ethanatos” (adjective)
means dead with ease. Euthanasia is broadly defined as
the practice of accelerating one’s death who is in pain
and suffering that cannot be healed.

In medieval times, it was emphasized that
euthanasia was a painless death. At the beginning of
the 20th century, euthanasia was under the influence
of Nationalist-Socialist politics where euthanasia
could be used as a legalized act of killing people who
were considered unworthy of life. In its development,
currently, the definition of euthanasia is narrowed down,
where the euthanasia action can only be carried out by
a doctor on the willingness of the patient concerned.

There are currently no new and complete regulations
in Indonesia regarding this euthanasia. However, because
the issue of Euthanasia concerns the safety of human life,
it is necessary to look for a regulation or article which is
at least relevant to the elements contained in the practice
of Euthanasia.

The practice of euthanasia is prohibited by Article
344 of the Criminal Code; therefore, the regulations must
be based on the court order, either the active Euthanasia
which is stated real and sincere by the victim or the
passive Euthanasia which is stated by other parties other
than the victim. In Article 344 of the Criminal Code,
it only regulates active Euthanasia, which is the victim
declares in a real and sincere manner to accelerate the
death of the victim and without force from any party.
As it is formulated as follows: “whoever takes the life
of another person at his request, which is clearly stated
with sincerity, shall be punished with a maximum
imprisonment of 12 (twelve) years”.

And the elements are as follows: the first is whoever.
The formulation of offense in regulations usually begins
with the words “whoever is”, the word “whoever”
cannot be interpreted other than “a person”. The element
“whoever” is subjected to anyone who is the legal
subject to whom that person can be accountable for the
committed act. According to Sudikno Mertokusumo:
A legal subject (Subjectum Juris) is anything that can
obtain, have or bear rights and obligations from the
law, which consists of persons (Natuurlijkeperson):
Legal entity (Rechtsperson); People in the conditions
of punishment must be in the elements of a criminal act
(strafbaarfeit), namely being able to take responsibility
and the existence of mistakes (culpa); Article 344 of the
Criminal Code as stated above explains that “whoever”
is a person who commits a criminal act, however Article
344 of the Criminal Code does not explain that a doctor
or medical officer has committed the crime of euthanasia.

The second element is taking other people’s lives, is
an objective element, namely the act of a person is the
connect point and basis of giving punishment. These
actions include doing and not doing, the act of taking
someone else’s life must cause the death of a person, a
dead person is someone else and not themselves. The act
of taking someone else’s life must fulfill the subjective
element of strafbaarfeit, that is, the action must be done wrongly. Death does not always occur immediately, but it may occur later. According to Article 117 of Law Number 36 of 2009 concerning Health, a person is declared dead if the function of the circulatory heart system and respiratory system is proven to have stopped permanently, or if the death of the brain stem has been proven.

The third element is the person’s intentional sincere request. Their request element is a request made by someone without forces from other parties aimed to make the perpetrator convinced to quickly do the practice that can finish their life. Sincerity here means that the request is continuously made by the victim by showing their intentions to convince the perpetrator. To decide that Euthanasia is a convictable practice, it must be proved to have material unlawfulness, which means not only contradicting to the applicable legislation but also contradicting to the customs. The practice of Euthanasia is highly disapproved by moral teachings as well as religion because it is only God who can decide whether someone should be alive or dead, not another man, even a doctor. The real motive of Euthanasia is “the feeling of giving up”. It is a disgraceful practice and it is prohibited by religious teachings, moreover if the feeling of giving up is expressed in a form of an action that may harm someone’s security and life.

The existence of the person’s request that is showed sincerely (Active Euthanasia) element is also found in the form of voluntary Euthanasia, therefore this type of Euthanasia can also be reached by Article 344 of the Criminal Code. The subject matter of Euthanasia, especially the active form, can also be related to suicide which is related to Article 345 of the Criminal Code, that is: “Any person who with deliberate intent instigates another to commit suicide, aids him thereby or provides him with the means thereto, shall, if the suicide ensues, be punished by a maximum imprisonment of four years.”

Article 345 of the Criminal Code implies meaning that even though not practicing active Euthanasia which according to most people is murder, helping or providing with the means towards it is going to be criminalized. The word ‘aids’ or ‘provides … with the means’ can be related to the intention to get Euthanasia. A patient or their family must be clueless about the ways to get rid of their sufferings. Medical and other health care workers know more about it if it is related to Euthanasia. In a condition where a patient’s health condition is becoming worse, a doctor will advise the patient’s family. The family chooses to take Euthanasia to solve the problem. The doctor agrees to the patient’s family’s request. What is done by the health care workers can be considered as a practice that ‘aids’ or ‘provides … with the means’. This regulation should be recognized by medical and health care workers because even though there are many reasons to help a patient in suffering, they are still going to face criminalization because of it.

Article 338 of the Criminal Code stated that “The person who with deliberate intent takes the life of another person, shall, being guilty of manslaughter, be punished by a maximum imprisonment of fifteen years.” Also, Article 340 of the Criminal Code stated that “The person who with deliberate intent and with premeditation takes the life of another person, shall, being guilty of murder, be punished by capital punishment of life imprisonment or a maximum imprisonment of twenty years.”

The main purpose of Euthanasia is to help to get rid of or to stop the suffering which according to the perpetrator there is no other way besides death. Knowing the purpose behind an action is very important, remembering the articles in the Criminal Code related to violence regarding wealth and life, mainly about abuse should be looked by the purpose of them. Even though a person is hurting others, if the real purpose is not to abuse them but for a good purpose such as when a doctor is taking a surgery for the patient or a teacher hits their students to educate them, it is not considered to be unlawful. Euthanasia in hospitals is clearly planned and it must have been through thorough consideration, and perhaps the person considering Euthanasia has been through some discussions with their friends.

In indirect active Euthanasia, a doctor whose main purpose is to relieve the patient’s suffering by injecting analgesic at high doses must already know that the high dose will kill the patient. This kind of Euthanasia is not an error, but rather an intention, remembering there are three types of intention: intention with purpose, intention with certain awareness, and legal intent.

Elisabeth Kubler-Ross in her book Questions and Answers on Death and Dying stated that some patients tend to commit suicide when facing the reality of dying. For these patients, if the nurse or the doctor gives them advice or suggestions leading to Euthanasia, they will tend to agree. In this case, health care workers are considered to help them commit suicide. Therefore, this
case applies Article 304 of the Criminal Code, which stated that “The person who deliberately brings or leaves someone, to whose sustenance, nursing or care he is obliged by the law applicable to him or under an agreement, in a helpless state, shall be punished by a maximum imprisonment of two years and eight months or a maximum fine of four thousand and five hundred rupiahs.”

The practice of passive Euthanasia can also be linked to this article, even for the case of when a very ill patient is forced to go home, which then is allowed by the doctor or usually called pseudo Euthanasia13. In this circumstance, the health care workers will say that they are respecting the patient’s rights, when in fact the one who knows more about the effect of the patient being sent home is the doctor. This condition can be relieved by doing at-home treatment. If this happens, it will be considered as passive Euthanasia or pseudo-Euthanasia and it means the patient is being left alone without care until the patient dies. This case will be charged with Article 304 of the Criminal Code, meanwhile for the case regarding the violation of someone in need of help will be charged with Article 531 of the Criminal Code stating “Any person who, witnessing the immediate danger of life that befalls another, fails to extend or provide the assistance which he is capable to extend or provide to him without reasonable danger for himself or another, shall be punished by a maximum light imprisonment of three months or a maximum fine of Rp 4,500”. If the death of the destitute person follows, charged with the Criminal Code 45, 165, 187, 304s, 478, 525, 566.

According to Hermien Hadafi Koeswadji, in the conclusion of his writing about Hospital Ethics and Laws for Hospital, law source for health and/or medical law is taken from written regulations, unwritten customs, permanent court judgments, and science doctrines or teachings14. A legal practitioner will face difficulty in analyzing law sources from medical science; therefore it is better if the legal practitioner is accompanied by a doctor in facing the work. For Euthanasia or malpractice by a doctor in Indonesia, it is not enough to regulate it based only on the Criminal Code, but many legal considerations are taken from science doctrines or teachings, including medical science.

**Conclusion**

Formulation policy of Euthanasia criminal action in the current Indonesian criminal law system is that the practice of Euthanasia is prohibited by Article 344 of the Criminal Code; therefore, the regulations must be based on the court order, either the active Euthanasia which is stated real and sincere by the victim or the passive Euthanasia which is stated by other parties other than the victim. Article 345 of the Criminal Code implies meaning that even though not practicing active Euthanasia which according to most people is murder, helping or providing with the means towards it is going to be criminalized. Regarding health care workers that are considered helping the patient to commit suicide will be charged with Article 304 of the Criminal Code, meanwhile, the case regarding the violation of someone in need of help will be charged with Article 531 of the Criminal Code.

**Ethical Clearance:** Yes.

**Conflict of Interest:** No

**Source of Funding:** Authors

**References**


Efficacy of Tongue Stimulation in Neurorehabilitation–A Narrative Review

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Abstract

Introduction: The tongue is being represented bilaterally in the motor homunculus of the brain. Tongue has been used as an effective interface to send signals to central nervous system. The purpose of this article is to review all articles related to tongue stimulation in neurological rehabilitation.

Method: All studies including case studies, cohort studies, experimental studies and reviews, which dealt with tongue stimulation in neurological conditions during the period between 2010 and 2020, were included in the study.

Results: Tongue Stimulation has been used effectively in rehabilitation for improving balance in patients with vestibular disorders, multiple sclerosis patients, spinal cord injury patients and stroke patients. Tongue Stimulation has also been used to improve motor recovery in stroke patients.

Conclusion: Tongue stimulation becomes a novel mode of stimulation in inducing neuroplasticity and can be used in wide variety of neurological patients. Further researches needs to be done on the effect of tongue stimulation on upper extremity rehabilitation in stroke patients.

Keywords: Hand Gesture, Speech, Tongue Movements.

Introduction

Tongue has been represented in both hemisphere and recovery of tongue in brain damaged patients is faster compared to limb recovery. This unique representation of the tongue has been used in various types of rehabilitation.

The purpose of this review is to review all articles which has dealt with tongue stimulation on neurological patients.

Method

Literature search for case studies, cohort studies, experimental trials and reviews on the tongue stimulation, hypoglossal stimulation and periglossal stimulation on neurological patients were performed in the following online databases: PubMed, EMBASE, The Cochrane Library, and Scopus. Three of the authors independently screened all papers titles and abstracts for relevance and reviewed by one reviewer.

Results

After appropriate screening, 11 articles published during the period between 2010 and 2020 have been taken for this review.

Wildenberg et al (2010) did a study on balance dysfunction of twelve patients and found that cranial nerve non-invasive neuromodulation involving tongue stimulation improved the balance of the patients by
increasing activity within the dorsal pons. Similar results were reported on nine balance impaired patients who were given tongue stimulation for 10 days and their sensory organization testing scores improved. 

Fourteen weeks of balance training along with tongue stimulation were given to twenty chronic multiple sclerosis patients and their dynamic gait index improved significantly. (Mitchell E Tyler et al, 2014).

In a study done by Brittany M. Young et al, sixteen subjects received up to 15 two-hour sessions of interventional therapy using an EEG-guided brain-computer interface (BCI) device, which incorporated visual display, tongue stimulation, and functional electrical stimulation as feedback. These BCI therapy sessions were scheduled over the course of up to 6 weeks with no more than three sessions per week. Functional MRI, Action Research Arm Test (ARAT), 9-Hole Peg Test (9-HPT), and Stroke Impact Scale (SIS) domains of Hand Function (HF) and Activities of Daily Living (ADL) were assessed before and after the therapy. The correlations noted between changes in functional (FC) measures and changes in behavioral outcomes indicate that both adaptive and maladaptive changes in FC may develop with this therapy. Similar results were found in nineteen stroke patients with upper extremity impairment.

Fourteen Multiple Sclerosis patients (7 in active tongue stimulation and 7 in sham stimulation group) received intensive physical therapy and working memory training for 14 weeks. Active group showed improvement in sensory organization testing scores. Results showed that tongue stimulation can enhance motor performance and working memory while also driving neuroplasticity. (Gabriel Leonard et al, 2017)

Rosaleena Mohanty et al (2018) did a study on twenty chronic-stage stroke subjects exhibiting persistent upper-extremity motor deficits and they were given intervention using a closed-loop neurofeedback BCI device for 3 weeks. Functional MRI, Action Research Arm Test, Nine-Hole Peg Test, and Barthel Index as well as subjective measures including the Stroke Impact Scale were assessed. Higher number of strengthening functional changes in comparison to the ones weakening between pre- and post-therapy in functional MRI suggests a greater overall positive impact of BCI intervention on stroke recovery at a whole-brain level.

Discussion
Tongue stimulation has been used in various patient categories with primarily sensory-driven balance deficits: people with vestibular loss, peripheral neuropathy, mild traumatic brain injury, and older adults, as well as people with stroke, Parkinson’s disease, and ataxia

Loss of motor function is a common deficit following brain insult and often manifests as persistent upper extremity (UE) disability which can affect a survivor’s ability to participate in activities of daily living.

Brain computer interface therapy has been developed in addition to tongue stimulation for improving motor functions in cerebrovascular accident patients.

Conclusion
Tongue Stimulation has been safely used in wide category of neurological as well as other non neurological patients. Further research can be done to find out the effect of tongue movement and/or stimulation in improving various motor deficits in stroke patients, creating new pathway for recovery.

Funding: This paper received no sources of funding or sponsorship and there is no financial disclosure.

Conflict of Interest: None declared

Acknowledgment: I have to thank my family and friends for supporting me to write this review article.

Ethical Clearance: This review has been done to support the experimental study which was approved by institutional ethics committee of Narayana Health.

References


Retrospective Study of Blood Transfusion Transmitted Infections (HIV, HCV, HBV, Syphilis & Malaria) among the Blood Donors in Dhiraj Hospital

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Abstract

A blood transfusion is a way of adding blood to your body after an illness or injury. It’s a kind of life saving procedure. But this procedure also has life threatening hazards. Transfusion transmitted infections are one of the major side effects of blood transfusion. We can prevent them by proper screening of blood products and public awareness. To know about trend of transfusion transmitted infections (TTI) for the blood donors of Dhiraj hospital blood bank, the study was done.

Method:
Study was done including blood donors of age 18-65 years from 2011 to 2016 retrospectively. TTIs testing for HIV, HBV and HCV was done with 3rd generation ELISA but from the year 2016 onwards 4th generation ELISA was used for HIV testing. Syphilis and malaria screening was done with rapid card test.

Result:
Over a six year period total blood donation was 20,392. The overall prevalence of HIV, HbsAg, HCV, syphilis and malaria were 0.16%, 1.43%, 0.10%, 0.61% and 0.009% respectively.

Conclusion:
Nucleic acid amplification testing (NAT) must be applied that identify positive blood donor during the immunological window period before seroconversion. Information to TTIs reactive donor is a best method to prevent the chance of repeated reactive donation.

Keywords: Blood donor, ELISA, NAT, Seroprevalance, TTI.

Introduction

Blood is a special form of natural fluid that is made & synthesized within the body and again used by the body for different bodily function. Despite all the medical advances, there is no good manmade substitute for human blood, which is why blood transfusion is still clinically important for human being. Blood transfusion is a unique technology in which its collection, processing and use are scientifically based. But its availability depends on the extraordinary generosity of the people who donate it.[1]

Blood banks are essential part of each and every hospital with basic purpose of provision of blood transfusion services. Blood transfusion services are required in a number of clinical conditions like...
anemia, thalasemia, hemophilia or may be required in gynecological problems or when surgery of the patient is unavoidable. Transfusion of blood/blood product becomes unavoidable if there is extensive bleeding during surgery. \[2\]

Large number of people are exposed to life - threatening risks of TTIs such as Hepatitis B, Hepatitis C, Malaria, Autoimmune deficiency virus infection and Syphilis due to transfusion of unsafe blood which can be avoidable. There is a challenge for safe transfusion, requiring the application of science & technology to blood processing & testing. \[1\]

The present study gives the idea about the current situation of transfusion transmission related infections and that will help in the way to establish a good national strategy for the blood donation system.

**Materials and Method**

The present study was carried out using a retrospective blood donor related data from January 2011 to December 2016 in Dhiraj blood bank unit of Dhiraj hospital.

**Inclusion:** Every single blood donor who came to Dhiraj Hospital from January 2011 to December 2016 who satisfied the criteria for blood donation as per drugs and cosmetic act 1940 were included.

**Exclusion:** Blood donor not satisfying the criteria for blood donation as per drugs and cosmetic act 1940.

The donor questionnaire forms with details of donors like demographic data, age, weight, hemoglobin status and the results of serological test are recorded and maintained in blood bank of Dhiraj Hospital. We saw the data and there were approximate 20,392 donors who donated blood in last 6 years.

From all related data records, we collected data of blood donors without revealing their personal identity.

Here in Dhiraj Hospital blood bank, firstly Blood Donors comes to Blood bank and their counselling is done by social worker. The venous blood is collected from all eligible donors with their permission after the complete physical examination by Blood bank medical officer. For screening, venous blood is collected in plain vaccute, it is allowed to clot naturally and serum is separated after centrifugation. Serum sample is then subjected to serological tests for HBV, HCV, HIV, syphilis and malaria infection screening.

Two kits are used based on WHO recommendation for two different testing strategies involved in ELISA and simple or rapid essays for surveillance. In house positive and negative controls are performed for each serological test.

- *HIV screening is done using Erba Lisa 3rd generation and Erba Lisa HIV generation 4 from the year 2016 onwards. (ELISA)*
- *HBS screening is done using Erba Lisa HBV generation 3. (ELISA)*
- *HCV screening is done using Erba Lisa HCV generation 3. (ELISA)*
- *Malarial parasite screening is done using pan/pf malaria rapid card.*
- *Syphilis screening is done using VDRL rapid card.*

Patients suffering from any of infections are referred for the necessary treatment.

Collected data was compiled in Microsoft office Excel 2013 format. Data was presented in tabulated format. Descriptive method was used for the preparation of result.

**Result**

We evaluated a total of 20392 units of blood during 1st January 2011 to 31st December 2016. The result was interpreted and following details were drawn in a table.

**Table 1: Blood collection during study period**

<table>
<thead>
<tr>
<th>Study Years</th>
<th>Unit Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>2484</td>
</tr>
<tr>
<td>2012</td>
<td>2732</td>
</tr>
<tr>
<td>2013</td>
<td>3086</td>
</tr>
<tr>
<td>2014</td>
<td>3140</td>
</tr>
<tr>
<td>2015</td>
<td>4037</td>
</tr>
<tr>
<td>2016</td>
<td>4913</td>
</tr>
<tr>
<td><strong>Total collection</strong></td>
<td><strong>20392</strong></td>
</tr>
</tbody>
</table>

Table showing the year wise collection of blood units, year 2011 show the lowest collection (2484), and the highest collection was found in 2016(4913). The number of donations has increased from 2484 in 2011 to 4913 in 2016.
Table 2: Distribution of voluntary and replacement donor

<table>
<thead>
<tr>
<th>Year</th>
<th>Voluntary Donor</th>
<th></th>
<th></th>
<th>Replacement Donor</th>
<th></th>
<th></th>
<th>Grand Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>F</td>
<td>Total</td>
<td>M</td>
<td>F</td>
<td>Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>495</td>
<td>35</td>
<td>530</td>
<td>1949</td>
<td>5</td>
<td>1954</td>
<td>2484</td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>794</td>
<td>65</td>
<td>854</td>
<td>1855</td>
<td>23</td>
<td>1878</td>
<td>2732</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>442</td>
<td>75</td>
<td>517</td>
<td>2541</td>
<td>28</td>
<td>2569</td>
<td>3086</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>484</td>
<td>104</td>
<td>588</td>
<td>2522</td>
<td>30</td>
<td>2552</td>
<td>3140</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>241</td>
<td>85</td>
<td>326</td>
<td>3688</td>
<td>23</td>
<td>3711</td>
<td>4037</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>322</td>
<td>50</td>
<td>372</td>
<td>4513</td>
<td>28</td>
<td>4541</td>
<td>4913</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2778</td>
<td>414</td>
<td>3187</td>
<td>17068</td>
<td>137</td>
<td>17205</td>
<td>20392</td>
<td></td>
</tr>
</tbody>
</table>

During the study period, 17205 (84.37%) of the donors were replacement donors and remaining 3187 (15.62%) were voluntary. The highest voluntary donation trend of 854 (26.79%) donors was seen in 2012. In six year study overall voluntary blood donation has decreased and replacement blood donation has increased.

Table shows 19,846 (97.32%) were males blood donors and 551 (2.7%) were females blood donors giving male: female ratio of 36:1.

Seropositivity distribution in the study with an average prevalence of 2.32% showed higher prevalence in the years 2013 (2.91%), 2012 (2.56%), 2015 (2.47%) and 2011 (2.41%). Lower prevalence was seen in the years 2016 (1.99%) and 2014 (1.81%).

Table 3: Seropositive and seronegative blood samples from the year 2011 to 2016

<table>
<thead>
<tr>
<th>Year</th>
<th>Positive</th>
<th>Negative</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>60</td>
<td>2424</td>
<td>2484</td>
</tr>
<tr>
<td></td>
<td>2.41%</td>
<td>97.58%</td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>70</td>
<td>2662</td>
<td>2732</td>
</tr>
<tr>
<td></td>
<td>2.56%</td>
<td>97.43%</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>90</td>
<td>2996</td>
<td>3086</td>
</tr>
<tr>
<td></td>
<td>2.91%</td>
<td>97.08%</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>57</td>
<td>3083</td>
<td>3140</td>
</tr>
<tr>
<td></td>
<td>1.81%</td>
<td>98.18%</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>100</td>
<td>3937</td>
<td>4037</td>
</tr>
<tr>
<td></td>
<td>2.47%</td>
<td>97.52%</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>98</td>
<td>4815</td>
<td>4913</td>
</tr>
<tr>
<td></td>
<td>1.99%</td>
<td>98.00%</td>
<td></td>
</tr>
</tbody>
</table>

Table 4: Overall prevalence of TTIs among blood donors

<table>
<thead>
<tr>
<th>Year</th>
<th>HIV</th>
<th>HCV</th>
<th>HBsAg</th>
<th>VDRL</th>
<th>Malaria</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>6(10%)</td>
<td>1(1.66%)</td>
<td>39(65%)</td>
<td>14(23.33%)</td>
<td>00(00%)</td>
<td>60(2.41%)</td>
</tr>
<tr>
<td>2012</td>
<td>3(4.28%)</td>
<td>7(10%)</td>
<td>44(62.85%)</td>
<td>16(22.85%)</td>
<td>00(00%)</td>
<td>70(2.56%)</td>
</tr>
<tr>
<td>2013</td>
<td>6(6.66%)</td>
<td>7(7.77%)</td>
<td>51(56.66%)</td>
<td>27(30%)</td>
<td>00(00%)</td>
<td>90(2.91%)</td>
</tr>
<tr>
<td>2014</td>
<td>3(5.26%)</td>
<td>2(3.5%)</td>
<td>33(57.89%)</td>
<td>19(33.33%)</td>
<td>00(00%)</td>
<td>57(1.81%)</td>
</tr>
<tr>
<td>2015</td>
<td>4(4%)</td>
<td>4(4%)</td>
<td>59(59%)</td>
<td>31(31%)</td>
<td>02(2%)</td>
<td>100(2.47%)</td>
</tr>
<tr>
<td>2016</td>
<td>12(12.24%)</td>
<td>0(0%)</td>
<td>67(68.36%)</td>
<td>19(19.38%)</td>
<td>00(00%)</td>
<td>98(1.99%)</td>
</tr>
<tr>
<td>Total</td>
<td>34(0.16%)</td>
<td>21(0.10%)</td>
<td>293(1.43%)</td>
<td>126(0.61%)</td>
<td>02(0.009%)</td>
<td>475(2.32%)</td>
</tr>
</tbody>
</table>

The rate of all five mandatory TTI markers were 2.32%. The prevalence was found for individual TTI markers and arranged in decreasing order: HBV, Syphilis, HIV, HCV, Malaria were respectively 1.43%, 0.61%, 0.16%, 0.10%, 0.009%.
Table 5: Dual infections among donors

<table>
<thead>
<tr>
<th>Type of infection</th>
<th>No. of Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>HBV and HCV</td>
<td>1</td>
</tr>
<tr>
<td>HCV and VDRL</td>
<td>1</td>
</tr>
<tr>
<td>HBV and HIV</td>
<td>1</td>
</tr>
<tr>
<td>HBV and VDRL</td>
<td>2</td>
</tr>
</tbody>
</table>

As shown in table during the study period five donors showed co-infections.

Discussion

Though the blood transfusion plays a vital role in management of many diseases, it always carries a risk of TTIs and many other adverse reactions. Blood transfusion is a highly avoidable treatment ever prescribed. It is essential to adopt strict criteria in selection of donors and to avoid unnecessary transfusion because there is no screening method which can make transfusion transmitted disease rate at zero level.[3]

During the study period, the rate of all five mandatory TTI markers were 2.32%. Amrutha Kumari B et al[4] (2.81%) also found similar to lower transfusion transmitted infections marker rates and for other studies comparison see table no. 6.

Among all TTI markers, highest prevalence was for HBV (1.43%) in present study, but its prevalence was low when we compare it with Karnataka(1.77%)[4] and Bengaluru (1.86%)[5] studies. Frequency of occurring hepatitis infection after blood transfusion is higher than any other infection. HBV was the most prevalent TTI in blood donors, suggesting that it might be linked with poor health practice of people, high cost of good health facilities and economic status. Ensuring good health facilities at low cost by Government may reduce the risk factor of these common infectious diseases and ensure better health conditions. Economic status also plays a very important role. Consultancy with health specialist during early diseases may reduce the prevalence of infectious diseases.[2,6]

HCV infection is about 1% according to the national center for disease control in India. In this study its about 0.10%. As shown in table -6, majority of the blood donors studied from different regions of India have higher prevalence rate as compare to this study.[7,8,9]

Syphilis is sexually transmitted disease so when someone diagnosed with it, it means individuals maybe exposed to other sexually transmitted disease also. So screening of donated blood for syphilis is important. Thus it serves primarily as a surrogate test to identify donors with potentially high risk behavior. Our study showed that the prevalence of syphilis was 0.61%. Prevalence of syphilis is higher among male that might be related to common bed sharing in working place and no proper cleanliness. [2,8,10]

The HIV/AIDS pandemic has focused particularly on the importance of preventing transfusion-transmitted infections. Up to 3% of HIV infections worldwide are transmitted through the transfusion of contaminated blood and blood products.[11] In present study, six years sero-reactivity rate was 0.16%.

The fifth and mandatory but neglected marker for TTI screening in India is Malaria. In our study malaria prevalence rate was 0.009%. Its low because of better pre donation screening and people knows well about the symptoms of malaria.

Most blood banks in India use ELISA kit which cannot detect HIV before 22 days, HBV before 59 days and HCV before 82 days of infection. Usually when we do the blood transfusion, volume which is given is very large so even lowest viral load cause transmission of infection. Prevalence of asymptomatic carriers in the society, and when the blood donations done in window period of infections which also posses a great threat to safe blood supply.

The most effective strategy must be started where we inform the TTI positive donors and advice them for no such donation in future. They should be sent for appropriate treatment. Pre-donation counseling and donor self-exclusion will be effective in decreasing the TTIs as well as practices of autologous blood transfusion should be encouraged.
Table 6: Comparison of Transfusion transmitted infection markers in different studies.

<table>
<thead>
<tr>
<th>Studies</th>
<th>Region of study</th>
<th>Period of Study</th>
<th>TTIs markers prevalence rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>HBV</td>
</tr>
<tr>
<td>Leena MS et al[12]</td>
<td>South India</td>
<td>2004 to 2010</td>
<td>0.7</td>
</tr>
<tr>
<td>Amrutha Kumari B et al[4]</td>
<td>Karnataka</td>
<td>2006 to 2010</td>
<td>1.7</td>
</tr>
<tr>
<td>Kumar R et al[6]</td>
<td>Punjab</td>
<td>2008 to 2013</td>
<td>1.0</td>
</tr>
<tr>
<td>Panda M et al[13]</td>
<td>Orissa</td>
<td>2005</td>
<td>1.1</td>
</tr>
<tr>
<td>Srikrishna A et al[7]</td>
<td>Bengaluru</td>
<td>1997 to 1998</td>
<td>1.8</td>
</tr>
<tr>
<td>Sastry JM et al[14]</td>
<td>Pune</td>
<td>2008 to 2013</td>
<td>1.2</td>
</tr>
<tr>
<td>Present Study</td>
<td>Vadodara</td>
<td>2011 to 2016</td>
<td>1.4</td>
</tr>
</tbody>
</table>

**Conclusion**

The present study has limitations in the use of ELISA test for TTIs screening. The latest more sensitive method such as PCR (Polymerase chain Reaction) and NAT (Nucleic acid amplification Test) can uncover latent infections in the window period and may actually suggest underestimation of prevalence by currently used screening tests in the present study. This implies that screening for TTI needs to be upgraded across blood banks in India. HBV was the most prevalent TTI among all, so there is a need of initiating efforts for community level health program for HBV in addition to UIP (Universal Immunisation Programme) with HBV vaccine started in 2007 and the government should focus on present youth population which has not taken this vaccine in childhood life.

**Ethical Clearance:** Ethical clearance was taken from SBKS & MIRC

**Source of Funding:** Self

**Conflict of Interest:** Nil

**References**


11. Khare V, Jain VK, Tantuway R. Study of Transfusion transmittable Infections: Seroprevalence among Blood Donors in a tertiary Care Hospital of


Effectiveness of Parent Focused Group Program on Obesity-Related Behavior & Anthropometric Measurements among 6-12-Year-old Obese Children-A Pilot Study

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Abstract

**Background:** Obesity is caused due to the mismatch between energy intake and expenditure, with food intake more than the requirements leading to an increase in Body mass index (BMI) as a body measurement parameter. Parent focused group program is an intervention program where parents are involved in targeting the changes in obesity-related behavior of their obese children.

**Objectives:** To determine the effectiveness of parent-focused group programs on obesity-related behaviors of children aged 6-12 years.

**Method and Results:** The study was conducted in two phases. The first phase included a survey design to identify overweight and obese children from two randomly selected schools as control and experimental from the southern part of Kerala, India. The second phase included an intervention design with a parent-focused group program for the program’s experimental group, and effectiveness was analyzed from children’s obesity-related behaviors. The key findings indicated that the parent-focused group program was effective in the pre-test and post-test scores of anthropometric measures in the experimental group for both boys and girls. The study suggested that parent-focused programs effectively bring changes in children’s obesity-related behavior, thus reducing the chances of getting overweight/obese.

**Conclusion:** Parent-focused group interventions are effective as a preventive strategy in reducing obesity-related behavior among children.

**Keywords:** Parent focused group program, obesity-related behaviors, BMI.

Introduction

In an individual’s lifespan, there are critical periods of development of obesity and its complications mostly observed during gestation, early in infancy, in the period of adiposity rebound, which usually occurs in 5-7 years of age and adolescence period. Behavioral and developmental processes have described these critical periods. Hence in this critical period, focus on preventive efforts should be made. There is a limited number of studies conducted in India around intervention programs for children in reducing obesity. Cochrane reviews have elicited studies involving parents, teachers, and children in the intervention programs. Several systematic reviews have reported that obesity is a global problem in both developing and developed countries. Early age interventions can help in changing and building a healthy lifestyle among children. Interventions like healthy eating habits, healthy lifestyle modifications, physical exercise, screen time interventions can help in controlling obesity.

Furthermore, involving parents in the intervention programs can make a difference in bringing changes in obesity-related behavior among children. An expert...
committee of the Maternal and Child Health Department of Boston, United States of America, concluded that parental skills are the basic foundation for having a successful intervention for managing pediatric obesity by targeting an increase in physical activity and reducing high fat and calorie foods in children. The report says further that the families need initial support in the weight management period and will gradually learn as a new behavior.

A multi-component intervention based randomized controlled trial with 120 children aged 10-16 years from 11 schools in India suggested being effective in reducing BMI among obese children. Therefore, raising the necessity to conduct studies on identifying effective strategies to improve obesity-related behaviors among school-going children.

**Aims and Objectives:** The study aimed to determine the effectiveness of the parent-focused group program on changes in obesity-related behavior and anthropometric measurements among children identified with overweight and obesity and to modify dietary habits, emotions & attitudes towards eating, screen viewing & sleep, and physical activities.

**Materials and Method**

**Study type:** An interventional study was conducted in two phases. The first phase included a survey design to identify overweight and obese children from two randomly selected schools as control and experimental from an education district of the southern part of Kerala, India. The second phase included an intervention design with a parent-focused group program for the experimental group, and the effectiveness of the program was analyzed from children’s obesity-related behaviors.

**Study area:** The study was conducted among school children of randomly selected eight schools of Pathanamthitta Education District of South Kerala, India.

**Study duration:** The study was conducted between June 2017 to September 2017.

**Study population:** The participants included boys and girls in the age group of 6-12 years attending schools from class 1 to class 6.

**Inclusion and Exclusion criteria:** The study included children belonging to both sexes in the age group of 6-12 years studying in class 1-6. Parents and children who knew both English and Malayalam were included in the study. Children having medical disorders, hormonal problems, metabolic disorders were excluded from the study. Also, both parents & children who refused to participate in the study were excluded.

**Sampling technique & Sample size calculation:** The sample size was calculated based on the review of literature. The study was conducted in two phases in which a descriptive survey design was carried out in the first phase among 175 children studying in class 1-class 6 in the age group of 6-12 years. They were selected from two schools randomly. Initially a survey method was used to identify children as overweight and obesity.

In the first phase, the height, weight and body mass index were calculated for each child. Height of the child was measured to nearer 0.1 cm using a non-flexible inch tape measure and noted in meters. Age of the child was derived using school records. Weight was measured using a calibrated standard weighing machine. BMI: Body Mass Index is generally used for assessing the nutritional status. It is expressed as a ratio of weight in kilogram to height in meter square. The BMI was calculated using the formula: BMI = Weight (kg)/Height (m²). All the measurements were done after removing the shoes and with light clothing. Prevalence of obesity and overweight were categorized using the age and sex specific BMI cut offs for Indian children. The demographic Performa was filled in first phase of study which had details related to child age, height, weight. The study was carried out during June 2017-September 2017.

In the second phase that includes the evaluative phase where the before and after control group design was involved. The questionnaires on obesity related behavior, child eating behavior was assessed. Both child and parents were involved during the data collection. The eating habits of the children were assessed using questions asked to both parents and to the child. The sample who met the inclusion criteria from both the schools were identified. These two schools were taken as control and experiment. The control group (20/90) was taken from one school while the experimental group (26/85) was taken from other school to avoid any contamination. The experimental group was intervened with the parent focused program for a period of one month comprising of two teaching session. The post test measures were taken after a period of 3 months to evaluate the effectiveness of Parent group program.
Ethical Consideration: Ethical permission was obtained from the institutional ethical committee of Saveetha University (approval number 028/06/2017/IEC/SU dated 09 June 2017). The study was conducted after obtaining necessary permission from the Headmaster as well as the District Director of Education in the month of June 2017. As the study involved both the child as well as the parent, informed consent and assent were obtained from both.

Data Collection Strategy: Appropriate tool was developed with the help of literature to collect background information on the age of the child, gender, place of residence, type of family, the annual income of the family, and the educational level of the parent. A second tool with 35 questions was developed to frame a questionnaire on obesity-related factors such as children’s physical activity, dietary habits, television viewing patterns, and sleep patterns. Each item on the tool was given the highest score of 3 and the lowest score of 1. Both the parent and child in the control and experimental group were assessed through pre-test, and intervention was given only to the experimental group.

The parent-focused group program was planned and implemented as two sessions covering 120 minutes in each session in one month, in the presence of a pediatrician and dietitian only for the experimental group. Each parent was made aware of the focused group program and how they have to bring obesity-related behavior changes in the intervention phase. The sessions delivered knowledge on obesity-related factors and how as parents, they can manage obesity & its complications, teach healthy eating habits, understand eating behaviors, and regulate healthy lifestyle, screen viewing & sleep habits. After the intervention, the parents in the experimental group had telephonic conversations and feedback, and the post-baseline data were collected after ten months of the parent-focused group program. Hence, in the study, the parents were given regular feedback through telephonic sessions only in the experimental group, but no further feedback was provided for the control group.

Statistics: The data were expressed in mean±SE, Median, Wilcoxon Signed rank sum focused group program.

Results

Table 1 shows the prevalence of boys with overweight were 21.6% and the prevalence of obese boys were 8.2% giving an overall prevalence (OW & OB) of 29.8%. The corresponding figures among girls were 16.7%, 5.1% and 21.8% respectively. The prevalence among boys was higher compared to that among girls. However, the difference was not statistically significant. The prevalence of overall overweight & obesity in both boys and girls was found to be 46(26%) which showed an increasing rise.

Table 2 shows the pre test and post test scores of obesity related behavior of the identified children in both control and experimental group. For the 12 items in the dietary habits subscale the experimental group showed an increase in median score from 22 to 23 which is statistically significant at p<0.001 (Z=4.204, W=283 & p<0.001). For the five items in the emotions and attitude subscale there is a slight increase in the experimental group from median scores 10 to 11 which is statistically significant at p<0.001 (Z=3.76, W=78, p<0.001). Similarly for the five items in the subscale physical activity changes there is a change in the median scores of control group from 6 to 6.5 but is not statistically significant (Z=1.58, W=2 & p=.195). In the subscale physical activity changes there is a slight change in the median scores of control group from 11 to 13 at p<0.001, which is statistically significant (Z=4.218, W=276 & p<0.001).

Table 3 shows when comparing post-test scores of parameters height, weight and BMI of Control group and Experimental group. It shows that the Mean height ±SE of control group after intervention is 148±1.19 while in the Experimental group it is 134.5 ±1.19 (t=8.014 p<0.001***). Similarly the Mean Weight ±SE of control group post test is 46.6 ±1.62 while the post test Mean Weight ±SE of the experimental group is 34.9 ±1.25 at(t=5.81 p<0.001**). Further the Mean BMI±SE of Control group is 21.13 ±0.51 and Experimental group is 19.22 ±0.51 (t=2.575 p<0.013).

Table 4 shows that Mean ±SE of parameter Height in both Control group and experimental group is significant at p<0.001 taken at baseline and follow up. However the other two parameters weight & BMI show no statistical significance within the groups.

Table 5 shows Mann whitney test showing T values and P values of eight subscales of eating behavior among
children in both pre test and post test of con-exp group. The results however show statistically no significance. The sample

**Limitations of the study:** The pilot study was done with an intervention period of three months which was inadequate to observe changes in eating behavior.

### Table 1: Prevalence of Overweight and Obese children according to gender and age

<table>
<thead>
<tr>
<th>Age (Yrs.)</th>
<th>Number</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>OW</td>
<td>OB</td>
</tr>
<tr>
<td>6-8</td>
<td>19</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>8-10</td>
<td>30</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>10-11</td>
<td>48</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>97</strong></td>
<td><strong>21(21.6%)</strong></td>
<td><strong>8(8.2%)</strong></td>
</tr>
</tbody>
</table>

### Table 2: Comparison of pretest and post test scores of obesity related behavior for Control and Intervention group.

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Subscale</th>
<th>Control group</th>
<th>Intervention group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest mean</td>
<td>Post test mean</td>
<td>Z</td>
</tr>
<tr>
<td>1</td>
<td>Dietary habits</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>2</td>
<td>Emotions and attitude towards eating</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>3</td>
<td>Screen viewing and sleeping</td>
<td>6</td>
<td>6.5</td>
</tr>
<tr>
<td>4</td>
<td>Physical activity</td>
<td>11</td>
<td>11</td>
</tr>
</tbody>
</table>

**Significant at p<0.001.

### Table 3: Comparison of Post test scores of Parameters Height, Weight and BMI between Control group and Experimental group:

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Parameter</th>
<th>Groups</th>
<th>Mean±SE</th>
<th>Unpaired t -test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Height</td>
<td>Control</td>
<td>148.3 ±1.19</td>
<td>t=8.014 p&lt;0.001**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Experimental</td>
<td>134.5 ±1.19</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Weight</td>
<td>Control</td>
<td>46.6 ±1.62</td>
<td>t=5.81 p&lt;0.001**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Experimental</td>
<td>34.9 ±1.25</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>BMI</td>
<td>Control</td>
<td>21.13 ±0.51</td>
<td>t=2.575 p&lt;0.013</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Experimental</td>
<td>19.22 ±0.51</td>
<td></td>
</tr>
</tbody>
</table>

**Significant at p<0.001.

### Table 4: Shows comparison of Pre-test Post –test Mean ±SE scores of Parameters measured in both Control and Experiment group in the study

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Parameter</th>
<th>Groups</th>
<th>Mean ± SE</th>
<th>Statistical analysis</th>
<th>Paired t –test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Height</td>
<td>Control Pre</td>
<td>146.1 ±1.2</td>
<td>t value</td>
<td>t value</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Experimental Pre</td>
<td>132.6 ±1.2</td>
<td>10.341</td>
<td>12.550 p&lt;0.001**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control Post</td>
<td>148.3±1 .1</td>
<td>p&lt;0.001**</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Experimental Post</td>
<td>134.5 ±1.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Significant at p<0.001.
### Table 5 Eating behavior problems among obese children (pre test and post test) of control group and experiment group of the study.

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Subscale</th>
<th>Groups</th>
<th>Mann Whitney rank sum test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Food response</td>
<td>Pre Con-Exp</td>
<td>t=482, p=0.620</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post Con -Exp</td>
<td>t=417, p=0.329</td>
</tr>
<tr>
<td>2</td>
<td>Emotional overeating</td>
<td>Pre Con-Exp</td>
<td>t=472, p=0.785</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post Con -Exp</td>
<td>t=472, p=0.785</td>
</tr>
<tr>
<td>3</td>
<td>Food enjoyment</td>
<td>Pre Con-Exp</td>
<td>t=452, p=9.954</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post Con -Exp</td>
<td>t=460, p=1.00</td>
</tr>
<tr>
<td>4</td>
<td>Desire to drink</td>
<td>Pre Con-Exp</td>
<td>t=407, p=0.222</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post Con -Exp</td>
<td>t=407, p=0.222</td>
</tr>
<tr>
<td>5</td>
<td>Satiety responsiveness</td>
<td>Pre Con-Exp</td>
<td>t=439, p=0.634</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post Con -Exp</td>
<td>t=441, p=0.668</td>
</tr>
<tr>
<td>6</td>
<td>Slowness in eating</td>
<td>Pre Con-Exp</td>
<td>t=503, p=0.335</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post Con -Exp</td>
<td>t=302, P=0.341</td>
</tr>
<tr>
<td>7</td>
<td>Emotionalundereating</td>
<td>Pre Con-Exp</td>
<td>t=463, P=0.963</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post Con -Exp</td>
<td>t=470, P=0.836</td>
</tr>
<tr>
<td>8</td>
<td>Food fussiness</td>
<td>Pre Con-Exp</td>
<td>t=491, P=0.483</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post Con -Exp</td>
<td>t=491, P=0.483</td>
</tr>
</tbody>
</table>

*** Statistically not significant.

### Discussion

The overall prevalence of obesity and overweight is 26% in this study. In a similar cross sectional study done in Telengana, it was found using IAP charts, 24.6% of children in class 4-10 were obese while 35.8% were found to be overweight while using CDC criteria the prevalence seem to be 15.4% obese and 26.1% overweight. Further the mean BMI was found to be 25.6±3.5 kg/m² in the obese group and 21.1±1.9 kg/m² in the overweight category. Prevalence recorded was highest in 8-10 years of age group. In the present study also the prevalence of overall overweight & obesity is found to be higher in boys (29.8%) than in girls (21.8%). The study findings revealed that the prevalence of overweight & obesity among boys was higher compared to that among girls.

The study findings show statistical significance at p<0.001 in the obesity related behavior subscales in both pre test and post test scores of control group and experimental group. The obesity related behavior included for subscales-Dietary pattern, Emotional eating and attitude, Screen viewing & sleeping and Physical activity. Similar study findings are reported in Michigan where sleep duration per night (p=0.04) and frequency...
of eating breakfast (p=0.04) show significant predictors of overweight and obesity. In a study conducted in rural Coimbatore to find the effectiveness of multi strategic health screening cum educational intervention model in promoting health of school children shows similar findings like changes in dietary and personal assessment score. Even in the pre-post scores there are improved practices of nutrition and personal hygiene and pre-post mean scores were found to be statistically significant. The mean BMI distribution of the students in the pre and post intervention was found to be significant. Further the intervention had improved in the normal BMI category though it showed slight increase in the overweight and obese category. At the end of 6 months the intervention has shown improvement in total mean score of diet and personal hygiene assessment among students.

The eating behavior scores in the study in pretest posttest done among both control and experimental group shows no statistical significance. In a population based prospective birth cohort study conducted among 3331 children in Netherlands to examine the longitudinal and bidirectional association between eating behavior and body composition. The BMI measurement at 6 years and 10 years were taken, body composition was measured using Fat mass index and Fat free mass index was measured using dual energy x ray absorptiometry scans. Also eating behavior was measured using child eating behavior questionnaire. The study findings showed a higher BMI and high fat mass at preschool age. Further more food approaching and less food avoiding eating behaviors at 10 years of age were noticed. The study finally concludes stating that increased adiposity might increase appetite and eating related behavior.

Similar results are reported in a community-based study approach involving both teachers and parents who were imparted nutrition and lifestyle interventions among adolescents to adopt a healthier lifestyle. The study shows positive behavioral changes and healthier eating choices.

**Conclusion**

This study reported changes in the post-test scores of the experimental group and reduction or no increase in BMI, which is a significant finding after the intervention compared to the control group. This study indicated that the intervention was effective in bringing changes to the obesity-related behavior in the experimental group. The results are highly encouraging which interprets that if parents are involved as change agents then obesity in young children can be controlled.

**Conflict of Interest:** None

**Source of Funding:** Self funding

**Findings:**


Effects of Virtual Reality Based Therapeutic Exercise on the Upper Extremity Function and Activities of Daily Living in Patients with Acute Stroke: A Pilot Randomized Controlled Trial

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Abstract

Background: Virtual reality-based therapeutic exercise (VRTE) has been considered as a rehabilitative intervention for neurological deficits. The aim of this study was to compare the effects of VRTE and occupational therapy (OT) on the upper extremity function and activities of daily living in patients with acute stroke.

Method: Twenty-four patients who had suffered a stroke within the last 30 days before enrollment participated in this study. They were randomly assigned to either the VRTE group (n = 12) or the OT group (n = 12). Twenty sessions were conducted in all. To quantify the upper extremity function, the Jebsen-Taylor hand function test (JT) and Fugl-Meyer Assessment (FMA) of the upper limb were used, and the grip strength (GS) was assessed. To assess activities of daily living, the modified Barthel index (MBI) was used.

Results: In the VRTE group, JT (p = 0.002), FMA (p = 0.002), GS (p = 0.002), and MBI (p = 0.002) showed a significant improvement after the intervention. In the OT group, JT (p = 0.002), FMA (p = 0.001), GS (p = 0.002), and MBI (p = 0.001) significantly improved after the intervention. However, compared with OT, VRTE did not show significant improvements in upper extremity function and activities of daily living.

Conclusions: This study suggests that the early approach of VRTE is not superior to OT for the improvement of upper limb function and activities of daily living in patients of stroke.

Keywords: Activities of daily living, occupational therapy, upper limb function, acute stroke, therapeutic exercise, virtual reality.

Introduction

Neurological deficits are common after stroke and can lead to sensory, psychological, and motor disorders¹. More than half of the stroke patients suffer from permanent impairment and manifest various symptoms². Reduced function of the upper extremity is the most common impairment in patients of acute stroke³. Moreover, approximately 55%–75% of the patients with stroke show a decrease in activities of daily living due to the residual dysfunction and physical disabilities⁴. These deficits affect their quality of life⁵.

Virtual reality can be used as a rehabilitation tool, and virtual reality-based therapeutic exercise (VRTE) is
used as a rehabilitation therapy to improve the physical function in patients with stroke\cite{6,7}. An exercise program using virtual reality (VR) is a method of performing a given task by looking directly at the screen, which is enjoyable and effective in improving the physical function\cite{7}. Previous studies have reported VRTE as an effective rehabilitative intervention\cite{6,8}. Thus, it can be a highly useful intervention for the rehabilitation of stroke patients.

A previous study reported that a program using VR is more effective than conventional rehabilitation therapy to improve the function of the upper extremity and activities of daily living\cite{6}. VRTE has positive effects on the functional recovery of the upper and lower extremities, and balance ability for stroke patients has been well documented in the previous studies\cite{9-13}. In addition, VRTE using Nintendo Wii has been reported as an effective VRTE intervention for neurological deficits\cite{9,10,12}.

Several clinical studies have reported the use of VRTE for improvement of the upper extremity function in stroke patients; these studies involved patients of stroke in the sub-acute or chronic phase\cite{6,8,14}. Effects of early use of VRTE for the improvement of upper extremity function and activities of daily living in patients with acute stroke have not yet been investigated. Hence, the aim of this study was to investigate the feasibility of early use of VRTE to improve the function of the upper extremity and activities of daily living in patients with stroke. We compared the effects of VRTE and of occupational therapy (OT) on the upper extremity function and activities of daily living in patients with acute stroke.

**Materials and Method**

**Study Design:** This study was a single-blinded, randomized, controlled trial. It was approved by the Gachon University Institutional Review Board (1044396-201708-HR-136-01). The study was performed in accordance with the protocol, and all participants provided written informed consent prior to enrollment in the study.

**Participants:** Twenty-four participants were recruited from a medical center located at Incheon. Participants who had (a) suffered a stroke within the last 30 days; (b) upper extremity dysfunction, which the fulfilled criteria (< 50 in Fugl-Meyer assessment (FMA); over fair grade in manual muscle testing), (c) stable medical condition, and (d) no severe cognitive disorder (< 21 in mini mental state examination) were included in the study. The exclusion criteria were (a) visual spatial neglect, (b) apraxia, or (c) contracture of the upper extremity.

**Experimental Procedures:** All participants were randomly divided into either the VRTE or OT groups using the block randomization method\cite{15}. Allocation was performed by another employee not related to this study. The assessors were blinded to the intervention allocation and was performed by another therapist who did not perform the intervention. To maintain blinding until the end of the study, participants were asked not to discuss about their groups with the assessors. For allocation concealment, numbered, sealed envelopes with allocation sequences were kept in a room separated from the area where the measurements were performed and were not available to everyone involved in the study until the randomization.

The VRTE group played three different 3 type of sports games: swordplay, table tennis, and canoe in Nintendo Wii Sports Resort. Detailed descriptions can be found at http://wiisportsresort.com/. Participants in the VRTE group can play a rehabilitation game with a remote controller. They performed a variety of movements on the shoulder, elbow, and wrist for VRTE. Those who could not hold the remote controller by degradation of loss of muscle strength or poor grip strength were trained with straps to fasten a remote controller for effective training. In the OT group, OT was performed by occupational therapists for 30 minutes. It consists of strengthening and stretching exercises using full range of motion of the upper extremity, which is a task-oriented therapy. Participants in both groups received general physical therapy including stretching, lower extremity strength, and gait training for 30 minutes. All treatments were performed 5 days per week for 4 weeks (20 sessions).

Outcome variables were assessed before the first intervention and after 20 sessions of intervention. Jebsen-Taylor hand function test (JT) and Fugl-Meyer assessment (FMA) were used to assess the upper limb function. Grip strength (GS) and Modified Barthel index (MBI) were used to quantify the grip strength and activities of daily living, respectively. All interventions and assessments were performed by 4 occupational therapists, with a clinical experience of more than 5 years.
Outcome Measures: JT was used to assess the function of the hand. The reliability of the dominant hand JT score was 0.67-0.99, while that for the non-dominant hand it was 0.60-0.92\(^{[16]}\). We assessed the affected side and used the Korean version of JT\(^{[17]}\). The maximum score is 105 and minimum is 0; a higher score indicates better upper limb function.

FMA was used to test the performance of the upper extremity\(^{[18]}\). It has a maximum possible score of 66 and minimum of 0. The inter-rater reliability of FMA has been reported to be 0.96\(^{[19]}\).

We used a dynamometer to assess the GS of the hand. The participants were comfortably seated and their affected hand was positioned on their lap. The normal position was the elbow at 90° with the arm positioned close to the side of the body and neutral position of the wrist. GS was measured 3 times and mean values were used for the analysis\(^{[20]}\).

MBI was used to assess the performance in activities of daily living. It comprises 10 activities to be assessed: feeding, grooming, bathing, dressing, toileting, bladder control, bowel control, chair/bed transfer, mobility, and stair climbing. The maximum possible score is 100, which indicates completely independence in performing activities of daily living. The inter-rater reliability of MBI has been reported to be 0.95, and the intra-rater reliability is reported to be 0.89\(^{[21]}\).

Statistical Analysis: SPSS version 18.0 was used for all statistical analyses (SPSS Inc., Chicago, USA). All values are expressed as mean ± standard deviation (SD). The Wilcoxon-signed rank test was performed to analyze the scores before and after VRTE and OT. The Mann-Whitney U test was used to compare the change in scores between the two groups. A p-value < 0.05 was considered statistically significant.

Results

Participant Characteristics: All participants completed the trial. The general characteristics of the participants are shown in Table 1, and there were no significant differences between the groups in terms of sex, age, height, weight, stroke type, affected side, duration since onset, and results of the mini mental state examination. There were also no significant differences in the values of the assessment variables between the two groups before the intervention (Table 2).

Table 1. General characteristics between the two groups

<table>
<thead>
<tr>
<th></th>
<th>VRTE (n = 12)</th>
<th>OT (n = 12)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex (Male/female)(^{†})</td>
<td>7/5</td>
<td>6/6</td>
<td>0.688</td>
</tr>
<tr>
<td>Age (Years)</td>
<td>71.00±8.36</td>
<td>67.25±10.33</td>
<td>0.259</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>166.66±8.17</td>
<td>165.66±9.20</td>
<td>0.707</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>63.54±9.15</td>
<td>63.50±10.27</td>
<td>0.840</td>
</tr>
<tr>
<td>Stroke type (Ischemic/hemorrhagic)(^{†})</td>
<td>9/3</td>
<td>8/4</td>
<td>0.660</td>
</tr>
<tr>
<td>Affected side (Left/right)(^{†})</td>
<td>7/5</td>
<td>8/4</td>
<td>0.680</td>
</tr>
<tr>
<td>No. of days since onset (Days)</td>
<td>17.66±3.20</td>
<td>17.25±3.13</td>
<td>0.747</td>
</tr>
<tr>
<td>MMSE (Score)</td>
<td>25.25±2.92</td>
<td>25.33±2.90</td>
<td>1.000</td>
</tr>
</tbody>
</table>

VRTE, virtual reality based therapeutic exercise; OT, occupational therapy; MMSE, mini mental state examination
Values are expressed as mean ± standard deviation or the number of participants\(^{†}\).

Outcome Measures: In the VRTE group, JT (p = 0.002) and FMA (p = 0.002) significantly improved after the intervention (Table 2). In the OT group as well, JT (p = 0.002) and FMA (p = 0.001) significantly improved after the intervention (Table 2). Compared with the OT group, the VRTE group did not show significant improvements in JT and FMA (Table 2).

In both, VRTE group and OT groups, GS significantly improved after the intervention (p = 0.002 for both) (Table 2). The OT group showed significant improvement in GS compared to the VRTE group (p = 0.018).

In both, VRTE and OT groups, MBI significantly improved after the intervention (p = 0.002 and p = 0.001
respectively) (Table 2). Compared with the OT group, the VRTE group did not show significant improvements in MBI (Table 2).

Table 2. Comparisons of changes in the outcome variables

<table>
<thead>
<tr>
<th></th>
<th>VRTE (n = 12)</th>
<th>OT (n = 12)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>JT (score)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-test</td>
<td>27.58±16.74</td>
<td>27.67±18.60</td>
<td>0.817</td>
</tr>
<tr>
<td>Post-test</td>
<td>55.08±13.56*</td>
<td>55.92±13.45*</td>
<td>0.544</td>
</tr>
<tr>
<td>Post - Pre</td>
<td>27.50±7.13</td>
<td>28.25±7.20</td>
<td>0.885</td>
</tr>
<tr>
<td>p</td>
<td>0.002</td>
<td>0.002</td>
<td></td>
</tr>
<tr>
<td><strong>FMA (score)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-test</td>
<td>27.50±5.98</td>
<td>27.75±3.70</td>
<td>0.464</td>
</tr>
<tr>
<td>Post-test</td>
<td>47.67±2.46*</td>
<td>49.75±3.89*</td>
<td>0.086</td>
</tr>
<tr>
<td>Pre - Post</td>
<td>20.17±5.80</td>
<td>22.00±5.48</td>
<td>0.772</td>
</tr>
<tr>
<td>p</td>
<td>0.002</td>
<td>0.001</td>
<td></td>
</tr>
<tr>
<td><strong>GS (kg)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-test</td>
<td>8.19±3.70</td>
<td>6.24±3.56</td>
<td>0.371</td>
</tr>
<tr>
<td>Post-test</td>
<td>13.24±4.18*</td>
<td>14.76±3.87*</td>
<td>0.525</td>
</tr>
<tr>
<td>Pre - Post</td>
<td>5.05±1.32</td>
<td>8.52±4.07</td>
<td>0.018*</td>
</tr>
<tr>
<td>p</td>
<td>0.002</td>
<td>0.002</td>
<td></td>
</tr>
<tr>
<td><strong>MBI (score)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-test</td>
<td>57.83±12.97</td>
<td>55.17±14.29</td>
<td>0.603</td>
</tr>
<tr>
<td>Post-test</td>
<td>88.92±5.38*</td>
<td>88.17±9.29*</td>
<td>0.885</td>
</tr>
<tr>
<td>Pre - Post</td>
<td>31.08±11.40</td>
<td>33.00±14.03</td>
<td>0.665</td>
</tr>
<tr>
<td>p</td>
<td>0.002</td>
<td>0.001</td>
<td></td>
</tr>
</tbody>
</table>

VRTE, virtual reality based therapeutic exercise; OT, occupational therapy; JT, Jebsen Taylor hand function test; FMA, Fugl-Meyer assessment (upper limb); GS, grip strength; MBI, modified Barthel index
*p < 0.05, significant difference within the group; †p < 0.05, significant difference between the groups
Values are expressed as mean ± standard deviation.

Discussion

This study showed that both, VRTE and OT significantly improved the upper limb function and activities of daily living in patients with acute stroke. However, there were no significant differences between VRTE and OT in the outcome variables. Furthermore, there was a significant improvement in handgrip strength in the OT group compared to that in the VRTE group. VRTE was not superior to OT for rehabilitation of the upper limb function in the acute phase of stroke.

In this study, VRTE significantly improved the upper limb function and activities of daily living in patients with acute stroke; however, these results comparing the effects of virtual reality training and daily OT showed no significant recovery of the motor function. Contrary to the findings of this study, Saposnik et al.[12] reported significant differences in grip strength and hand dexterity compared with virtual reality using Wii and recreational therapy. VRTE using Wii was more effective than recreational therapy for improvement in hand function. The reason for the inconsistent results might be because our study used task-repetition based training in the OT group; however, the previous study used recreation therapy as the control group, which showed differences in treatment intensity and form.

Task-oriented training provides opportunities for stroke patients to solve motor problems while performing functional tasks, and is effective in improving the function of the upper extremity and performance of daily activities after stroke[22]. According to a previous systematic review, various task-oriented treatments improved the lower and upper extremity functions after stroke[23]. Due to the effects of task-oriented training for rehabilitation of stroke patients, the effect of VRTE seen in this study might fail to be superior to that of task-oriented OT training applied in this study.
The findings of this study might also be due to the severely degraded upper extremity function after injury. The mean FMA scores of the participants in this study were reported to be around 27, which indicate moderate to severe impairment of the upper limb function[24]. Thus, patients with acute stroke had severely reduced hand function and participants in the VRTE group trained with straps to be able to grasp the remote controller during VRTE training. The straps might have restricted the movement of their hand and wrist. These results match those of a previous study by Yin et al.[25].

The present study has some limitations. First, the sample size was small. A further study with sample size calculation is necessary to validate the findings of this study. Second, the VRET group used an exercise program provided by Nintendo Wii. To reach a general conclusion, the efficacy of a more suitable VRTE program for rehabilitation of acute stroke patients should be investigated. Third, despite reporting the benefits of VRTE, this study did not investigate mental health such as depression and anxiety. A low level of physical function can lead to depression in patients with stroke[26], and post-stroke depression increases fatigue and incompetence, and decreases the motivation for rehabilitation[27]. VRTE might have positive effects such as prevention of depression, and motivate active participation in the rehabilitation programs[8]. Future studies considering mental health in the acute stroke phase are needed.

Conclusion

In conclusion, VRTE was not superior to OT for the improvement in upper limb function and activities of daily living in patients with acute stroke patients. Further studies with a suitable sample size should be performed.

Ethical Approval: It was approved by the Gachon University Institutional Review Board (1044396-201708-HR-136-01).

Source of Funding: Self

Conflict of Interest: Nil

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The Influence of Telenursing against Adherence to Anti TB Treatment toward Tuberculosis Patient in BIMA City

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Abstract

Tuberculosis (TB) is an infectious disease that is caused by Mycobacterium tuberculosis, which attacks various organs, especially lungs. This disease must be treated immediately before it causes complications even death. The number of TB cases in Indonesia was 420,994 cases in 2017. Lack of adherence against TB treatment still becomes an obstacle of global health, and mobile phone-based interventions have potential to solve this problem. Furthermore, this research aimed at investigating the influence of telenursing against adherence to anti-TB treatment toward patient with tuberculosis. This research was conducted in Bima City, West Nusa Tenggara Province, Indonesia which consisted of 3 (three) Public Health Centers. Method of this research was experimental and design in this research used quasi experimental design (One group Pretest-Posttest Design). Moreover, results of this research showed that TB respondents before being treated by telenursing who were in category of moderate adherence were 14 respondents (23.3%), meanwhile, in category of poor adherence were 46 respondents (76.7%). After being treated by telenursing, TB respondents who were in category of high adherence were 60 respondents (100%). Test through SPSS was obtained a significant result which was 0.001 for intervention with a significance level of 0.05. Because p value was <0.05, then Ho was rejected, which meant that there was a significant difference in results between before and after being treated by telenursing.

Keywords: Tuberculosis, Telenursing, Adherence to Treatment.

Introduction

Tuberculosis (TB) is an infectious disease that is caused by Mycobacterium tuberculosis, which attacks various organs, especially lungs. This disease must be treated immediately before it causes complications even death. WHO reported that in 2012, there were 1.1 million patients (13%) of whom were HIV positive patients and the patients increased in 2013 as many as 8.6 million TB cases. Moreover, there were 75% of these patients in African region.

In 2017, the number of TB cases in Indonesia was 420,994 cases (data as of 17 May 2018). However, based on sex variable, male is 1.4 times greater than the female one. Results of tuberculosis prevalence survey showed that males were three times higher than females. This occurs because males are more exposed to have risk factors, such as smoking and less medication adherence than the females.

The highest prevalence of TB based on age in 2013 was at the age of 65-74 years (0.8%). According to occupation variable, respondents who did not work were 11.7%. According to the highest education variable, respondents who did not have education from school were 0.5%. Furthermore, the highest prevalence of TB based on province in 2014 was in Papua (302 cases/100,000 population), meanwhile, the lowest one was in Yogyakarta or DIY Province (74/100,000 population), and West Nusa Tenggara Province was in the same position as Central Sulawesi Province which was as much as 136/100,000 population.

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In West Nusa Tenggara Province in 2016, the number of TB patients (all types) was 5,828 patients, and 3,860 of them were new smear positive cases. Whereas in 2017, the total number of TB patients was 6,644 patients and the 4,149 patients of them were new smear positive pulmonary TB cases. When it was compared to 2016, TB cases in 2017 increased to be 14.04%.

Clinical pulmonary TB cases in Bima City in 2016 were 206 cases and new smear positive pulmonary TB cases in 2016 were found 98 cases. It decreased if it was compared with TB cases in 2015 which 167 cases were reported (Division of Bina P2PL of Public Health Office in Bima City 2017). In 2017, the number of new smear positive pulmonary TB cases was 149 cases and the total number of TB cases was 282 cases. In 2018, patients with smear positive and positive X-rays were obtained as many as 210 patients with data that was collected quarterly, data from first quarter to fourth quarter were 210 patients from all Public Health Centers.

Failure in the treatment based on Basic Health Research 2010 was found that 19.3% of pulmonary TB patients did not adhere to take medication. Lack of adherence to TB treatment becomes a challenge of global health, and mobile phone-based interventions have the potential to solve this problem. Based on the results of previous research were found that there were pulmonary TB patients who failed to undergo complete and regular treatment. This research used SMS (Short Message Service) as a reminder for adherence and cure of TB treatment but the success rate was 63.5% in intervention group and 62% in control group due to dropouts at sixth month of treatment. Meanwhile, conducted research from other researches showed that result of TB medication increased when the health education, psychological intervention, reminder (SMS (Short Message Service)) or mobile digital technology were applied.

One of interventions which are able to be conducted in order to increase adherence of TB treatment is through telenursing. Telenursing is a process of providing nursing care by utilizing technology of communication and information.

Another source states that telenursing is a media of health information technology that is able to be applied in nursing care. Thus, the people are able to access the needs of nursing services through telecommunication media. Telenursing services are able to provide information about what medicine that must be taken and advice that should be taken or not, making appointments for visits and disease management. Moreover, the role of telenursing is very effective for cost and time aspect, even it is able to improve the quality of nursing services.

People in Bima City, West Nusa Tenggara Province, Indonesia mostly have used communication technology, which is mobile phone. It is a communication tool that is used either directly or indirectly. The example is for Short Message Service (SMS) that is used to send and receive messages in text form from and to the other mobile phones. The text that is sent can consist of words or numbers or even an alphanumeric combination.

Communication through mobile phone can be utilized to overcome health problems and one of the health problems is tuberculosis (TB).

**Method**

This research method was experimental. Meanwhile, research design here utilized quasi experimental design (One group Pretest-Posttest Design) due to without using control group. This research was conducted in Public Health Centers in Bima City in July – December 2019.

Population in this research for all public health centers in per quarter was 60 patients. Sampling technique in this research was total sampling. Total sampling is a sampling technique which the number of samples is the same as the population.

**Data collection in this research was conducted by:**

1. This research was conducted by utilizing SMS (Short Message Service) as time reminder to take medicine which contained an appeal to immediately take medicine. At the beginning of treatment, patient and health workers had coordinated the time to take medicine in the morning, afternoon, or evening, then, the medicine was taken appropriately at the agreed time. This aimed at improving medication adherence and timeliness of sending SMS, thus, it was in order to avoid TB drug resistance to the patients. SMS was sent 10 minutes before taking the medicine once a day for two months at the beginning of treatment, then, the SMS was sent three times in a week for the following month. In order to confirm that the respondent had opened and understood the messages that had been sent, a Short Message Service (SMS) that was sent contained questions which related to time to take the medicine, such
as “Have you taken the medicine? And the patient answered the message that was sent.

2. Filling Morisky Medication Adherence Scales (MMAS 8) questionnaire sheets. Some experts have provided opinions on how to measure medication adherence, including the measurement of medication adherence, which can be identified in 7 ways, which are: doctor’s decision based on examination results, observation against medical treatment schedule, assessment on medical treatment goals, calculation of the number of tablets/pills at the end of medical treatment, measurement of drug levels in blood and urine, interviews with patients and filling the special forms. Based on this theory, researchers collected data through filling special form (questionnaire) which was calculated by using medication adherence score. The questionnaire that was used by the researchers was Morisky Medication Adherence Scales (MMAS 8) questionnaire to the patients who took medical treatment at the public health centers by calculating total score from the questionnaire and classifying into three levels, which were high adherence (score 0), moderate adherence (score 1-2), and poor adherence (score 3-8). The scale that was used was ordinal data scale. Furthermore, Morisky Medication Adherence Scales (MMAS-8) questionnaire was used as an instrument. Validity and reliability tests had been conducted by several previous researchers and it showed validity and reliability to assess medication adherence.

### Result

Data in this research included respondents’ characteristics that consisted of age, sex, latest education, and occupation which were presented in the following table:

1. **Data of Characteristics of Respondents with Pulmonary TB:**

   **Table 1.1 Distribution of Characteristics of Respondents with Pulmonary TB in Public Health Center in Bima City 2019**

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>%</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean±Median</td>
<td>45.73±51.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>18.198</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>81</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Analysis result of respondents’ ages was found that most of respondents who were at the maturity age of 25-60/65 years were 38 respondents (63.3%), young adult age of 12/20-25 years old were 14 respondents (23.3%), and elderly age of > 65 years were 8 (13.3%) respondents. It was tested by Likelihood Ratio and it was obtained p value = 0.978, which meant that p value > 0.05. In other words, there was no significant influence between age and medication adherence. Analysis results of respondents’ sex was found that more than half of the respondents were male which were 39 respondents (65%). Besides, chi square test was conducted with p value of 0.001, which meant that there was a significant correlation between respondents’ sex and medication adherence. Meanwhile, analysis results of respondents’ latest education was found that most of the respondents had graduated from Junior High School education which were 32 respondents (53.3%), 15 respondents (25%) had graduated from elementary school education, and 13 respondents (21.7%) had graduated from senior high school education. Moreover, chi square test was conducted with p value of 0.255, which meant that there was no significant correlation between education and medication adherence. Analysis results of respondents’ occupation was found that most of the respondents who had occupation were 41 respondents (68.3%), meanwhile, 19 respondents (31.7%) did not have any occupation. Chi square test was conducted with p value =0.001, which meant that there was a significant correlation between occupation and medication adherence.
2. **Data Analysis:** Based on the research results regarding the influence of telenursing against adherence to anti TB treatment at Public Health Center in Bima City, could be described as the following data:

**Table 1.2: Frequency Distribution of Adherence on Respondents to Take Anti-TB Medicine at Public Health Centers in Bima City 2019**

<table>
<thead>
<tr>
<th>Respondents with Pulmonary TB</th>
<th>MMAS of Medication Adherence</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High Adherence</td>
<td>Moderate Adherence</td>
</tr>
<tr>
<td>Pre Test</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>23,3%</td>
<td>76,7%</td>
</tr>
<tr>
<td>Post Test</td>
<td>60</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

*P value* .001

Based on table 1.2, it showed that respondents with pulmonary TB before being treated by telenursing who were in category of moderate adherence were 14 respondents (23.3%), meanwhile, in category of poor adherence were 46 respondents (76.7%). Then, all of the respondents were treated by telenursing and the result showed that respondents who were in category of high adherence were 60 respondents (100%).

**b. Difference in Average of Medication Adherence before and after Telenursing Treatment**

**Table 1.3: Wilcoxon Test for the Difference of Average Before and After Telenursing Treatment**

<table>
<thead>
<tr>
<th>Post Test - Pre Test</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative Ranks</td>
<td>0a</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>Positive Ranks</td>
<td>60b</td>
<td>30.50</td>
<td>1830.00</td>
</tr>
<tr>
<td>Ties</td>
<td>0c</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

According to table 1.3, it was obtained that negative ranks of adherence to anti TB treatment between pre-test and post-test was 0, which showed that there was no significant reduction value from pre-test to post-test or the pre-test value was greater. Meanwhile, positive ranks for pre-test and post-test showed that there were 60 positive data (N), which meant that the 60 respondents experienced an increase in adherence to take anti-TB treatment from pre-test to post-test. However, the average of the increase was 30.50, while the number of positive ranks or sum of ranks was 1830.0.

**c. The influence of Telenursing against adherence to anti TB treatment on patient with tuberculosis**

**Table 1.4 Wilcoxon Test Before and After Treatment of Adherence to Anti TB Treatment**

<table>
<thead>
<tr>
<th>Post Test-Pre Test</th>
<th>Z</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-.7152a</td>
<td>.001</td>
</tr>
</tbody>
</table>

This research used Wilcoxon test in order to investigate whether there was a significant difference between two dependent groups or not. Tests with SPSS was obtained significant results of 0.01 for interventions with significance level of 0.05 because p value <0.05, Ho was rejected. In other words, there was a significant difference in results between before and after telenursing.
treatment. Based on the results of the test through SPSS, telenursing had a significant influence against the adherence to take anti TB treatment for patients with tuberculosis.

Discussion

This chapter described discussion of research results that had been conducted at Public Health Center in Bima City, West Nusa Tenggara, Indonesia.

1. Identifying the average of respondents before and after being treated by telenursing against the adherence to take anti-TB treatment for Tuberculosis patients in Bima City: Based on table 1.2, it showed that TB respondents before being treated by telenursing were in category of moderate adherence, which were 14 respondents (23.3%) and in category of poor adherence were 46 respondents (76.7%). Then, after all of the TB respondents were treated by telenursing treatment, they were in category of high adherence, which were 60 respondents (100%).

Based on the research result that was conducted by Bediang, it was obtained that this research used SMS as a reminder for adherence and TB cure. The success rate was 63.5% in intervention group and 62% in control group due to a drop out at sixth months of treatment. This was in accordance with the research results that had been conducted by noticing to several things. Thus, in order to achieve success of increasing awareness for TB patients’ treatment in this research was through increasing respondents’ knowledge and strengthening the role of PMO by taking actions. One of the actions was providing a book of nursing care for tuberculosis patients, being responsive for providing feedback from respondents, and patient absence from taking the treatment package. Furthermore, research results showed that the success rate or respondents who were in category of high adherence after telenursing treatment were 60 respondents (100%) and there were no respondents who dropped out in doing treatment in this research.

2. Identifying the influence of telenursing against adherence to anti TB treatment on patient with tuberculosis in Bima City: Tests with SPSS was obtained significant results of 0.001 for interventions with a significance level of 0.05 because p value <0.05, then Ho was rejected. In other words, there was a significant difference in results between before and after telenursing treatment. Most of respondents who did not adhere to treatment were at early elderly age of 46-55 years and they were 17 respondents (28.3%). 15 respondents (25%) were at late adolescence of 17-25 years. 13 respondents were at late elderly of 56-65 years (21.7%). This was in line with results of conducted research by Erawatyingsih et al in 2009 which showed that most of respondents who did not adhere to treatment were respondents who were 49-55 years old group rather than other age groups.

When we looked at the age variable, most of respondents in this research were in age group of 55 year more or in other word, it was the late elderly age group or unproductive age. At the elderly age of more than 55 years, a person’s immunolosis system decreased. Hence, they were very vulnerable against various diseases, including pulmonary TB disease. The increase of TB cases was influenced by the immune system, nutritional status, personal hygiene, and the density of the residential environment.

Analysis results of respondents’ sex in this research was found that more than half of the respondents were males, which were 39 respondents (65%). This was in line with results of conducted research by Aziz et al which showed that there were 336 (91.8%) male respondents and 30 (8.2%) female respondents and chi square test was conducted with p value of 0.001. In other words, it meant that there was a significant correlation between sex and medication adherence. The results of Riskesdas (basic health research) in 2013 showed that diagnosis of pulmonary TB based on sex was male (0.4%) and female (0.3%). The previous Indonesia health profile in 2012 showed that smear positive pulmonary TB cases in men were almost 1.5 times (59.4%) greater rather than in women (40.6%).

Higher TB case rate in men rather than women could reflect on the exposure on infection risk (including lifestyle, such as smoking, alcohol consumption, and occupation which were from indoor pollutants) and disease progression. This was in accordance with result of conducted research by Haslinda & Juni, (2017), which showed that smoking, alcohol and drug abuse were risk factors for discontinuation of TB treatment. Another conducted research by (Faletetehan, 2014) regarding smokers, who were found almost 18,000 people that represented general population over the past three years, “were found twofold increase of the risk of active TB on smokers rather than those who never smoked”, smokers had more potential to suffer tuberculosis (TB).
Analysis results of respondents’ latest education aspect was found that most of the respondents had graduated from senior high school education which were 21 respondents (35%), 15 respondents (25%) had graduated from elementary school education, and 11 respondents (18.3%) had graduated from junior high school education. Chi square test was conducted with p value of 0.255, which meant that there was no significant correlation between education and medication adherence. Nevertheless, education is very important to improve someone’s knowledge and insight, likewise with health education that can enable a person to improve control and individual health and make changes voluntarily in individual behavior.

This was in line with conducted research by Prayogo, (2013) which stated that low level of education would impact on lack of person’s knowledge and insight against TB disease. Thus, it would impact on person’s level of medication adherence. Other researches showed that low level of education and inadequate knowledge affected more on the level of medication adherence. Therefore, it was expected that TB patient would improve health education in order to encourage contributions for controlling TB.

Analysis results of respondents’ occupation was found that most of respondents had occupation as farmer which were 16 respondents (26.7%), 13 respondents (21.7%) worked as private employees, 10 respondents (16.7%) worked as laborers. Moreover, chi square test was conducted with p value of 0.001, which meant that there was asignificant correlation between occupation and medication adherence. Nevertheless, occupation is an indicator to measure person’s education level. Knowledge that is influenced by education level is one of predisposing factors that has a role in influencing person’s decision to behave healthily.

According to result of conducted research by (5) showed that mobile phone-based interventions helped to overcome barriers such as stigma, loss of privacy, limited transportation, and to make respondents feel “cared for” and they were “responsible for their own care”. Being compared to respondents who were not treated through mobile phone-based interventions, SMS interventions significantly improved adherence to anti TB treatment. However, this was in accordance with the research result that was obtained in this research that there was a significant difference between before and after being treated by telenursing against medication adherence.

Conclusion

Conclusion of this research as follows:

1. Description of adherence to anti TB treatment improved all respondents which were 60 respondents (100%).
2. There was a significant influence and difference against adherence to anti TB treatment after telenursing treatment in pre and post intervention (p=0.001).

Ethical Clearance: Taken from University Mataram.

Source of Funding: Health Polytechnic of Ministry of Health at Mataram.

Conflict of Interest: None

References


Use of Postoperative TENS Along with Rehabilitation Protocol Following Total Knee Replacement for Better Results

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Abstract

Objective: To assess the viability of TENS in diminishing agony and increasing function following TKR.

Sample: 30 subjects (age>55years)chose based on consideration and avoidance standardsare included in the study.

Method: 30 subjects were taken in the study,chosen based on consideration and rejection models and arbitrarily assigned to each group. Group 1 and group 2. Experimental group (group 1) received TENS and exercise while control group received only exercises for 20 days (6 days per week). Functional testing was done using a questionnaire.

Results: Paired t-test was used for statistical analysis. There was huge distinction between the two groups (A & B). The experimental group has significant improvement then the observational group. The pain VAS score has more difference. There was no significant difference in ADL activities score.

Conclusion: It was concluded that applying TENS along with exercises on initial days of rehabilitation shows better results and increases the recovery process.

Keywords: Total Knee Replacement (TKR), Transcutaneous Electrical Nerve Stimulation (TENS), Osteoarthritis, Pain, Muscle Strength.

Introduction

Total knee replacement (TKR) or total knee arthroplasty (TKA) could be a common procedure which is finished for the betterment of knee function and reduce pain mainly in cases of degenerative knee disease called arthritis.¹ Osteoarthritis is the commonest arthritis that ends up in replacement surgeries in knees in maturity patients. People (>55 years) normally suffers from some quite knee problems including disability and pain.

On evaluation 7.5% maturity people suffer from these problems, and a couple of them have acute problems. Within the process of ageing there’s reduction in size of muscle fibers (fast glycolytic type II), in OA these changes are elevated. Altogether these years strength training programs are used stop all the morphological changes within the muscles assigned to injury or surgery and also in cases of ageing. Within the onset of arthritis, the most muscle that goes first into atrophy is quadriceps causing altered gait and stance.² Within the subject of knee pain there’s weakness and disability and by the time the patient goes for the surgical procedure the damage to the muscle has already exhausted the shape of muscle atrophy. Rehabilitation following TKR is usually painful for a few of the knee movements like flexion and knee extension.³ The acute pain during this phase indicates poor recovery (functionally). Pre-surgical program helps to coach muscles for the surgery and also plays a giant role in the post-operative recovery. For the pain

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management patients rarely receive the other treatment then pharmacologic drugs. However, drugs can’t be much help in cases of acute movement pain within the rehabilitation process. In such cases electrical nerve stimulation (TENS) is incredibly effective for pain management and improving the patient ability to perform exercises. It eventually helps with fast recovery of the patient. TENS blocks the pain stimulation within the neural structure and brain stem by engaged on pain gate mechanism. TENS helps in postoperative pain management. In any case, the few clinical preliminaries that have determined the viability of TENS for torment following TKR were directed over 10 years prior with little example estimates and differing results utilized high recurrence TENS with a ground breaking abundance (30–40mA) and detailed huge variety contrasted with fake treatment TENS on torment very still, torment after extensor muscle compression, and muscle withdrawal capacity, while others indicated no noteworthy variety in pain relieving utilization among TENS, fake treatment TENS, or no TENS. One among these examinations used tangible edge TENS and also the other didn’t give specific data on adequacy. Earlier work shows that sufficiency is basic in giving absence of pain TENS in sound controls and people with postoperative agony, demonstrating low adequacy may have added to the noteworthy discoveries in these examinations. Furthermore, these two investigations utilized pain relieving admission because the essential result which can are impacted by different variables, for instance, lack of ability to direct prescriptions during rest or modified wellbeing spans. We’ve got indicated that TENS declines development yet not resting torment which isn’t all around controlled with analgesics. In spite of the actual fact that there are numerous examinations about applying TENS on TKR patients is powerful or not. Here we are going to apply TENS on quadriceps (VMO and Vastus intermedius) alongside the physiotherapy practices convention and check whether there’ll be any noteworthy outcomes.

BARBARA RAKEL, RN, PhD, FAANa, M. BRIDGET ZIMMERMAN, PhDb, KATHERINE GEASLAND, RN, BSNa, JENNIE EMBREE, MSa, CHARLES R CLARK etal. Transcutaneous Electrical Nerve Stimulation (TENS) for the Control of Pain during Rehabilitation Following Total Knee Arthroplasty (TKA): A Randomized, Blinded, Placebo-Controlled Trial, j. pain.2014.09.025. This investigation assessed the adequacy of TENS in lessening torment and hyperalgesia and expanding capacity following all out-knee arthroplasty (TKA). Assessors, blinded to treatment portion, estimated torment, work (ROM and walk speed), and hyperalgesia (quantitative tactile tests) postoperatively and a month and a half after process. S. Asif et al, December 2005, assessed the mid-term consequences of fifty patients who experienced Total knee arthroplasty utilizing press fit condylar sigma framework. Patients were assessed clinically and radiographically by an autonomous spectator. The American knee society score, oxford knee score, and knee society radiographic appraisal were utilized to rate knee work and to come to a decision the fulfillment level of each patient. The reasoned that patient indicated great mid-term results. Total knee replacement (TKR) or total knee arthroplasty (TKA) because it is often known is perhaps the most effective innovation of the sole remaining century. It’s one in all the foremost well-known orthopedic method performed. Effectively reproducible with reliable results. The careful procedure is easy. In early 1970’s and

M. Weiss et al, November 2002; led an investigation to tell apart the exercises critical to patients after TKR and also the pervasiveness of constraints to interest in these exercises. A survey was created involving 55 inquiries. Patients were asked the recurrence with which they did the exercises, the exercises imperative to them and also the degree to which their support was restricted by their knee substitution. The poll was endeavored by 176 patients, 40% men and 60% ladies. Accordingly, the investigation demonstrated a high connection between the importance of exercises and recurrence of patient’s interest affirming that knee substitution effectively reestablishes an enormous level of capacity.
Barbara. E. Lamb et al, August 2002; examined the practicality and impact of neuromuscular incitement on recuperation of portability after careful obsession for hip crack. Recovery of strolling pace and capacity, postural security, lower appendage muscle power and agony at 7 and 13 weeks after process.

Methodology

Subjects: An absolute number of 30 subjects were chosen and treated that supported inclusion and exclusion standards expressed underneath.

The subjects were isolated (randomly) into two gatherings:

Group A/Group 1. (Experimental group) n= 15
Group B/Group 2 (Control group) n =15

Inclusion Criteria:
1. Patients agreeing to use TENS on them.
2. Never had any surgery of hip or knees before.
3. Age group of 55 and above.
4. Unilateral or bilateral TKR both
5. History of OA

Exclusion Criteria:
1. Had encountered a stroke/CNS malady or had mental disability influencing their capacity to urge tests/measures;
2. Had incessant torment apart from knee OA.
3. Had tactile weakness, characterized as absence of sharp or dull sensations over any of 5 dermatomes in their careful leg.
4. Were for all time wheelchair bound.
5. Had a condition that contraindicates TENS use, as an example, pacemaker or hypersensitivity to nickel.

Sampling: The total number of 30 subjects (age: >55) who took an interest within the examination, chose supported consideration and avoidance standards and arbitrarily assigned to both groups. From the primary day both the groups were provided same exercise protocols. Only the experimental group were provided the appliance of TENS prior the exercises in sitting or lying position. The terminals were put over the distal vastus medialis and proximal vastus lateralis muscles and then activities were performed a day. The sessions were scheduled 6 days every week from the primary day of discharge. There have been total 20 sessions given to every patient. Functional testing was done employing a questionnaire. Patient was provided a questionnaire to test the ADL recovery.

Data Analysis: The matched example t-test was performed for intragroup examinations. A free T-test was utilized for the examination between the two groups (P < 0.05). Enlightening investigation was utilized to ascertain standard deviation. Graphical portrayal was finished utilizing MS-EXCEL 2016.

Results

In the current examination, information investigation has demonstrated that there is huge distinction between
the two groups (A & B). The experimental group has significant improvement then the observational group. The pain VAS score has more difference.

The mean score on comparison of ROM of right knee on 14th day were 96.2±14.4529 (Conventional group) and 109.333±10.4722 (experimental group) and of left knee were 95±16.084 (Conventional group) a n d 107.533±14.2371 (experimental group). Now on 21st day the mean score was: Right knee: 108.8667±6.9371 (Conventional group) and 114.4±10.5749 (experimental group); Left knee:107.1333±8.3655 (Conventional group) and 113.6±8.3655 (experimental group). This shows a significant improvement in the experimental group.

In case of VAS score there is huge distinction between the two groups. The mean score of comparing VAS score of Right knee on 14th day were: 4.0667±0.8837 (Conventional group) and 1.6±1.1212 (experimental group); Left knee:

4.333±0.9759 (Conventional group) and 1.933±1.387 (experimental group). Now on the 21st day the mean VAS score comparison of right knee was: 1.6667±0.6172 (Conventional group) and 0.8+1.0142 (experimental group); and of left knee: 2.2667+1.0328 (Conventional group) and 1+1.1952 (experimental group).

There is no significant difference in ADL score. The mean score on 7th day were 42.333±3.64 and 40.6667±2.55 of conventional group and experimental group. On 20th day mean score were 60.3333±1.799 and 61±1.964 of conventional group and experimental group.

**Discussion**

Neuromuscular electrical incitement offered a protected expansion to customary, high force intentional reinforcing program. The patients accomplished a more noteworthy power gains in an exceedingly shorter timeframe than has been commonly detailed within the writing permitting them to return back to autonomous exercises of day by day living and recreational exercises rapidly. The utilization of Transcutaneous Electrical Nerve Stimulation has been empowered for quite 2 decades and has picked up substantial fame within the clinical field as a successful methodology within the administration of agony”.

It is entrenched that quadriceps shortcoming is obvious right off the bat in knee osteoarthritis and, alongside torment, is one amongst the past clinical manifestations announced by patients. Exceptional shortcoming and squandering of quadriceps muscle may be a typical finding in patients after injury or activity of the knee. this outcome shows that TENS (NMES) helps with improving the standard of quadriceps muscle after complete knee arthroplasty and furthermore helps in introductory restoration of the patient. Absolute knee arthroplasty is an exceptionally fruitful system that extensively lessens torment and redesigns personal satisfaction for a few patients.

R.L. Mizner’s investigation demonstrated that patients finally out knee arthroplasty create less power and show bigger disappointment of willful enactment of quadriceps muscle.

Earlier investigation by Sarah E. Sheep presumes that NMES may be a practical a good treatment choice in speeding the recuperation of versatility after careful obsession of hip for a situation study presented by Michael Lewek et.al presumed that neuromuscular electrical incitement offers a conceivably more achievement method for upgrading muscle power than flow restoration conventions. They likewise inferred that their patient had the choice to come back to autonomous exercises of day by day living and recreational exercises.

Alexander Berth likewise reasoned that patients with osteoarthritis knee have eminent respective willful shortages that are in any event to some extent reversible inside 3years finally out knee arthroplasty.1

In an examination done by Kyriakos Avramedis et.al, electrical incitement was applied on the second day after absolutely the knee substitution they chose invigorate the vastus medialis muscle thanks to its significance in step execution and engine control of the knee) they consequently connoted that the clinical use of the electrical incitement helps in improving the strolling pace of the patients who are recuperating from the full knee arthroplasty and increment their capacity to participate within the activity program. They saw a continued refinement within the movement execution of the patients. They from this point forward, reasoned that the electrical incitement may be utilized to accelerate the recovery in patients who have experienced absolute knee arthroplasty, especially in those with critical quadriceps shortcoming.
Relevance to Clinical Practice: Transcutaneous electrical stimulation may be employed in cases after total knee arthroplasty to boost strength within the quadriceps, mainly in cases which have a history of osteoarthritis.

Future Research: Further research is critical with the inclusion of a greater number of subjects to line up the generalization of those results.

In future research outcome of transcutaneous electrical stimulation may be studied on cases of total knee arthroplasty thanks to other causes in addition. Bilateral total knee arthroplasty may also be taken under consideration to work out their progress.

Conclusion

Thus, the study supports the experimental hypotheses expressing that: “There are going to be an impact of TENS on Postoperative pain in TKR which there’s huge distinction between the patients having TENS applied with exercise vs no TENS with exercises. There’ll be improved strength in quadriceps and ROM.”

Limitations of Study:
1. The sample size is small in the following study.
2. The Study is not separated for Male and female.
3. All patients had bilateral knee replacement surgery.
4. Only the patients with history of osteoarthritis were taken.

Ethical Clearance: Participants gave informed consent before taking part.

Source of Funding: Self

Conflict of Interest: Nil

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The Impact of Resistance and Aerobic Exercises on Blood Sugar Level in Type 2 Diabetes Mellitus: A Pilot Study

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Abstract

Objective: To rule out the impact of resistance and aerobic exercises on sugar level in the blood in type 2 diabetes mellitus population.

Sample: 10 subjects who have type 2 diabetes mellitus comes under this study.

Method: 10 subjects having type 2 diabetes mellitus were taken to control and experimental sets. Experimental set received aerobic and resistance exercise training program as well as medication while control set received only medication for 4 weeks (6 weeks per day).

Results: Paired t-test was used, and it was found that blood sugar was reduced in experimental set and two sample t-test was used to check between the group analyses and between set comparison it was found that there was no significant difference detected in sugar level in the blood.

Conclusion: It was concluded that resistance and aerobic exercises are beneficial for lowering the blood glucose level in type 2 diabetes mellitus population.

Keywords: Type 2 diabetes mellitus (T2 DM), Aerobic exercise, Resistance exercise.

Introduction

Daily physical activities are necessary to maintain blood sugar in type 2 diabetic population[1].

Resistance exercise and aerobic exercise reduces the risk factors to develop cardio vascular diseases, obesity and help to maintain overall health. Aerobic exercises involves large muscle group's movement which depend on large amount of energy produced by aerobic activities that is running or swimming[2].

Resistance exercise is physical workout that causes the muscles to contract against an external resistance, the aim of that is to increase muscle strength and muscle mass[3].

Diabetes is a condition in which blood sugar level of the body become impaired due to inadequate insulin secretion from the pancreas or poor sensitivity of the body towards insulin[4].

Type 2 diabetes is distinguish by reduced insulin production in blood compared to the blood glucose level with peripheral insulin resistance, which results in chronic hyperglycemia. Type 2 diabetes is categorized by three fundamental metabolic abnormalities:

1. Impaired insulin production by glucose stimulation in the pancreas.

2. Major organ system like muscle, liver, adipose tissue become less sensitive to the insulin

3. Hepatic glucose produces in more abundance in the basal state.

Diabetes mellitus may result in complications. Diabetes is associated with accelerated atherosclerosis.

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formation which leads to acute myocardial infarction. In addition, diabetes can cause retinopathy, nephropathy, autonomic neuropathy and cerebral stroke. The life expectancy of diabetes patient is reduced to two-thirds that of a non-diabetic individual. Diabetes 1 and 2 are diagnosed by detection of a fasting (>8 hours) plasma glucose level which exceed by 126mg/dL, or blood sugar level more than 200mg/dL at 2 hours after an oral glucose tolerance test [5].

Component of physical activity in the form of physical workout or sports is necessary or important thing to manage the diabetes because of its effects in reducing blood glucose levels. The principle of exercise for diabetics is not different from other sport. The exercise aims to burn calories, convert glucose into energy, so the sugar in the blood would decrease. Currently, it is calculable that around one hundred fifty million people in the world suffer from diabetes mellitus, and it’ll most likely double by 2025. The causes of rising diabetes mellitus sufferers in developing countries are increasing population, aging, unhealthy diets, obesity and lack of activities. Physical activity for 3-4 times every week, minimum time for 75 minutes a week. The exercise aims to burn calories, convert glucose into energy, so the sugar in blood would decrease [6].

Peoples with obesity are under the risk to develop diabetes mellitus. By involving in regular physical workout or activity, individuals can reduce excessive body weight and by controlling and maintaining wholesome diet, individuals can control type 2 diabetes mellitus and prevent the problem from developing where they must take ordinary insulin tablets [7].

Methodology

Sampling: A sample of convenience was chosen for the study.

Sample Setting: A written consent form of patient and the inclusion criteria were considered the basis of their participation in the study.

Sample Size: A sample of 10 patients was taken for the study.

Inclusion Criteria:

- Age 35-60 years
- Population with type 2 diabetes mellitus

Exclusion Criteria:

- Age below 35 years
- Type 1 diabetes
- Subjects should not have any musculoskeletal condition, cardiovascular condition or any neurological condition.

Instrumentation:

- Glucometer

Protocol: A total number of 10 subjects aged 35-60 years were selected based on inclusion criteria and with a written consent form of patient to participate in the study. After completion of the consent form, body weight, body height, pre fasting and post prandial blood sugar levels was measured. We divided the subjects into two sets that is experimental set and control set. Experimental set consisting of 5 subjects received both types of exercise as well as medications while controlled group consisting of 5 subjects received medications only for 4 weeks (6 days per week). The control set will receive medications only. After completion of 4 weeks exercise training program post fasting and postprandial blood sugar levels was measured by using glucometer.

<table>
<thead>
<tr>
<th>Aerobic Exercise</th>
<th>Resistance Exercise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking: A 30-minutes daily walk</td>
<td>Resistance band exercise: 30 minutes daily exercise with Thera-band for 6 days in a week.</td>
</tr>
<tr>
<td>for 6 days in a week</td>
<td>Upper body exercises training program: biceps curl, push-ups, overhead triceps, seated row, shoulder lateral raise, forward raise were included.</td>
</tr>
<tr>
<td></td>
<td>Lower body exercises training program: squats, leg extensions, leg curl, hip extension, standing abduction were included.</td>
</tr>
</tbody>
</table>

Data Analysis: Analysis were done for 10 subjects to complete the study. The physical characteristics data of the subject including age, height, weight and BMI that descriptive summarized. Paired t test performed within the group analysis. Two sample t test was used to check between the group analyses. Graphical illustration was done using MS-EXCEL 2016.

Results

The study involved 10 patients of type 2 diabetic mellitus aged from 35 to 60 years. The patients were separated into two equal sets: the first group did aerobic and resistance exercise as well as medications for 4 weeks (6 days per week). The second group took medications only for 4 weeks. Then we compared the
effect of both the exercises on the blood sugar of the patient.

By this experiment we found that there is no significant changes in the data (Table 1). The average age of the subjects in experimental set was $52 \pm 5.43$ and average age of control set was $48 \pm 3.50$ with t value 1.17 and p value 0.27.

### Table 1. Physical Characteristics of Subjects

<table>
<thead>
<tr>
<th>Variable</th>
<th>Experimental set (n=5) (Mean±SD)</th>
<th>Control set (n=5) (Mean±SD)</th>
<th>T-value</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Year)</td>
<td>$52 \pm 5.43$</td>
<td>$48.6 \pm 3.50$</td>
<td>1.17</td>
<td>0.27</td>
</tr>
<tr>
<td>Height (m)</td>
<td>$1.688 \pm 0.04$</td>
<td>$1.694 \pm 0.09$</td>
<td>-0.12</td>
<td>0.90</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>$67.6 \pm 5.94$</td>
<td>$69.6 \pm 6.18$</td>
<td>-0.52</td>
<td>0.61</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>$23.72 \pm 1.73$</td>
<td>$24.36 \pm 2.59$</td>
<td>-0.45</td>
<td>0.65</td>
</tr>
</tbody>
</table>

Intragroup comparison of experimental set, it was found that blood glucose level demonstrated statistically significant difference between PRE FBS level and PRE-PP sugar level and PO.FBS level and PO. PP sugar level. On comparison, after exercise blood sugar level was improved (Table 2).

### Table 2. Intragroup Comparison of Blood Glucose Level of Experimental Set

<table>
<thead>
<tr>
<th>Pairwise comparison</th>
<th>T value</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRE FBS and PRE-PP</td>
<td>4.07</td>
<td>0.0152*</td>
</tr>
<tr>
<td>PO.FBS and PO.PP</td>
<td>4.08</td>
<td>0.015*</td>
</tr>
</tbody>
</table>

PR.FBS- pre fasting blood sugar, PO.FBS- post fasting blood sugar. PR. PP- pre post-prandial, PO. PP- post post-prandial. *P<0.05, statistical significance.

On the other, on intragroup comparison of control set, the result shows no significant difference observed between PRE FBS level and PRE-PP glucose level and PO.FBS level and PO. PP glucose level (Table 3). On comparison, after exercise blood sugar level was improved.

### Table 3. Intragroup Comparison of Blood Glucose Level of Controlled Set

<table>
<thead>
<tr>
<th>Pairwise comparison</th>
<th>T value</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRE FBS and PRE-PP</td>
<td>1.61</td>
<td>0.181</td>
</tr>
<tr>
<td>PO.FBS and PO.PP</td>
<td>2.37</td>
<td>0.076</td>
</tr>
</tbody>
</table>

Though, on between set comparison it was found that there was no statistical difference detected in sugar level in the blood. The average values of fasting and post-prandial blood sugar level were significantly decreased from $148.4 \pm 33.45$ and $225.8 \pm 65.85$ to $128.4 \pm 33.65$ and $206.4 \pm 51.42$, respectively, in experimental set and from $157 \pm 31.53$ and $186.44 \pm 18.41$ to $154.6 \pm 28.77$ and $182.6 \pm 17.99$, respectively, in control set (Table 4). So, it is concluded that with the help of aerobic and resistance exercise the blood sugar level of the body reduced in T2 DM.

### Discussion

In this research, we studied the impact of resistance and aerobic exercise on the daily basis on sugar level in the blood in T2 DM population. The physical demographics variables taken were age, weight, height and BMI. The results suggested that, on comparing the pre and post data in experimental group, result shows that after aerobic and resistance training for 4 weeks helps in reduction of blood sugar level (Table 2). On the other hand, there was the reduction in controlled group also but on comparison between experimental and controlled group, better results show in the experimental group. So, it is concluded that by doing regular physical exercise the blood glucose level reduced in the body in T2 DM population.

It was understood from one of the discourse physical workout can control the blood glucose and helpful for overall health improvement[2]. Another study examined that organized exercise of more than 2 hours and 30 minutes per week shows a better reduction compared to the exercise of exact 150 minutes or less than 150 minutes per week [i]. As reported by Rajiv Sighamoney et al., 2018 investigated that before exercise training program the mean value blood glucose level was 143.937 mg/dl...
and after exercise was 112.1 mg/dl and the mean value of post prandial blood sugar before the exercise training program was 193.167 mg/dl and after the exercise was 156.49 mg/dl. So, they concluded that aerobic exercise improves the activity of insulin in blood, which result in the lowering of blood sugar in T2 DM population[4].

The present study indicates that by doing aerobics and resistance exercise regularly is beneficial for lowering the blood sugar level in the type 2 diabetic population. Another research suggest that aerobic and resistance exercise is usually suggested for the care in the T2 DM population[3]. One of the researchers found a major difference in blood sugar of the body in the intervention group with a value of p <0.05, which means there is a significant influence of diabetes exercises on the blood sugar levels [6]. Another review research by Elizabeth Anderson et al., 2018 suggested that by indulging in regular physical workout is helpful in the elimination and management of chronic diseases. They concluded that by indulging in regular physical activity can provide a non-invasive mode of preventing the long-term chronic diseases and provide numerous health benefits, improve or encourage societal growth and improves overall universal health [8].

Resistance and aerobic exercise help to ameliorate the action of insulin and maintain the level of glucose or lipids in blood. It is also beneficial in maintaining blood pressure and improve the quality of living[9]. According to PeeyooshaGurudut et al., in 2017 concluded that passive static stretching, and resistance exercises are evenly advantageous in lowering the blood glucose level and helpful for the management of glycemic control[10].

In general, by indulging in regular physical exercise or any sports activity is useful for the lowering the blood glucose level in type 2 diabetic patients. Our findings suggest that, both the sets (experimental set and controlled set) show reduction in blood sugar level. However, the experimental set shows better result than the controlled set. So, it is attributed that aerobic and resistance exercise helps in lowering the blood sugar level. Though, on between set evaluation no statistical difference was detected for blood glucose level. In experimental set, an average difference of 14 mg/dL was detected among the pre- and post-post-prandial period and 20 mg/dL was detected among the pre- and post-fasting period suggested that aerobic and resistance exercise helpful in lowering the blood glucose level. In contrast, in controlled set, an average difference of 4 mg/dL and 3 mg/dL was found during the fasting and post-prandial period (Table 4).

**Future Research:** Future study is needed to see long term effect of resistance and aerobic exercise daily in type 2 diabetic patient. The future research could be done by comparing several activities or exercise and their impact in the population of T2 DM.

**Conclusion**

In order to get the result of resistance and aerobic exercises on sugar level in the blood in type 2 diabetic people, this research was held. It is found that, there is a significant difference in blood sugar of the body before and after the aerobic and resistance exercise in post-prandial period in the experimental set with a value of p<0.05. And by this study we concluded that resistance and aerobic exercise is beneficial for lowering the glucose level in blood T2 DM people.

**Ethical Clearance:** Participants gave informed consent before taking part.

**Source of Funding:** Self

**Conflict of Interest:** Nil

**References**

6. Mustikawati D, Erawati E, Supriyatno H. Effect Of The Diabetes Exercise On The Blood Sugar Levels


Association between Antibiotic Resistance with Duration of Hospitalisation in Diabetic Foot Ulcer Inpatient at Internal Ward in Dr. Soetomo General Hospital

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Abstract

Introduction: Diabetic Foot Ulcer (DFU) are microvascular and macrovascular complications from diabetes and has potential pathological risks including infection, ulceration, and deep tissue damage and is associated with neurological abnormalities, peripheral arterial disease, and metabolic complications in the lower extremities. Diabetic foot injury is an infection of several pathogenic microorganisms that cause tissue damage, if the infection is not handled properly then the wound will worsen and have an impact on amputation. Those pathogenic microorganisms could be a mono-microbial infection or a poly-microbial infection and those infections could be multi-drug resistant organisms (MDRO).

Objective: To analyse the association between antibiotic resistance and the duration of the hospitalisation in diabetic foot ulcer patient at Dr. Soetomo General Hospital.

Method: This study is a cohort retrospective study that reviews medical records of all diabetic patients with diabetic ulcer that was admitted into Dr. Soetomo General Hospital.

Result: In Dr. Soetomo General Hospital the average duration of hospitalisation is 11.48 days. The species that caused the most infection under the category of gram-positive organisms are Enterococcus faecalis (7.8%), Staphylococcus aureus (5.2%) and Staphylococcus haemolyticus (3.9%). In the gram-negative category of bacterial species, Proteus mirabilis (10.5%), Acinetobacter baumannii (9.8%) and Escherichia coli ESBL (8.5%) Patients had a high resistance towards is Cephazolin with a rate of 85.5% followed by Ampicillin with 83.2% and Tetracyclin with 82.0%. Piperacillin-tazobactam (p-value 0.045) and Ceftazidime (p-value 0.046) showed an association between antibiotic resistance and duration of hospitalisation. All patients presented with MDRO and 35 (29.7%) were poly-microbial infection

Conclusion: There is an association between antibiotic resistance and duration of hospitalisation for Piperacillin-tazobactam and Ceftazidime as well as 100% of patient presented with Multi-drug resistant organism. Clinicians should refer to the periodic report from the internal ward on dominant species found and antibiotic resistance more.

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Keywords: Antibiotic resistance, Diabetic Foot Ulcer, Duration of hospitalization.

Introduction

Diabetic foot ulcer (DFU) is a serious and common complication of patients with diabetes mellitus, it significantly increases the cost of treatment. Diabetes
is one of the most prevalent chronic diseases in 2010, one study reported that 285 million adults worldwide had diabetes and this figure is projected to rise to 439 million by the year 2030.

This profound demographic shift is likely to result in a corresponding increase in the prevalence of chronic diabetes complications, including those in the lower extremity, the diabetic foot. Prevalence of risk and DFU is higher in Indonesia. The current study found that the prevalence of risk (neuropathy and angiopathy) in this study was 55.4%. These findings are within global prevalence of risk 40% - 70%. This percentage still remains higher compared to India. Meanwhile, current prevalence of DFU is 12%. These findings are higher compared to China which is the most populated Diabetes Mellitus country and in comparison with global prevalence 1.4% - 5.9%. In Dr. Soetomo General Hospital, diabetic foot ulcer is the most common cause of inpatient registration in the Internal Medicine Department and with an average duration of 28 days of hospitalisation amongst those that has been admitted 30% had to undergo amputation, however this data was done from 2003-2007.

Many studies have reported on the bacteriology of Diabetic Foot Infections (DFIs) over the past 25 years, but the results had varied and often contradicted one another. The varied results could be due to differences in causative agents, which had occurred over time, geographical variations, or the type and the severity of the infection, as were reported in the studies. In Indonesia, based on a study conducted in Jakarta, has several limitations. This research was done before the implementation of BPJS which was implemented in 2014 and more people had access to health care therefore and increase use of antibiotics which may result in resistance thus contributing to community based infections which are becoming increasingly common. Moreover, this research was done in a navy hospital which can’t account for the entire Indonesian population as a navy officer lives a far more different lifestyle than the average Indonesian regardless. The sample size is also a matter of limitations with only 35 patients to study from.

Impairment of microvascular circulation limits the access of phagocytic cells to the infected area therefore causing a reduced concentration of antibiotics at the infected tissue area. Due to the reduced concentrations of phagocytic cells and antibiotic concentrations, diabetic foot wounds are easily infected leading to micro-thrombi causing ischemia, necrosis, and then gangrene which requires the need of limb amputation. Therefore, accurate diagnosis of causative organism is essential for the management of these cases especially with the implementation of the new government insurance scheme (BPJS) where only a government approved drug is given to patients with diabetic ulcer under this scheme. Patients with diabetes have a 10-fold higher chance of hospitalisation due to soft tissue and bone infection when compared with nondiabetic individuals. Due to inadequate foot care and local, blood supply to the lower extremities is further compromised.

Diabetic neuropathy leads to repeated non-recognized trauma to the insensate feet and this causes callosities, cracks, fissures, and ulcer formation. Secondary infection of the ulcer with arterial abnormalities further complicates the condition leading to gangrene and limb loss. A compromised immune state in patient with diabetes favours rapid and relentless development of local sepsis and even life-threatening septicemia. Massive infection is the most common factor leading to limb amputation. Patients with diabetes are often exposed to many antibiotics and therefore can develop multiple-drug resistant infections (MDRO) and most diabetic foot infections are caused by mixed bacterial infection (poly-microbial). Proper management of infections requires an appropriate antibiotic selection, based on the culture and the antimicrobial susceptibility testing results.

Although there is an abundance of research regarding the type of bacteria found and its antibiotic sensitivity, however there is none regarding its association to the duration of hospitalisation but there are research regarding its risk factors. Moreover, external data from Western countries cannot be generalized into Indonesian setting due to difference in demography, lifestyle and behaviour. This fact leads to limitation of preventive strategies for the presence of risk and DFU based on Indonesian. Knowing the duration of therapy will greatly improve the efficiency of treatment, it will aid patients and insurance company to predict the average cost needed for treatment. Knowledge on bacterial antibiotic resistance will provide a more accurate empirical treatment and if there is a new emerging resistance amongst the diabetic ulcer community. The aim of this research is to determine the association between antibiotic resistance and duration of hospitalisation in patients with infected diabetic ulcer foot in Surabaya.
**Methodology**

**Selection and description of Participants:** This is an analytical study, a cohort retrospective study with total sampling that reviews medical records of all diabetic patients with diabetic foot ulcer that was admitted into the Internal Ward at Dr. Soetomo General Hospital. It is the primary reference hospital in East Java and the main teaching hospital for the Medical Faculty, University of Airlangga. Patients with various diabetic complications are referred to this hospital. This study was conducted over a period of 3 years from January 2016 till December 2018.

Those without bacterial sensitivity tests/antibiotic resistance are excluded along with those without a proper record of the type of bacteria and the duration of hospitalisation based on the type of bacteria and its antibiotic resistance at the time of admittance. The types of bacteria and its sensitivity pattern were noted and the results were presented as descriptive statistic and analysed using IBM SPSS Statistics 26.0 on windows. Ethical clearance obtained by the medical research ethical committee at Dr. Soetomo General Hospital, Surabaya. Reference number: 1432/KEPK/VIII/2019

**Statistical Analysis:** Statistical analysis is done by categorising the type of antibiotics used with the type of bacterial infection and is measured using the chi-square test to discriminate between the groups that are significantly different from those that are not. Variable characteristics and frequency are expressed in terms of mean ± standard deviation and compared by one wat ANOVA. All statistical analysis is carried out using IBM SPSS Statistics 26.0 on windows.

In that period there were a total of 425 patients admitted with diabetic foot ulcer and 118 of them have culture done. Out of 118, 35 of them have poly-microbial infection therefore there is a total of 153 species and out of that 153, 86 of the infections are gram negative and 71 of the infections is gram positive.

The patients are characterized mainly by their gender and age, generally patients come in with a mean age of 58.2 and a range of 30-90 years old, and there are slightly more male patients 53.4% (63 cases) than female patients 46.6% (55 cases). The rate of mortality is 39.0% (46 patients).

Males have a mortality rate of 39.7% (25 cases) where else in females it is 38.2% (21 cases). The rate of mortality increases with age, as seen from the table below. Patients age 58 and above have a mortality rate of 50.8% (32 cases) and patients who are below 58 have a mortality rate of 25.5% (14 cases).

Distribution of Wagner’s grading to assess the severity of DFU can be seen in the pie chart below. Wagner grade 1 makes up about 1% of the sample, grade 2 make up 13%, grade 3 occupies 20.2% of sample, which makes up the highest frequency, grade 4 has 17.1% and grade 5 makes up 9.8% of sample.

In Dr. Soetomo General Hospital, Surabaya there are 118 patients that present with both poly-microbial infection and mono-microbial infection. There are more gram negative 60.8% (93 cultures) organisms that infect patients compared to gram positive organism 39.2% (60 cultures).

There are a total of 40 different species and the most common gram-positive organisms are *Enterococcus faecalis* (7.8%), *Staphylococcus aureus* (5.2%) and *Staphylococcus haemolyticus* (3.9%). *Proteus mirabilis* (10.5%), *Acinetobacter baumannii* (9.8%), *Escherichia coli* (8.9%).

**Results**

A total of 425 patients admitted with diabetic foot ulcer and 118 of them have culture done. Out of 118, 35 of them have poly-microbial infection therefore there is a total of 153 species and out of that 153, 86 of the infections are gram negative and 71 of the infections is gram positive.
coli ESBL (8.5%), *Escherichia coli* non ESBL (7.2%) and *Pseudomonas aeruginosa* (7.2%) were common gram negative organisms. There were a total of 2 species of yeast infection, *candida albicans* (1.6%) and *candida tropicalis* (0.5%) but it was not included into the analysis.

### Table 1. Distribution of 153 bacterial isolates

<table>
<thead>
<tr>
<th>Bacterial species</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gram-positive</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corynbacterium non urealyticum</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Corynbacterium striatum</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Corynebacterium amycolatum</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Corynebacterium uerialyticum</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Enterococcus faecalis</td>
<td>12</td>
<td>7.8</td>
</tr>
<tr>
<td>Enterococcus faecium</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Gamella morbillorum</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Methicillin-Resistant Staphylococcus aureus</td>
<td>6</td>
<td>3.9</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>8</td>
<td>5.2</td>
</tr>
<tr>
<td>Streptococcus mutans</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Staphylococcus haemolyticus</td>
<td>6</td>
<td>3.9</td>
</tr>
<tr>
<td>Staphylococcus hominis</td>
<td>3</td>
<td>2.0</td>
</tr>
<tr>
<td>Stapylococcus coagulase negative</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Streptococcus agalactiae</td>
<td>4</td>
<td>2.6</td>
</tr>
<tr>
<td>Streptococcus anginosus</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Streptococcus dysgalactiae</td>
<td>4</td>
<td>2.6</td>
</tr>
<tr>
<td>Streptococcus gordonii</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Streptococcus parasanguinis</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Streptococcus pyogenes</td>
<td>4</td>
<td>2.6</td>
</tr>
</tbody>
</table>

There are 35 poly-microbial infections and 79 mono-microbial infections bringing the total number of cultures to 153 for 114 patients with bacterial infection excluding yeast infections.

The antibiotic with the highest resistance rate is Cephazolin (85.5%) followed by Ampicillin (83.2%) and Tetracyclim (82.0%).

Based on the Centre of Disease Control (CDC) the definition of Multidrug resistant organisms (MDRO) are microorganisms’ that are resistant to ≥ 1 antibiotic class/group (CDC, 2020). There are a total of 153 (100%) Multi-drug Resistant Organism in the patients of Dr. Soetomo General Hospital. A statistical analysis could not be done with MDRO due to consistency.

No statistics computed because MDRO is a constant Gram negative organisms are generally sensitive towards with an exception to *Acinetobacter baumannii* (53.3%). *Methicillin-Resistant Staphylococcus aureus* is 100% resistant towards Amikacin. *Enterococcus faecalis* (100%), *Methicillin-Resistant Staphylococcus aureus* (80%), 84.6% resistance *Acinetobacter baumannii, Escherichia coli* and *Pseudomonas aeruginosa* with a resistance of 66.7% towards Gentamycin.

Gram negative organisms were resistant towards all β-Lactam-Penicillin except Piperacillin-tazobactam. β-Lactam-Penicillin has moderate to high resistance to all species with an exception for *Enterococcus faecalis*. Cephazolam and 3rd generation cephalosporin’s were resistant to all bacterial isolates except for Klebsiella pneumoniae with a resistance of 42.9%. *Escherichia coli, Klebsiella pneumoniae, Proteus vulgaris and Pseudomonas aeruginosa* were susceptible towards Cefepime.

Most isolates excluding *Escherichia coli* (30%), *Klebsiella pneumoniae* and *Morganella morgani* (33.3%), *Proteus vulgaris* and *Staphylococcus aureus* (0%) showed high resistance towards Trimethoprim-sulfamethoxazole. *Escherichia coli, Klebsiella pneumoniae ESBL, Kluyvera ascorbate* were susceptible towards Tigecycline. *Enterococcus faecium* (54.5%), *Streptococcus pyogenes* (66.7%), and all gram negative bacterial isolates except *Klebsiella pneumoniae ESBL* and *Proteus vulgaris* showed resistance towards Chloramphenicol.

Gram positive organisms showed resistance towards Daptomycin. *Streptococcus pyogenes* (25%), *Acinetobacter baumannii* (100%) and *Morganella morgana* (100%) were resistant to Clindamycin. *Kluyvera ascorbate* (0%), *Morganella morgani* (33.3%) and *Staphylococcus aureus* (0%) are all susceptible towards Ciprofloxacin and Quinolon. Imipenem, Ertapenem and Meropenem. Fosfomycin generally susceptible showed 100% resistance against *Acinetobacter baumannii* (100%) and *Morganella morgana* (100%). *Acinetobacter baumannii* (100%) resistant towards ertapenem. *Enterococcus faecalis, Methicillin-Resistant Staphylococcus aureus, Staphylococcus aureus* and *Streptococcus pyogenes* were all 100% susceptible to Vancomycin and Linezolid.
<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>No. Sensitive (%)</th>
<th>No. Resistant (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aminoglycoside</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amikacin</td>
<td>79 (81.4%)</td>
<td>18 (18.6%)</td>
</tr>
<tr>
<td>Gentamicin</td>
<td>40 (36.7%)</td>
<td>69 (63.3%)</td>
</tr>
<tr>
<td><strong>β-Lactam-Penicillin</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aztreonam</td>
<td>36 (43.4%)</td>
<td>47 (56.6%)</td>
</tr>
<tr>
<td>Amoxicillin-clavulanic acid</td>
<td>27 (29.7%)</td>
<td>64 (70.3%)</td>
</tr>
<tr>
<td>Ampicillin</td>
<td>20 (16.8%)</td>
<td>99 (83.2%)</td>
</tr>
<tr>
<td>Ampicillin-sulbactam</td>
<td>23 (23.0%)</td>
<td>77 (77.0%)</td>
</tr>
<tr>
<td>Penicillin G</td>
<td>16 (30.2%)</td>
<td>37 (69.8%)</td>
</tr>
<tr>
<td>Piperacillin-tazobactam</td>
<td>64 (68.1%)</td>
<td>30 (31.9%)</td>
</tr>
<tr>
<td>Oxacillin</td>
<td>13 (39.4%)</td>
<td>20 (60.6%)</td>
</tr>
<tr>
<td><strong>β-Lactam-Cephalosporin</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1st Generation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cephazolin</td>
<td>11 (14.5%)</td>
<td>65 (85.85%)</td>
</tr>
<tr>
<td><strong>3rd Generation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefazidime</td>
<td>41 (45.6%)</td>
<td>49 (54.4%)</td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>40 (42.1%)</td>
<td>55 (57.9%)</td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>15 (20.8%)</td>
<td>57 (79.2%)</td>
</tr>
<tr>
<td>Cefoperazone-sulbactam</td>
<td>54 (62.8%)</td>
<td>32 (37.2%)</td>
</tr>
<tr>
<td><strong>4th Generation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cefepime</td>
<td>10 (50.0%)</td>
<td>10 (50.0%)</td>
</tr>
<tr>
<td>Trimethoprim-sulfamethoxazole</td>
<td>53 (39.0%)</td>
<td>83 (61.0%)</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>20 (18.0%)</td>
<td>91 (82.0%)</td>
</tr>
<tr>
<td>Tigecycline</td>
<td>4 (22.2%)</td>
<td>14 (77.8%)</td>
</tr>
<tr>
<td>Chloramphenicol</td>
<td>50 (35.2%)</td>
<td>92 (64.8%)</td>
</tr>
<tr>
<td><strong>Macrolides</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Erythromycin</td>
<td>23 (43.4%)</td>
<td>30 (56.6%)</td>
</tr>
<tr>
<td>Clindamycin</td>
<td>22 (39.3%)</td>
<td>34 (60.7%)</td>
</tr>
<tr>
<td>Daptomycin</td>
<td>10 (100.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td><strong>Quinolone</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>33 (36.3%)</td>
<td>58 (63.7%)</td>
</tr>
<tr>
<td><strong>Carbapenem</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imipinem</td>
<td>36 (69.2%)</td>
<td>16 (30.8%)</td>
</tr>
<tr>
<td>Ertapenem</td>
<td>18 (51.4%)</td>
<td>17 (48.6%)</td>
</tr>
<tr>
<td>Meropenem</td>
<td>58 (70.7%)</td>
<td>24 (29.3%)</td>
</tr>
<tr>
<td><strong>Others</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fosfomycin</td>
<td>54 (52.9%)</td>
<td>47 (46.1%)</td>
</tr>
<tr>
<td>Vancomycin</td>
<td>15 (100.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Linezolid</td>
<td>14 (100.0%)</td>
<td>0 (0.0%)</td>
</tr>
</tbody>
</table>
Duration of hospitalisation is categorised in to those who have stayed for more than or equals to 7 days (≥7) and for those who have stayed for less than 7 days. Majority of the patients have stayed for ≥ 7 days with a percentage of 73.7% (87 patients) and the remaining stayed for less than 7 days. The mean duration of hospitalisation is 11.48±7.52 with a range of 2–37.

Antibiotic resistance is grouped based on their drug classes and its resistance or sensitivity towards the bacteria. Duration of hospitalisation consists of those who stayed for less than 7 days and for those who stayed for 7 days or more and the severity of the foot ulcer by using Wagner’s grading is subdivided into 2 groups of Wagner’s grade less than 3 and those with Wagner’s grade 3 or more. There is an association between Duration of hospitalisation and the severity of foot ulcer with a p-value of 0.039 and a moderate correlation between the 2 variables. There is significant correlation between antibiotic resistance and duration of hospitalisation although weak.

Amikacin and Gentamycin both showed no association. Piperacillin Tazobactam (p-value 0.045) showed an association with the duration of hospitalisation. Only the 1st generation cephalosporin showed an association. Ceftazidime (p-value 0.046) has an association with the duration of hospitalization. Trimethoprim-sulfamethoxazole has no association with the duration of hospitalisation. Chloramphenicol showed no association with duration of hospitalisation. Tetracyclins and tigecycline showed no association with duration of hospitalisation. Macrolides showed no association with duration of hospitalisation. Ciprofloxacin has no association with the duration of hospitalization. Imipenem, Meropenem, Ertapenem and Fosfomycin have no association with the duration of hospitalisation. Vancomycin and Linezolid are 100% sensitive to bacterial isolates therefore due to the consistency in data, a p-value could not be computed.

There is an association between the duration of hospitalization and the severity of foot ulcer based on Wagner grading ≥ 3 with p-value 0.034 and there is a strong correlation. There is also an association between duration of hospitalization and severity of infection based on poly-microbial infection or mono-microbial infection with a p-value of 0.032 and a weak correlation.

**Discussion**

In Dr. Soetomo General Hospital, Surabaya, there are more male patients 53.4% (63 cases) compared to female patients 46.6% (55 cases). The mean age of patients are 58.22 ± 10.05 years with a range of 30 – 90 years. A similar trend found in studies conducted in India¹⁶ and China¹⁵.

Duration of hospitalisation was an average of 11.48 ± 7.52 days. A study done in Jakarta, Indonesia states that patients have a duration of hospitalisation of 2 weeks to more than 4 weeks⁹. A study carried by Wu et al, states that the duration of hospitalisation was significantly longer in patients with chronic ulcer wounds than in patients with acute ulcer wounds¹⁷.

Distribution of Wagner’s grading to assess the severity of DFU and majority of the sample has Wagner grade 3 and 4 which coincides with previous studies carried out¹⁵,¹⁸. There seems to be a trend in patients coming in with a much advanced DFU. Indonesia still has over 105 million people living just above the poverty line (Project, 2020). That being said, patients prefer to self-medicate or choose a more traditional or cheaper alternative before seeing a doctor which would further exacerbate the infection. It is also known that initial therapy is mainly an average of what has worked for most patients and is not tailored specifically until the cultures and antibiotic sensitivity test return¹⁷. Patients age 58 and above have a mortality rate of 50.8% (32 cases) which is higher compared to non-asian countries but within range amongst certain Asian countries as seen in¹⁹,²⁰.

Patients presented with more gram negative 60.8% (93 cultures) organisms compared to gram positive 39.2% (60 cultures) organism. Similarly some studies showed
that gram-negative organisms were more common than gram-positive especially in South-east Asia and African countries\textsuperscript{12,21,15}.

This could be explained by using climate difference as a theory, a study conducted in Germany showed that warmer weathers are promote the growth of Gram-negative bacteria. In that study, Clinical pathogens vary by incidence density with temperature. Significant higher incidence densities of Gram-negative pathogens were observed during summer whereas S. pneumoniae peaked in winter. There is increasing evidence that different seasonality due to physiologic changes underlies host susceptibility to different bacterial pathogens\textsuperscript{22,17}.

Likewise, the distribution of pathogens will vary. The most common gram positive organism were Enterococcus faecalis (7.8%), Staphylococcus aureus (5.2%) and Staphylococcus haemolyticus (3.9%) and Proteus mirabilis (10.5%), Acinetobacter baumannii (9.8%), Escherichia coli ESBL (8.5%), Escherichia coli non ESBL (7.2%) and Pseudomonas aeruginosa(7.2%). Enterococcus faecalis being the most common gram negative organism which could be due to contamination as all culture taken are from pus on gangrene or ulcer and not blood cultures. This is a similar finding to studies conducted in other parts of Indonesia, China and India and certain western countries however it varies in which is the dominant organism\textsuperscript{9,12,15,18,21}.

There are 35 poly-microbial infections and 83 mono-microbial infections in Dr. Soetomo General Hospital. Polymicrobial infection occurs due to composition of early colonizers that determines which microbes colonize at later time points\textsuperscript{23}. This process of sequential attachment is commonly referred to as coaggregation\textsuperscript{23}. Poly-microbial infections were found in subjects was associated with severity of DFU\textsuperscript{24}. Gram negative bacteria are dominant in DFU patients. Pseudomonas sp. and Staphylococcus aureus were the most commonly identified Gram negative and Gram positive microorganism. The sensitivity patterns of common organisms suggested that they are susceptible to commonly use drugs\textsuperscript{24}.

According to this hypothesis, singular organism alone may not cause a disease but when they coaggregate or consort together into afunctional equivalent pathogroups the synergistic effect provides the functional equivalence of well-known pathogens, such as Staphylococcus aureus, giving the biofilm community the factors necessary to maintain chronic biofilm infections\textsuperscript{25}.

All patients presented with MDRO. In a study by Richard et al, MDRO were isolated in 45 (23.9%) of the 188 patients studied\textsuperscript{26}. Deep and recurrent ulcer, previous hospitalization, HbA\textsubscript{1c} level, nephropathy and retinopathy were significantly associated with MDRO-infected ulceration. By multivariate analysis, previous hospitalization and proliferative retinopathy significantly increased the risk of MDRO infection\textsuperscript{26}. MDRO are pathogens frequently isolated from diabetic foot infection in our foot clinic\textsuperscript{26}.

Patients of Dr. Soetomo General Hospital, generally had a high resistance towards is Cephazolin with a rate of 85.5% followed by Ampicillin with 83.2% and Tetracyclin with 82.0%. Followed by, Ceftriaxone 79.2%, Tigecycline 77.8% and Ampicillin-sulbactam 77%. Which can be observed from Table 5.5 and Table 5.6. Most studies showed a various susceptibility to many drugs and what may be sensitive in on study isn’t in another\textsuperscript{9,17,27}. Thus, no one fix empirical treatment can be determined from studies alone, but requires detailed analysis of the patients that come in and has to be updated frequently.

All patients presented with multi-drug resistant organisms (MDRO) and 29.7% were poly-microbial patients. This study was carried out to find an association between Antibiotic resistance and duration of hospitalisation however out of 29 different antibiotics tested only 2 had a p-value of less than 0.05. Piperacillin-tazobactam (p-value 0.045) and Ceftazidime (p-value 0.046) which showed that there is an association. Moreover, there is significant correlation between all antibiotic resistance and the duration of hospitalisation. The hypothesis of this study is accepted for two antibiotics, further research is needed to determine the correlation for other antibiotics. Diabetic foot ulcer patients are responsible for more hospital days than any other aspect of diabetes\textsuperscript{28}.

The authors noted that complexity of infection increases with inpatient care and duration of ulcers and suggested that MRSA antibiotic coverage be considered in cases of prolonged duration, inpatient management, or chronic kidney disease. Prolonged duration of hospitalisation patients are susceptible to nosocomial infections and drug resistant strains of organisms.
There appears to be a network of factors in the aging body, including degenerative changes and the declining immune response, that interact with and compound each other to markedly increase susceptibility to infection. Thus, this factor could contribute to the rise in multi-drug resistant organisms emerging.

The data and analysis obtained in this research further confirms that there is a need for an accurate diagnosis of causative organism is essential especially with the implementation of the new government insurance scheme (BPJS) where only a government approved drug is given to patients with diabetic ulcer under this scheme. Patients with diabetes are often exposed to many antibiotics and therefore can develop multiple-drug resistant infections (MDRO). Knowing the duration of therapy will greatly improve the efficiency of the treatment and help patients and insurance company predict the average cost of treatment and what risk factors prolongs the duration of treatment and hospitalisation.

Limitations: There are several limitations found during the course of this study among them are.

- This study did not prioritize the general profile of the patient which would include other risk factors such as glycaemic index and detailed description of foot ulcer.
- This study is a bivariate study which finds the correlation between antibiotic resistance and duration of hospitalisation. It isn’t a multivariate study that takes into account multiple variables with the duration of hospitalisation.

Conclusion

Patients generally come in with a mean age of 58.2 Males make up 53.4% (63 cases) of the cases and females having 46.6% (55 cases). Rate of mortality is around 39.0% (46 patients). Majority of the sample has Wagner grade 3 and 4. The most common gram-positive organisms were Enterococcus faecalis (6.2%), Staphylococcus aureus (4.1%) and Methicillin-Resistant Staphylococcus aureus (3.1%) and Proteus mirabilis (7.8%), Acinetobacter baumannii (7.8%), Escherichia coli ESBL (6.2%), and Escherichia coli (5.7%) were common gram negative isolates. There is an association between duration of hospitalization and severity of infection based on poly-microbial infection or mono-microbial infection with a p-value of 0.032. Patients generally had a high resistance towards is Cephazolin (82.0%). The average duration of hospitalisation is 11.48 days. Piperacillin-tazobactam and Ceftazidime showed that there is an association between antibiotic resistance and duration of hospitalisation.

Ethical Clearance: Taken from

The authors declare that they have no competing interests. (nil)

Source of Funding: Self

Conflict of Interest: The authors declare that they have no competing interests. (nil)

References


20. Shanmugam P. The Bacteriology of Diabetic Foot Ulcers, with a Special Reference to Multidrug


H/D Exchange for 4-Aminopyridine:
Application on MAO in Sera of Multiple Sclerosis Patients

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Abstract

Multiple sclerosis (MS) is a neurological disorder characterized by a complex array of symptoms affecting movement and the senses. It is an inflammatory disease of the central nervous system (CNS) causes an injury in the myelin sheaths, leading to demyelination and thus, consequently, a series of neurologically dysfunction known as relapses. 4-Aminopyridine is used in the treatment of MS patients as a selective voltage blocker channel. The study designed over two stages, first 4-aminopyridine went under H/D exchange, and then both deuterated and non-deuterated 4-AP was applied on the serum of MS patients and the activity of serum monoamine oxidase was estimated. The study included 120 subject which divided over two groups, control and MS patients, each of which contain 60 subject. The activity of MAO was significantly (P<0.01) higher in patients than that of control. The activity of MAO activity has decreased significantly (P<0.01) in the presence of 4-AP, as well as a further significant decrease in the presence of deuterated 4-AP. In conclusion, 4-AP has inhibitory effect on MAO activity, and the replacement of hydrogens with deuterium gives an enhancement on this inhibitory effect.

Keywords: Multiple sclerosis, monoamine oxidase, H/D exchange, platinum catalyst.

Introduction

Multiple sclerosis (MS) is a neurological disorder characterized by a complex array of symptoms affecting movement and the senses. It is an inflammatory disease of the central nervous system (CNS) causes an injury in the myelin sheaths, leading to demyelination and thus, consequently, a series of neurologically dysfunction known as relapses. Once it causes a relapses, it’s called relapses-remitting multiple sclerosis (RRMS) and it is the most common subtype of MS. Another subtype is secondary progressive multiple sclerosis (SPMS) and is, often, follows RRMS when patient is no longer has no longer exacerbations and has continuous accumulation of disability with time. Primary progressive multiple sclerosis subtype (PPMS) is recognized by disease progression without remarkable exacerbations. Progressive relapsing multiple sclerosis (PRMS) is the rarest and most progressive subtype of MS⁵.

Multiple sclerosis considered as the most epidemic of demyelinating diseases, as well as, it is the most common of the CNS disorders that causes a permanent disability in young adults⁴. World health organization (WHO) have estimated the over 2 million people are suffering MS in the world⁶. The rate of the prevalence in the world is about 100 to 150 per 100000 populations, presented in the ages between 20 and 40 years with a higher percentage in women than men. It has been believed that the prevalence of MS increases with the increasing of distance away from equator¹.

Several studies were applying on the effect of 4-amonopyridine on the treatment of multiple sclerosis symptoms⁷. In myelinated neurons, under normal conditions, potassium (K⁺) voltage-gated channels Kv1.1 and Kv1.2 are gathering under the myelin sheath close to the nodes of Ranvier ⁸. Regarding to these channels location, when a demyelination occur it will be exposed, and migrate through the demyelinated fragment, also an increasing with several fold in expression will be concomitant¹⁰. This irregular redistribution of potassium channels reduces conduction of action potentials, and leads to neurological deficits¹⁰,¹⁷-²¹. 4-aminopyridine is a selective blocker of voltage-dependent channels²². 4-aminopyridine is using in a
clinical way to improve the neurological conduction in MS patients [29-32] by a mechanism in which it blocks the exposed potassium channels [23, 24, 26, 27, 33-36].

Deuterium labelled derivatives considered as an important materials for the development of drugs as becoming an internal standards of animal and human drug experiments, also they involved in the mechanical studies in the investigation of reaction pathway. Deuterated compounds share a similar characteristics of both physical and chemical properties, with other isotopologues and contain the same ionization properties. The whole process depend on the mass differences among the compound isotopologues, in which the analysis went more easily as the mass difference became greater than that of natural isotope due to the easing in separating signals [37].

Materials and Method

Chemicals: Deuterium oxide (TCI/Japan), 4-aminopyridine (TCI/Japan), potassium hexachloro palatinate (TCI/Japan), sodium hydroxide (MERCK/USA), dichloromethane (Sigma-Aldrech/Germany), magnesium sulfate (Sigma-Aldrech/Germany), ethanol (Scharlau/Germany), NaH2PO4 (BDH/England), Na2HPO4 (BDH/England), benzylamin hydrochloride (BDH/England), perchloric acid (BDH/England), and cyclohexane (Sigma-Aldrech/Germany).

Subjects: Sixty patients whom already diagnosed with multiple sclerosis have been enrolled in this study, their ages were between 18 and 46 years old and the mean ± SD was (33.37 ± 8.36). The patients with multiple sclerosis who provided in the study were acclimated at Neuroscience Hospital from January to September 2020. Sixty healthy individual have been volunteer as control group of the study, their ages were between 19 and 48 years old and the mean ± SD was (32.66 ± 8.66). Control group was selected from Mustansiriyah University.

Specimens Collection: A plastic syringe used to pull the blood from vein. The blood then transported to gel tube let few minutes to rest and clot then centrifuged at 1500 g for 10 min in order to collect the serum. The produced serum distributed over three Eppendorf tubes and stored in deep freezer at -20 ºC.

Method

H/D Exchange of 4-aminopyridine: In a microwave vial, a weight of 0.3g of 4-aminopyridine was added and followed by the addition of 5mL of D2O. Next, 0.1g of K2PtCl6 were added to the vial mixture, then the vial was shook gently and transferred into Antonpaar-Microwave synthesis reactor for 2 hours, under power equal to 300 W, pressure equal 150 Psi, and the temperature 190 ºC.

After that, the vial permitted to stand at room temperature for 30 minutes. The mixture was filtered by using filter paper, and then the filter paper was washed with 10 mL (1M) hydrochloric acid. The filtered solution was neutralized with (1M) NaOH. The solution then transported into separation funnel, and followed by the addition of 10 mL from CH2Cl2, and the mixture shook in order to extract the polar phase (The process repeated three times). A weight of 0.1g MgSO4 was added to the solution, and starred for 10 minutes at room temperature. And followed by filtration process. Then the solution was evaporated in a vacuum with evaporator devise (Rotavapor R-205). At the last step, the yield was analyzed for FT-IR and HNMR.

Determination of monoamine oxidase activity: The Activity of monoamine oxidase determined by using McEwen and Cohen method [38]. The method requires two test tubes (calibration tube and assay tube) for each sample. A volume of 600 μL of serum was added to the tubes and followed by the addition of 700 μL of sodium phosphate buffer (0.1M, pH=7.3). Then 200 μL of 5mM of benzylamine hydrochloride were added to assay tube only. Both of the tubes were incubated at 37 ºC for 3 h. After the end of the incubation 200 μL of benzylamine hydrochloride were added to calibration tube, and then volume of 200 μL of 50% perchloric acid was added to both tubes to stop the reaction. Next, volume of 1.5 mL of cyclohexane was added to each tube, and the tubes contents emulsified with super mixer. Then the tubes were allowed to stand for 15 minutes at room temperature, and a second emulsification was applied. The tubes were centrifuged at 1500 g for 5 minutes and the absorbance of benzaldehyde was read (in cyclohexane) at 242 nm. The activity of MAO calculated as the following equation:

\[ \text{MAO (U)} = \frac{(\text{calibration} - \text{assay}) \times 100}{\text{vial volume}} \]
The measurement of the activity of MAO in sera of patients was repeated but this time in the presence of 4-AP, and deuterated 4-AP. Three tubes were used this time, 4-AP, deuterated 4-AP, and ethanol (because ethanol was used as solvent). A volume of 200 μL of ethanol, 4-AP (0.1M), and deuterated 4-AP (0.1M) was added to corresponding tube, and tubes were incubated at 37 ºC for 5 min. after the incubation the instructions at the previous paragraph were repeated to determine the activity of MAO.

Results and Discussion

FT-IR Results: The peaks at the two charts are almost identical in position, which reflects the fact that the compound have no change in its functional groups. The extra peak 2974.56 cm⁻¹ at assay chart could be attributed to C-D bond, which gives initial impression on the H/D exchange in 4-aminopyridine, see Fig 1.

Figure 1: The FT-IR charts of 4-aminopyridine, a) before deuteration b) after deuteration.
**HNMR Results:** In the comparison of deuterated 4-AP chart with the initial 4-AP chart, it had been observed that the intensity of the aromatic peak at 8 ppm was reduced in deuterated 4-AP chart, which indicates the presumption that the protons at the difficult positions (2, and 6) were replaced by deuterium. It may attributed to platinum catalyst, K2PtCl6, which may underwent a reduction from Pt(IV) to Pt(II), and lose a chlorine into the reaction mixture that could react with the amine group of 4-AP in acid base reaction. The salts are deactivating groups that reduce the electron density of the ring and drive the replacement toward the difficult position.

![Figure 2: The HNMR charts of 4-aminopyridine.](image)  

**MAO Activity Results:** The activity of MAO was significantly (P<0.01) higher in MS patients group (44.99 ± 3.51 U) than control group (30.45 ± 2.1 U). The results are listed in Table 1.

**Table 1: The means of MAO in MS patients and control groups.**

<table>
<thead>
<tr>
<th>Group</th>
<th>MAO activity (U) (Mean ± SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male, N=24</td>
</tr>
<tr>
<td>Control</td>
<td>30.99 ± 1.61</td>
</tr>
<tr>
<td>MS</td>
<td>46.17 ± 1.6</td>
</tr>
<tr>
<td>P-value</td>
<td>&lt; 0.01</td>
</tr>
</tbody>
</table>
The activity of MAO in MS group (44.99 ± 3.51 U) have decreased high significantly (P<0.01) in the presence of ethanol (37.03 ± 2.89 U), 4-AP (22.1 ± 1.74 U), and the deuterated 4-AP (22.1 ± 1.74 U), see Table 2.

Table 2: Means of MAO activity in MS group with and without the presence of ethanol, 4-AP, and the deuterated 4-AP.

<table>
<thead>
<tr>
<th>Group</th>
<th>MAO (U) (Mean ± SD)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS</td>
<td>44.99 ± 3.51</td>
<td></td>
</tr>
<tr>
<td>MS + Ethanol</td>
<td>37.03 ± 2.89</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>MS + 4-AP</td>
<td>22.1 ± 1.74</td>
<td></td>
</tr>
<tr>
<td>MS + DAP</td>
<td>20.37 ± 1.65</td>
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</tbody>
</table>

Ethanol had been used as a solvent for both 4-AP and deuterated 4-AP. Thus, the activity of MAO in the presence of ethanol compared with 4-AP and DAP. The results declared high significant (P<0.01) difference in the activity of MAO between ethanol presence and 4-AP from one hand, and between ethanol presence and DAP from the other hand. Thus enable the assumption that both 4-AP and DAP have an inhibition effects on MAO enzyme. The inhibition percentage of DAP (54.72 ± 0.61) was the highest obtained value which is significantly (P<0.01) higher than ethanol inhibition percentage (17.69 ± 0.45) and 4-AP inhibition percentage (50.87 ± 0.83), see Table 3 and 4.

The presence of mono-amine group at 4-aminopyridine, drive a basic conclusion in which 4-AP is a competitive inhibitor which compete with the substrate on the active site of the enzyme, yet further information regarding Km and Vmax are required.

Table 3: The inhibition percentage of ethanol, 4-AP, and DAP in the activity of MAO for MS patients.

<table>
<thead>
<tr>
<th>Inhibitor</th>
<th>% inhibition for MAO (Mean ± SD)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>17.69 ± 0.45</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>4-AP</td>
<td>50.87 ± 0.83</td>
<td></td>
</tr>
<tr>
<td>DAP</td>
<td>54.72 ± 0.61</td>
<td></td>
</tr>
</tbody>
</table>

Table 4: Mean differences of MAO activity among ethanol, 4-AP, and DAP.

<table>
<thead>
<tr>
<th>Inhibitor</th>
<th>Mean difference</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>33.17</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

Conclusion

The use of K$_2$PtCl$_6$ has shown to drive the electrophilic aromatic substitution to substitute at the difficult positions in the H/D exchange reaction. Further reactions are required with and without microwave assistant for more clarity on this type of catalysts. Also, 4-AP has shown a great inhibition effect on MAO enzyme, and the deuterium replacement gave enhancement to the inhibition effect.

Conflict of Interest: None
Funding: Self
Ethical Clearance: Not required
Acknowledgement: The authors express their gratitude to Department of Chemistry at Mustansiriyah University, for their kindness, affords, and easements.

References


Descriptive Study of Septicemia among Children Under Five Years in Wasit Province, Iraq in 2019

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Abstract

Sepsis is a common illness; however, it strikes aged people and very young people in more tendency. The most susceptible age group of sepsis is children, and more specifically newborns and young infants. In addition, underlying health problems increase the risk of illness. The aim of this study is to determine prevalence of septicemia in children under five years in Al-Kut hospital for Gynecology obstetrics and pediatrics, numbers of cases are 135 patients. A descriptive analysis study design was used for the purpose is conducted at Al-Kut hospital for Gynecology obstetrics and pediatrics. There was significant differences in the prevalence of septicemia among children with different ages. The prevalence of septicemia was higher in the 1st month of age. Generally, prevalence of septicemia did not significantly affected by gender, however age is the most influencer since the infection was higher in children samples which were collected from stool isolates. At end, to reduce the complication and mortality of septicemia and to prevent sepsis formation infection including antibiotic-resistant pathogens related infection, research recommend a rapid diagnosis and effective treatment.

Keywords: Descriptive epidemiology, Septicemia, Children.

Introduction

Infected of blood with bacteria is named as septicemia and causing a sepsis. It is also called “blood poisoning”, and this term come from the idea that the infectious bacteria poison the blood by itself or their toxins. (1). Generally, any positive blood culture with systemic bacterial infection consider as septicemia (2). It is a common cause of morbidity and mortality in children (3). According to WHO, about 85% of deaths in newborn resulting from infections, including tetanus, pneumonia, and sepsis. The later cause lead to death in about 40% of affected infants most of them in developing countries (4). In addition, mortality and hospitalization is common in children affected by septic shock around the world (6).

Globally, every year about 3 million newborns and 1.2 million children had an infection lead to sepsis (8). The resistant pathogens count to be a cause of sepsis leading death in 3 out of 10 in neonatal (9). Although it a major cause of global morbidity and mortality, sepsis still lacking of targeted therapy (5,6).

Every year more than 75,000 infant and children in the U.S. develop severe sepsis. Almost 7,000 of them die, and this number is more than deaths from cancer in children (American Academy of Pediatrics, 2017). The aim of this study to identify prevalence of septicemia in children under five years.

Materials and Method

A descriptive analysis study design was used in collect data, after taking permission from the Laboratory Unit Officer at al-kut hospital for maternity and pediatric, the data was taken from bacteriology unit that affiliate to microbiology Laboratory on (5th August, 2019). A total of 135 number of cases were collected from children suffering with septicemia under five years and for both sex (70 male and 65 female) during a period from 1st January 2019 to 30th June 2019 (it is mean the first 6 month of 2019), the data recorded the type of samples that were used to diagnose septicemia among the children such as urine, stool, blood, and throat swab.

Data Analysis: In order to determine whether the objectives of the study have met or not, that data of the present study has been analyzed through application of the descriptive statistical (Microsoft Excel 2010) analysis approach. The researcher divided children ages to five
age groups which include Group one from 1 month to 12 months, Group two from 13 months to 24 months, Group three from 25 months to 36 months, Group four from 37 months to 48 months and Group five from 49 months to 60 months.

**Results**

Septicemia is a major cause of death in neonates and children. A total of 135 children with septicemia under five years in Al-Kut hospital for Gynecology obstetrics and pediatrics, table (1). There was significant differences in the prevalence of septicemia among children with different ages, the prevalence of septicemia was higher in the 1st month of age $P < 0.001$, as shown in table (2). Newborns, and young children with age less than 1 year are more susceptible for sepsis than older children and adults because of under development of their immune systems.

<table>
<thead>
<tr>
<th>No. of cases</th>
<th>135</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ages</td>
<td>1- 60</td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>11.488 ± 13.724</td>
</tr>
<tr>
<td>Minimum</td>
<td>1</td>
</tr>
<tr>
<td>Maximum</td>
<td>60</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age/Months</th>
<th>Frequency</th>
<th>Valid %</th>
<th>95% Confidence Interval</th>
<th>Significance (t-test)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>27</td>
<td>20.0 %</td>
<td>(9.152683-13.825095)</td>
<td>$t = 9.726$ $P &lt; 0.001$</td>
</tr>
<tr>
<td>2-12 months</td>
<td>17</td>
<td>12.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td>4.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>1.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>9</td>
<td>6.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>12</td>
<td>8.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>5</td>
<td>3.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>5</td>
<td>3.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>3</td>
<td>2.2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>3</td>
<td>2.2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>10</td>
<td>7.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>1</td>
<td>0.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>1</td>
<td>0.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>1</td>
<td>0.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>4</td>
<td>3.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>2</td>
<td>1.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>14</td>
<td>10.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>5</td>
<td>3.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>5</td>
<td>3.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>3</td>
<td>2.2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>135</td>
<td>100.0 %</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Male and female have no significant difference in the prevalence of septicemia with percentage of 51.9 % and 48.1 %, $P = 0.666$, for male and female respectively as shown in table (3). Mugalu et al.,$^{10}$ finding does not agree with this data since he reported significant difference with higher prevalence in the females. This difference has no apparent reason, however it may due to geographical origin.
Table (3): Effect of gender on the prevalence of septicemia

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Valid %</th>
<th>Significance (Pearson’s chi-square test)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>70</td>
<td>51.9 %</td>
<td>(X^2 = 0.185) (P = 0.666)</td>
</tr>
<tr>
<td>Female</td>
<td>65</td>
<td>48.1 %</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>135</td>
<td>100.0 %</td>
<td></td>
</tr>
</tbody>
</table>

In our study, septicemia prevalence were detected in all age groups, result showed that the most cases were occurred among children in first age groups (1-12) months. Table (4).

Table (4): The distribution of ages group

<table>
<thead>
<tr>
<th>Age/Months</th>
<th>Frequency</th>
<th>Valid %</th>
<th>Significance (Pearson’s chi-square test)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-12</td>
<td>99</td>
<td>73.3 %</td>
<td>(X^2 = 249.777) (P &lt; 0.001)</td>
</tr>
<tr>
<td>13-24</td>
<td>23</td>
<td>17.0 %</td>
<td></td>
</tr>
<tr>
<td>25-36</td>
<td>5</td>
<td>3.7 %</td>
<td></td>
</tr>
<tr>
<td>37-48</td>
<td>5</td>
<td>3.7 %</td>
<td></td>
</tr>
<tr>
<td>49-60</td>
<td>3</td>
<td>2.2 %</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>135</td>
<td>100.0 %</td>
<td></td>
</tr>
</tbody>
</table>

The prevalence of septicemia from different samples in children was significantly differences \(P < 0.001\). Results in this study showed high septicemia among children which were collected from stool isolates than isolates collected from blood, urine and throat as shown in table (5).

Table (5): The collected samples frequencies

<table>
<thead>
<tr>
<th>Samples</th>
<th>Frequency</th>
<th>Valid %</th>
<th>Significance (Pearson’s chi-square test)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urine</td>
<td>60</td>
<td>44.4 %</td>
<td>(X^2 = 105.859) (P &lt; 0.001)</td>
</tr>
<tr>
<td>Stool</td>
<td>67</td>
<td>49.6 %</td>
<td></td>
</tr>
<tr>
<td>Blood</td>
<td>6</td>
<td>4.4 %</td>
<td></td>
</tr>
<tr>
<td>Throat</td>
<td>2</td>
<td>1.5 %</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>135</td>
<td>100.0 %</td>
<td></td>
</tr>
</tbody>
</table>

Conclusion

From the analysis we found that increased frequency of septicemia in the children whose age group is 1 month to 12 months, and Particularly in age of 1 month and below. The present decreases to the low value with increase of age .There is simple difference between male and female (little increase in male). Stool sample is the more one that used in diagnosis of septicemia, depend on the come cause of this disease, followed by urine sample, Rapid diagnosis and effective treatment to reduce mortality and complications of septicemia, and preventing sepsis from infections including antibiotic-resistant pathogens infection.

Conflict of Interest: None

Funding: Self

Ethical Clearance: Not required

References


6. Opal SM The current understanding of sepsis and research priorities for the future. Virulence 2014. 5: 1–3


Cortical Thickness in Pre Central and Post Central Human Brain Cortex of Patient with Headache: MRI finding

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Abstract

It is now clear that the brain of the headache sufferers are different from those of people without headache, the imaging study showed thickening in specific area of brain related to communication of sensory processing called somatosensory cortex (post central region) in this study we examine 36 patient, 28 of them have headache of variable duration, 8 healthy patient used as control (i.e. has no headache). The result has found that the cortex area of brain is thicker in pre central and post central cortex, especially predominant in post central cortex and this thickening is increasing with duration of headache and not related to the age of patient, the explanation of these structural changes will be discussed in this study.

Keywords: Headache, Migraine, Cerebral Cortex, Sensory Neurons, Motor Neurons, MRI.

Introduction

From anatomical point of view the pre central gyrus lies immediately anterior to the central sulcus and is known as the motor area .large motor nerve cells in this area control voluntary movement on the opposite side of the body . In motor area the body represented in an invested position that the feet located in the upper part and those controlling the movement of face and hand in the lower part. The post central gyrus lies immediately posterior to the central sulcus, and is known as sensory area. The small nerve cell in this area receive the interpret sensation, temperature, touch and pressure from opposite side of body¹. The motor area is region from which most of cortico spinal and cortico nuclear nerve fiber arise, and the region where low intensity stimulation most readily elicits movements of contra lateral side of the body. Sensory area is the region to which the impulse ascending in the medial lemniscus and spino thalamic tracts are transmitted².

Headache is very widespread disease, and according to the WHO, we have 243 types of headache, one of the most common this disorder of the nervous system. Migraine effects 15-45 of women and 6-8 man (3-6). The path physiology of migraine is not yet fully understood, and the available treatment and cure attach are not optimal. Migraine patient have visual symptom in 94% of cases (7), but symptom may involve sensory and speech deficits (8).

Recently two published article reporting cortical thickness differences in migraine sufferers (⁹ and ¹⁰). In the first paper (⁹) we examined the visual areas involved in motion processing were thickened migraineurs. the second article (¹⁰) reported increase thickness in somatosensory cortex of migraineurs, especially in the area the head and face representation. What do these cortical thickness increase mean and what are the potential implication, indeed be explain in several ways which are discussed later.

In 2007 researcher have identified specific differences in brain of migraine sufferers linked to the processing of sensory information including pain. in earlier research Harvard medical school investigator used MRI to show structural differences between brain of people with and without migraine, specially the imaging showed thickening in a specific area of the brain.
related to communication of sensory processing called somatosensory cortex. It is not clear if migraine cause the brain changes or if the brain differences causes migraine. Researcher Nouchin Hadjikhani that is the big question she says “A person could be born with these cortical differences making them susceptible to migraines, later in life, but we just don’t know”.

In newly reported imaging study researcher compared the brain of 24 people with migraine and 12 people withoutmigraine. they found that somatosensory was an average of 21% thicker in migraine sufferer. The thickness changes were especially pronounced in the part related to sensation of head and face(11).

**Patient and Method**

28 Patients have headache of variable duration undergo CT scan of brain in radiology department college of medical Al-Nahrain university were matched for age and sex with 8 healthy subjects(without headache). In all these patients measure the thickness of pre central and post central cortical thickness in millimeter and pre central and post central gyrus.

**Result**

36 patients, 28 patients with headache and 8 patients without headache, 17 patient’s females with headache and 11 patient’smales with headache. Average age of patients [17- 66] years and duration of headache from one to ten years. The results were summarized in table(1-4).

![Fig. 1: MRI of normal person, age 40-44 years, has no headache showing normal pre central and post central cortical thickness.](image1.png)

![Fig. 2: MRI of patient age 46 year has headache of one-year duration showing slight increasing cortical thickness of pre central and post central cortical area.](image2.png)
Fig. 3: MRI of patient, (A); Age 64 years has headache of 4-year duration showing increasing thickness of pre central and post central gyrus). (B); Age 17 years has headache of 5 years duration showing increasing thickness of pre central and post central cortical region). (C); Age 26 years has headache of 10 years duration showing increasing thickness in pre central and post central cortical regions).

Table [1]: Patients with headache.

<table>
<thead>
<tr>
<th>Thickness of post-central gyrus (mm)</th>
<th>Thickness of pre-central gyrus (mm)</th>
<th>Thickness of post-central GM (mm)</th>
<th>Thickness of pre-central GM (mm)</th>
<th>Duration of headache (years)</th>
<th>Age of patient (years)</th>
<th>No. of patient</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>12</td>
<td>3.6</td>
<td>3.2</td>
<td>3</td>
<td>47</td>
<td>1</td>
</tr>
<tr>
<td>21</td>
<td>16</td>
<td>2.8</td>
<td>2.5</td>
<td>1</td>
<td>46</td>
<td>2</td>
</tr>
<tr>
<td>15</td>
<td>17</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>20</td>
<td>3</td>
</tr>
<tr>
<td>24</td>
<td>19</td>
<td>2.4</td>
<td>2.8</td>
<td>2</td>
<td>40</td>
<td>4</td>
</tr>
<tr>
<td>19</td>
<td>16</td>
<td>3</td>
<td>3.4</td>
<td>4</td>
<td>22</td>
<td>5</td>
</tr>
<tr>
<td>16</td>
<td>20</td>
<td>2.9</td>
<td>2.6</td>
<td>3</td>
<td>37</td>
<td>6</td>
</tr>
<tr>
<td>19</td>
<td>13</td>
<td>5.4</td>
<td>5.1</td>
<td>5</td>
<td>17</td>
<td>7</td>
</tr>
<tr>
<td>15</td>
<td>11</td>
<td>2.6</td>
<td>2.4</td>
<td>1</td>
<td>28</td>
<td>8</td>
</tr>
<tr>
<td>22</td>
<td>13.6</td>
<td>4.2</td>
<td>3</td>
<td>6</td>
<td>62</td>
<td>9</td>
</tr>
<tr>
<td>19</td>
<td>16</td>
<td>5.3</td>
<td>3.6</td>
<td>10</td>
<td>26</td>
<td>10</td>
</tr>
<tr>
<td>19.2</td>
<td>17.7</td>
<td>2.9</td>
<td>2.6</td>
<td>4</td>
<td>64</td>
<td>11</td>
</tr>
<tr>
<td>19</td>
<td>17</td>
<td>2.5</td>
<td>2.4</td>
<td>2</td>
<td>66</td>
<td>12</td>
</tr>
<tr>
<td>18</td>
<td>13</td>
<td>4.2</td>
<td>3.6</td>
<td>4</td>
<td>49</td>
<td>13</td>
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<tr>
<td>13</td>
<td>10</td>
<td>2.8</td>
<td>2.5</td>
<td>1</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>20</td>
<td>17.1</td>
<td>3.3</td>
<td>2.8</td>
<td>3</td>
<td>53</td>
<td>15</td>
</tr>
<tr>
<td>17.3</td>
<td>14</td>
<td>3.5</td>
<td>3</td>
<td>3</td>
<td>20</td>
<td>16</td>
</tr>
<tr>
<td>17</td>
<td>12</td>
<td>4.2</td>
<td>3.7</td>
<td>4</td>
<td>20</td>
<td>17</td>
</tr>
</tbody>
</table>
Table [2]: Normal person (without headache).

<table>
<thead>
<tr>
<th>post-central gyrus (mm)</th>
<th>pre-central gyrus (mm)</th>
<th>post-central GM (mm)</th>
<th>pre-central GM (mm)</th>
<th>Age (years)</th>
<th>No. of patient</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>12</td>
<td>1.8</td>
<td>2.2</td>
<td>54</td>
<td>1</td>
</tr>
<tr>
<td>12.7</td>
<td>13.2</td>
<td>2.3</td>
<td>2.6</td>
<td>32</td>
<td>2</td>
</tr>
<tr>
<td>13.2</td>
<td>11.1</td>
<td>2.5</td>
<td>3</td>
<td>55</td>
<td>3</td>
</tr>
<tr>
<td>11.6</td>
<td>13</td>
<td>2.4</td>
<td>2.6</td>
<td>43</td>
<td>4</td>
</tr>
<tr>
<td>11.3</td>
<td>12.4</td>
<td>2.2</td>
<td>2.7</td>
<td>40</td>
<td>5</td>
</tr>
<tr>
<td>12.2</td>
<td>10.9</td>
<td>2.6</td>
<td>2.5</td>
<td>46</td>
<td>6</td>
</tr>
<tr>
<td>10.1</td>
<td>11.5</td>
<td>2.3</td>
<td>2.2</td>
<td>44</td>
<td>7</td>
</tr>
<tr>
<td>13.2</td>
<td>12.8</td>
<td>2.2</td>
<td>2.4</td>
<td>51</td>
<td>8</td>
</tr>
</tbody>
</table>

Table [3]: Patient with headache and normal patient.

<table>
<thead>
<tr>
<th>Pre central cortical thickness mm.</th>
<th>Pre central gyrus mm.</th>
<th>Post central cortical thickness mm.</th>
<th>Post central gyrus mm.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal (without headache)</td>
<td>2.2 - 3.0</td>
<td>10.9 - 13.2</td>
<td>1.8 - 2.6</td>
</tr>
<tr>
<td>With headache</td>
<td>2.0 - 5.1</td>
<td>11.0 - 20.0</td>
<td>2.4 - 5.4</td>
</tr>
</tbody>
</table>

Table [4]: Duration of headache.

<table>
<thead>
<tr>
<th>Duration of headache(year)</th>
<th>Pre central cortical thickness mm.</th>
<th>Pre central gyrus mm.</th>
<th>Post central cortical thickness mm.</th>
<th>Post central gyrus mm.</th>
</tr>
</thead>
<tbody>
<tr>
<td>One year</td>
<td>2.4 - 2.5</td>
<td>10.0 - 16.0</td>
<td>2.6 - 3.6</td>
<td>13.0 - 21.0</td>
</tr>
<tr>
<td>6 - 10 year</td>
<td>3.0 - 3.6</td>
<td>13.6 - 17.7</td>
<td>4.2 - 5.3</td>
<td>17.0 - 24.0</td>
</tr>
</tbody>
</table>

Conclusion

Patients with headache have pre central, post central cortical thickness, and pre central and post central gyrus more than normal patients. Fig. [1,2, and 3].

More specific post central cortical thickness and post central gyrus is more than pre central cortical thickness and gyrus, Fig. [3].
The precentral, postcentral, cortical thickness and gyrus is increased with duration of headache and not related to the age of patients. Table [1 and 4].

Discussion

Structural changes in migraineurs is unknown. diagnosis of migraine relies on patient history and finding different in brain of migraineurs might help to contribute the basic research aimed at better understanding the patho-physiology of migraine.

Headache is one of the man’s most common affection the frequency of disabling headache is explain in part by rich nerve supply to head (including efferent nerve fibers from trigeminal, glossopharyngeal, vagus and upper three cervical nerve). And in part psychological implication of head pain, causing anxiety about even modest headache, head pain can be result of either intra or extra cranial disease in the distribution of any of above nerves (12).

The first possible explanation is that migraineurs have brain structural differences compared with healthy people due to their genetic background (12-14).

Anatomical changes underlying increases in cortical thickness may include an increasenumber and/or density of neuronal and/or glial cells in certain part of the cortex [fig. 1,3].this focal dysplasia may render the cortex more excitable, one of the leading hypothyces in migraine patho physiology is indeed that the brain of migraineurs are hyper excitability (15-17).

The hypo thesis of hyper excitabile brain in migraine is supported by fact that preventing treatment using drugs likely to reduce the cortical excitability are beneficial in migraine with or without aura. independent from etiological nature of the cortical thickness increase in migraineurs, it is worth noting that the anatomical modification that we described were present both in migraine, substrate for these clinical entities(18).

So, understanding the patho physiology of migraine is an essential step in design of drugs at preventing and treating migraineaffectively (19).

The result indicates that there is thickening of pre and post central cortex in patient with headache [fig. 1]. And from review of literature, at seem that the article concentrates on post central cortex and specifically on somatosensory area (12),[table1, fig.2 and 3].

Dr. Hidijikani and Collages (12) said that there was no difference in cortical thickness in pre central cortex in patient with headache. but in my research, there is changes in pre central cortex. And these changes can be explained according to the hypo thesis of rich nerve supply to head(11). And increase number and/or density of neuronal cells(16) in addition to hyper excitabile of brain in migraineurs patients.

US study have found the cortex are brain is thickening in people who have migraine compared to those who do not the research don’t know whether the difference causes the migraine or having migraine over the years has led to the difference in brain structure.

Reported headache attach may lead to or to be the result of these structural changes in the brain said Hadjikhani in a prepared treatment, she said that most of those people had been suffering from headache since childhood .so long term overstimulation of the sensory field in the cortex could explain these changes.

Using MRI, researchers had already discovered there were structural differences between brain of people with headache and people without headache or the other hand, it could also be that their brain structure changed progressively for some other reason and this led to the headache.

However, regardless of the cause the result show that the sensory areas of the brain are important components in headache. this explain why patient with headache often also have other pain disorder such as back pain, jaw pain, and other sensory (3). Problems, where the skin becomes so sensitive that even a gentle breeze can be painful [Hadjikhani] (12).

Other studies have also revealed the cortex of people who have certain condition is different, for instance people with multiple sclerosis and Alzheimer disease have thinner cortex. The area become thicker with extensive learning and motor training(11).

Recommendation:

1. Early diagnosis and treating causes of headache in order to preventing a complication and side effect like weakness of memory.
2. Using complimentary medication which content drug and certain behavior training exercises which related to relaxation and preventing tension, stress, anxiety with continues using physical exercises to increase the ability of person in order avoiding the
result of damage or injury to cortical area of brain.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Taken from Al-Farahidi University Ethical committee

Reference

Socio Demographic Profile and Pattern of Injuries Due to Workplace Accidents in a Tertiary Care Hospital at Kancheepuram District

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Abstract
Workplace (occupational) injuries pose major public health and socioeconomic developmental issue leading to mental and physical disability. However, efforts towards investigation of determinants among factory workers are very minimal in developing countries. Thus, this study aimed at evaluation of the Socio demographic profile, identify determinants and pattern of occupational injury among victims of industrial accidents was undertaken. This retrospective study was conducted over a period of 2 years in a Tertiary care centre at Kancheepuram district. Total of 4693 work place accident cases visited the hospital (OP and IP) between January 2018 to December 2019. On statistical analysis, Male preponderance was noted and 3/4th of the study population belonged to age group of 20-40 years. Most of accidents 2815 (59.98%) took place in semi urban area and 1549 (33.01%) victims occurred in the Urban locality. 44.13% of the cases (2071) occurred in the summer season. 36% of the events were seen between 12 Noon to 6 PM. It was noted that abrasion was the commonest injury noted (69%, 3238) and the least common were burns injury (12%, 563). Upper limb injuries were noted in almost 3/4th of the cases (3426) and intracranial haemorrhages were observed in 55 cases. Only 1/3rd of the cases used protective gear during the incident. Lack of effective training, sleeping disturbance, and job stress increased the risk of occupational injury. Hence, providing health and safety education with importance given to the younger male workers, reducing stressors, and offering sleep health education were recommended.

Keywords: Occupational injuries, Workplace, Demographic profile, Safety, Construction workers.

Introduction
Occupational injury is any physical injury condition sustained on the worker in connection with the performance of his or her work. Employed people in industries spend at least one third of a day at work which have a strong effect on their health and safety due to work and work-related injuries. The International Labour Organization (ILO) estimates that 860,000 people sustain injury or ill health at work daily, and nearly 1000 people die worldwide as a result of occupational injuries daily. Worldwide in 2005, an estimated of 250 million occupational injuries and 5.4 million deaths due to injuries occurred annually. From this, over 90 percent was in low- and middle income countries where the greatest concentration of world’s workforce and low level of factories found. This problem costs the world a loss of roughly 4% of the gross national product. Despite this, only 5 to 10 percent of the workforce in developing countries has access to some kind of occupational health and safety services. In 2010 alone, over 313 million suffered non-fatal injuries at work globally leading to at least 4 days of absence from work. Unintentional industrial accidents across the

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globe accounts to 3.40 lakhs injuries every year. This is because of rapid urbanisation and industrialisation with labour oriented markets which depends on automation and mechanisation at workplace.(1,2,3)

Industrial accidents are related to certain factors like lower support of the society, low job opportunity, violence among the co-workers in the industries, also depends on physical and mentally associated factors. The highest rate is associated with low socio economic people, male sex, overweight, and other factors that are controversial are age, smoking, drinking alcohol, marital history and number of children in the house. (4)

Industrial accidents are caused due to exhaustion of energy caused due to long hours of working shift, sleeplessness, lack of safety equipment. Over time working without any food cause hypoglycaemia which induce tiredness, giddiness, loss of concentration will lead injury during working hours. Every labours working in the industrial sector should be given proper training about the work and usage of personal protective gear for working to prevent the accident. (5,6)

Appropriate evidence is required for injury prevention and control triumphantly although most studies have focused on general causes rather than association of different factors with occupational injury. Hence, our study surveyed the socio-demographic, work environment and behavioural factors associated along with the occupational injuries pattern in order to inform relevant injury prevention and control efforts.

**Methodology**

A retrospective study for a period of 2 years (January 2018 to December 2019) was conducted at Saveetha Medical College and Hospital where the data of 4693 cases of occupational injuries were collected from the medical records department. These cases presented to the emergency department and other Outpatient/Inpatient departments of the hospital.

Necessary information for the study was gathered with the help of a detailed proforma for the purpose of recording history, epidemiological data, type of the industry involved and the details of injuries. The information thus collected, was Statistical analysed with SPSS software version 24.

**Observation and Results**

**Sex:** Among 4693 patients included in the study, 4177 were male (89%) and 516 were female (11%) victims. [Fig 1]

**Age:** Majority of the victims belonged to 20 to 30 years of age group accounting to 40% (1877) victims and 34.99% (1642) cases belonged to age group between 31 to 40 years. 17.02% (799) patients were from age group between 41 to 50 years and age group above 50 years amounted to 7.99% (375) patients only. [Fig 2].

**Time of accident:** Maximum cases were noted between midnoon to 6 pm (1689, 36%) followed by that between midnight to 6 am (1314, 28%). 892 (19%) cases were noted between 6 pm to 12 midnight and from 6 am to 12 noon, 798 (17%) of them had injuries. [Table 1]

**Place of injury:** The site of study being in the semi urban zone, the maximum cases presented from semi urban, 59.98% (2815) locality followed by those which occurred in Urban area, 33.01% (1549) and a very minimal case belonged to the village accounting to 7.01% (329) cases. [Table 1].

**Seasonal variation:** In this retrospective study patients sustained injuries most commonly in summer season (2071, 44.13%) followed by winter season (1498, 31.92%) and rainy season (1124, 23.95%). [Table 1].

**History of substance abuse:** History of alcohol usage was found in 15.89%, 746 cases and Tobacco consumption in the form of bid is, cigarettes and Khaini was noted in 34.23%, 1606 cases. Combined usage was noted in 27.99%, 1314 cases. History with regards to substance abuse was undetermined in majority of cases. [Table 1].

**Socioeconomic status:** According to Modified Kuppuswamy scale 2020, majority of the cases belonged to upper lower socioeconomic class (2019, 43.02%), followed closely by lower middle socioeconomic class (1025, 21.84%). The least numbers belonged to Upper socioeconomic status (239, 5.1%). [Table 1].

**Type of the industries:** The victims sustained injuries in their respective workplaces which are as follows: Automobile industry showed 36% (1689) cases, welding industry had 29% (1361) cases, Construction site and textile industry accidents accounted to 11% (516) and 8.99% (422) cases respectively. The other industries involved were electrical and chemical industry amounting to 7.99% (375) and 7.02% (330) of respective cases.
Parts of the body injured: Injury to the Upper limb was seen in 73% victims (3426), lower limb injuries were noted in 21% (986) patients. 4% of the cases of head injury were noted in this study accounting to 188 cases. Intracranial haemorrhages were noted in 29% or 55 cases of the head injury cases (n=188). Injuries over the other body parts amounted to 9% (422) of cases. [Table 1]

Type of injury: In this retrospective study, the most common injury found was abrasion in 69% (3238) patients, laceration was noted in 44.60% (2093) cases, contusion was seen in 33.41% (1568) cases. Fracture caused by the accident accounted to 21% (986) of cases followed by cut injury accounting to 19% (892) injuries and injury due to burns was noted in 12% (563) patients. [Table 2].

Usage of protective gears: More than 2/3rd of the cases were not using protective gear (68%, 3191). [Fig 3].

**Fig 1: Gender of the Victims Of Industrial Accidents**

![Gender Distribution Chart]

**Fig 2: Age Groups of the Victims of Industrial Accidents**

![Age Groups Chart]

**Fig 3: Usage of the Protective Gears/Devices.**
### Usage of Protective Gears

![Graph showing usage of protective gears](image)

### Table 1: Profile of Industrial Accident Injury Cases (N=4693)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>No. of Cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time of Accident</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:01AM-06:00AM</td>
<td>1314</td>
<td>28%</td>
</tr>
<tr>
<td>06:01AM-12:00PM</td>
<td>798</td>
<td>17%</td>
</tr>
<tr>
<td>12:01PM-06:00PM</td>
<td>1689</td>
<td>36%</td>
</tr>
<tr>
<td>06:01PM-12:00AM</td>
<td>892</td>
<td>19%</td>
</tr>
<tr>
<td><strong>Season</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summer</td>
<td>2071</td>
<td>44.13%</td>
</tr>
<tr>
<td>Monsoon</td>
<td>1124</td>
<td>23.95%</td>
</tr>
<tr>
<td>Winter</td>
<td>1498</td>
<td>31.92%</td>
</tr>
<tr>
<td><strong>Place of Accident</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>1549</td>
<td>33.01%</td>
</tr>
<tr>
<td>Semiurban</td>
<td>2815</td>
<td>59.98%</td>
</tr>
<tr>
<td>Rural</td>
<td>329</td>
<td>7.01%</td>
</tr>
<tr>
<td><strong>Socio Economic Status (Modified Kuppuswamy Scale 2020)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper Class</td>
<td>239</td>
<td>5.1%</td>
</tr>
<tr>
<td>Upper Middle Class</td>
<td>636</td>
<td>13.55%</td>
</tr>
<tr>
<td>Lower Middle Class</td>
<td>1025</td>
<td>21.84%</td>
</tr>
<tr>
<td>Upper Lower Class</td>
<td>2019</td>
<td>43.02%</td>
</tr>
<tr>
<td>Lower Class</td>
<td>774</td>
<td>16.49%</td>
</tr>
<tr>
<td><strong>History of Substance Abuse</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol</td>
<td>746</td>
<td>15.89%</td>
</tr>
<tr>
<td>Tobacco</td>
<td>1606</td>
<td>34.23%</td>
</tr>
<tr>
<td>Both Alcohol And Tobacco</td>
<td>1314</td>
<td>27.99%</td>
</tr>
<tr>
<td><strong>Parts of the Body Injured</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undetermined</td>
<td>3379</td>
<td>72%</td>
</tr>
<tr>
<td>Upper Limb</td>
<td>3426</td>
<td>73%</td>
</tr>
<tr>
<td>Lower Limb</td>
<td>986</td>
<td>21%</td>
</tr>
<tr>
<td>Head And Neck</td>
<td>188</td>
<td>4%</td>
</tr>
<tr>
<td>Thorax And Abdomen</td>
<td>422</td>
<td>9%</td>
</tr>
</tbody>
</table>

### Table 2: Injury Pattern with Respect to Industrial Accidents

<table>
<thead>
<tr>
<th>Type of Injury</th>
<th>Total Numbers</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abrasion</td>
<td>3238</td>
<td>69</td>
</tr>
<tr>
<td>Contusion</td>
<td>1568</td>
<td>33.41%</td>
</tr>
<tr>
<td>Laceration</td>
<td>2093</td>
<td>44.60%</td>
</tr>
<tr>
<td>Fractures</td>
<td>986</td>
<td>21%</td>
</tr>
<tr>
<td>Cut Injury</td>
<td>892</td>
<td>19%</td>
</tr>
<tr>
<td>Burns</td>
<td>563</td>
<td>12%</td>
</tr>
</tbody>
</table>

### Discussion

A total of 4693 industrial accident cases were observed in this retrospective study done at a tertiary care hospital in Kancheepuram district between 2018 to 2019. On analysis it is found that males were more vulnerable to industrial accidents than females. Males being the breadwinner in majority of family are exposed more frequently to outdoor work than females. Also male workers have high willingness and inclination to engage in risk-taking behavior and work than female
workers. This explains the male preponderance in the study similar to the observation made by few authors.\(^{(8)}\)

On comparison with working age groups in these industries who attained injuries, it was found that 20 to 40 years of age group people had the higher incidence of injuries compared with other age groups. Most study findings at various places by many authors reported that working at younger age increases the risk of sustaining more occupational injury among factory workers compared with older workers as the younger age group people are more employed in the factories. They also have inaccessibility to health and safety information, lack of training on health and safety, less work experience, low level of knowledge and skill towards the work.\(^{(9,10)}\) However the values of this study contradicts with a study done among coal mining industrial workers which reported that older age group workers were at higher risk of occupational injury than young age group workers.\(^{(11)}\)

Maximum cases were noted between mid noon to 6 PM, more in the summer season. This can be due to exhaustion caused by extreme heat and probable hypoglycemia caused delayed reflexes. Almost 1/3\(^{rd}\) of the cases had history of substance abuse at workplace leading to accidents.

Regarding the place of industrial accidents, majority were seen semi urban and urban areas. This could be explained as many industries have been established due to the globalisation where youngsters are employed for better productivity.

In this retrospective study, it is found that most type of industrial accidents are involving abrasion followed by laceration fractures cut injuries and burns. Majority of the victims sustained injuries on their hands, feet, legs or head/neck, shoulder, chest, eye, back or abdomen. This indicates that personal protective equipment targeting extremities and other safe working practices would make a change in industrial accidents. These findings are in accordance with other studies who reported injuries to the upper and lower limbs, upper trunk and extremities, i.e. eyes, neck, back, shoulder, arm, finger, and hand.\(^{(12,13)}\)

**Conclusion**

The findings from this study provide an insight into the injury experiences of workers in the Semiurban locality of Kancheepuram District. The analysis shines light on the vulnerabilities faced by workers of lower socioeconomic strata who experience work-related injuries.

There was a relatively high prevalence of injuries over upper and lower extremities leading to loss of a considerable number of productive days. Low income, job stress, lack of Personal Protective Equipments provision and poor safety environment were significantly associated with occupational injuries. Multimodal approach integrating education for behavioural change, creating awareness amongst workers to demand for their rights to safety and protection at work, and legislation enforcement should be implemented in the best interests of all the workers in the industries.

**Conflict of Interest:** Nil

**Ethical Clearance:** Obtained

**Source of Funding:** Self

**References**


Microorganisms Resistance Pattern and Antibiotic Prescriptions in Patients Admitted to the Intensive Care Unit in Ghazy AL Hariri Hospital

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Abstract

Introduction: Resistance to antibiotics has emerged recently due to the misuse of antibiotics and is a threat to the health-care system, especially in developing countries like Iraq where there are no antimicrobial stewardship programs in most intensive care units (ICU).

Materials and Method: This was an observational, cross-sectional study done in the ICU of Ghazi AL Hariri hospital, Medical City/Iraq. All patients getting admitted to ICU from both genders were included in the study. Samples taken for culture and sensitivity tests included blood, urine, tracheostomy tube, sputum, cerebrospinal fluid, central venous line, and bed sore swab.

Results: 43 patients satisfied the inclusion and exclusion criteria and were included in the study. The most common isolated pathogens were pseudomonas in sputum and blood samples, Acinetobacter in wounds and operation skin site infection, Klebsiella in central venous line, and bed sore swab, while Candida in the urine. Klebsiella was the most frequently isolated in overall culture results, it was most sensitive to imipenem, meropenem, and amikacin.

Conclusion: Ceftriaxone was the most commonly used antibiotic as an empiric treatment followed by meropenem and amikacin. Most of the isolated pathogens (> 90%) had resistance to ceftriaxone. ICU-acquired Klebsiella, P. aeruginosa, and Acinetobacter predominate hospital-acquired infections.

Keywords: Intensive care unit, Microorganisms resistance, Antibiotics.

Introduction

Infections are a common cause of hospital admission, and hospital-acquired infections are an increasingly common condition, mainly within the acute/critical care setting[1]. Incidence of hospital-acquired infections in the Intensive Care Unit (ICU) has been stated to be about 2–5 times greater than in the general inpatient hospital residents. These infections add considerable costs, morbidity, and mortality to the patients. The epidemiology, microbiology, and impact of ICU-acquired infections such as ventilator-associated pneumonia (VAP), catheter-associated urinary tract infections, and catheter-related bloodstream infections have been comprehensively studied and reported in the western literature[2]. There is growing evidence to propose that rates of ICU-acquired infections might even be more significant in developing countries[3]. ICU is a center for the development of antibiotic-resistant Gram-negative bacteria, and multi-resistant Gram-positive infections, since of high degrees of antibiotic usage, quick patient turnover, the immunological vulnerability of acutely ill patients, and recurrent interaction between healthcare staffs and patients, enabling cross-
transmission. Antibiotic stewardship programs are considered essential to reduce antibiotic resistance\(^4\),\(^5\). There is inadequate literature concerning common ICU-acquired infections in the Iraqi setting, and therefore, western guidelines are deduced for the treatment of these infections. The local distinctions in the incidence, microbiology, and resistance patterns within Iraq are not well documented yet. Local guidelines for the prevention and treatment of these infections cannot be made without a proper assessment of the region-specific study. Hereafter, we sought to perform a cross-sectional, prospective data collection evaluating the microbiology, resistance patterns, and outcomes of ICU infections. Although the developments in modern medicine and intensive care, the rate of sepsis in intensive care units (ICUs) remains high. In a global study of 1265 ICUs, 60% of ICU patients at the period of the study were considered infected, with infection found to be a strong independent predictor for mortality \(^6\). The threats of infection in general and with a resistant pathogen in particular, increased with the interval of patient stay in the ICU. Several influences contribute to the elevated incidence of these infections in the ICU and the related poor patient outcomes, in comparison with patients in different hospital wards, patients in ICUs have more chronic comorbid diseases and more acute physiologic instabilities and thus are relatively immunosuppressed\(^7\).

**Materials and Method**

This was a hospital-based observational, cross-sectional study done in the intensive care unit (ICU) of Ghazi AL Hariri hospital, Medical city/Baghdad, Iraq during the period from 1st October 2018 to the 1st of August 2019. All patients getting admitted to ICU from both genders with different infections will include in the study. Demographic details, comorbidities, duration of ICU admission, number of antibiotics used, antibiotic prescription, antimicrobial resistance pattern of patients will be collected. Patients who are HIV positive, who could not provide an adequate specimen, and patients who died within 48 h after admission, patient with incomplete data. Since most of the patients were incapable of talking, because of being critically ill or intubated (by endotracheal tube or tracheostomy), data collection mainly from patients’ case files and unit’s staff (doctors, nurses, pharmacists, and lab technicians). Samples taken for culture and sensitivity tests included blood, urine, tracheostomy tube, sputum, cerebrospinal fluid, central venous line, and bedsore swab.

**Statistical Analysis:** Data of 43 cases and 430 samples collected from the admitted patients analyzed by using the statistical package for social sciences (SPSS) software version 23, IBM, Chicago, US, for windows. Descriptive statistics presented as mean, frequencies, and proportion (%). Finally, results are presented in tables and or figures with an explanatory paragraph.

**Results**

Throughout the study period, 105 patients admitted to ICU were enrolled, 62 of them excluded from the study, 43 patients satisfied inclusion and exclusion criteria, and included in the study. The mean age of the study population was 50.72 ± 20.73 and of whom 23 (52.30%) were men, and 20 (46.5%) were females. From the 43 participants 23 (53.5%) survived and 20 (46.5%) died. The most common admitted cases to the ICU was stroke representing (20.9% [9/43]), postoperative cases (18.6% [8/43]). The duration of hospitalization was between 2 – 180 days. The mean duration of admission was 22.38 (SD ±15.4) days. The outcome of the admitted patients was as follows: 20 patients went back to their original wards to finalized their therapies, three patients discharged home. Twenty patients died (mortality rate of 46.5%). All patients received pharmacological treatments regarding their conditions, involving empirical antibiotics depending on the physician’s opinion about the clinical state of the patient. The mean period for empiric treatment was 5.67 (SD ±4.92) days, the empirical antibiotics used in variable combinations considering the patient’s condition; ceftriaxone was the most commonly used antibiotic as an empiric treatment (39.7%) followed by meropenem (23.5%) and amikacin (5.9%) (Table 1).

**Table 1: Antibiotics used for empiric treatment.**

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceftriaxone</td>
<td>27</td>
<td>39.7</td>
</tr>
<tr>
<td>Meropenem</td>
<td>16</td>
<td>23.5</td>
</tr>
<tr>
<td>Amikacin</td>
<td>4</td>
<td>5.9</td>
</tr>
<tr>
<td>Piperacillin/Tazobactam</td>
<td>3</td>
<td>4.4</td>
</tr>
<tr>
<td>Levofloxacine</td>
<td>3</td>
<td>4.4</td>
</tr>
<tr>
<td>Metronidazole</td>
<td>3</td>
<td>4.4</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>2</td>
<td>2.9</td>
</tr>
<tr>
<td>Imipenem</td>
<td>2</td>
<td>2.9</td>
</tr>
<tr>
<td>Vancomycin</td>
<td>2</td>
<td>2.9</td>
</tr>
<tr>
<td>Amoxicillin</td>
<td>2</td>
<td>2.9</td>
</tr>
</tbody>
</table>
Antibiotic Frequency Percent
Amoxicillin/Clavulanic acid 1 1.5
Ceftazidem 1 1.5
Azithromycin 1 1.5
Linezolide 1 1.5
Total 68 100.0

The antibiotics, as mentioned earlier used as a single agent or in combinations of two or three agents according to the patient’s status, 48.8% of the patients given a combination of two or more antibiotics. All patients underwent culture and sensitivity (CS) test as soon as they were admitted to the ICU, the meantime needed for CS test results to return to the ICU was 10 (SD± 5.1) days, range (2 – 25) days. In most of the cases, the antibiotics changed according to the results of the bacteriological test. Samples obtained for CS tests included blood, sputum, urine, tracheostomy tube, central venous line, foley catheter tip, and bedsores. The number of positive cultures and sensitivity test results obtained in 327 samples out of a total of 430 tests. The most common isolated pathogen was summarized in Figure (1).

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Klebsiella</td>
<td>90/327</td>
</tr>
<tr>
<td>Pseudomonas</td>
<td>67/327</td>
</tr>
<tr>
<td>Acinetobacter</td>
<td>50/327</td>
</tr>
<tr>
<td>E.coli</td>
<td></td>
</tr>
<tr>
<td>Coagulase negative staph</td>
<td></td>
</tr>
<tr>
<td>Staphlococcus lenticus</td>
<td></td>
</tr>
<tr>
<td>Staph. Aureus</td>
<td></td>
</tr>
<tr>
<td>G-ve bacilli</td>
<td></td>
</tr>
</tbody>
</table>

![Figure 1: (a) blood cultures pathogens (b) wound swab pathogens (c) central venous line pathogens (d) bedsore pathogens(e) sputum cultures pathogens (f) urine cultures pathogens (g) Foley catheter cultures pathogens.](image)

In overall culture results in a total of 327 tests the most frequently isolated pathogens were Klebsiella 27.5% (90/327), followed by Pseudomonas 20.5% (67/327) and Acinetobacter 15.3% (50/327) Table (2).
Table 2: The frequency and percentage of isolated pathogens in cultures and sensitivity tests

<table>
<thead>
<tr>
<th>Pathogens</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Klebsiella</td>
<td>90</td>
<td>27.5</td>
</tr>
<tr>
<td>Pseudomonas</td>
<td>67</td>
<td>20.5</td>
</tr>
<tr>
<td>Acinetobacter</td>
<td>50</td>
<td>15.3</td>
</tr>
<tr>
<td>Candida</td>
<td>42</td>
<td>12.8</td>
</tr>
<tr>
<td>E.coli</td>
<td>33</td>
<td>10.1</td>
</tr>
<tr>
<td>Proteus</td>
<td>18</td>
<td>5.5</td>
</tr>
<tr>
<td>Enterobacter</td>
<td>10</td>
<td>3.1</td>
</tr>
<tr>
<td>Coagulase -ve staphylococcus</td>
<td>7</td>
<td>2.1</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>5</td>
<td>1.5</td>
</tr>
<tr>
<td>Streptococcus</td>
<td>2</td>
<td>.6</td>
</tr>
<tr>
<td>Gram -ve bacilli</td>
<td>1</td>
<td>.3</td>
</tr>
<tr>
<td>Burkholderiacepacia</td>
<td>1</td>
<td>.3</td>
</tr>
<tr>
<td>Total</td>
<td>327</td>
<td>100.0</td>
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</tbody>
</table>

These microorganisms tested for their sensitivity to several antimicrobial kits to about 30 antibiotics. From the results of Klebsiella sensitivity tests, there are only 188 time-sensitive results of the tested antibiotics (about 30) for a total of 90 times detected positive culture tests. Klebsiella Pneumonia was most commonly sensitive to imipenem 55% (50/90), followed by meropenem 30% (27/90), and amikacin 26.6% (24/90) Figure (2).

![Chart Title](chart.png)

Figure (2): Percent of Klebsiella pneumonia sensitivity and resistance to antibiotics
In regards to Pseudomonas which they reported positively in 67 tests, it showed sensitivity to piperacillin/tazobactam in 43.2%, imipenem 35.5%, ceftazidime 31.3% Figure (3).

Figure (3): Percent of Pseudomonas aeruginosa sensitivity and resistance to antibiotics

Acinetobacter bumanii which was isolated in 15.5% of all positive results showed sensitivity to amikacin in 22%, tetracyclin in 18%, ampicillin, gentamicin, tobramycin, imipenem were 14% for each one, Figure (4).

Figure (4): Percent of Acinetobacter bumanisensitivity and resistance to antibiotics
Proteus showed sensitivity in to piperacillin/tazobactam 61.1%, imipinem 55.5%, ciprofloxacin 44.4%, meropenem 44.4%, amikacin 38.8%, cefpodoxem 33.3%, gentamicin 33.3%, cefoxitin 22.2%, cefotaxime 22.2%, chloramphenicol 16.6%, ceftriaxone 16.6%, aztreonam 11.1%, amoxicillin/clavulanic acid 11.1%, TMP 11.1%, piperacillin 5.5%, and levofloxacin 5.5%.

E. coli was sensitive to imipenem in 60.6%, chloramphenicol 36.6%, and 33.3% sensitive to meropenem, amikacin 30.3%, ciprofloxacin 21.2%, Piperacillin/Tazobactam 21.2%, gentamicin 18.1%, nitrofurantoin 18.1%, levofloxacin 9%, tetracyclin 9%, cefpodoxem 6%, cefoxitin 6%, ampicillin, aztreonam, tobramycin, ceftriaxone and cefotaxime 3%. Streptococcus pneumonia was sensitive only in two times, once for tetracycline and the second for trimethoprim-sulfamethoxazole. Enterobacter was sensitive for chloramphenicol in 40%, Ciprofloxacin in 30%, Imipenem in 20%, and 10% for each aztreonam, levofloxacin, tetracycline. Staphylococcus aureus was sensitive to chloramphenicol in 50%, 30% to vancomycin, and 20% to trimethoprim-sulfamethoxazole. Coagulase-negative staphylococcus was 100% sensitive to Vancomycin, tetracyclin in 42%, gentamicin & nitrofurantoin in 28%, and chloramphenicol 14%. Candida Albicans was the most isolated fungi it was sensitive 6 times to miconazole, 5 times for both fluconazole and ketoconazole. Staphylococcus lentus isolated in one case of sepsis. Overall bacterial sensitivity between the tested antibiotics showed 17.7% to imipenem, amikacin, and meropenem 10.2%. Table (3).

Table (3): Overall bacterial sensitivity to antibiotics in the 327 positive culture tests

<table>
<thead>
<tr>
<th>Tested Antibiotics</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imipinem</td>
<td>113</td>
<td>34.5</td>
</tr>
<tr>
<td>Amikacin</td>
<td>65</td>
<td>19.8</td>
</tr>
<tr>
<td>Meropenem</td>
<td>65</td>
<td>19.8</td>
</tr>
<tr>
<td>Piperacillin/Tazobactam</td>
<td>57</td>
<td>17.4</td>
</tr>
<tr>
<td>Chloramphenicol</td>
<td>53</td>
<td>16.2</td>
</tr>
<tr>
<td>Gentamicin</td>
<td>45</td>
<td>13.7</td>
</tr>
<tr>
<td>Ceftazidem</td>
<td>38</td>
<td>11.6</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>36</td>
<td>11.1</td>
</tr>
<tr>
<td>Tetracyclin</td>
<td>29</td>
<td>8</td>
</tr>
<tr>
<td>Piperacillin</td>
<td>24</td>
<td>7.3</td>
</tr>
<tr>
<td>Levofoxacin</td>
<td>16</td>
<td>4.8</td>
</tr>
<tr>
<td>Aztreonam</td>
<td>14</td>
<td>4.2</td>
</tr>
<tr>
<td>TMP</td>
<td>14</td>
<td>4.2</td>
</tr>
<tr>
<td>Tobramycin</td>
<td>14</td>
<td>4.2</td>
</tr>
<tr>
<td>Cefoxitin</td>
<td>13</td>
<td>3.9</td>
</tr>
<tr>
<td>Vancomycin</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Nitrofurantoin</td>
<td>9</td>
<td>2.7</td>
</tr>
<tr>
<td>Ampicillin</td>
<td>8</td>
<td>2.4</td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>7</td>
<td>2.1</td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>6</td>
<td>1.8</td>
</tr>
<tr>
<td>Amoxicillin/Clavulanic acid</td>
<td>2</td>
<td>0.6</td>
</tr>
<tr>
<td>Azithromycin</td>
<td>1</td>
<td>0.3</td>
</tr>
</tbody>
</table>
Also, there are samples taken as a swab from the beds, ventilator machines, oxygen suppliers, fluid stands, floors, walls. coagulase-negative staphylococcus was the most frequently isolated pathogen followed by bacillus species.

Discussion

In the current study each patient with a documented or a suspected source of infection received antibiotic prescription by the physician in charge, and generally, it is grounded on a clinical basis and experience. And this is what followed in five tertiary carehospitals in Germany as mentioned by Wilke M et al. who stated that therapy grounded on local experiences might be appropriate for patients with low complicated pathogen risk score (CPRS) but insufficient for those with high CPRS. As well, in the current study, the meantime for culture and sensitivity results to come back to ICU was very long, this is a time-consuming step. This issue is also a challenge in therapeutic practice even in European countries. As there is a profound difference between countries in retrieving the results of the culture tests, for example in the United Kingdom, 2 hours are needed from collection to incubation while in Germany 20 hours are necessary for incubating the bacteria due to distant laboratories, still, these times are much shorter than that in the settings followed in Ghazi Al Hariri center. Many studies are debating new method to reduce the period of detecting the causal organisms in the patients to enhance the choice of the antibiotics as early as possible and consequently improve the outcome. Such as a study that employed a new spectrometry method that provides rapid pathogen identification in critically ill patients with the capability to rule out infection within 6 hours. This has potential clinical and economic benefits. In the present study, the most frequently isolated pathogen was Klebsiella pneumoniae, and the lowest isolation rate was for Burkholderiacepacia and Gram-negative bacilli. Causative organisms diverge in different geographical areas. This result is differing from that previously published in Asian countries, a study conducted in a tertiary teaching hospital of Eastern India intensive care unit which stated Pseudomonas is the most isolated microorganism while the lower isolation rate was for the Coagulase-negative staphylococci, Enterobacter spp, Stenotrophomonas spp, Burkholderiacepacia. In a study of Ghanshi et al. they found a higher rate of bacterial isolation for the following pathogens: Acinetobacter, Klebsiella, Streptococcus, Pseudomonas, and Staphylococcus. Several studies from other Asian countries such as Indonesia, Thailand stated that frequency of Pseudomonas isolation was about (26%–50%) followed by Klebsiella and S. epidermidis. In another study, done in Turkey showed that Pseudomonas spp. were the most frequently isolated Gram-negative spp., followed by Klebsiella spp. E. coli, Acinetobacter spp. And Enterobacter spp. were the other commonly isolated organisms. Antimicrobial resistance is a major worldwide problem in ICU, including Iraq. ICUs are the main foci of antibiotic resistance within the hospital wards. Antimicrobial resistance is emerging due to the deficiency of hospital hygiene and the misuse of antibiotics. Antibiotic prescription in an ICU is mostly empirical and centered on previous practices; hereafter, patients who got improper empirical antibiotic treatments significantly increase hospital stay, and increases mortality. Hospital-acquired infections originating from drug-resistant microorganisms further add to the existing problem. A striking outcome from this study was the degree of drug resistance among key pathogens. This study detected high drug resistance of Klebsiella to a commonly prescribed drug compared to a study done by Kumari et al., who observed similar levels. P. aeruginosa isolates showed a high rate of resistance to ceftriaxone, TMP, ciprofloxacin, levofloxacin, gentamicin, amikacin, the most effective antibiotics were piperacillin/tazobactam, imipenem, and ceftazidime. The similar result reported previously in a study by Radji et al. in which they stated P. aeruginosa isolates displayed a high rate of resistance to cefotaxime, cephalixin, and ceftriaxone. But in this study amikacin was the most effective antibiotic, followed by imipenem, and meropenem. Acinetobacter humani is extremely resistant to antibiotics. In this study, the resistance was higher in Acinetobacter than all of the other isolated pathogens. This is in concordance to what was reported by Tran et al. where they stated that acinetobacter was resistant to nearly all antibiotics. Staphylococcus lentus a zoonosis pathogen was reported for the first time as a cause of septic shock during the work on this research. Proteus mirabilis showed marked resistance to commonly used antibiotics. In the European and North American Surveillance study by Mark et al. they reported the resistance profile of Proteus in the US, Canada, Italy, Germany, and France. The resistance rate was different from ours; ceftriaxone resistance was (0.3%, 0%, 13.8%, 0%, 0%) in the US, Canada, Italy, Germany, and France respectively. On the other hand, E. coli showed high resistance to several broad-spectrum antibiotics. Best sensitivity results achieved by imipenem,
chloramphenicol, and meropenem. In comparison to what reported previously in a study by Zhanel et al.\textsuperscript{[24]}, E. coli showed no resistance to amikacin, meropenem, and tigecycline. In the current study, ceftriaxone was the main antibiotic used as an empiric treatment followed by meropenem, amikacin, and piperacillin/tazobactam. This may be due to the previous experience with these drugs, its availability, its opened dispense with no limitation, and its broad spectrum of action. The infrequent use of chloramphenicol may explain its probable activity against isolated pathogens as shown by culture studies, and this, in turn, should alert the clinicians in charge (physician and the clinical pharmacists) to review their choices of the empirical therapy medications and to reduce their use of ceftriaxone as first choice antibiotic in the empirical management. Source of infections seem to be from the ICU equipment like the ventilator, sucker, fluid stands, and oxygen suppliers. Also, the wall, floor, and patients bed showed colonization with different microorganisms; Coagulase-ve staphylococcus and Bacillus spp were the most predominant pathogens. This is the leading cause of secondary endogenous infections and exogenous infection. It accounts for more than one-third of all types of ICU infections according to what reported in a study by Mukhopadhyay\textsuperscript{[25]}. Ceftriaxone resistance was noted by Tran et al. who studied the resistance of bacteria in ICU against several antimicrobials and showed that most of Acinetobacter, Klebsiella, and Pseudomonas were resistant to ceftriaxone.

**Conclusion**

This study concluded that ICU-acquired Klebsiella, P. aeruginosa, and Acinetobacter predominate hospital-acquired infections. More disturbingly, all of them were multiple-drug resistant. The result here supports the view that multidrug resistance is a global public health threat, and highlights the need to study combined therapies and rational treatment strategies. Ceftriaxone was the most common empirical antimicrobial prescribed to patients admitted to ICU. Most of the isolated pathogens (> 90%) had resistance to it. Suitable antibiotic employment in ICU is crucial not only in guaranteeing the best outcome but also in inhibiting the development of multidrug-resistant bacteria.

**Ethical Approval:** The study protocol approved by the Scientific Council of the Iraqi Board of Medical Specialization.

**Conflict of Interest:** Nil

**Funding:** Nil

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Effect of *Moringa Oleifera* Leaf Extract on Oxidative Stress and Theca Cell in Polycystic Ovary Syndrome Model with Insulin Resistance

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Abstract

**Background:** The use of *Moringa oleifera* as an antioxidant should be investigated as an alternative treatment of oxidative stress and follicular refinement in PCOS with insulin resistance.

**Purpose:** We aimed to prove the effect of *Moringa oleifera* leaf extract in various dosages to decrease the malondialdehyde levels and theca cell thickness of PCOS female rat with insulin resistance.

**Method:** Three month old *Rattus norvegicus stran wistar* rat weighing 100-130 grams were divided into 5 groups (n = 8). PCOS model obtained by giving injection of testosterone propionate for 28 days, followed by metformin therapy and *Moringa oleifera* leaf extract at 250 and 500 mg/KgBW for 14 days. Then, we analyzed levels of malondialdehyde in the blood and the thickness of theca cell.

**Results:** Malondialdehyde levels in the PCOS control group (5.694±1.464) increased significantly (p <0.05) compared to the normal controls (1.939 ±0.341). Leaf extract *Moringa oleifera* 500 mg/KgBW (1.982±0.383) showed a significant decrease (p <0.05) to malondialdehyde levels compared to the PCOS control group. Examination of ovarium histology showed that leaf extract *Moringa oleifera* 500 mg/KgBW (0.931±0.457) significantly decreased the thickness of theca cells (p <0.05) compared to the PCOS control group.

**Conclusion:** *Moringa oleifera* leaf extract as an antioxidant proven to decrease the malondialdehyde levels and the thickness of theca cell of the female rat model of PCOS.

**Keywords:** *Moringa oleifera*, Polycystic Ovary Syndrome, malondialdehyde, Theca Cell Thickness.

**Introduction**

Polycystic Ovary Syndrome (PCOS) was the most common endocrinopathy in women, thus the affects 5 to 10% of women of reproductive age, 50-70% have insulin resistance, 35% of endometrial hyperplasia, 5-3 times could occur endometrial cancer, 36-56 % experienced recurrent pregnancy loss(¹). The prevalence of clinical presentation of PCOS varies were considerably(²).
The definition of PCOS includes both clinical and biochemical criteria as well as ovarium morphology (3). PCOS have been regarded as a chronic systemic disease rather than a simple local disease, and it was often associated with insulin resistance, hyperandrogenemia, chronic inflammation, and oxidative stress, although pathogenesis has not been well defined. (4). Insulin and IGF-1 indirectly also could increase androgen levels by decreasing the production of SHBG (Sex Hormone Binding Globulin) in the liver and suppress the synthesis of IGFBP-1 (Insulin-Like Growth Factor Binding Protein-1) directly, quickly, and completely liver and ovaries so that levels of IGF-I, IGF-II, and free testosterone were increased (5).

Moreover, in previous research it has revealed that OS levels were significantly increased in patients with PCOS compared with normal, when oxidative status was evaluated by circulating markers, such as malondialdehyde (MDA), superoxide dismutase (SOD), and glutathione peroxidase (GPx) (6). Research conducted by Sabuncu et al (2001), Zhang et al (2008) and Kuscu et al (2009) showed significantly elevated levels of serum MDA levels in PCOS patients compared with non-PCOS (7).

Metformin is the first line of PCOS obese treatment by inhibiting hepatic glucose absorption, increasing peripheral glucose uptake, reducing peripheral insulin levels, and improving GLUT-4 (8). Metformin treatment might not be suitable for a long-term PCOS treatment.

The search for herbs that have potential capabilities as preventative and scientifically proven could be used for treatment alternative a much-needed. Phytochemical studies of the Moringa oleifera plant that revealed large polyphenols such as quercetin glucoside, routine, kaempferol glycoside, and chlorogenic acid in Moringa oleifera flour via HPLC analysis (9). Quercetin exhibits activity as an antioxidant by decreasing lipid peroxidation (MDA) and increasing antioxidant enzyme activity in STZ-induced diabetic-induced mouse mellitus (10).

In this study, we aimed to determine that giving Moringa oleifera leaf extract as an antioxidant could decrease the MDA levels and follicle repair in PCOS with insulin resistance. This plant was an original plant in various Asian countries, abundant and cheap as a food source. Thus, every health benefit of this plant will reach most of the population.

Method
Moringa oleifera commonly referred as the miracle tree that was a family of Moringaceas originating from southern Asia. The leaves of this tree are rich in minerals, vitamins and other important phytochemicals (11). Moringa oleifera extract (Kelorina, Moringa Indonesia, Blora, Indonesia) in powder form, all the process was done according to standard to obtain Moringa oleifera extract. The Moringa oleifera leaf was also used in several studies to determine its effectiveness in chronic hyperglycemia and dyslipidemia (12).

The female rat of Rattus norvegicus strain Wistar (Biochemistry Laboratory, Faculty of Medicine, Airlangga University, Surabaya, Indonesia) was 3 months old and weighed 100-130 grams. These rat were also used in research as animal models of diabetes (13). Before the study began, it gives the period of adaptation for a week, in healthy condition, in normal behaviour and the results of normal vaginal swab. We excluded rat with anatomical abnormalities and in pregnant during the adaptation. All procedures described were approved by the ethics committee of the Faculty of Veterinary Medicine of Universitas Airlangga.

The white wistar strain female rats (Rattus norvegicus) of 40 samples were divided into 5 groups randomly (n = 8). Normal control group was only given aquades, while the other four groups were PCOS model. Preparation of PCOS with insulin resistance model using testosterone propionate injection (Testohormon, Wonderindo Pharmatama, Jakarta, Indonesia), this hormone was given intramuscularly in the thigh with a dose of 1 mg/100grBW once a day for 28 days until PCOS-resistance insulin model obtained. Furthermore, the second group as the positive control only given aquades, then the third group was followed by giving metformin therapy (2mg/100gBW, orally) as the comparison while the fourth and fifth group followed by giving Moringa extract oleifera orally (250 mg/KgBW) and (500 mg/KgBW) for 14 days. Before and after the study period, animals try to swab the vagina to know what cycle was ongoing before and after the study. Before the animal was sacrificed, it has fasted for 12 hours and then blood was taken to analyze MDA levels and ovarium removal to measure the thickness of the theca cell.

The measurements of MDA levels using blood serum specimens of rat were examined using the thiobarbituric acid (TBA) reagents by reaction with a nucleophilic
addition that forming the MDA-TBA compound. Then measured its intensity by using a spectrophotometer at 532 μm wavelength with the simple spectrophotometric method was done in Biochemistry Laboratory, Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia.

The thickness of theca cells follicle was examined by HE staining (Hematoxylin-Eosin). Later on, HE was a colouring method widely used in tissue staining, aiming to make it easier to see changes in the tissue. The preparation of ovarium organs was coloured with a hematoxylin-eosin dye, so it could be clearly seen the shape of each cell. The coloured tissue was then placed on the glass object (object glass) which was covered with a glass cover (cover glass) that has been previously spilled with entellan, then the tissue was observed under a microscope.

Normality test using Shapiro-wilk test. All results were statistically analyzed using SPSS statistical software package version 18.0 (SPSS, Inc., Chicago, IL). One-way factorial analysis of ANOVA variance or Krukal Wallis test were performed based on the distribution data. The data were considered statistically significant at value p <0.05.

**Results**

The results of the vaginal swab after treatment showed that there was a diestrus phase in the group receiving 1 mg/100grBW injection treatment intramuscular for 28 days (Table 1).

<table>
<thead>
<tr>
<th>Samples</th>
<th>Groups</th>
<th>K1</th>
<th>K2</th>
<th>K3</th>
<th>K4</th>
<th>K5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Before</td>
<td></td>
<td>115.50</td>
<td>121.88</td>
<td>118.62</td>
<td>112.75</td>
<td>119.12</td>
</tr>
<tr>
<td>Mean After</td>
<td></td>
<td>174.25</td>
<td>195.88</td>
<td>195.62</td>
<td>179.00</td>
<td>174.75</td>
</tr>
<tr>
<td>Mean Increases</td>
<td></td>
<td>58.75</td>
<td>74</td>
<td>77</td>
<td>66.25</td>
<td>55.63</td>
</tr>
</tbody>
</table>

K1: normal control group; K2: PCOS insulin resistance control group; K3: PCOS insulin resistance metformin group; K4: PCOS insulin resistance *Moringa oleifera* leaf extract 250mg/KgBW group; K5: PCOS insulin resistance *Moringa oleifera* leaf extract 500mg/KgBW group.

The results of MDA level measurements on blood samples of female rats (Table 2) showed that significant oxidative stress increased in the PCOS- insulin resistance control group compared to the normal control group (p <0.05). The *Moringa oleifera* leaf extract group showed the significantly decreased of MDA levels in female PCOS-insulin-resistance (p <0.05). The group given *Moringa oleifera* leaf extract at 500 mg/KgBW resulted lowest MDA levels compared to the PCOS-insulin resistance control group (p <0.05) (Table 2).

<table>
<thead>
<tr>
<th>Samples</th>
<th>Groups</th>
<th>K1</th>
<th>K2</th>
<th>K3</th>
<th>K4</th>
<th>K5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity of MDA</td>
<td></td>
<td>1.939 ±0.341</td>
<td>5.694±1.464*</td>
<td>3.759±1.384</td>
<td>3.315±1.128**</td>
<td>1.982±0.383**</td>
</tr>
</tbody>
</table>

*significantly different from normal control (p <0.05) ** significantly different from PCOS control-insulin resistance (p <0.05)

K1: normal control group; K2: PCOS insulin resistance control group; K3: PCOS insulin resistance metformin group; K4: PCOS insulin resistance *Moringa oleifera* leaf extract 250mg/KgBW group; K5: PCOS insulin resistance *Moringa oleifera* leaf extract 500mg/KgBW group.
The results of measurements of theca cell thickness on ovary samples of control female rats and treated groups using the HE method showed that the PCOS control group had higher cell-density cells than the other groups. The group treated with the leaf extract of *Moringa oleifera* at the dose of 500 mg/KgBW had a lower theca cell thickness than the other group. Metformin and *Moringa oleifera* leaf extracts showed the significant decrease in the thickness of theca cell (p <0.05) compared to the PCOS-insulin resistance control group (Table 3).

**Tabel 3. Effect of treatment on histological parameters**

| Sampel Ketebalan sel teka | K1 1.573±0.551 | K2 0.000±.000* | K3 1.950±0.577** | K4 2.187±0.860** | K5 0.931±0.457** |

*significantly different from normal control (p <0.05) ** significantly different from PCOS control-insulin resistance (p <0.05)

K1: normal control group; K2: PCOS insulin resistance control group; K3: PCOS insulin resistance metformin group; K4: PCOS insulin resistance *Moringa oleifera* leaf extract 250mg/KgBW group; K5: PCOS insulin resistance *Moringa oleifera* leaf extract 500mg/KgBW group.

**Discussion**

The PCOS model in this study shows that oxidative stress has occurred. There was a significant difference between the normal and the PCOS control group, it was indicating that the successful of PCOS modelling was characterized by significant increases in MDA levels. Testosterone, an androgens causes an increase in oxidative stress by facilitating lipolysis and the breakdown of abdominal fat leading to increased free fatty acids\(^{(14)}\). The statistical results showed a significant difference between PCOS control group and *Moringa oleifera* group, whereas between PCOS control group and metformin group showed no significant difference.

Moreover, the *Moringa oleifera* leaf extract in a female mouse model of PCOS as antioxidant in this research was proven to decrease the MDA level. MDA levels of the group given *Moringa oleifera* leaf extract at doses of 500 mg/KgBW had a better decrease than the metformin group and the *Moringa oleifera* group at 250 mg/KgBW, this result was close to normal control. *Moringa oleifera* leaf extract in Wistar strain rats might protect it from oxidative stress with decreased MDA levels compared with normal diet\(^{(15)}\).

The PCOS model in this study increased the thickness of the theca cell. The PCOS control group significantly increased the thickness of the theca cells compared with the normal control group. Women with PCOS syndrome usually have an enlarged ovary with an increased number of follicles and volume of the stroma. The treatment of high-dose androgens causes suppression of gonadotropin, but their ovaries were not depressed but enlarged by the increasing number of “cystic” follicles and theca-interstitial hyperplasia, meeting the PCOS morphology criteria. These observations show that androgens could cause growth of ovarian and theca-interstitial follicles \(^{(16)}\). The previous studies whose using rat that was given testosterone injections for 28 days also showed a change in ovarian morphology including the presence of thickening of theca cells \(^{(17)}\).

Furthermore, the drumstick tree was a rich plant in nutrients as well as macro, micronutrients, minerals, and vitamins. The nutrient content of the powder of the drumstick tree leaf was Vitamin A 16,3 mg/100gr, vitamin C 17,3 mg/100gr, vitamin E 113,6 mg/100gr, flavonoid 473,3 mg/gr also selenium 0,9 μg/100gr. Vitamin E was the most important fat-soluble antioxidant and protects against lipid membranes from oxidative damage. Vitamin E has a major function as a fat-soluble antioxidant and it was easy to provide hydrogen from the hydroxyl (OH) groups in the ring structure to free radicals. Vitamin E improves the potential for free radical defense systems and has a beneficial effect in the improvement of glucose transport and insulin sensitivity. Previous research conducted by Rzepczynska et al (2011) proves that administration of anti-oxidants (vitamin E) could improve the theca cell in rats induced by 17β estradiol \(^{(18)}\). Study of antioxidant effects (routine flavonoids) in PCOS showed that there was an improvement in theca cell and oxidative stress cells in letrozole-induced rat \(^{(19)}\).
Other studies have shown that Moringa oleifera can reduce blood insulin levels, then decrease androgens thereby allowing an increase in folliculogenesis in PCOS\(^{(20)}\). On the other hand, insulin is related to other aspects of reproduction. Insulin Transferrin Selenium and Bovine Serum Albumin can increase the amount of fertilization and support the development of embryos\(^{(21)}\). Sperm quality including motility, viability and membrane integrity are lower after centrifugation for sperm viability, motility, membrane integrity and capacitation\(^{(22)}\).

**Conclusion**

This study showed that the extract of *Moringa oleifera* leaf as an antioxidant could decrease the MDA levels and cell follicular thickness of PCOS rats along with insulin resistance induced by testosterone propionate.

**Ethical Clearance:** This study received an ethical test from Dr. Soetomo General Hospital and faculty of medicine Universitas Airlangga.

**Source of Funding:** This research was carried out through individual funding.

**Conflict of Interest:** There was no conflict of interest from this study.

**References**


A Review on Efficacy of Sensors in Capturing Biophysical Measures and its Application in the Field of Physical Therapy and Rehabilitation

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Abstract

Background: Use of sensors for assessment and treating orthopedic and neurological conditions in physical therapy and rehabilitation is in practice since last 2 decades. Its efficiency has been promising with advancements in research and clinical practice.

Objective: The aim of the present review is to synthesize and evaluate studies which have performed a role to test efficacy of sensors following orthopedic and neurological conditions for research and clinical practice in physical therapy and rehabilitation.

Data Source: A view of articles identified from high impact journal from Springer, Hindawi, MDPI, PLOSone, De Gruyter was performed by both researchers.

Study Eligibility Criteria: Articles published only in English between January, 2010 and December, 2019 were included which investigated role of sensors in physical therapy and rehabilitation.

Study Appraisal and Synthesis Method: Studies were grouped as wearable, bio-mechanical pressure, motion capture sensing technology and stretch sensors.

Results: From the 17 articles identified, 10 papers were involved in the review which was deemed as being of high quality.

Conclusion: Sensor technology is a full-fledged and rapidly growing field with imperative focus and noteworthy role in assessment and treatment for upper and lower limbs insufficiencies, spinal curve corrections in numerous orthopedic and neurological conditions. Research over the past 10 years grandly focused on the use of sensors in physical therapy and rehabilitation.

Keywords: Sensor, rehabilitation, physical therapy, orthopedic, neurology.

Introduction

In the modern world rehabilitation has grown to its appreciable level of invention and deployment. This still has not led to stopping in induction of new and advanced inputs in different domains of healthcare, bio-engineering, sports and entertainment to work collectively towards betterment of mankind[1]. One of the widely developed measures being used in assessment and treatment in physical therapy and rehabilitation isthe use of ‘Sensors’[2]. Sensors installed in equipments or wearable component have been used in rehabilitation of orthopedic and neurological for performing functions.
of developing motivation while commencing of rehabilitation programs\cite{2,3}. Monitoring correctness and irregularities in patterns different from normal prototype, identification of setbacks and unwarranted behavior\cite{1,4}. Regular association between health information being transferred to health care professionals as exact and confirmative values\cite{5}. Data stored in the sensors to be transferred and expanded to provide visual and auditory feedback to subjects\cite{6-7}. Sensors are being used while performing exercise, in corsets as wearable sensor orthosis, walking aids, attached to elastic bands for shoulder, knee and hip rehabilitation along with specialized ergonomic equipments\cite{8-10}. The two mainly used equipment involving sensors in physical therapy and rehabilitation are ‘3D motion capture systems’ and ‘depth camera system’ such as Microsoft Kinect in assessing the application of sensors in neurological conditions of Parkinson’s disease, Cerebral Palsy and patients with Multiple Sclerosis\cite{1}. The researchers found the technique to be low cost and acceptably reliable but could be used for upper and lower limb rehabilitation training and monitoring balance and increasing the range of movement for both, upper and lower limbs. Both systems pose their respective advantages over each other with even their setbacks. 3D motion capture technology is expensive wherein the skin mounted sensors have a tendency to hinder the movement but provide an advantage of providing accuracy in collection of data\cite{11,12}. But after collection of data, processing the data with recommendations to the subject by a therapist requires deep knowledge regarding the functioning, calibration and interpretation with subject’s findings. Hence, this system is used by priority only in research setting than used for clinical practice\cite{13}. However, depth cameras systems like the Microsoft Kinect offer an ease in use wherein data can be easily calibrated and interpretive\cite{3,14}. But it poses a disadvantage of slight lower in accuracy than 3D motion capture technologies\cite{14}. Following to easy portability and cost efficiency this system is grasped for research, commercial and clinical benefits. The common disadvantage seen with use of depth camera systems is the crossing over seen in body segments during action, in addition with inappropriate lightening effects and hindrance caused due to movement of people and restrictions offered from self-clothing\cite{15}. Lastly, this system requires significant empty and large area to be used in practice which is usually a constraint in small research laboratories and clinical settings. This systematic review would organize and discuss use of sensors in the field of physical therapy and rehabilitation.

**Method**

**Literature source strategy and study selection Process:** In the present review, authors present with a systematic review for using sensors in physical therapy and rehabilitation as per the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement\cite{16}.

A literature search was conducted with MeSH (Medical Subject Heading) terms, abstract keywords and titles along with their synonyms and spelling variations in combinations for all database. The general search strategy including the search terms used in the review are mentioned in table 1.

<table>
<thead>
<tr>
<th>Table 1. Literature search strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical therapy</strong></td>
</tr>
<tr>
<td><strong>Rehabilitation</strong></td>
</tr>
</tbody>
</table>

Reputed database were selected for gathering articles from high impact journal of Springer, Hindawi, MDPI, PLOSone, De Gruyter. Articles published between January, 2013 to December, 2019, analyzing the latest and in action utilization of sensors in physical therapy and rehabilitation were only searched and considered for the present review. While selecting articles to be considered in the review, conference proceedings’ were also considered to be instituted, but no proceedings were attained by the authors. Search did not limit an article based on publication date during the tenure. Reference list of the included articles was also searched for further prioritizing selections. Due to prove efficacy of sensors in physical therapy and rehabilitation, grey literature was not searched, rather only peer-reviewed articles were considered for the present review. The article selection process consisted of the following steps on the PRISMA guidelines which have been shown in Figure 1:

| The records recognized after searching database | (n=17) |
| Articles removed after noticing duplication of title and or abstract | (n=10) |
| Full text articles screened based on inclusion and exclusion criteria | (n=10) |
| Number of articles finally included in the review | (n=10) |

**Inclusion and Exclusion Criteria:** The present review emphasize on functionality of sensors in physical
therapy and rehabilitation. Inclusion criteria for the articles were the instrument, mode, purpose and inference obtained following sensor use. Articles only with the concerned information were included to maintain homogeneity of information procured from articles for a uniform and disciplined review among all articles. Any article published before 2010 was excluded. This act was performed as the authors installed greater emphasis on articles published only in recent years which would render latest developments in sensor technology and their benefits. Articles published other than English were not included in the review. Titles and abstracts of the identified articles were read keeping in mind both the inclusion and exclusion criteria’s. Articles fulfilling both the criteria only were read in full text to extract desired information.

**Data Extraction Process:** The work of data extraction was completed by both authors where they discussed all discrepancies in finding articles from various database with outline and in-depth understanding of the articles for common interest. To maintain compliance, a standardized data extraction form was used in the review where in the study design; types of sensors used in physical therapy and rehabilitation used were ascertained. The review were later divided in 4 types of sensors; wearable sensors, bio-mechanical pressure sensors, 3D motion capture sensors and stretch sensors for practicality in research and clinical settings.

**Assessment of Study Quality:** Both authors evaluated the quality of articles retrieved from database which were deemed eligible to be included in the present review. All articles were verified to contain content expected to be present in an article to be considered to perform a review to be published in journals of high repute as journals with high impact factor prefer articles written following guidelines as per the universally accepted protocols only. Hands on self-administered protocols are rarely given place in journals of prestigious honor. Keeping this view in mind, strict adherence was followed while performing the present review.

**Results**

**Database Search and Paper Lists:** A detailed overview of results at different stages following PRISMA guidelines have been shown in Figure 1. From the 17 articles that were identified in the search categories, 10 papers of high repute with vast content of information was only included in the present review following the selection criteria. While searching all articles it was noticed that the not included 7 article contained the inclusion criteria to be selected in the study but in addition even contained parameters which were set as exclusion criteria making the authors of the review to finally exclude them to prevent biasing and interpretation of incomplete and irrelevant information. After reading the extracted information, sorting and documentation of information has been presented.

**Discussion**

Sensors with their ability towards precision and accuracy are widely used for assessment, progression and rehabilitation in physical therapy and rehabilitation in the domain of orthopedics and neurology producing promising results when used among age groups from childhood to geriatric population. Studies were evaluated based on their type of sensor being used, instrument used for installing the same, purpose of the same and results delivering on implementation of the sensors. Studies presented with positive implications of sensors in subjects by enhancing the overall physical and mental status of the subject leading to an improvement in the overall quality of life. Studies included in the present review presented a wide option of sensors like wearable sensors, bio-mechanical pressure sensors, motion capture sensing technology and stretch sensors delivering services to yield excellent and observable positive results in time to time recovery and enhancement of functions affecting the overall physical, mental and psychological mindset of the subjects’. Researchers emphasized if possible the use of sensors to start right from the assessment phase which will help significantly in predicting the realistic expectations to be set according to individual subject’s physical and mental status. Faster and focuses assessment brings effective and timely rehabilitative effects leading to reduction in unwanted cost on the patients and country’s economy. The researchers also noticed that few sensor technologies are expensive, but on the hand cost efficient modes are also available in the market to cater all sections of the society yielding promising results without compromising with accuracy and overall quality of the product. Application of sensors in gadgets such as corsets, mobile phones and walking aids have been be promoted both at research and clinical level to train patient with pathologies, disorders to move forward to faster recovery. Elderly population could be started with training with markers followed by application of sensors in quadripod, tripod and cane respectively to improve balance and reduce the
risk of fall which have been proved in researchers from all over the world to be a major source of injury seen among elderly population. A progression from a wider base of support to a narrower one with using sensors imparts visual feedback from the equipment itself while testing and training used in conjunction with the sensors and in addition from the auditor stimuli received from the equipment and commands from the therapist to promote variability and extensibility in enhancement of movement and functions while performing all major to promote activities of daily living thus, bringing back the subject to his optimum level for self-independence in daily life.

**Review Limitations:** Despite the strength of the present review, it is mandatory for a researcher to consider limitations while result interpretation. Studies other than English language were not included in the review, which can influence the outcomes of present analysis as certain database comprise of journals in context to language other than English. So, due to this limitation, articles published in those databases might be contained with latest and valuable information to increase the potency of the current review. Both authors were actively involved in data extraction as there is possibility of wrong exclusion of an article to be included in the present review. This article is in compliance with PRISMA guidelines, but the protocol of the present review did not gothrough a registration prior to its completion. Articles before 2010 were not included in the present review along with articles were not selected only from a particular database.

**Practical Implications:** Yurtman A et al, Hondori HM et al, Postolache O etal, Rathleff MS et al, Vallati C et al, Spilz A et al and Kongcharoen J et al, studied the role of sensors specifically in condition dealt by physical therapist on daily basis using equipments in routine protocols for assessment and rehabilitation. The researchers proved sensor technology when used in physical therapy as cost effective with few delivering accurate and some low level of accuracy in results but still could be used assessing with their added advantages over the expensive ones and bulky to be installed in research and clinical practice. Sensor technique was found to be effective in storing data and later on retraction followed by interpretations in strength training techniques, early correction of spinal curves, increasing the range of motion of upper and lower limbs by focusing on individual or cumulative joints in a trajectory and instigating adjustments to be made at home for activities such as walking, bathing, eating etc to attain independence in activities of daily living. Parameters like stride and step length, cadence, acceleration and deceleration during swing phase and ground reaction forces acting on individual joints during stance along with foot placement deviations and anomalies could be assessed and measured by using sensors in clinical and research settings. Unnikrishnan R et al found use of video games in combination with sensors too were found to be effective to promote exercise on daily basis with bodily movement seem an increase in range of motion and muscle strength when used for treatment of upper limbs. Kristof M et al suggested sensors when installed in a mechanical pressure named equipment Pressure X promote significant reduction in scoliotic curves wherein the major corrections were seen in thoracic curves, followed by thoraco-lumbar and less correction were seen in lumbar curves which they attributed due to large size of vertebrae which once fused during spinal deformities are driven by less chance to correct to greater modifications. Kent P et al emphasized assessing the Cognitive Functional Therapy by using sensor feedback in treating subjects with chronic low back pain. The researchers found it to be an effective technique for the same and suggested the same protocol to be carried out in conducting Randomized Controlled Trials with substantial subjects in different demographic locations with gender variation and varied age groups.

**Conclusion**

Research in the past 10 years has involved use of sensor both in physical therapy and rehabilitation for orthopedic and neurological pathologies and conditions. Sensor technology has been a boon in rehabilitation helping millions of people from varied age groups. The use of sensor use in assessment and rehabilitation enables both therapist and patient to isolate the validated improvement during interventions and identify from a small to major deviation during the treatment. There exist a vast number of considerations of sensor use in conditions specific to individual joints which are to be characterized either in orthopedic and neurological domain to be studied individually to obtain data for further joint wise reviews estimating, use of sensor role concerning the efficacy of sensors. Such studies if promoted will be vital in developing advanced and cost effective assessment and treatment strategies.

**Ethical Clearance:** Not Applicable
References
Prediction of Stature in Males of Tamil Population from Measurements of Percutaneous Tibial Length

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Abstract

Forensic experts are often in confrontation with the challenging task of determination of stature along with race, age etc. for the purpose of establishing the identity of the deceased individual in those circumstances where only skeletal remains, mutilated or dismembered body parts, extremely decomposed body parts etc. are provided by investigating authorities. In the current study, a genuine attempt has been made to arrive at the population specific regression equation for stature prediction from the percutaneous length of Tibia. The subjects chosen for this study include 120 adult males belonging to Tamil population falling within the age range of 21 to 30 years. Stature and percutaneous lengths of right and left Tibia from each subject were precisely recorded following standard protocols using appropriate instruments and analysis of the data collected was done applying Pearson correlation through SPSS software version 26 to arrive at the regression equations for stature assessment based on percutaneous right and left Tibial lengths respectively. By comparing the regression formulae obtained from the present study with those derived from various population specific studies done on Indian population, our regression equations found to be distinctive to Tamil population and therefore can be authentically applied for calculation of stature of deceased from percutaneous Tibial length in males of Tamil population whenever skeletal remains are available.

Keywords: Stature, Tibial length, Regression equation, Males, Tamil population.

Introduction

One of the significant parameters for establishment of individuality of a person is the determination of stature from the length of long bones. In those circumstances where dismembered, putrefied human body parts or skeletal remains are available, Anatomical method\textsuperscript{1} may be adopted for prediction of stature of the deceased if entire skeleton is provided for examination or by applying Mathematical method where taking measurement of length of a particular long bone may help the purpose as there exists a firm relationship between stature and skeletal element. Commonly Mathematical estimates of height are derived by means of application of a single general regression formula that is population specific. The most reliable estimates have been derived by employing regression formulae based on length of long bones, especially those of lower limb. Nevertheless, it is clearly known that a regression equation that is formulated for one particular population does not automatically yield dependable results for another.\textsuperscript{2}

After Femur, Tibial length measurement provides more reliable estimation of height than any other long bone. This is because of the fact that Tibia can be readily accessible for length assessment which is responsible for 22\% of stature.\textsuperscript{3,4} Similarly, percutaneous measurement of length of Tibia in the living gives high degree of accuracy for stature prediction.\textsuperscript{5} In addition, Tibia plays a vital role in anthropological research as it resists

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disintegration and thereby retaining its morphology long after death.6-9

For stature determination from long bones, Trotter and Gleser regression formula has been frequently used. As population specific regression equations specific to Tamil population are negligible, we did the detailed study and derivation of regression formula pertaining to males of Tamil population. Different parameters gained in the current study were put into comparison with those derived by similar research studies done on various population groups in India and found to have definite statistical significance.

**Materials and Method**

The participants chosen for this study included 120 adult males in the age group 21 to 30 years belonging to Tamil population. The procedure, aims and objectives of the present study were clearly explained to every subject and written informed consent obtained with signature. The subjects with skeletal abnormalities involving limb, foot or spine were carefully exempted as participants of the study. To exclude possible diurnal height variation, all stature data were collected during morning hours i.e. 9 am to 11 am and to avoid any inter-observer variation, same investigator involved in taking all measurements.

Stature measurement was taken while participant standing upright on base platform of stadiometer with head held in Frankfort horizontal eye-ear plane by supporting subject’s chin and living stature estimated as the distance between heel and utmost point on vertex of the head with accuracy of 0.1 cm.

For measurement of right and left percutaneous Tibial length (PCTL), standardized and commonly applied protocol10 and techniques11-14 were followed. The spreading caliper with accuracy of measuring up to 0.1 cm. was used and degree of arms separation of caliper was determined from its steel tape. The participant was made to sit facing the examiner in a position keeping his ankle of the measurement side relaxing on the opposite side knee exposing medial side of Tibia upwards so that Tibiale point is easily accessible. Percutaneous Tibial length is determined as the maximum distance between Tibiale, the highest point on medial condyle along its medial border and Spherion, the distal most point on medial malleolus15 after marking these two Tibial landmarks with skin marking pencil. The recorded stature and Tibial length data from all subjects were carefully analyzed using the latest SPSS software version 26 and the statistical results such as Mean, Standard deviation, Correlation coefficient and linear regression equation for stature estimation.

**Results**

Various statistical parameters derived based on the analysis of stature and length of either side Tibia were tabulated (Table 1) for comparative interpretation. The determined mean lengths of left and right Tibia were 37.59 cm. (Standard deviation of 1.18 cm.) and 37.62 cm. (Standard deviation of 1.16 cm.) respectively. The estimated mean stature of participants was 170.5 cm. (Standard deviation of 3.9 cm.). Pearson’s Correlation coefficient (r) for height to left Tibial length was 0.757 (p<0.001) with Regression coefficient (b) of 2.51 (p<0.001). Similarly, the Correlation coefficient (r) pertaining to right Tibial length was 0.741 (p<0.001) with corresponding Regression coefficient (b) of 2.5 (p<0.001).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Dependent Variable</th>
<th>Independent Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Stature (cm.)</td>
<td>170.5</td>
<td></td>
</tr>
<tr>
<td>Mean Length (cm.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard Deviation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation Coefficient (r)</td>
<td>0.741 [p&lt;0.001]</td>
<td>0.757 [p&lt;0.001]</td>
</tr>
<tr>
<td>Coefficient of Determination (R²)</td>
<td>0.550</td>
<td>0.573</td>
</tr>
<tr>
<td>Regression Constant</td>
<td>76.440</td>
<td>76.111</td>
</tr>
<tr>
<td>Regression Coefficient (b)</td>
<td>2.5</td>
<td>2.51</td>
</tr>
<tr>
<td>Standard Error of Estimate</td>
<td>2.6380</td>
<td>2.5639</td>
</tr>
</tbody>
</table>
Table 2: Regression equation for Stature estimation from PCTL in Males

<table>
<thead>
<tr>
<th>PCTL</th>
<th>Regression equation for Stature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right PCTL (cm.)</td>
<td>( y_1 = 2.5 \times \text{Right PCTL (cm.)} + 76.440 )</td>
</tr>
<tr>
<td>Left PCTL (cm.)</td>
<td>( y_2 = 2.51 \times \text{Left PCTL (cm.)} + 76.111 )</td>
</tr>
</tbody>
</table>

Fig. 1 and 2 are scatter diagrams prepared by means of plotting the stature data against those right and left Tibia from subjects and Table 2 shows the linear regression equations for determination of stature with respect to each side Tibia.

![Fig. 1: Correlation between Right PCTL (X1) and Stature (y1) in Males](image1)

![Fig. 2: Correlation between Left PCTL (X2) and Stature (y2) in Males](image2)
Discussion

Anthropometric measurements are generally applied for the assessment of stature of a deceased person for establishing the identification in medicolegal circumstances. Then regression formula derived from a particular population study cannot be applied for stature calculation for all population types which necessitates various baseline data have to be derived from different ethnic populations leading to more accurate equations that can be reliably applied for the stature assessment amongst them. Regression analysis leads to the derivation of formula for stature assessment that can provide 95% confidence intervals with respect to estimation of stature. The similar stature assessment techniques were advocated by different authors.\textsuperscript{16-20}

Since the actual stature of victims is commonly unknown in most of forensic cases, we did the present study focusing on this challenging problem. Therefore, we have attempted to establish the particular population specific stature formulae based on lengths of right and left Tibia. The data derived from the present investigation indicates that population specific stature regression formulae provide more reliable and accurate estimates than those from general formulae.

The derivation of stature needs special attention in those cases where corpses are found in extremely decomposed, mutilated state or only fragmentary remains of skeleton are available. The present study was done on living adult male subjects belonging to Tamil population to correlate body height with percutaneous tibial length in various ethnic populations. Simple population specific linear regression formulae for stature corresponding to right and left Tibia were derived that can be applied for determination of stature.

It is obvious from Table 3 that minor variations pertaining to mean right and left percutaneous Tibial lengths and mean height when these data are compared in different ethnic populations in India and these variations may very well be assumed as the result of multiple factors affecting a person’s growth and body proportions viz. dietary habits affecting nutritional status, heredity, physical stress modifying life style, environmental conditions, geographical factors etc. If we assume these minor variations with respect to stature and PCTL existing in different populations are the result of above-mentioned influencing factors, then the results will remain unchanged when statistical studies done in various populations at any given point of time due to the fact that those influencing factors do not lead to different modifications in different populations. Nevertheless, if such variations in results are presumed to be due to influencing factors of plastic ones like lifestyle, physical stress, nutritional status etc. then we can safely propose that the different anthropometric data as reference standards should be measured, recorded and analyzed periodically at constant time intervals in every population so that the results can very well be employed with high accuracy and reliability.

\begin{table}[h]
\centering
\begin{tabular}{|l|c|c|c|c|c|}
\hline
Name of the Researcher & Year & Population for study & Mean Stature (cm.) & Mean Tibial length (cm.) &  \\
& & & & Right & Left \\
\hline
Present Study & 2020 & Tamil Nadu & 170.5 & 37.6208 & 37.5973 \\
Kavyashree AN & 2018 & Karnataka & 170.88 & 38.52 & 38.56 \\
Anitha MR & 2016 & South India & 161.93 & 37.43 & 37.50 \\
Prema Gupta & 2014 & Uttar Pradesh & 168.56 & 37.23 & 37.33 \\
Akhilesh Trivedi & 2014 & Madhya Pradesh & 164.5 & 38.26 & 38.22 \\
Ashita Kaore & 2012 & Karnataka & 170.08 & 35.77 & 35.73 \\
\hline
\end{tabular}
\caption{Comparison of Mean Stature and Mean Tibial length in Males}
\end{table}
Table 4: Comparison of Regression Formula for Stature (y) in Males from length of Right Tibia (X₁) and Left Tibia (X₂)

<table>
<thead>
<tr>
<th>Name of the Researcher</th>
<th>Year</th>
<th>Population for study</th>
<th>Regression formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present Study</td>
<td>2020</td>
<td>Tamil Nadu</td>
<td>(Y_1 = 2.5 X_1 + 76.44) (Y_2 = 2.51 X_2 + 76.11)</td>
</tr>
<tr>
<td>Kavyashree AN(^2)</td>
<td>2018</td>
<td>Karnataka</td>
<td>(Y_1 = 1.52 X_1 + 112.20) (Y_2 = 1.56 X_2 + 110.56)</td>
</tr>
<tr>
<td>Anitha MR(^2)</td>
<td>2016</td>
<td>South India</td>
<td>(Y_1 = 1.8 X_1 + 94.5) (Y_2 = 1.95 X_2 + 88.55)</td>
</tr>
<tr>
<td>Prema Gupta(^1)</td>
<td>2014</td>
<td>Uttar Pradesh</td>
<td>(Y_1 = 2.37 X_1 + 80.03) (Y_2 = 2.39 X_2 + 79.26)</td>
</tr>
<tr>
<td>Akhilesh Trivedi(^2)</td>
<td>2014</td>
<td>Madhya Pradesh</td>
<td>(Y_1 = 1.40 X_1 + 110.76) (Y_2 = 1.59 X_2 + 103.71)</td>
</tr>
<tr>
<td>Ashita Kaore(^2)</td>
<td>2012</td>
<td>Karnataka</td>
<td>(Y_1 = 1.84 X_1 + 104.42) (Y_2 = 1.85 X_2 + 104.08)</td>
</tr>
</tbody>
</table>

On comparison of different regression equations for stature prediction derived from various ethnic populations of our country, as shown in above Table 4, we can very well presume that all these investigators have made out the existence of obvious positive correlation between percutaneous right and left Tibial lengths and stature which clearly proves that there remains a stronger and reliable relationship between person’s height and Tibial length.

**Conclusion**

The derived regression equations for stature assessment have been found to be fairly accurate for males belonging to Tamil population based on the fact that estimated stature were within the range of error and found to be in close approximation with that of the observed stature and therefore the derived regression equations for stature assessment for males based on percutaneous length of Tibia in males belonging to Tamil population and can be employed with authentication whenever the determination of height of deceased person arises with respect to highly putrefied bodies, skeletons, dismembered limbs are available for the establishment of identity of deceased which in turn leads to the establishment of corpus delicti i.e. facts suggestive of criminal offence where personal identification is one of the significant fact. Based on the results of the present study, we highly recommend that several similar studies among Tamil population involving different age groups to arrive at the specific regression formulae which will be of immense help to forensic experts and anthropologists for population specific stature estimation and subsequent establishment of identity of individual in mass disasters and other above mentioned challenging forensic circumstances.

**Conflict of Interest:** None declared.

**Source of Funding:** Nil.

**Informed Consent:** Obtained from all subjects.

**Ethical Clearance:** Necessary ethical approval was obtained from the Institutional Ethics Committee, Chettinad Academy of Research and Education (CARE), Kelambakkam - 603103.

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Pregnancy Induced Hypertension among Pregnant Women in Dhaka City, Bangladesh

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Abstract

This cross-sectional study has been conducted in the Bangabandhu Sheikh Mujib Medical University Gynaecology and Obstetrics Division on 72 patients who have been admitted from December 2018 to March 2019, in order to find out the percentage of pregnancy-induced high blood pressure among pregnant mothers. Of the 72 patients, 25(34.7%) have been diagnosed with pre-eclampsia-toxaemia 27(37.1%) induced pregnancy and 20(27.8%) with eclampsia. Most people were 21-25 years old and their average age was 25.3 years old. Of the 72 patients, 38 were primipara (52.8 percent). 20 (27.8%) of newborns were delivered before 37 weeks, while 52 (72,2%) were delivered before 37 weeks. A cesarean section was available in 37 of all patients (51 percent). The cesarean portion in PIH & PET was higher. Of the 72 newborn patients 16(22.2%) were low in birth weight, and patients with eclampsia were more likely to experience low birth weight. 35 of 72 patients had poor fetal results, including 1.4 percent perinatal and 33.3 percent asphyxiated infants. Only 5 (6.5 percent) had complications in maternal outcomes such as strokes, renal eclampsia. All participants in this study are women who are pregnant and receive prenatal care. WHO normally recommends patients with an antecedent of antenatal treatment less than 4 times eclampsia. In patients with eclampsia it is more common to see low birth weight, pre-term delivery and the complication for prenatal mortality.

Keywords: Primipara, ecclampsia, asphyxiated infants, hypertension, blood pressure.

Introduction

One of the most common complications of birth and one of the most common causes for fetal and maternal morbidity and death worldwide, hypertensive pregnancy disorder[1]. Almost 10 per cent of all births are complicated by elevated blood pressure and the frequency is greater if women are nulliparous or have several fetuses[1]. The pattern to complicate multigrain loss is if proper management is not achieved in good time [2].

One of the main causes of maternal death and morbidity is hypertensive pregnancy disorders in Bangladesh. Details on the occurrence of this condition would be documented on a prescribed schedule, including blood pressure, albuminuria, edema, immunization and antenatal treatment. Even though the effects of these conditions have been minimized in developed countries by adequate prenatal care on the mothers and fetuses, it endangers the result of pregnancies in most developing countries such as Bangladesh. Lack of education, a lack of sufficient antenatal care and nutrition has caused births more likely to suffer the symptoms of hypertensive disorders. Bangladesh, which also has an exceptionally high rate of maternal mortality due to preventable reasons, is a country with a high population density. In Bangladesh, death from mothers is a significant issue of public health[3].

Hypertensive maternity disease involves gestational high blood pressure, gestational uric hypertension protein, and chronic high blood pressure. The risk of
high blood sugar disorders, including preterm birth, restrained intrauterine development, perinatal mortality, acidic renal and hepatic dysfunction, anteriopartum hemorrhage, postpartums hemorrhage (Postpartum hemorrhage) including epilepsy, stroke, premature delivery, and maternal death, is complicated by 5-10 percent across all pregnancies [3].

Maternal or fetal outcomes of hypertensive pregnancy disorders rely on various factors particularly if the early pregnancy is high in hypertension. Hypertension caused by pregnancy, which involves both hypertension and preeclampsia in infancy, a common and morbid complication of pregnancy. Emerging data indicates that insulin resistance associated with critical hypertension may play a role in hypertension triggered by pregnancy. Conditions associated with increasing insulin resistance may be predisposed to hypertensive pregnancy, including gestational diabetes, ovary syndrome, and obesity [5].

The group of symptoms concerned with elevated blood pressure, proteinuria and convulsion during breastfeeding are the hypertensive pregnancy disorders. Preeclampsia and eclampsia have the most severe effects on mother and infant. Eclampsia is typically the product of the preeclampsia of a central nervous system and is often unconscious and can lead to death if untreated. Both preeclampsia and eclampsia are not well evaluated in their long term sequelae and mortality is the cause of hypertensive diseases in the pregnancy[6].

Hypertension (Sbp> 140 mmHg or DBP 11 > 90 mmHg) and proteinuria (0.3 g protein in 24-hour or 1+ on a dipstick) after 20 weeks of gestation for the previously normoteness women lead to new onset of hypertension (SBPs > 140 mmHg or DBPs 11 > 90 mmHG). It is a life-threatening, multi-organ illness that appears to be the main cause of maternal mortality. Its clinical manifestations are due to widespread vasospasm, coagulation system triggering and changes in the volume-related and blood pressure-control humoral and autoregulatory systems[7].

High perinatal death and morbidity rates are blamed for pre-eclampsia, largely due to the early end of pregnancy. The symptoms of chronic placental hypo-perfusion[7] are fetus growth limitation, oligohydramniotics, and no comforting fetal status.

Preeclampsia is significant in the developed as well as in the developing world. It also remains a leading cause of death and morbidity of pregnancy and perinatal conditions. With a prior history of preeclampsia, pre-existing diabetes, multiple births, family history of preeclampsia [3], the likelihood of preeclampsia is enhanced.

Pregnancy with high maternal and perinatal mortality is highly dangerous and relatively normal. Antenatal appointments should be screened in order to guard from the hazards of preeclampsia pregnant. Bangladesh is one of the developed countries that lack functional antenatal care services and is also the leading cause of maternal and perinatal mortality in developing countries. Although eclampsia has become increasingly avoidable and uncommon in developing countries, in Bangladesh it remains a major problem in obstetrics [6].

In Bangladesh, Eclampsia accounts for 16% of maternal death. It remains the leading cause in many other areas of the world of maternal and perinatal mortality, including Bangladesh. In developing countries this is a common problem, where analphabets, lack of knowledge, health education, poverty and superstition preclude women from seeking healthcare during pregnancy. There is a lack of sufficient maternal treatment in developed countries such as Bangladesh. The coverage of prenatal care (minimum 1 visit) in Bangladesh is 48.7% [6].

While exact etiology is still unknown, the incidence of complications with proper antenatal care can be avoided. There are many disorders in our country because of poor prenatal care, early marriage and more pregnancy. This can reduce the complication by early detection and treatment. With this backdrop, this study was designed to determine the hypertensive disorders of pregnant women in Bangladesh.

**Justification of the study:** Hypertension is one of the common complications of pregnancy, contributing significantly to maternal and perinatal mortality and morbidity.

Hypertension is a symptom of chronic condition pre-existing or arising during birth for the first time. The recognition and successful control of this therapeutic organization play a decisive role in the result of both mother and baby pregnancy. Many births exist unrestricted in developed countries such as Bangladesh, where there are many prospects unnoticed before significant complications arise.
Early marriage in this country is more commonly seen in the underprivileged sector and hypertensive condition & associated complication is also popular. It may cause severe maternal and fetal problems or losses if it is untreated and neglected. This study shows the maternal and fetal results of a patient with high blood pressure. This study findings can be used to increase awareness among hypertensive moms, public health professionals, clinicians and health officials who can use an intervention program to minimize mortality and morbidity in mothers and fetuses due to the effects of hypertension.

The research is intended to provide useful knowledge on hypertension during pregnancy and the pregnancy of the high-volume mother to medical staff, public health professionals, average citizens and hypertensive mothers. In order to produce a better result, the individual involved would have a preventive action at a reasonable moment, effectively mitigating the unfortunate fate, reducing maternal and fetal mortality and morbidity.

**Materials and Method**

**Study Objectives**

1. **General Objective:** To estimate the proportion of pregnancy induced hypertension among pregnant women.

2. **Specific objective**

   1. To find out the complication of hypertension among respondents.
   2. To find out the factors responsible for hypertension.
   3. To find out the type of hypertension disorder in pregnancy.

3. **Study design:** It was a descriptive type of cross-sectional study.

4. **Study population:** Pregnant woman with hypertension (either pre-existing or pregnancy-induced) delivered baby at the obstetric department of Bangabandhu Sheikh Mujib Medical University irrespective of age, gravida.

5. **Sample Population:** The sample population was those who were available at the time of data collection.

6. **Study Site:** Bangabandhu Sheikh Mujib Medical University which is a tertiary level hospital in Dhaka.

7. **Study Area:** Bangabandhu Sheikh Mujib Medical University which is a tertiary hospital in Dhaka. The hospital established in 1965 which situated at Shahbag, Dhaka. This study is done in the Obstetrics and Gynecology Department, This department situated in building Block-C (8th Floor). The emergency unit of the obstetric department is situated in building Block-D (ground floor).

8. **Study Period:** Total Study lasted for a period of four months commencing from December 2018 to March 2019.

9. **Sample size:** Statistical calculation of sample size was followed by using a sound statistical formula, indicated below:

   \[ n = \frac{Z^2pq}{d^2} \]

   Where, \( n \) = Desired sample size, \( Z \) = Standard normal deviate, usually set at 1.96 which corresponds to 95% confidence level.
   \( p \)= 30.2% = 0.312[10]
   \( q \)= 1-\( p \) = (1-0.312) = 0.688
   \( d \)= Degree of absolute precision, usually at 0.5%

   Therefore, the desired number of participants is

   \[ n = \frac{(1.965)^2 * 0.312 * 0.688}{(0.025)^2} = 329.84 \]

   The sample size was taken to be 72 after discussion with the supervisor of the study.

10. **Inclusion & exclusion criteria:**

    - **Inclusion criteria:** Having the ability to understand interview questions.–Having the ability to give information.
    - **Exclusion Criteria:** Those who are seriously ill or unwilling to talk to the interviewer would be excluded from the study.

11. **Sampling technique:** A purposive sampling technique was used

12. **Data collection tools:** A questionnaire was prepared and printed. The final questionnaire was used for data collection. Hospital-records were also reviewed.

13. **Data collection technique:** Face to face interview, observation and record review. A brief introduction was given verbally to each respondent by the
interviewer at the beginning of the interview to explain the purpose and importance of the study. The questionnaire was filled up by the interviewer during the interview. Socio-demographic, previous reproductive information was collected by the interviewer.

14. Data management & analysis: All the data were checked, cleaned and edited after collection. Then those cleaned data were entered into the SPSS program of computer were done by the SPSS-20 program on the computer. Analyses were done according to the objectives and variables of the study. Simple techniques of data analysis, as for example-frequency, percentage, average etc were done by the SPSS program in the computer and results were presented in the form of tables and graphs.

15. Limitations of the study:

1. As it is a hospital record-based study of BSMMU, the findings of the study about antenatal checkup may not reflect the actual picture of the entire Bangladesh
2. The patients who did not bring their antenatal care visit card or who had no obstetric checkup records were not included in the study population.
3. Many of the respondents did not give their previous history of pregnancy-induced hypertension.
4. As I have used some administrative record-based data which may include women with incorrect information.
5. Shortage of time for data collection was the main limitation.
6. Small sample size was one of the weaknesses of this study.
7. The sampling technique was used in this study was purposive sampling which had chances of bias.

Result and Discussion

Hypertension can be graded as chronic if recognised before 20 weeks of gestation, or if it happens only in the second half of pregnancy. This distinction is clinically beneficial since almost all hypertension arising in the first half of pregnancy results from underlying chronic hypertension. The progression of hypertension in the second half of pregnancy is more complicated, arising from either a pregnancy-specific phase or a complex interplay of pregnancy with renal failure or chronic hypertension leading to exacerbation of hypertension[9].

The research sought to see the result of women with hypertensive disorder during pregnancy and to figure out the respondents’ obstetric background and socio-demographic characteristics. This is a cross-sectional descriptive style of research and was performed at Bangabandhu Sheik Mujib Medical University among pregnant women who were admitted to the eclampsia and labour ward for delivery for antenatal checkups in the antenatal treatment outpatient unit. Pregnant women aged 20 weeks or older who had medical tests during this pregnancy were included. Bangladesh’s maternal mortality rate is 3.2 per thousand live births. Eclampsia is the third-largest source of maternal mortality. Many preeclamptic and gestational pregnant women eventually experience eclampsia and complications and even death.

WHO reports that 15 percent of women have a degree of hypertension during pregnancy. Fortunately, most of these cases are benign, not requiring medication or complication. However in some cases women have a hypertensive pregnancy condition like pre-eclampsia, which can lead to severe complications or death. Hypertensive pregnancy results in 12% global maternal mortality and up to 40% maternal death in some countries[11].

72 pregnant women with hypertensive conditions were studied. Much research population is from low-income communities. Of 72 patients, 32% had monthly income ranging from 8,000 to 10,000; 16.7% had monthly family income > 10,000; 15.3% had s 6,000; and only 6.9% had < 4,000 taka. [Table 1].

Much of the sample population refers to the age group 25 years and are more likely to experience hypertension than the other age group. To compare this study with another previous study, a Relationship with Parity study like this shows that the majority (52 percent) was primiparous; simulating with other studies at home and abroad. Regarding the level of education, 26 percent are in high school, 44.41 percent are in elementary school, 25 percent are illiterate. Buchbinder et al 19 observed 25.4 ± 5.3 in patients with moderate preeclampsia and 25.9 ± 6 years with extreme preeclampsia. Relationship with parity indicates that 71.5 percent of the majority
are primipara, with 26.4 percent in high school being 44 percent in elementary school, 25 percent analfabet. [Table 1].

Table 1: Distribution of respondents by Demographic information

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 20 years</td>
<td>9</td>
<td>12.5</td>
</tr>
<tr>
<td>21-25 years</td>
<td>26</td>
<td>36.1</td>
</tr>
<tr>
<td>26-30 years</td>
<td>20</td>
<td>27.8</td>
</tr>
<tr>
<td>&gt;30 years</td>
<td>17</td>
<td>23.6</td>
</tr>
<tr>
<td><strong>Religion</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Muslim</td>
<td>62</td>
<td>86.1</td>
</tr>
<tr>
<td>Hindu</td>
<td>10</td>
<td>13.9</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>18</td>
<td>25</td>
</tr>
<tr>
<td>Primary</td>
<td>32</td>
<td>44.4</td>
</tr>
<tr>
<td>Secondary</td>
<td>19</td>
<td>26.4</td>
</tr>
<tr>
<td>Degree and Above</td>
<td>3</td>
<td>4.2</td>
</tr>
<tr>
<td><strong>Occupation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>House Wife</td>
<td>27</td>
<td>34.7</td>
</tr>
<tr>
<td>Agriculture</td>
<td>23</td>
<td>31.7</td>
</tr>
<tr>
<td>Service</td>
<td>22</td>
<td>30.6</td>
</tr>
<tr>
<td><strong>Husbands Occupation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>24</td>
<td>33.3</td>
</tr>
<tr>
<td>Service</td>
<td>22</td>
<td>30.6</td>
</tr>
<tr>
<td>Business</td>
<td>16</td>
<td>22.2</td>
</tr>
<tr>
<td>Rickshaw puller</td>
<td>9</td>
<td>12.5</td>
</tr>
<tr>
<td>Others</td>
<td>1</td>
<td>1.4</td>
</tr>
</tbody>
</table>

The number of family members ranges from 4-6 in most patients. According to national statistics, the family member is 2.3 and the goal is 3.5. People of specified occupations were found, most of them housewives. [Table: 1]

Among the sample group, P.E.T. suffered mostly, (37.1%), followed by PIH (34.3%), and Eclampsia (27.8%). [Figure: 1]

Most participants in this sample received prenatal treatment, this care has an increasingly important role to play in reducing maternal and perinatal morbidity and mortality because pregnancy hypertension cannot be prevented, but usually maternal death can. Considering antenatal treatment, 80.6 percent of the overall population obtained antenatal care independent of maternity forms of hypertensive disorders. 73% of patients received antenatal treatment, so it is clear that there could be a link between less antenatal care and eclampsia. Factors identifying between low-risk and high-risk women experiencing hypertensive symptoms and recognizing the condition as early as possible to schedule rational antenatal treatment and maternal-fetal monitoring [8].

Figure 1: Distribution of respondents by type of hypertension disorder during pregnancy
A typical complication of hypertensive disease is prematurity, either due to spontaneous labour or obstetric activity of interrupting pregnancy due to impaired maternal-fetal. A research in our area showed a higher relative risk of prematurity in pregnant women with chronic hypertension compared to a pregnancy-induced population. Prematurity raises perinatal morbidity and mortality rates of potential imminent or late sequels, requiring public policy to protect these neonates [5].

Analyzing fetal result, it was clear that 31(51.9%) were alive and well, 24 births. (33.1%) were birth-asphyxiated, 13% were stillborn, 1(1.4%) died after birth.

In the present study, fetal outcome in eclampsia patients was comparatively poor than the other 2 classes. Considering low birth weight was 16. On the other birth weight, 28%. Hand-cumulative evidence from another retrospective analysis revealed a birth-weight incidence of 28%[2].

The present research found that 32.3% of babies were born before 37 completed weeks; the remainder was delivered after 37 weeks. There is no substantial correlation in pregnant women between prior experience of hypertension and hypertensive disorder. There is no clear link between pregnant women’s family history of hypertension and hypertensive disorder.

A recent study found that both gestational and chronic hypertension increased the relative risk of premature SAG, limited intrauterine growth, and low birth weight were the results of premature delivery among women with severe pre-eclampsia[5].

In this report, 50% of babies were born via cesarean section; most of them had PET and PIH. In eclampsia patients, cesarean section was comparatively fewer than the other 2 categories.

Of 72 patients, 46.5 percent) had different complications and all were eclampsia patients. This group of patients had no maternal mortality. Of 72 patients, 20 experienced convulsion. Of 20 patients experiencing seizures, 75% of seizures occur at home and 25% of seizures occur in hospital.

Of the 72 patients, only 20 patients took hypertension medication, and 52 patients took no hypertension medication.

Since the study was limited to a few patients admitted to Bangabandhu Sheik Mujib Medical’s gynecology and obstetrics department. University over a brief period of time, the research might have little epidemiological significance, yet it definitely provides an aggregate picture of hypertensive condition patients in our nation.

**Conclusion**

The births all come from all social backgrounds and were aged 18 - 39 years. In this study, the age of the pregnant woman was linked with hypertension, which was higher than the respondent’s age and higher.
All pregnant women should be appropriately trained, appropriate technologies should be used to recognise risk factors, and appropriate antenatal treatment and care should be given for them during childbirth. Sensitizing and emphasizing the risk factors within the population on health issues is an important step in controlling hypertensive disease during pregnancy. This can be achieved in multiple mainstream media.

The family history of elevated blood pressure and the hypertension of the respondents during this pregnancy are not closely related.

Reference

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4. American heart association web-https://www.hyper.ahajournal.org/cgi/content/full/36/2/149
Knowledge Regarding the Benefits of Physiotherapy among Physiotherapy Specialty Students

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Abstract

Background: Physical treatment is a unique calling with broad clinical applications in the rebuilding, support and advancement of ideal physical capacity

Aim of study: To assess the level of knowledge regarding the benefits of physiotherapy among Physiotherapy Specialty students.

Methodology: A cross sectional descriptive study included (54) Physiotherapy students of Medical Technical Institute, Technical College of Health and Medicine/Baghdad, during November and December 2018.

They were selected randomly and they were asked to answer a self-administered questionnaire in 3 main domains (general benefits, woman’s health, chronic disease management) of physiotherapy. The questionnaire covered different aspects regarding the knowledge of the benefits of physiotherapy. The percent score for each question and overall mean score for each domain was assessed.

Results: The total number of included students in the study was 54 distributed an 51.9% males 48.1% females, 64.81% from the Medical Technical Institute and 35.19% from the college of Technical Health and Medicine. Distribution of knowledge of students regarding the general benefits of physiotherapy was with overall mean percent score=80, women’s health with overall mean percent score=67% and for the benefits of physiotherapy in chronic diseases with overall mean percent score=84%. The overall mean percent scores for all domains were 77.

Conclusion: In general, satisfactory level of knowledge of included students regarding the benefits of physiotherapy.

Keywords: Physiotherapy, Benefits, Knowledge, Students.

Introduction

Physiotherapy (PT) is treatment to reestablish, keep up and take advantage of the patient’s portability, capacity and prosperity. It will help physical restoration, injury counteraction and wellbeing and wellness. Non-intrusive treatment is utilized to improve a patient’s personal satisfaction through assessment, conclusion, visualization, physical intercession, and patient training.(¹)

Physiotherapists (PTs) are medical services experts who analyze and treat people, everything being equal, who have clinical and other related issues that limit their capacities to move and perform utilitarian exercises in their day by day lives.(²,³)

PT the board incorporates explicit activities, manual treatment and control, mechanical gadgets, for example, foothold, instruction, electro physical modalities which incorporate warmth, cold, power, sound waves, radiation, assistive gadgets, protheses, orthoses and different mediations.(⁴)

Active recuperation administrations might be given as essential consideration therapy or close by, or related to, other clinical administrations (including clinics, private practices or outpatient centers.(¹)
Physiotherapy can be given distinctly by qualified physical advisors or physical specialist partners\(^2\). Physiotherapy therapy alternatives for: Problems brought about by wounds, infections and handicaps, neck and back torment, solid and tendon conditions, for example, joint pain and after removals, lung and heart issues, bladder and entrail issues brought about by labor likewise malignancy treatment (palliative consideration). Loss of portability sicknesses because of injury to cerebrum or spine or infections like different sclerosis and Parkinson’s malady.\(^5\)

A few dated worldwide examinations have analyzed the information view of physiotherapy by physiotherapy understudies\(^6\) Health Science understudies.\(^7\)

To the best of our knowledge, no study has been acted in Iraq that has assessed the information on physiotherapy college understudies about the advantages of physiotherapy as a calling. The consequences of this examination could help in recommending medical care ways for the improvement of physiotherapy calling for ideal patient consideration.

**Aim of study**: To assess the level of knowledge regarding the benefits of physiotherapy among Physiotherapy specialty students.

**Subjects and Method**

After all ethical permissions were obtained from the institutional and college Scientific Counsel. A cross sectional descriptive study included (54) second year undergraduate Physiotherapy students of Medical Technical Institute/Baghdad and Technical College of Health and Medicine/Baghdad was conducted. Data was collected during November and December 2018.

They were selected randomly and an invitation to participate in the study along with the explanation of its importance was achieved and willing students gave verbal consents and the data was collected through answering a self-administered questionnaire. The questionnaire included various sections about students’ demographics, knowledge of the benefits of physiotherapy in three domains (general benefits, benefits regarding women health, management of chronic diseases by physiotherapy techniques). Descriptive statistics including frequencies and percentages were used for demographic data analysis. Each knowledge question responses were scored as (3) for each yes answer, (2) for answering don’t know and (1) for answering (No).

The percent score for students’ responses in each specific question was calculated according to the following equation:

\[
\text{Percent score} = \left( \frac{\text{Total scores for all students in each question}}{\text{Most extreme potential scores for all included students for a similar question}} \right) \times 100
\]

Furthermore, most extreme potential scores for all members in the equivalent question = [No. of complete understudies’ x 3], in light of Triple Likert Scale\(^8\).

**Results**

The total number of included students in the study was 54 distributed an 51.9% males 48.1% females, 64.81% from the Medical Technical Institute/Baghdad and 35.19% from the college of Technical Health and Medicine, 29.62% of students were < 20 years and 70.38% ≥ 20 years, as shown in table 1:

| Table 1: Distribution of students regarding socio demographic characteristics: (N=54) |
|-----------------|----------|-----|
| **Gender**      | **No**  | **%**  |
| Male            | 28       | 51.9 |
| Female          | 26       | 48.1 |
| **Academic Setting** |      |     |
| Institute       | 35       | 64.81|
| College         | 19       | 35.19|
| **Age**         |          |       |
| <20 years       | 16       | 29.62|
| ≥ 20 years      | 38       | 70.38|

The distribution of students’ responses regarding the general benefits of physiotherapy was highly correct 94.44%, 79.6%, 77.77% with percent score 98%, 90%, 86% regarding recovery from sport injuries, improving balance by using assisting devices, reduction of muscle and joint pain by using therapeutic exercises. While the lowest proportion of correct responses 16.66%, 18.51% with percent score 60%, 57% regarding the help in the recovery of patient with cerebral palsy and recovery from vertigo condition respectively. The overall percent score for this domain is 79.66% as shown in table (2).
Table 2: Distribution of knowledge of students regarding the general benefits of physiotherapy. (N=54)

<table>
<thead>
<tr>
<th>Benefits of physiotherapy</th>
<th>Yes</th>
<th>No</th>
<th>Don't Know</th>
<th>Percent score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To reduce muscle and joint pain by using therapeutics exercises .</td>
<td>42</td>
<td>77.77</td>
<td>11</td>
<td>20.37</td>
</tr>
<tr>
<td>2. To avoid surgery sometimes</td>
<td>42</td>
<td>77.77</td>
<td>12</td>
<td>22.22</td>
</tr>
<tr>
<td>3. To recover before surgery and to decrease health care costs .</td>
<td>32</td>
<td>59.25</td>
<td>17</td>
<td>31.48</td>
</tr>
<tr>
<td>4. To improve mobility by doing stretching and strong theming exercises.</td>
<td>39</td>
<td>72.22</td>
<td>7</td>
<td>12.96</td>
</tr>
<tr>
<td>5. To improve balance by using assisting devices</td>
<td>43</td>
<td>79.62</td>
<td>5</td>
<td>9.25</td>
</tr>
<tr>
<td>6. To help in using orthosis</td>
<td>32</td>
<td>59.25</td>
<td>3</td>
<td>5.55</td>
</tr>
<tr>
<td>7. To improve mobility of stroke patients</td>
<td>41</td>
<td>75.92</td>
<td>5</td>
<td>9.25</td>
</tr>
<tr>
<td>8. To prevent and recover from sport injuries</td>
<td>51</td>
<td>94.44</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>9. To prevent fall of high risk people</td>
<td>40</td>
<td>74.07</td>
<td>3</td>
<td>5.55</td>
</tr>
<tr>
<td>10. To reduce or recover from vertigo condition.</td>
<td>10</td>
<td>18.51</td>
<td>26</td>
<td>48.14</td>
</tr>
<tr>
<td>11. To help in rehabilitation of burn condition</td>
<td>18</td>
<td>33.33</td>
<td>20</td>
<td>37.03</td>
</tr>
<tr>
<td>12. To help the recovery of patient of cerebral palsy</td>
<td>9</td>
<td>16.66</td>
<td>20</td>
<td>37.03</td>
</tr>
<tr>
<td>13. To help in case of head injuries</td>
<td>32</td>
<td>59.25</td>
<td>8</td>
<td>14.8</td>
</tr>
<tr>
<td>14. To help cases of quadriplegia contrition</td>
<td>21</td>
<td>38.88</td>
<td>22</td>
<td>40.74</td>
</tr>
<tr>
<td>15. To help the rehabilitation of fracture cases</td>
<td>34</td>
<td>62.96</td>
<td>9</td>
<td>1.66</td>
</tr>
</tbody>
</table>

Overall mean percent score = 79.66%

The distribution of students’ responses regarding women’s health was highly correct 81.48% with percent score 91% regarding recovery from osteoarthritis and osteoporosis, the lowest proportion of correct responses 9.25% with percent score 49% regarding the caring of women before and after pregnancy The overall percent score for this domain =67%as shown in table (3).

Table 3: Distribution of knowledge of students regarding women's health (N=54)

<table>
<thead>
<tr>
<th>Women’s Health</th>
<th>Yes</th>
<th>No</th>
<th>Don’t Know</th>
<th>Percent score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To help in caring of women before and after pregnancy</td>
<td>5</td>
<td>9.25</td>
<td>34</td>
<td>62.96</td>
</tr>
<tr>
<td>2. To help women with breast cancer</td>
<td>13</td>
<td>24.07</td>
<td>19</td>
<td>35.18</td>
</tr>
<tr>
<td>3. To decrease pelvic pain</td>
<td>14</td>
<td>25.92</td>
<td>17</td>
<td>31.48</td>
</tr>
<tr>
<td>4. To help in recovery from osteoarthritis and osteoporosis.</td>
<td>44</td>
<td>81.48</td>
<td>4</td>
<td>7.40</td>
</tr>
</tbody>
</table>

Overall mean percent score = 67%

The distribution of student’s responses regarding the benefits of physiotherapy in the management of chronic diseases was with highest correct proportions 85.18% with percent score 92% regarding helping in case of urinary incontinence while the lowest correct proportions 42.49% with percent 76% regarding care of patients with burns and peptic ulcers. The overall percent score for this domain is84% as shown in table (4).
Table (4): Distribution of knowledge of students regarding the benefits of physiotherapy in chronic diseases (N=54)

<table>
<thead>
<tr>
<th>Chronic disease</th>
<th>Yes</th>
<th>No</th>
<th>Don’t Know</th>
<th>Percent score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To help in rehabilitation of cardiac problems.</td>
<td>23</td>
<td>42.59</td>
<td>6</td>
<td>11.11</td>
</tr>
<tr>
<td>2. To help in rehabilitation of pulmonary problems</td>
<td>44</td>
<td>81.48</td>
<td>6</td>
<td>11.11</td>
</tr>
<tr>
<td>3. To improve sensation of feet and legs of patients of diabetes mellitus</td>
<td>37</td>
<td>68.51</td>
<td>6</td>
<td>11.11</td>
</tr>
<tr>
<td>4. To care for patients with burns and peptic ulcers.</td>
<td>23</td>
<td>42.49</td>
<td>8</td>
<td>14.81</td>
</tr>
<tr>
<td>5. To help in case of urinary in continuance.</td>
<td>46</td>
<td>85.18</td>
<td>5</td>
<td>9.25</td>
</tr>
<tr>
<td>6. To help cases of fecal continuance.</td>
<td>45</td>
<td>83</td>
<td>5</td>
<td>9.25</td>
</tr>
</tbody>
</table>

Overall mean percent score = 84%

Discussion

Physiotherapy (PT) has been considered as a method of treatment throughout the long term and is quickly developing as a calling, particularly in creating nations.\(^{(9,10)}\)

The present study evaluated the knowledge of junior college and institute students regarding the benefits of physiotherapy. The results indicated that the students had a varied knowledge regarding the benefits physiotherapy services.

Regarding the orthopedic prevention and recovery from sport injuries, the students correct responses was 94.44% with percent score 98%, in comparison in Harare, Zimbabwe the participants indicated that physiotherapists should assist the first aid treatment of sport related injuries 92.2%\(^{(11)}\).

Physical therapists can fit people with any of assistive devices or orthotic prescription adapted to ensure maximal performance and safety\(^{(12)}\) and the students correct responses was79% with percent score 90%.

Remedial activities and manual treatment method, for example, joint and delicate tissue assembly medicines, activation and delicate tissue back rub can assist with easing torment and improve quality\(^{(12)}\).

The students’ responses were 77.77% with percent score 86% while the results of Harare, Zimbabwe study revealed that the majority knew that physiotherapy optimizing movement efficiency 95.1% for muscle pain, 88.2% for ligament injuries, use of exercise machines but only31.4% knew that physiotherapy use electrotherapy equipment, in addition 90.2% knew about massage\(^{(11)}\).

Physical advisors can perform explicit moves that can rapidly reestablish appropriate vestibular working, and diminish and dispense with manifestations of unsteadiness or vertigo and improve balance conditions\(^{(12)}\) however under students’ reactions was baffling 18.51% with percent score, 57%.

As a feature of maturing measure, individuals may create joint pain or osteoporosis or need a joint substitution some of the time. Physical advisors can assist patients with recouping from joint substitution, and oversee ligament or osteoporotic conditions moderately\(^{(12)}\) and under students’ reactions was 81.48%, with percent score 91%. In Ischikkawa, high school students showed accurate responses regarding instruct a client in exercises 68.4%, doing massage 58.5%, works with joint decrease pain/stiffness 34.7%\(^{(13)}\).

In kwazulu Natal, the students responses about conditions treated by physiotherapists 79% for arthritis and the majority of respondents knew that physiotherapists could manage musculo-skeletal conditions.\(^{(14)}\)

As to’s Health, as ladies have explicit medical issue, for example, with pregnancy and baby blues care. Physical advisors can offer particular administration of issues identified with ladies’ wellbeing\(^{(12)}\) and students’ responses was 9.2% with percent score 49%. In kwazulu Natal students’ responses was disappointing 19.4% for ante-natal care\(^{(14)}\).
Prati V and Liu H in their study found that the respondents were generally not aware that physiotherapy could manage antenatal care.\(^\text{(15)}\)

Role of physiotherapy in the management of chronic diseases and their complications like urinary incontinence by offering specialized treatment and students correct responses was 85.18%, while the help in rehabilitation of cardiac conditions 42.59% while in Harare, Zimbabwe\(^\text{(11)}\), the majority of students showed awareness in that physiotherapists do not manage cardiac pain 86.3%

The majority of respondents of Kwazulo Natal. not identified that physiotherapists work with patients with respiratory disease or thoracic surgery and fewer identified obstetrics and gynecology.\(^\text{(14)}\).

Cerebral paralysis (CP) is a gathering of perpetual development problems that show up in early childhood\(^\text{(16)}\). Signs and manifestations differ among individuals and after some time.\(^\text{(16,17)}\)

There is no solution for CP; be that as it may, steady medicines, prescriptions and medical procedure may support numerous people. Physiotherapy is critical to diminish spasticity and disfigurement\(^\text{(18)}\), furthermore, the understudies’ reactions were just right in 33.3%.

**Conclusions**

The knowledge level of students regarding benefits of physiotherapy in general was satisfactory.

**Recommendations:**

1. The examination featured the need to lead a comparative report with bigger example size to evaluate information with different establishments and schools.

2. There is consistent requirement for a focused on training and mindfulness program for understudies having a place with various schools present in various Iraqi governorates.

**Acknowledgment:** Should be offered to all participated Physiotherapy students of Medical Technical Institute, Technical College of Health and Medicine/Baghdad.

The source of funding for the study was self-dependence

**Conflict of Interests:** Was just limited time in data collection.

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Patterns of Chemical Pesticide Use and Determinants of the Use of Personal Protective Equipment to Minimize Chemical Exposure in Vegetable Farming, Maldives

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Abstract

Background: The overuse of chemical pesticides without proper Personal Protective Equipment (PPE) use has put vegetable farmers at risk and has been an extreme concern over the past decades in the Maldives. Therefore, this study aimed to describe the patterns of chemical pesticide use and determinants of PPE use to diminish chemical exposure.

Method: This cross-sectional study applied a two-stage random sampling method to select the study subjects to respond a structured questionnaire. The multiple logistic regression was applied to determine the association.

Results: Of 306 respondents, 90\% used chemical pesticides while only 23\% used PEE. The multivariable analysis indicated the use of PPE was significantly associated with education attainment (adj. OR=3.17, 95\% CI=1.80-5.57, p-value=<0.001), amount of chemical pesticide used per month (adj. OR=2.20, 95\% CI=1.37-4.43, p-value=0.002), main sources of pesticide information (adj. OR=2.31, 95\% CI=1.33-4.01, p-value=0.003), hired someone to spray chemical pesticides (adj. OR=2.46, 95\% CI=1.13-4.31, p-value=0.02), and ever participated in any farming-related trainings (adj. OR=2.97, 95\% CI=1.63-5.49, p-value=<0.001).

Conclusions: Almost all of the farmers used chemical pesticides and less than a quarter used full PPE. Educational attainment, quantity of pesticides used, sources of pesticide information and other farming practices have a strong relationship with PPE use.

Keywords: Chemical Pesticides, Personal Protective Equipment, Vegetable Farming.

Introduction

A pesticide is defined as any chemical substance intended for eliminating, repelling or controlling certain forms of plant or animal life that are considered to be pests, produced and used worldwide especially in developing countries\textsuperscript{1}. Nowadays, chemical pesticides play an essential role in modern agriculture as a commodity to prevent crop loss from pests, raising the yield to sustainably feed the rapid growth of the world population which has doubled to around 7 billion since the 1970s\textsuperscript{2}. Chemical pesticides used in agriculture are rapidly increasing in developing countries, particularly in Southeast Asia, as most member countries \textquoteleft economies depend heavily on agriculture. The annual rise in pesticide imports for Cambodia is estimated at 61\%, for Laos at 55\%, and Vietnam at 10\%\textsuperscript{3}.

With the overuse of chemical pesticides, pesticide pollution has become a significant global issue\textsuperscript{4}. It is generally well known that applicators and their families receive the greatest pesticide hazards, particularly
in developing countries where a large number of the population contributes to agriculture, where the pesticides are sprayed manually with simple equipment, and applicators have a low level of awareness about pesticide impacts and safety. According to a report conducted by PAN International, 41 million among 1.3 billion farmers were affected by pesticide poisoning at 32% annually\(^5\). While all counties have their registry of pesticides, protocols, and guidelines for safe use of pesticides, some countries still lack the required tools such as accessibility to PPEs, trainings in pesticide protection management which slows down the full implementation of pesticide adverse hazard prevention\(^6\).

After a long history of sustainable farming in Maldives, chemical pesticide use was introduced into farming in the early 90s which also surged a huge variety of pesticides to the farming industry. Since then, there has been an increase in the suppliers and different varieties in the market, where several pesticides have also been banned from the country due to the toxicity of these products. Lack of knowledge and awareness among the farmers creates an unhealthy cycle of pesticide usage and practices across the country. Furthermore, although the articles’ studies describe PPE use in several countries, there is no current overview of PPE use by agricultural pesticide handlers. Despite the fact that some studies explore factors affecting the use of PPE and pesticide safety practices, the information appears fairly limited and inconsistent. In addition, there are gravely concerning issues related to the patterns of chemical usage across the country such as absence of protective clothing while using pesticides, using the chemicals near to the residential area, the storage and the disposal of these chemicals. Although FAO has issued a manual “Good Agricultural Practices” for the use of chemicals, these rules have not been well implemented in the majority of the islands of the country. The Maldives lacks secondary literatures and relevant studies to properly tackle the critical issue. Therefore, the aim of this study was to determine the chemical pesticide patterns and identify the association between the appropriate use of PPE and other related factors.

**Materials and Method**

**Study Design:** This cross-sectional study used a two-stage random sampling method. A structured questionnaire interview was conducted to collect the data from July to September 2020. 6 islands were selected for the study by using Male’ Local Market data and information from the relevant ministries. All fulfilled participants from the inclusion criteria were randomly chosen proportional to the size of the samples to a total of 306 vegetable farming households for the study.

**Dependent Variable:** The outcome was the use of Personal Protective Equipment (PPE) while handling, mixing, and spraying chemical pesticides. PPE is defined as any specialized equipment used to minimize the exposure of chemical pesticides to the individuals and the environment\(^6\). The most important types of PPE refer to the mask for reducing inhalation of chemicals and goggles for protecting the eyes from pesticide hazards. Two of these PPEs or more were used as the cutoff point to determine the outcome of the study. Among 306 samples, only 284 used chemical farming. Those who did not use any PPEs during the handling of chemical pesticides were coded as 0. The responses were then created and categorized as a dichotomous variable (Yes/No).

**Independent Variables:** According to our extensive literature reviews and other relevant studies of the farming industry of the country, a set of self-explanatory variables was selected for the analysis.

**Statistical Analysis:** All analyses were performed using the Stata program version 14.0. The baseline characteristics and other variables were reported as frequency and proportions for categorical data and mean, standard deviation, median, maximum, minimum for continuous data.

To determine the association of using PPE with the independent variables, a simple logistic regression was applied. The independent variables that had a p-value < 0.25 were processed for the multivariable analysis. The multiple logistic regression was utilized to determine the strength of the association between PPE use and other variables, which adjusted all confounders, and showed adjusted OR, 95% CI, and P-value. Finally, all variables with p-value less than 0.05 were considered statistically significant.

**Results**

**Sample Characteristics:** The study was conducted in randomly selected 6 islands of the Maldives. Initially, 306 respondents were selected to describe the socio-economic demographics, farming practices and patterns of pesticide uses.
The mean age of the farmers was 47.41 years ± 12.38. 59.48% were males, 50.33% received no formal education, and around 63% had more than or equal 7 people living in the household.

The average monthly household income was MVR 20127.45 ± 7371 ($1= MVR 15.42) and the average monthly household expenditure was MVR 10640.52 ± 4687($1= MVR 15.42).

The results of the number of people living in a household and household expenditure were in line with the national levels, however, the study shows a lower figure in the income value of the households as the mean household expenditure for the atoll is MVR 18000.

55.56% of the farmers farmed in an area less than 4000sqft indicating the smaller area allocated for farming. The average duration involving in vegetable farming was 11.12 years ± 6.15years. 94.12% of the farmers farmed all year around while 89.87% of the farmers practices farming in areas far from the household. 24.84% of the farmers hired labor to spray chemical pesticides, of which 92.11% were foreigners.

The three main vegetable crops grown by the farmers were Chili, Pumpkin and Cucumber and the three main chemical pesticides used by the farmers were all insecticides, specifically, Avermectin (78.76%), Imidaclorpid (46.41%) and Cypermethrin (28.17%), all insecticides which consistent with a study done in 12. 78.43% used chemical pesticides, of which 45.83% did not used organic pesticides because of inaccessibility to information.

The average number of days per month for spraying chemical pesticides was 3 ± 1.7 days and the average amount of chemical pesticides used was 656.49±443.64ml. Pesticides were mainly purchased from the islands and the 69.01% of the farmers bought chemical pesticides once every 3 months.

62.68% acquired chemical pesticide information from the retailers, creating a huge bias in the use of chemical pesticides. Stakeholders faced several challenges in terms of access on information and to fill the gap in extension. Nearly a quarter (23.2%) of the farmers using chemical pesticides had received any form of trainings related to farming.

82.04% of the farmers stored chemical pesticides in the farm. 184 farmers have stated to have chemical pesticides without or with an unreadable label, now prohibited under the Pesticide Act of Maldives. 90.49% of the farmers mixed two or more chemical pesticides and the majority of them burnt or buried chemical containers.

As for the attitude of the farmers towards organic farming, about a quarter 26.41%were interested in changing their practices. Level of knowledge of the farmers were tested using questions related to chemical pesticides, human health and the environment. 38.73% of the farmers had a poor knowledge regarding chemical pesticides, while 54.93% had an average level of knowledge.

The appropriate use of PPE was determined by the use of mask and goggles or any other protective equipment observed in the study. The use of PPE was 33.1%.

Mask was the most used item as a PPE, and boots being the least used item of PPE amongst the vegetable farmers contradicting with a survey in Tanzania 7 where boots were the most used item and masks being the least.

48.94% of the farmers using PPE had a lower PPE rate. The highest use of PPE was 24.47%.

Bivariate Analysis: The bivariate analysis indicated that potentially associated factors with appropriate PPE use (p-value<0.25) were age, educational attainment, number of people living in the household, farming area, duration involved in farming, hired labor for chemical pesticide spraying, number of days/month the farmers used chemical pesticides, the amount of chemical pesticide used, source of information about chemical pesticides, participation in farming-related training and health literacy. These variables were employed to the multiple variable analysis using multiple logistic regression

Multivariable Analysis: The final model after adjusting for other covariates in the multiple logistic regression demonstrated the appropriate PPE use was significantly associated with those had formal education compared to those who did not receive any formal education (adj. OR = 3.17, 95% CI=1.80-5.57, p-value=<0.001). Amount of chemical used by the farmers showed a positive correlation as the higher the number of chemical pesticides was used; the more appropriate PPE has been adopted by the farmers. The farmers who used ≥700ml of pesticides per month were
2.2 times more likely to use PPE compared to those who used <700ml (adj. OR = 2.20, 95% CI=1.37-4.43, p-value ≤0.02). The farmers hiring foreign labors for the handling, mixing and spraying of chemical pesticides were more likely to use PPE compared to those who never hired anyone for doing such activities (adj. OR=2.46, 95%CI=1.13-4.31, p-value=0.02). Source of information about the chemical pesticides was also a significant variable as the farmers who received information from trainings and fellow farmers were proven to use PPE more appropriately than those who mainly acquired the pesticide information from other retailers (adj. OR= 2.31, 95%CI = 1.33-4.01, p-value=0.003). The odds of appropriate PPE use were 2.97 times higher among farmers who ever participated in any farming-related trainings compared to the farmers who did not receive any forms of trainings (adj. OR=2.97, 95% CI=1.63-5.49, p-value=<0.001) (Table 1).

Table 1: Multivariable analysis of factors associated with the appropriate use of personal protective equipment (n=284)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
<th>% appropriate PPE</th>
<th>Cr. OR</th>
<th>Adj. OR</th>
<th>95%CI</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education attainment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No formal education</td>
<td>148</td>
<td>22.97</td>
<td>1</td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Received formal education</td>
<td>136</td>
<td>44.12</td>
<td>2.65</td>
<td>3.17</td>
<td>1.80-5.57</td>
<td></td>
</tr>
<tr>
<td>Amount of chemical pesticide used per month (ml)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.002</td>
</tr>
<tr>
<td>&lt;700</td>
<td>174</td>
<td>26.44</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥700</td>
<td>110</td>
<td>43.64</td>
<td>2.15</td>
<td>2.2</td>
<td>1.37-4.43</td>
<td></td>
</tr>
<tr>
<td>Do you hire people to spray chemical pesticides?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.020</td>
</tr>
<tr>
<td>No</td>
<td>208</td>
<td>25</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>76</td>
<td>36.06</td>
<td>1.69</td>
<td>2.46</td>
<td>1.13-4.31</td>
<td></td>
</tr>
<tr>
<td>Where do you mainly get information about chemical pesticides?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.003</td>
</tr>
<tr>
<td>From retailers</td>
<td>178</td>
<td>25.28</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not from retailers</td>
<td>106</td>
<td>46.23</td>
<td>2.15</td>
<td>2.31</td>
<td>1.33-4.01</td>
<td></td>
</tr>
<tr>
<td>Did you participate in any farming-related trainings?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>No</td>
<td>71</td>
<td>26.76</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>213</td>
<td>52.11</td>
<td>2.98</td>
<td>2.97</td>
<td>1.63-5.49</td>
<td></td>
</tr>
</tbody>
</table>

Discussion and Conclusion

Discussion: Our current study identified and discussed the pattern of pesticide used and factors associated with the appropriate use of personal protective equipment among vegetable farmers in the Maldives. The results showed that approximately 90% of the vegetable farmers used chemical pesticides. Pesticide usage in vegetable production has been increasing around the world and the pesticide use reflects the situation in underdeveloped and developing countries\textsuperscript{11,13,15}.

The socio-economic demographics of the study determined that approximately 70% of the vegetable farmers were above 40 years old. The engagement of youth in farming was low. However, this contradicts with the study\textsuperscript{11} whereas more than 50% of the farmers in the study were younger than 40 years old. The main socio-economic factor that correlated with the use of PPE was the education attainment of the farmer. As the farmers have been involved in the farming sectors for a longer period of time, the older population had basic or no formal education. With a very few exceptions, the only available educational facilities before the 1970s were ‘edhuruge’ [literally teacher’s house] run by individuals or communities expanded during the study 115-year period into a full-fledged public-funded education system by 2005\textsuperscript{16} indicating that two-third of the farmers received no formal education.

The income and expenditure of the farming in the household was not significant in the study, mainly due
to farming being a secondary economic activity in the households and did not reflect the total income and expenditure of the household.

The increase in the amount of the use of pesticides and the use of PPE showed a significant relationship. This may be because farmers are more cautious that they encounter higher risks and adverse effects with a greater dose of chemical pesticides. The farmers were more inclined to use PPE with more chemical pesticide use as most farmers in the study were well aware of the common knowledge of pesticides and the harm to human and health and environment

Only one-fourth of the farmers in the study had received any farming trainings which was consistent with other studies. However, trainings from governments and extension services and training programs are crucial factors in promoting the use of PPE and pesticide safety practices. This study confirmed that farmers who acquired their information from retailers were less likely to use PPE than the farmers who got information from other sources such as other fellow farmers and trainings. Retailers may prefer to sell their products rather than allow the farmers to take their own decisions. Training the retailers about the correct use of chemical pesticides and protective equipment is absolutely vital as they are the primary source of information for the farmers.

Of the 306 participants of the study, 30% of the farmers have been farming for over 15 years. However, approximately 25% of the farmers had received any types of trainings over the years. The use of PPE showed a significant relationship with the trainings with \( p<0.001 \).

As the proper use of PPE reduced the implications on the health of the farmers. Therefore, the use of PPE and the adoption of other safely protective measures and attitudes during preparation and application of pesticides are extremely crucial to mitigate occupational exposure to pesticides. Farmer trainings can be a key tool to increase the use of PPE and to adopt Good Agriculture Practices in vegetable farming. Trainings are associated with increased levels of farmers’ knowledge of pesticides, and was accompanied by elevated safety behavior, and thus was connected by lower occupational exposure to pesticides.

**Limitation:** The present study covered major areas of vegetable farming from 6 islands and selected an enough size representative to the total population of the country. However, the in-depth study on the issues could help getting detailed to improve the use of PPE.

**Conclusion**

Almost all of the vegetable farmers used chemical pesticides, however, nearly a quarter of respondents had used the PPE. The statistically significant factors associated with the appropriate use of PPE were educational attainment, quantity of chemical pesticides used, hired labor for spraying, main source of chemical pesticide information, and participation in any trainings related with farming.

The major factors determining the appropriate use of these PPE was proven to be strongly related to the information and awareness of the farmer related with farming practices, hence, the government, organizations, and relevant stakeholders need to conduct specific training programs to raise the awareness of both the farmers and the public. Moreover, a cross sectional study of chemical pesticide use and the effects on health and the environment would be helpful for the farmers to understand a better picture of the effects of chemical pesticide exposure.

**Ethical Considerations:** This study received an approval from Khon Kaen University, Ethics Committee for Human Research. After the clear clarification of the purpose of the study and the method of conducting the study, a written consent was taken from all the participants.

**Acknowledgement:** The authors are truly grateful and thankful to the Thailand International Cooperation Agency for funding this independent Study and the KhonKaen University for the technical support.

**Conflict of Interest:** No conflicts of interest to declare.

**Source of Funding:** Thailand International Cooperation Agency (TICA).

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Diuretics increase Blood Creatinine in the Treatment of Hypertension

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Abstract

Background: Diuretics have been used in the treatment of hypertension by either alone or combining it with other antihypertensive drugs. It treated about 50% of hypertensive patients alone and about 80% when treatment was a combination with other antihypertensive drugs. Oral diuretics are used as an initiating antihypertensive treatment in stepped care approach the antihypertensive management. One such loop diuretic called as Furosemide is being regularly used in different stages of acute kidney injury and hypertension. Lowering the blood pressure is ultimately reducing the risk of cardiovascular morbidity and mortality. The side effects of diuretics are dose dependent. The intake of Furosemide will bring an increase in the creatinine level. It must be noted that if the diuretics are been taken for prolong usage, it might over-stress the function of kidney which will result in sodium resorption increase and elevation of creatinine levels.

Material and Method: Twenty hypertensive patients in the age range of 40 to 76 years old were subjected to a treatment with furosemide(20mg/day) for a variable period of one to three years. The analysis of blood samples was being done against the serum creatinine following the colorimetric method. The results were statistically processed and analyzed by SPSS using the T-test method.

Results: The trial was run on the participants being either hypertensive patients or normal individuals. The Mean (+/-SD) of age was 59.4 +/- 10.3, mean (+/-SD) of duration of treatment with furosemide was 2.1 +/- 0.7. Mean (+/-SD) of serum creatinine in the control individual was 0.9 +/- 0.22, and mean serum creatinine in hypertensive patients treated with furosemide was 2.37 +/- 0.69. (P value < 0.05.)

Conclusion: The diuretic Furosemide can increase the level of creatinine.

Aim of the work: Determine the effect of diuretics (furosemide) on serum creatinine.

Keywords: Diuretics, creatinine, Hypertension.

Introduction

Diuretics are being commonly used and being claimed as safe antihypertensive drugs over the experience of numerous decades of clinical application. Diuretics represent a better clinical outcome for the hypertensive patients.

Diuretics are used to correct the composition and the volume of body fluids, which treat hypertension. There are different types of diuretics: a) The most common antihypertensive drugs called thiazides and thiazide-like agents which help in inhibiting sodium re-absorption in the early distal convoluted tubule b) The loop diuretics like furosemide which inhibit Na/K/2Cl co-transport system in the thick ascending limb of the Henle loop c) The diuretics which can retain potassium and the aldosterone receptor blockers like epithelial sodium channel (amyloid) and spironolactone. They intervene in the sodium reabsorption and the excretion of hydrogen and potassium in the late distal tubule, the cortical collecting duct and the connecting tubule.

Some diuretics as thiazides and loop diuretics have shown that their actions on antihypertensive grounds are
independent of the effect they are bring in the diuretics. The reason for reduction in blood pressure cannot be accounted to decreased blood volume achieved by increasing urine production, rather being affected by other mechanisms and at lower dosage than that is required to produce diuresis⁴. 

**Advantages of Diuretics:** Lowering blood pressure will decrease the risk of cardiovascular clinical issues including the mortality. Also, lowering BP will minimize the hazards of stroke and heart failure. A slump in cardiovascular events was diuretics based⁴.

Numerous studies have proved that diuretics protect the body from the consequences of falling into osteoporosis condition as well minimizes the threat of hip fractures⁵.

Reid et al. 2000 ⁶, claimed that hydrochlorothiazide lowered the loss of cortical bone in the women who are into postmenopausal phase. Schoofs et al. 2003⁷, showed that thiazide acts as a protection against hip fractures and lasts within 4 months if the usage is being stopped. Thus apart from their use in lowering blood pressure, thiazide proves to play a pivotal role in the avoidance of osteoporosis condition and fractures. Other additional therapeutic advantage of Diuretic therapy is that it can reduce the threat of cardiovascular complications ⁸.

The patient has been taken care well of his associated disorders which includes diabetes mellitus, coronary related artery disease, overweight, lipid profile disorders and the metabolic syndrome. True health efficacy implies a decrease of total or cerebral- and cardiovascular mortality established by blood pressure decline using diuretics (thiazides) and beta-blockers in lengthy period studies. They prove to work in as a sufficient replacement either in the reduction of blood pressure that has been affected by the others drugs consumed individually or in combined mode⁹.

**Side effects of Diuretics:** Diuretics, like any other anti-hypertensive drug, prone to bring in some side effects. The most noticeable ones are hypokalemia, plasma lipid profile change, glucose intolerance and hyperuricemia. The hypokalemia induced by diuretics may be hazardous when combined with digitalistherapy ¹⁰.

All the recommendations were being generated by a treatment approach evaluating the characteristics of patients and the preponderance of guidelines based on confirmation for the classes of drugs rather than drugs being consumed individually. It should be thought if a hypertensive patient could be subjected to the diuretic treatment or not¹¹.

Diuretics remain as the first choice drugs in treating high blood pressure due to their effectiveness (particularly in blacks and the aged masses), the antihypertensive initiation efficacy of the other compounds, their little side-effects profile and their economical cost ¹⁰. Loop diuretics could be beneficial in case of chronic related kidney disease with serum creatinine greater than 1.50 milligrams/deciliter or e GF lesser than 30 milligrams/minute/1.73 square meter ¹².

Their antihypertensive effect might be enhanced with the administration of drugs during the nighttime. Diuretics are being commonly used and being claimed as safe antihypertensive drugs over the experience of numerousdecennium of clinical application¹³.

The concept of using diuretics to achieve better clinical outcomes for patient is considered the main for clinician prescription¹¹.

The atherosclerotic, and the changes which are related to hypertension-related vascular lesions that can be affecting in the kidney primarily is subjected to affect the pre- glomerular arterioles, they can be a wide range of variation resulting in ischemic changes which is most likely to occur in the glomeruli and probably it can be in post-glomerular structures also¹⁴. Glomerular injury can occur and maybe a probable stage in which the damage is done to the glomerular capillaries, which can be considered by the basic reason due to glomerular hyperactive perfusion.

Glomerular pathology can be further used to investigate the progresses to glomerulosclerosis, however, it can also provide a proper resulting diagnosis of renal tubules that may be responsible and may become ischemic finally subjecting to a change in gradually atrophic. The renal lesion which is supposed to be associated with malignant hypertension is more likely to contain fibrinoid necrosis which is indirectly connected to the afferent arterioles, sometimes it can be found extending into the glomerulus, which can result in the increase of focal necrosis of the glomerular tuft. So, it can be well identified that hypertension is a risk factor which may result factor for renal injury and can account for the end-stage renal disease¹⁵.

As per the study that is given, the long-term use of
diuretics can also be considered well associated with the increased incidence that is responsible of renal cell carcinoma. Grossman et al.,1999, the right to a conclusion that 55% of the patients who are treated by the diuretics for over long periods of renal cell carcinoma are more in number then in patients who are subjected to be treated with diuretics compared with the diuretic non-users. The renal tubular cells, which are considered the major areas of effect with the diuretics, many considered one of the origin of malignancy.

Furosemide (Lasix) can be considered one of the ingredients that can cause elevations of BUN. This type of reversible elevations can be caused and are associated with the dehydration of the, and as a result, they should be avoided in the patients with the acute symptoms for the renal insufficiency.\footnote{17}

Uremia is considered a state in which hyperactive responsiveness can be seen in the patient, which can thereby lead to the infection rates as very high in the populations, which are undergoing dialysis.\footnote{18} It can be thus deduced that the direct effect of the diuretic drugs can become a main cause for the increase in the mortality for the patient’s renal function. It can also further lead to the nonrecovery of the functions which can lead to a delay in the institution of renal support (it can be caused with the overload of the dialysis volume, or it can be with reference to the reversible predicted azotemia), or there can be various other unknown factors that may be a cause for the situation.\footnote{19}

Diuretics can also be one of the reasons which is able to increase the level of creatinine in the blood of the patient. Yet another causes that can be associated with the long-term use of diuretics drugs can be the overwork of the kidney in order to compensate and increase in sodium resorption, and this is a primary cause which can increase very high creatinine levels. By diuretic-use, there can be a considerable decrease in the volume of the plasma as well as the sodium level. Thus in order to maintain the compensation of the situation, it is really necessary to constrict the efferent arteriole. This mechanism will help to preserve glomerular filtration rate (GFR). However GFR is not assumed to be really increasing. The fraction that is filtered can be found increasing part.

This is due to the decrease in the flow of the renal plasma. Hence, it can be deduced from the above conditions that if the plasma filtered is less from glomerulus per unit time, then the production of the serum creatinine must increase to compensate the variation. However, there are certain Western medicines that are responsible for increasing the level of creatinine. But these medicines are subjected to provide side effects which cannot be ignored easily in the kidney treatment. However, the patients are subjected to know that best high creatinine level treatment can be a really great help to make kidneys work again rapidly. Once the kidney start functioning properly, it will be used for the removal of the waste and the various harmful substances that are available in the blood, which may reduce creatinine level naturally.\footnote{20}

Loop diuretics are the most common mechanism, which is used for the control of congestive heart attack symptoms, but it can be considered that these agents are actually responsible for various neuro hormonal activations. This type of activations can worsen the situation for the survival. It should be noted that blood urea nitrogen (BUN) levels increase with neuro-hormonal activation.\footnote{21}

There is a very strong risk which is associated to the use of the higher levels of diuretic drugs which can depend on BUN concentrations. There is a very strong chance for the reduced survival in the patients with elevated BUN and it can be considered that there are furthermore, better chances for survival in the patients with normal BUN. The information and the data which is available in the report supported at the reference tends to provide a very clear role for neuro-hormonal activation that can be caused as a result in high dose loop diuretic associated mortality.\footnote{21}

**Material and Method**

These patients were 20 aged between 40 - 76 years old, they were hypertensive and treated with furosemide(20mg/day) for (1-3) year’s period and their blood samples were analyzed against serum creatinine by colorimetric method. The results are analyzed by SPSS using T-test.

- All the patients are examined by measuring blood pressure and estimate their creatinine blood level.
- Blood samples are collected from patients and serum samples were obtained after centrifuged at 2000 rpm for 10 minutes.
- Serum creatinine is estimated by kineticJaff’s reaction without deproteinization method.\footnote{22}
Results

Table (1): Patients Data

<table>
<thead>
<tr>
<th></th>
<th>Range</th>
<th>Mean±S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>40–76</td>
<td>59.4±10.3</td>
</tr>
<tr>
<td>Duration of treatment</td>
<td>1–3</td>
<td>2.1±0.7</td>
</tr>
</tbody>
</table>

Table (2): Serum creatinine level in patients treated with furosemide.

<table>
<thead>
<tr>
<th>Creatinine (mg%)</th>
<th>Disease</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>1.3 – 3.5</td>
<td>0.6 – 1.2</td>
</tr>
<tr>
<td>Mean±SD</td>
<td>2.37 ± 0.69</td>
<td>0.90 ± 0.22</td>
</tr>
<tr>
<td>T. test</td>
<td>4.605</td>
<td></td>
</tr>
<tr>
<td>P. value</td>
<td>0.001*</td>
<td></td>
</tr>
</tbody>
</table>

Result Analysis: The trial was run on participant either hypertensive patients or normal individuals. Mean (SD) age was 59.4 +/- 10.3, mean (SD) of duration of treatment with furosemide was 2.1 +/- 0.7. Mean (SD) of serum creatinine in control individual was 0.9 +/- 0.22, and mean serum creatinine in hypertensive patients treated with furosemide was 2.37 +/- 0.69. (P value < 0.05).

Discussion

Furosemide is considered to be a loop diuretic, and have the main functionality in the increasing of the output of Eugene in the patients with acute injuries in the kidney. This drug is also utilized for the modification of the volume as well. With the increase in the composition of the fluid in the body of the patient, very high chances are available for the treatment of hypertension.

The treatment can be done with the variable and very high doses of the drug furosemide, which makes it possible for the conversion of the oliguric to non-oliguric acute renal insufficiency. This conversion makes it possible as an induction effect for harmful oxidative stress that is found inside the kidneys. A randomized controlled trial is required for the powered and controlled diagnosis of the drug to yield the clinical benefits of this dosing strategy. It can be helpful for the modification of the potential harms that can be caused and subjected to this diagnosis.

The results that have been approved in the study in this research proves that there was an increase in the serum creatinine level for all the patients who were treated with the drug furosemide (those who were hypertensive patients), if the group is compared to a controlled nature population. (P<0.05) this disagree with Tiziana proved that intermittent furosemide administration that is reflected on the population of the patients is considered to be not associated with the increased issues in the patients. There is no associative increase in the mortality of the patients who are suffering from hypertension or wire at the risk for kidney injuries that are cute in nature. However, it could be understood that the reduction of mortality can be one of the reasons that can be undertaken as a preventive measure for the treatment.

On one hand, it can also be identified with various studies that diuretics can decrease the senior nature of the acute renal failure, which will be helpful enough for the transformation of oliguric to not oliguric. It is also worth noticing that the duration for the acute kidney injuries can be reduced considerably by the improvement in the speed for the recovery of the renal functions and thus, overall, it will be carefully helpful to minimize or reduce the actual need of renal replacements. As an additional advantage, furosemide can also be proved very helpful for the management of the increase in the volume as well as the improvement in the electrolyte homeostasis, which can be considered to be actually related with the acute kidney injury results.

Our results agree with Mehat, who showed that using of diuretics for the patience that are critically in a state and unstable condition having acute kidney injuries may not be able to associate with the improvement for the clinical outcomes and there can be reasons that probably increase the mortality of such population.

Our result are also in Association with the findings with Sean et al., Where it can be very easily shown that furosemide did not reduce the rate of worsening in kidney diseases. This in turn can be one of the important factors that proves that the drug is not associated for abnormalities that are caused by increased electrolytes.

Ethical Clearance: The researchers were able to asked permission to conduct the study through the deanship of scientific research and manage to request official permission from Manger of universal Hospital in Shaqra, Government University in KSA to select the samples and data collection. The researchers explained the aim of the study to the respondents and confidentiality.
**Source of Funding:** There was no fund produced from any organization.

**Conflict of Interest:** There is no conflict of interest.

**References**


17. Sanofi-Aventis, Revised August 2011


investigators. Fluid balance and urine volume are independent predictors of mortality in acute kidney injury. Crit Care; 17:R14


The Relationship between Dental Care Perception toward Oral Health of Patients with Primary Hypertension in Padongko Health Center, Barru Regency

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Abstract

Background: The problem of unsanitary dental and that is influenced by several individual perception factors including perception of knowledge, perception of relatives people, and perception of desires. To find out whether the perception of knowledge, perception of relatives people of desires have a relationship toward oral hygiene in respondents with primary hypertension.

Material and Method: This research was an analytical observation using cross-sectional study. The population was the patients with primary hypertension, a purposive sampling technique was applied through path analysis test.

Results: The results of the research showed the relationship of perception of knowledge toward primary hypertension, it was obtained p 0.560> α 0.05, the perception of relatives toward primary hypertension, it was obtained p 0.394> α 0.05, and the perception of desire toward primary hypertension, it was obtained p value 0.762> α 0.05. Based on the three variables of perception, Ha obtained has a relationship but does not seem significant. Perception of knowledge toward oral health, it was obtained p 0.368> α 0.05 so that Ha obtained has a relationship but does not seem significant. Next, perceptions of relatives toward oral health, it was obtained p value 0.040 <α 0.05. Last, perception of desires toward oral health, it was obtained p 0.001 <α 0.05, thus Ha obtained has a significant relationship. The relationship of primary hypertension toward oral health has a significant relationship where the results of p 0.012 <α 0.05.

Conclusion: There is a relationship between perception of dental care toward oral health in patients with primary hypertension but it did not appear significantly.

Keywords: Knowledge, Relative, Desires, Primary Hypertension, Oral Hygiene (OHI-S).

Introduction

Hypertension or famously known as the silent killer is a condition where the increase of blood pressure above normal. Increased age is one factor causing the occurrence of hypertension, this is due to the increasing age of organ function decreased marked by decreased elasticity of the arteries and stiffness occurs blood vessels so vulnerable to an increase in blood pressure. Hypertension is defined as persistent blood pressure where the systolic pressure is above 140 mmHg and diastolic over 90 mmHg.1,2,3,4,5,6 Primary hypertension is a hypertension which causes is unknown (idiopathic), although it is associated with a combination of certain lifestyle factors such as lack of movement (inactivity) and diet. The prevalence of hypertension is predicted
to continue increasing, by 2025 it is predicted as many as 29% of adults suffering from hypertension worldwide.7,8,9,10

WHO explained that found that around the world there are about 972 million people or 26.4% people worldwide suffer from hypertension, this number is likely to increase to 29.2% people in 2025. Oral hygiene that is not maintained properly will cause disease in the oral cavity. The indicator of oral health is the level of oral and dental hygiene, where the way to maintain oral and dental hygiene is certainly influenced by the treatment in the oral cavity, that is by gargling and brushing the teeth regularly. 7,11, 12

The condition of the oral cavity that is often encountered in patients with primary hypertension is influenced by the numbers of the drugs used that have side effects on the oral cavity condition which is caused by a decrease in the flow rate of saliva which can cause xerostomia. The reduced amount of saliva will also cause the pH of saliva in the mouth to be low so that the growth of the bacteria Streptococcus Mutans, Lactobacillus, and Candida Albicans increase.13,14, 15

In patients with primary hypertension whose use of the drug is not regularly as directed by the doctor will be a predisposing factor of someone’s oral hygiene and it is supported by cleaning teeth and mouth that is not maintained properly (OHI-S) so that it can cause the conditions there are many debris and calculus in the mouth. 16, 17

In general, hypertension does not provide specific symptoms. Generally, the symptoms complained are related to: increased blood pressure (BP), vascular disorders, underlying diseases. For clinical blood pressure classifications include: optimal, nominal, high hypertension, first degree hypertension, second degree hypertension, third degree hypertension, and isolated systolic hypertension. 18,19,20, 21

Method

The design of this research used analytic observational research and this research was included in the cross-sectional study. The research was conducted in September-February 2020. The sample used in this study was 60 people with Primary Hypertension through appropriate purposive sampling method.

Result

The subjects of the research were conducted were 60 people with a diagnosis from a primary hypertension doctor and the sampling was adjusted according to inclusion criteria.

Regression Model I:

Table 1 (Regression model I Variable X3, X1, and X2)

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>R Square Change</th>
<th>F Change</th>
<th>df1</th>
<th>df2</th>
<th>Sig. F Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.164a</td>
<td>.027</td>
<td>-.024</td>
<td>20,452</td>
<td>.027</td>
<td>.527</td>
<td>3</td>
<td>57</td>
<td>.665</td>
</tr>
</tbody>
</table>

1. Predictors: (Constant), Desire (X3), Knowledge (X1), Relative (X2).

Table 2 (Contribution of Variable X toward Variable Z)

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
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<tbody>
<tr>
<td>Regression</td>
<td>661,578</td>
<td>3</td>
<td>220,526</td>
<td>.527</td>
<td>.665b</td>
</tr>
<tr>
<td>Residual</td>
<td>23843,340</td>
<td>57</td>
<td>418,304</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>24504,918</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dependent Variable: TD_Hypertension (Z).

Predictors: (Constant), Desire (X3), Knowledge (X1), Relative (X2).
Table 3 Coefficients of Variable X1, X2, and X3

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized B</th>
<th>Unstandardized Std. Error</th>
<th>Standardized Coefficients Beta</th>
<th>T</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Constant)</td>
<td>164,688</td>
<td>10,961</td>
<td>-</td>
<td>15,026</td>
<td>.000</td>
</tr>
<tr>
<td>Knowledge (X1)</td>
<td>-1.183</td>
<td>.313</td>
<td>-0.080</td>
<td>-5.86</td>
<td>.560</td>
</tr>
<tr>
<td>Relatives (X2)</td>
<td>-2.249</td>
<td>.290</td>
<td>-1.514</td>
<td>-8.58</td>
<td>.394</td>
</tr>
<tr>
<td>Desire (X3)</td>
<td>0.084</td>
<td>.275</td>
<td>0.052</td>
<td>3.05</td>
<td>.762</td>
</tr>
</tbody>
</table>

a. Dependent Variable: TD_Hypertension (Z)

Regression Model II

Table 4 (Regression Model II Variable X3, X1, X2, and Z)

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>R Square Change</th>
<th>F Change</th>
<th>df1</th>
<th>df2</th>
<th>Sig. F Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.699</td>
<td>.489</td>
<td>.453</td>
<td>20,268</td>
<td>.489</td>
<td>13,401</td>
<td>4</td>
<td>56</td>
<td>.000</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), TD_Hypertension (Z), desire (X3), knowledge (X1), Relatives (X2).

Table 5 Contribution of Variable X and Z toward Y

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Regression</td>
<td>22018,762</td>
<td>4</td>
<td>5504,691</td>
<td>13,401</td>
<td>.000</td>
</tr>
<tr>
<td>Residual</td>
<td>23003,467</td>
<td>56</td>
<td>410,776</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>45022,230</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: OHIS (Y).
b. Predictors: (Constant), TD_Hypertension (Z), Desire (X3), Knowledge (X1), relative (X2).

Table 6 Coefficients of Variable X and Z toward Y

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardize B</th>
<th>Coefficients Std. Error</th>
<th>Standardized Coefficients Beta</th>
<th>T</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Constant)</td>
<td>-36.252</td>
<td>24.192</td>
<td>-1.499</td>
<td>-1.499</td>
<td>.140</td>
</tr>
<tr>
<td>Knowledge (X1)</td>
<td>.301</td>
<td>.311</td>
<td>.097</td>
<td>.967</td>
<td>.338</td>
</tr>
<tr>
<td>Relative (X2)</td>
<td>.606</td>
<td>.289</td>
<td>.272</td>
<td>2.098</td>
<td>.040</td>
</tr>
<tr>
<td>Desire (X3)</td>
<td>.955</td>
<td>.273</td>
<td>.441</td>
<td>3.504</td>
<td>.001</td>
</tr>
<tr>
<td>TD_Hypertension (Z)</td>
<td>.339</td>
<td>.131</td>
<td>.250</td>
<td>2.581</td>
<td>.012</td>
</tr>
</tbody>
</table>

a. Dependent Variable: OHIS (Y)

Discussion

Tables 1, 2, and 3 explain the relationship of variable X against variable Z (Primary Hypertension). Based on the knowledge characteristics of respondents have a relationship at the level of education that affect respondents with Primary Hypertension. At a high level of education, it certainly will also influence in terms of knowledge that will support someone behaving that concerns the individual’s needs. The knowledge of respondents with Primary Hypertension in this research influences the continuity of prevention or anticipates the disease does not get worse, affects the consumption of drugs that are only recommended not in long-term and the most priority thing in Primary Hypertension respondents in this research is able to restore lifestyle to be stable or improved.
Extensive knowledge makes it easier to understand, digest, and comprehend the information that can be obtained either from social media or from information obtained from the family or relatives. Respondents with Primary Hypertension who are not handled properly by the doctor’s advice will continue to become resistant hypertension or secondary hypertension, and new disease problems may arise, therefore, sufficient knowledge is very necessary to support the individual’s understanding of the seriousness of diseases, especially primary hypertension.

That higher of the knowledge and understanding of health will also improve the way of viewing the concept of health and sickness into a stable which will ultimately affect the perspective, way of life and efforts to improve one’s health status. 22

Based on the research conducted the researcher wanted to see the relationship of respondent characteristics based on the closest person to Primary Hypertension patients. Some people who visit the hospital and check themselves are encouraged by the family or relatives. 23

Based on this research where conducted the researcher wanted to see the relationship between the characteristics of respondents, namely the relationship of perception of desire towards patients with Primary Hypertension. Based on the understanding of researcher at the interview, the respondent who came himself to visit the hospital, take medication according to the doctor’s recommendations, and follow the doctor’s instructions is none other than the desire of the individual.

Pameswari Puspa (2016) said that one’s own desire plays an important role as a strong motivation from within, being a major factor in the high level of patient compliance in taking medication prescribed by the doctor and when it should be stopped. 24

Tables 4, 5, and 6 explain the relation of the variable X is toward the variable Y (oral hygiene). Research conducted is relationship of the characteristics of respondents based on Knowledge. Knowledge and education are two things that cannot be separated because higher education will support higher insight and vice versa, but in this research these two things do not guarantee that respondents who have a higher education and extensive knowledge are able to maintain a clean and healthy oral or otherwise.

Respondents also suggested that knowledge of dental and oral health due to the lack of several health services was promoted through counseling, conducted either from the health center or health department students. Knowledge obtained by respondents is also still considered trivial for some respondents who tend not to apply in everyday life to maintain oral hygiene and can have an impact on dental and oral health problems, so the relationship of knowledge to oral hygiene does not have a very significant relationship.

This research also found the relationship between characteristics of respondents namely relatives toward Oral Hygiene. Some respondents who came alone did not guarantee that their family did not care about the respondent, but based on interviews conducted with respondents who came by themselves said that the family plays an important role in supporting the desire of patients to seek treatment.

Based on the research conducted at the perception of family or relatives has a great influence for each individual to keep oral hygiene in maintaining oral health problems which can also have an impact on general body health. This research also consists of the relationship between the characteristics of respondents namely the desire toward oral hygiene where this condition is the reason for patients to check themselves because they have desire that is subjective, in this case the desire is something that cannot be measured or assessed.

People are really need treatment, but to get it, is strongly influenced by individual desires. This is known as the “need and demand of oral health”. The need for care is not always followed by demand because it depends on the individual. It is influenced by several things, namely quality of life and perception of needs (need), psychological factors, belief in health conditions (behavior, values, and habits), social structure (education and culture), demographics (age, gender, income, facilities, and distance). 25

In the research conducted at where variable Z which is Primary Hypertension toward Y is (OHI-S) 0.012 <0.05, it can be concluded that there is a significant direct effect of the Z variable toward variable Y. However, in the research conducted, these respondents are not recommended to take long-term medication, it only lasts 3 days, after that it is stopped, because the respondent is given the drug only to lower blood pressure which suddenly rises.
This is supported by theory that explains the proper use of anti-hypertensive drugs influenced by adherence (compliance or adherence) which is described the extent to which patients follow medical instructions or advice. Disobedience to treatment will result in high rates of treatment failure, so that in patients with primary hypertension the administration of the drug is only temporary to stabilize the increased blood pressure for patients.22,26,27, 28

Research in cases of hypertension patients whom has been suffering for 2 years, so that the consumption of anti-hypertensive drugs must be continuous, the working process of the drug affects the salivary glands which can lead to xerostomia. Hypertension or famously known as the silent killer is a condition where the increase of blood pressure above normal.29,30

Conclusion

There is a relationship between perception of dental care toward oral health in patients with primary hypertension but it did not appear significantly.

Conflicts of Interest: The authors alone are responsible for the views expressed in this article and they do not necessarily represent the views, decisions, or policies of the institutions with which they are affiliated.

Source of Funding: None.

Ethical Clearance: Ethical Clearance was obtained from Universitas Muslim Indonesia; with number” 476/A/KEPK-UMI/IX/2019. Just before the interview, written consent was obtained from each participant in Universitas Muslim Indonesia guidelines.

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Epidural Cervical Hematoma in a Whiplash Cervical Injury: A Rare Condition

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Abstract

“Whiplash Injury” describes those injury deriving from the sharp whipping movement of both head and neck, produced at the moment of a traffic accident, particularly following collision from behind, head-on or side collisions. The use of safety belts has led to a reduction in deaths deriving from front-end collisions, but also to an increase in cases of typical whiplash. There are two types of forces that cause whiplash injuries in rear-end car crashes: external forces applied to the body by the seat and head restraint, and internal forces generated by the activation of body’s muscles. The combination of these forces causes differential motion of the cervical spine, which results in neck tissues’ strain. This event can affect all neck structures: facet joints capsule, muscles, intervertebral disks, nerves and vessels. We report a case of a 68-year-old woman. The subject, while driving her car, hit head-on a car moving in the opposite direction and died immediately. At autopsy the major findings were limited to multiple rib fractures and fracture of the fifth cervical vertebra with epidural hematoma. This case demonstrates that, even in the absence of direct traumatism, a potentially lethal epidural hematoma may occur as a result of whiplash.

Keywords: Whiplash, Epidural Hematoma, Epidural Bleeding, Spinal Cord, Autopsy.

Introduction

Whiplash is described by Spitzer et al¹ as “energy transfer to the cervical spine consequent to an acceleration-deceleration mechanism secondary to car crash or any other collision, which can lead to different tissues’ injuries and multiple clinical manifestation, described as whiplash associated disorders”. In fact, disorders associated with such indirect traumatic event - whiplash associated disorders (WAD) – could be complex and multifaceted, involving different degrees of both physical and psychological dysfunctions². Its pathophysiology is still unknown and there are no gold standard evaluation procedures. The most frequent symptoms are pain, stiffness and functional limitation of the cervical spine, headache, and dizziness. These symptoms may associate with pain in other districts³(shoulders, thoracic and lumbar spine), paraesthesia and hypaesthesia, generalized weakness, confusion, and visual and auditory disturbances. Annual incidence of WAD in the general population of North America and Western Europe is circa 300 inhabitants per 100000 and some data suggest a further increase in incidence⁴⁻⁵. The use of safety belts has led to a reduction in deaths deriving from front-end collisions, but also to an increase in cases of typical whiplash. We report a case of a 68-year-old woman, who died after a car crush. At autopsy investigation only epidural hematoma emerged as cause of death.

Case Report: A 68-year-old woman, height 158 cm and weight 72 kg, while driving her car, hit a car head-on from the opposite direction. The opposite vehicle was a medium-sized utility car proceeding at an estimated speed of approximately 85-95 km/h. The vehicle of the deceased woman was also a medium-sized utility car that was traveling at a speed of approximately 70-90 km/h. The woman was wearing seat belt and her car had...
no headrest in the front seats. Investigations of the event showed regular airbags functioning during the accident. After the accident, the woman died immediately. Based on the information provided by some family members, the driver had no notable pathologies. All toxicological investigations were negative. During autopsy, there was not external signs consistent with fatal injuries. Small bruising in various body districts were the only external findings. They were located to both face and neck, presumably being related to the impact with airbag. Internal examination revealed no lesions of the cranium. The brain showed no gross alterations, except for rare petechial hemorrhages throughout the cerebral peduncles. No other lesion affected the abdominal viscera. At the thoracic level, even though the sternum was found intact, four ribs on the left side of the thoracic cage were found to be fractured. Soft tissues and neck structures had no detectable lesions but, after removal of superficial structures, a considerable blood infiltration of the peri-vertebral muscles was evident (Figure 1A). There was a full thickness fracture of the fifth cervical vertebra body (compression fracture) with concomitant blood infiltration of cancellous tissue. An anterior approach to the spinal cord was performed at that level: both leptomeninges and dura mater were undamaged, while opening of the vertebral canal confirmed the presence of epidural hemorrhage with spinal cord compression (Figure 1B-2C). At the level of the spinal cord, the execution of parallel transverse cuts at a distance of 1 cm, allowed to detect small spinal hemorrhages. The examination of the remaining organs appeared devoid of elements worthy of note (no a cardiac contusion). Histological investigation confirmed both epidural and intra-parenchymal hemorrhages (Figure 2). Results of toxicological analysis were negative. Subject’s death was caused by irreversible spinal cord injury resulting in cardiorespiratory arrest. Damage of the spinal column and spinal cord was caused by the kinetic energy developed due to acceleration-deceleration mechanism. This dynamic caused vertebral fracture, epidural and spinal cord hemorrhages, leading to a spinal cord injury.

Figure 1: (A) Blood infiltration of peri-vertebral soft tissues and muscles; (B,C) Epidural hemorrhage with spinal cord compression after the opening of the vertebral canal.

Figure 2: Epidural (A) and intra-parenchymal (B) hemorrhages viewable by optical microscopy with hematoxylin-eosin staining. (C) Multiple red cell collections with consensual interruption of the bone structure.
Discussion

Whiplash Injury is characterized by different symptoms occurring following damage to the neck, usually as a result of sudden strain affecting discs, muscles, nerves or tendons. It is caused by a sudden acceleration or deceleration of both head and neck. The head is violently thrown back, forwards, or sideways followed, usually, by reflex contraction of the muscles in the opposite direction. Sometimes instead, the projection is one-directional (Figure 3).

In the reported case, it could be argued that damage from hyperextension was prevalent, given the absence of headrest, correct functioning of airbags and rupture of the anterior longitudinal ligament associated to compression fracture of the vertebral body, found during autopsy.

The pathophysiological mechanisms, clinical and symptomatologic characteristics of whiplash are widely described in literature. Therapeutic approach to whiplash has also been analyzed by studies evaluating the benefits of physiotherapy. After a brief review of the literature, we found that there are no studies describing possible lethal acute mechanisms of whiplash, except for a study describing an unusual case of post-whiplash pseudoaneurysm of the right common carotid artery, which led to acute massive hemorrhage and death, days after initial trauma.

We describe a very rare condition: formation of epidural hematoma following whiplash injury. Spinal epidural hematomas are a rare occurrence, accounting for less than 1% of all spinal canal space-occupying lesions. There are two main types of spinal epidural hematomas: spontaneous and traumatic. The first, most frequent, is often associated with vascular malformations, coagulopathies, anticoagulation, neoplasms, or thrombocytopenia. The latter, rarer, occurs frequently in patients affected by rheumatologic diseases, such as ankylosing spondylitis and rheumatoid arthritis. Although, it is not clear what caused the epidural hemorrhage following fracture of a cervical vertebra, one of the hypotheses is that a bone fragment damaged epidural vessels, resulting in bleeding within epidural space. Furthermore, the spinal bleeding can also be linked to the tearing of the microvasculature that supplies brainstem and spinal cord.

Conclusion

The current case is somewhat different from any previously described one. In fact, diffuse epidural hemorrhage, with development of small hemorrhages in the spinal cord, secondary to fifth cervical vertebra fracture due to whiplash, occurred in a patient without comorbidity. This particular succession of pathological events, moreover, was the cause of death of the patient.

Conflict of Interest: The authors declare that they have no conflicts of interest.

Ethical Approval: This paper was approved by all authors.

Informed Consent: Informed consent was obtained from the Judicial Authority for whom identifying information is included in this article.

References

Association between Patient’s Educational Degree with Level of Knowledge and Perception Regarding Pulmonary Tuberculosis

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Abstract

Background: Indonesia is the second largest population of pulmonary tuberculosis (TB) worldwide. Unfortunately, this condition has remained unchanged past decade. Education is essential for the formation of knowledge and perception, which is important, due to its impact on tuberculosis treatment implementation.

Objective: The aim of this study is to determine the association between patient’s educational degree with knowledge and perception regarding pulmonary tuberculosis.

Method: This was observational analytic study with cross-sectional design. The study was conducted on 51 patients in TB outpatient clinic from Siti Khodijah Hospital and two Primary Health Care in Sidoarjo. Using simple random sampling, a questionnaire was formed to obtain related information about the variables studied; including baseline characteristic (age, gender, education, occupation), patient’s knowledge, and perception regarding pulmonary tuberculosis. Then parameter’s of knowledge and perception were classified: good and low.

Results: Using multivariate analysis of Wilcoxon test, there was a significant difference between each group of patient educational degree with knowledge regarding tuberculosis (p = 0.00) and perception regarding tuberculosis (p = 0.00).

Conclusion: Different patient educational degree shows different knowledge and perception regarding Pulmonary TB. This result may indicate that the educational degree affected the patient to understand the disease. The collaborative approach needed to build proper patient’s knowledge and perception. Lack of knowledge regarding TB, may due to a deficiency in Indonesian school curriculum content. These results will inform the development of relevant education, and information system, to enhance awareness about tuberculosis in society.

Keyword: Education, knowledge, perception, tuberculosis.

Introduction

Tuberculosis (TB) is one of the leading cause of deaths in the world, ranking in the top 10 cause of global death (1). Worldwide, 1 out of 4 people is affected by TB (2). According to world organization health (WHO), there were 10 million people who suffered from TB, in which 1.6 million of them died because of it in 2017. It was also the leading cause of death in patients with HIV. TB spreads across the globe, but most of TB cases were found in South East Asia and Western Pacific regions (62% of new cases), followed by African region (25% of new cases) in 2017. The top eight countries with the most new cases in 2017 were India, China, Indonesia,
the Philippines, Pakistan, Nigeria, Bangladesh, and South Africa(1,2).

Indonesia is the second largest population of pulmonary TB worldwide. In Indonesia itself, according to the Indonesian Health Ministry Center of Data and Information, TB prevalence reached 254 per 100,000 population or 25.4 per 1,000,000 population in 2017. In 1992, data from Household Health Survey showed that TB is ranked 2nd as the cause of death in Indonesia. The ministry of health in 2016 has targeted to eliminate TB nationwide in 2035 and its elimination in 2050. The definition of TB elimination is if only 1 per 1,000,000 population suffers from TB (3).

Tuberculosis is caused by a bacterial agent named Mycobacterium tuberculosis, an obligate aerobic and slow-growing intracellular parasite (4). Tuberculosis itself has a very long history, dating from 70,000 years ago(5). Robert Koch was the first scientist that was able to isolate the bacteria (6). He then presented his result to the Society of Physiology in Berlin on March 24, 1882(7).

WHO has already declared that TB is a global public health emergency worldwide, thus launched the directly observed treatment short course (DOTS) strategy in 1993 (1). In 1995, the Indonesian government started to implement DOTS as a part of National Tuberculosis Control Program in several primary health cares, and in 2000 the strategy was conducted nationwide in all health cares, especially in primary health cares (3).

The long term goal of the TB Control Program is to lower the case and deaths that are caused by TB by breaking the transmission chain, thus making it no longer a problem in Indonesia’s population. To support this program, surveillance is not enough to control TB. Further analysis towards risk factor of TB transmission is needed to break the transmission chain, regarding the high prevalence of TB cases and its complication and burden towards the population. One of the factors that might contribute towards TB transmission is knowledge and perception about it.

Method

Study Area and Population: The study was conducted in Sidoarjo Regency, East Java, Indonesia. The region has a total population of 2,279 million, with an estimated area of 634.4 square kilometers. In the region, population density is about 3,089.09 persons/square kilometer though it varies from zone to zone.

The 2 districts; Taman, and Medaeng, were conveniently selected for a major study of the prevalence of latent and active TB. However, before the implementation of a survey on the prevalence of the disease, we attempted to assess the knowledge and perception of the communities about Lung TB. There was no previous information on the level of pastoral community awareness about Lung TB in the present study areas or the region as a whole. The participants were eligible if they were the patient, a husband/wife (or the responsible person) in the selected households, apparently healthy and willing to volunteer to be interviewed. The study protocol was approved by the Ethical Clearance Committee of the Muhammadiyah University of Surabaya, as well as by the Regional Committee for Medical Research Ethics of Sidoarjo Regency. Each participant was asked to fill the questionnaire independently, and the collected information was kept confidential.

Scope of the discovery of patients with new TB + AFB (Case Detection Rate-CDR) with a target of 70% and acquisition of 33.15%, up 4.72% compared to 2014 of 37.87%. The low TB CDR is still low because there are still 25% of hospitals implementing DOTS; the weak point of the Hospital is connected to the network between health facilities for TB case discovery. For this reason, it is necessary to do a strategy in the future so that the compatibility of the Hospital of Related Points can be obtained, among others, through internal hospital monitoring and evaluation, increasing findings of finding cases for TB case discovery, supported by active promotion to more intensive communities.

The data collected in 2013 found 733 new cases of smear + TB were approved, and completed as many as 624 cases (Cure rate = 85.13%), and the results of treatment were complete as many as 54 cases, so the Success Rate = 92.5%, this situation increased compared to 2012 Cure Rate = 82.6%, and Success Rate = 90.88%.

Study Design and Data Collection: This research was conducted at the Primary Health Care of Taman District, and Medaeng District, and Siti Khodijah Hospital, Sidoarjo Regency. This type of research is Analytical Observational with a cross-sectional approach. The population of this study was pulmonary tuberculosis patients at Taman Primary Health Center, Medaeng Health Center, and Siti Khodijah Hospital during February 2019.
The study sample was all Tuberculosis patients with positive Acid-Fast Stain. The sample was taken by simple random sampling, as many as 51 people. Data collection using a questionnaire. Data were analyzed using the Wilcoxon test.

Structured questionnaires were prepared in language, based on information from the available literature. The questionnaires were translated into language. Information on the socio-demographic characteristics of the participants was also included in the questionnaires.

Results

Based on the age distribution of respondents in this study, it can be seen that the youngest age of the respondents is 21 years, and the oldest is 72 years. The average age of the respondents was 43.39 years, and most respondents were 55 years old, with a standard deviation of 13.6. From the data, it can be seen that the characteristics of respondents based on age grouping are productive age groups (18-49 years). Whereas based on sex, most respondents were male, 29 people (56.9%) while women were 22 people (43.1%).

Based on the educational background of the respondents, most of the respondents in this study had a high school education, amounting to 32 people (62.7%). Distribution of respondents’ education level is in Figure 1.

In determining the level of knowledge in general, the authors did the normality test of data using SPSS. Based on the results of the normality test, the Asymp value is obtained. The sign is 0.000, so it can be concluded that there are significant differences, in other words, that the data is normally distributed. So to determine the knowledge level cut off point, the researcher uses the median value as a boundary value.

From the questionnaire data, the results show that the middle value of the knowledge level of the respondents is 8. Based on the analysis, the value of 8 is used as the cut of the point. If the score of the respondent’s knowledge is equal or more than 8, the respondent is categorized as knowledgeable, and if the respondent’s knowledge score is less than 8, then the respondent is categorized as lacking knowledge. Distribution of respondents’ level of knowledge category in this study in general, as many as 9 respondents (17.6%) have good knowledge, and 42 respondents (82.4%) lack knowledge.

To facilitate understanding of the distribution of knowledge levels according to the characteristics of respondents (age, gender, education, occupation, income and information sources) then the merging of each characteristic is carried out into two parts (good and less knowledge, positive and negative perception). The education group is divided into No schools, elementary, junior high, high schools, and diploma or above. The results of the level of knowledge distribution related to the characteristics of respondents are presented in Figure 1.

Questionnaires related to knowledge about TB disease distributed to respondents consisted of 6 sub-topics, namely risk factors and causes, modes of transmission, symptoms, and self-examination, treatment, and complications. The questions on the questionnaire take the form of true and false statements. The questionnaire statement on each sub-topic is summed and compared between the number of respondents’ answers with the correct number of scores, which should then be changed in the form of percentages. Then the percentage is categorized based on the cut of point determined by the author.

Determination of the cut-off point score in the perception category, the author, used the median value as the boundary value. Based on the analysis, the value of 12 is used as the cut off point. If the respondent’s perception score is equal or more than 12, the respondent is categorized as having a positive perception, and if the respondent’s perception score is less than 12 then the respondent is categorized as having a negative perception. Distribution of perceptual categories of respondents in this study can be seen as follows. Based on the analysis, it can be seen in general that ten respondents (19.6%) had positive perceptions, and 41 respondents (80.4%) had negative perceptions regarding TB disease. Using multivariate analysis of Wilcoxon test, there was a significant difference between each group of patient educational degree with knowledge regarding tuberculosis (p = 0.000) and perception regarding tuberculosis (p = 0.000).

Discussion

According to the result of this study, there was a significant difference between each group of patient educational degree with knowledge regarding tuberculosis (p = 0.000) and perception regarding tuberculosis (p = 0.000). Previous studies were related,
even though some of them were not directly linked to our study.

Manalu et al. held a survey towards a group of people, where he concluded that several people did not know about free TB treatment in primary health cares. This survey was also supported by another survey about tuberculosis prevalence in 2004, where 80% of the participants did not know about free anti TB drug (8). A study by Hoa reported that health education is significantly linked to national TB prevalence in Vietnam (9). A case report in Jakarta, Indonesia on 1996-1999 concluded that low education is related to lack of knowledge in environmental awareness, represented by the population’s behavior to spit sputum wherever they want to (10).

A study from Nurjana concluded that TB cases were found mostly in a low educated population (11). Based on a study in East Timor, a population who did not take any formal education were most likely to drop out from TB treatment (12). Another study that was held in Dompu, a city in West Nusa Tenggara Province, Indonesia showed that participants who had higher education (attended school until high school) were more obedient in TB treatment than participants whom only attended school until elementary school (13).

An epidemiological study involving the population in Europe from 1990 to 2003 showed that educational and socioeconomic inequality contributed to TB deaths in Europe (14). Ratnasari reported that alongside nutritional status and household density, education was one of the factors that can be used to predict TB infection towards the population in the city of Oku, South Sumatra Province, Indonesia (10). A study in India also showed the same result, where the population with higher education lower the risk of lung TB (15).

![Figure 1. Distribution of Subject’s Educational Level](image)

**Conclusion**

The level of knowledge and public perception about TB in the work area of the Taman Primary Health Center, Medaeng Primary Health Center, and Siti Khodijah Hospital are still relatively poor. The further finding, there were different finding in the level of knowledge and perception between the group who had a different level of education. This indicates that the level of education should be considered as a valuable factor affecting outcome program which targeting in increasing the level of knowledge and perception in the community. Also, the Primary Health Center and other health workers carry out more detailed counseling (TB
risk factors, efforts to prevent TB and complications of TB) and reach all levels of society so that information about TB that is owned by the community is uniform so that TB can be controlled. This result may indicate that the educational degree affected the patient to understand the disease. The collaborative approach needed to build proper patient’s knowledge and perception. Lack of knowledge regarding TB, may due to a deficiency in Indonesian school curriculum content. These results will inform the development of relevant education, and information system, to enhance awareness about tuberculosis in society.

Conflict of Interest: There is no conflict of interest to declare.

Acknowledgment: The author’s thanks Sidoarjo Regency Department of Health for their administrative support and Faculty of Medicine, Universitas Muhammadiyah Surabaya, Surabaya, Indonesia staff and student for their helpful comments, and support regarding the study and manuscript. We would like to express our sincere thanks to the Indonesia Tuberculosis International Meeting (INATIME) event which facilitated us to present this research on 5-7 April 2019 at Surabaya, Indonesia.

Funding: None

Data Availability: The data set used and/or analyzed during the current study are available from corresponding author on reasonable request.

Ethics Statement: All procedures performed in studies involving human participants were in accordance with the ethical standards of the Ethics Committee in Faculty of Medicine, Universitas Muhammadiyah Surabaya, Surabaya, Indonesia.

Reference
Factors Affecting Quality of Health Care among Old Adults at Beni-Suef University Hospital

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Abstract

Background: Aging is the process of progressive change in the biological, psychological and social structure of individuals' quality is affected by both the technical performance of providers and the extent to which a system reaches those in need.

Aim of Study: The study aimed to assess the quality of health care delivered to old age and factors affecting quality of health care.

Subjects and Method: The study was conducted in the inpatient units at Beni-Suef university hospital. Study sample were nurses and patients: For nurses; all nurses who have experience more than one year at medical surgical department, urinary tract diseases, and provide care for geriatric patients was included in this study. For patients; convenient sample from the pre mentioned setting. Two data collection tools were used to carry out the current study namely; structured Interviewing questionnaire and observational checklists.

Results: 26% of the nurses were satisfied according to work place satisfaction, the same was percent unsatisfied according to work place satisfaction, and the rest of them (48%) had average level of satisfaction. 58% of nurses had unsatisfied level according to their performance. (42%) of participants had satisfied level according to their performance.

Conclusion and Recommendations: 38% of patients had fair level about their evaluation, 33% of them had excellent level about their evaluation to quality of health care, and 29% of them had average level and 41% of them had negative level of satisfaction. Periodic assessment of nurses' perception about quality of care of elderly patient. Regular implementation of training programs regarding quality of care.

Keywords: Factors, Quality, Health Care, Old adults.

Introduction

Over the past century, truly remarkable changes have been observed in the health of older persons throughout the world, and these changes have strongly impacted society. The growth of the older population has resulted mostly from a general increase in the overall population size but is also strongly influenced by major declines in leading causes of mortality. These demographic transformations reverberate in society, increasing medical care and social needs, which are expected to increase steeply in the years to come(1).

Egypt is the most populous country in the Middle East and the third-most populous on the African continent (after Nigeria and Ethiopia). One of the main features of the Egyptian population over the last few decades is the gradual increase in the absolute and relative numbers of older people. This trend is expected to continue over the next decades(2).
This means that, around 20 million Egyptians will be categorized as elderly by that time, this is a big number that resembles a full nation at some parts of the world. There is an urgent need for the implementation of a national policy for elderly care. Although such policies exist, the effectiveness of existing policies and the role of national committees need to be evaluated in order to revive and mobilize the resources available. Older people, as stakeholders, are expected to participate in the implementation of the national policy through all phases of planning, intervention, and evaluation (3).

In addition, there is the migration within the country from rural to urban areas, leaving the elderly behind. This causes variation in the distribution of the aged population within the Egyptian governorates. According to the last Egyptian census, the absolute total number of the elderly is greater in rural areas than urban ones, in spite the fact that their percentage in more in urban (7.18%) than rural (5.6%). The policy making bodies in Egypt, mainly the Ministry of Health and Population, Ministry of social Solidarity, the universities and the academic institutions have been long acting to cope with the population ageing (4).

As more people live to advanced old age, these demographic changes imply much more than just an increase in chronic morbidity. The same age related susceptibility that leads to the occurrence of multiple chronic conditions in the same individual causes decrements in functional abilities as well as social and psychologic problems that may have an impact on many facets of their wellbeing and quality of life. Going beyond the demographic focus of counting and projecting the number of older people in the population, epidemiology has made additional contributions to our understanding of the health status and functional trajectory of older individuals (5).

Objective measures of physical performance have received increased attention as assessments that can measure functioning in a standardized manner in research and clinical settings. These measures can be used to represent impairments or actual disability, but most are indicators of functional limitations. Objective performance measures also provide a means of comparing functional status over time or across countries or cultures, whereas disability measures may lose comparability because of environmental differences or differential access to assistive devices (6).

This is clearly an essential aspect of quality of care and is exemplified by approaches taken by Professional Review Organizations in developing programs for quality assurance of inpatient care for Medicare beneficiaries. Other aspects of quality of care that require greater prominence and that are readily accommodated within the categories, structure, process, and outcome, are oriented toward prevention and a consideration of how a system of care is functioning, not only with respect to those who appear for care at the time they do so, but also in terms of the need that exists in a community or general population (7).

A comprehensive assessment of quality of care would be concerned with all three components and their interrelationship, with the ultimate measure of quality determined by the outcome of care. In practice, there are often severe constraints in linking particular structural factors and processes of care to specific measures of health status. Standards for many elements of structure are based on professional judgments and are used for such purposes as accreditation, licensing, Medicare certifications, and establishing qualifications for staff in, for example, hospitals, group practices, and nursing homes (8).

However, standards do not always represent a consensus; they are subject to change as new knowledge is acquired and new technology developed, and different structural patterns may achieve similar levels of quality. Furthermore, the fact that standards are met does not provide assurance that a favorable effect on health status will follow. In short, structural factors such as the availability of highly qualified primary care providers, specialists and support services, or regionalized emergency medical service systems may increase the probability of receiving high-quality care, but they are not sufficient conditions for determining quality (9).

Process of care measures provide more generally accepted indicators of quality of care, reflecting as they do what care is delivered and how. The measures are derived mainly from professional norms of practice or research in which some link to outcome is implicitly or explicitly expected, whether this is improved functioning, delay in dependency, or relief from pain or depression. The degree of certainty about a link may be weak in some cases because of lack of information about the natural history of disease, the relative effectiveness of alternative treatment modalities, or the role of behavioral
and biological characteristics of patients in determining the course of illness (1).

The selection of process measures for assessing quality of care seeks to minimize these limitations. Measures are available or being developed that range from adherence to algorithms for the treatment of specific conditions to communication and counseling (Inui and Carter, 1985), detection of need for health services, matching need with appropriate sources of care in acute episodes of illness and in long-term care, for which coordination of services is important (5).

Significance of study: The number of older persons in the world is projected to be 1.4 billion in 2030 and 2.1 billion in 2050, and could rise to 3.1 billion in 2100. Globally, the number of persons aged 80 or over is projected to triple by 2050, from 137 million in 2017 to 425 million in 2050. Poor patient care, safety and fall are the leading causes of fatal and nonfatal injuries among persons aged (10).

Provision of quality assured health-care services for the elderly population is a challenge that requires joint approach and strategies in addition to cooperation of all health team and the nurses are the corners stone of health care. Understanding quality of care can help nurses recognize problems and provide nursing interventions that will help aging individuals successfully meet the developmental tasks. As well as Optimal care must be delivered to minimize the time spent in the acute care setting. Avoiding costly complications and focusing on health promotion rather than disease management (8).

Aim of the study:
The aim of this study is to assess the quality of health care delivered to old age and factors affecting quality of health care through assessing the following:

- Level of health care provided to older adult (from patients’ perspective)
- Nurses’ job satisfaction
- Leadership and management skills (from nurses’ perspective)
- Nurses performance
- Safety measures and environmental setting

Subjects and Method
Research design: Descriptive research design was used in carrying out the current study.

Setting: This study was conducted in in the inpatient units at Beni-Suef university hospital. These settings were having both sexes male and female; Having flow of older adults seeking the foundation service. All settings following the same strategies of care delivery. Consists of two unit’s male and female unit.

Subjects: Subjects in this study were nurses and patients: For nurses; all nurses have experience more than one year at medical surgical department, urinary tract diseases and provide care for geriatric patients was included in this study.

For patients; convenient sample will be selected from the pre mentioned setting according to the following criteria; The older adult is already diagnosed with multi comorbidities disease’, receiving medical and nursing care for at least 3 months and stay 3 days or more. Fully oriented to place,

Data collection tools: Two data collection tools were used to carry out the current study namely; Structured Interviewing questionnaire and Observational checklists.

Tool 1: Structured Interviewing Questionnaires: include five parts
1. Demographic characteristics of the nurses and patients such as (age, sex, social status level of education, etc.).
2. Healthqual to assess quality of health care developed by the researcher based on related literature.
3. Patient assessment of health care (PAHC) to assess level of health care provided to older adult (from patient’ perspective), questionnaire adopted by the researcher based on related literature
4. Nursing workplace satisfaction questionnaire (NWSQ) to assess nurses’ job satisfaction developed by the researcher based on related literature
5. Leadership and management skills questionnaire filled by nurses by the researcher based on related literature

Tool 2: Observational checklist includes two parts

Part I: Six Dimensions Scale of Nurses Performance: It was developed by the researcher based on related literature
Part II: Safety measures and environmental setting: It was developed by the researcher based on related literature.

Scoring system: Each item was scored 1 for use and 0 for not use.

Part III: Environmental safety checklist developed by the researcher to assess environmental safety and sanitation condition. The items of this checklist were filled once by the researcher with the assistance of the safety engineers and it declare the absence and the presence of safety measures.

1. Patient Assessment of Health Care–PAHC:
   - This tool consists of 14 items in the form of three points Likert scale as the following Never (1), Sometimes (2), and Usually (3) and the final score is the sum of the 14 items, ranging from 14 to 42. These scores will be converted to percent and categorized as the following acceptable health care condition (≥60%) and unacceptable health care condition (<60%).

2. Leadership and management skills questionnaire:
   - This tool consists of 16 items in the form of three points Likert scale as the following Never (1), Sometimes (2), and Always (3) and the final score is the sum of the 16 items, ranging from 16 to 48. These scores will be converted to percent and categorized as the following adequate leadership and management skills (≥60%) and inadequate leadership and management skills (<60%).

3. Health qual items patient perspective:
   - This tool consists of 20 items in the form of three points Likert scale as the following Fair (1), Good (2), and Excellent (3) and the final score is the sum of the 20 items, ranging from 20 to 60. These scores will be converted to percent and categorized as the following acceptable quality level (≥60%) and unacceptable quality level (<60%).

4. Environmental safety:
   - This tool consists of 33 items in the form of “Yes” (1) and “No” (Zero) and the final score is the sum of the 33 items, ranging from 0 to 33. These scores will be converted to percent and categorized as the following safe environment (≥60%) and unsafe environment (<60%).

5. Nursing Workplace Satisfaction Questionnaire (NWSQ):
   - This tool consists of 15 items in the form of three points Likert scale as the following Disagree (0), partially agree (1), and agree (2) and the final score is the sum of the 15 items, ranging from 0 to 30. These scores will be converted to percent and categorized as the following satisfactory level (≥60%) and unsatisfactory level (<60%).

6. The Six Dimension Scale of Nursing Performance:
   - This tool consists of 28 items in the form of “Yes” and “No” (Zero) and the final score is the sum of the 28 items, ranging from 0 to 28. These scores will be converted to percent and categorized as the following adequate performance (≥60%) and inadequate performance (<60%).

Tools Validity: Face and content validity of the study tools was assessed by jury group consisted of five experts (They are Faculty members of Community Health Nursing Department at Beni-Suef University). Jury group members judge tools for comprehensiveness, accuracy and clarity in language. Based on their recommendation, correction, addition and/or omission of some items was done.

Fieldwork: Data collection of the study was started at the beginning of March 2019, and completed by the end of June 2019. The researcher attended at the geriatric units three days per week from 9am to 2pm at Beni-Suef university hospital for all The older adult is already diagnosed with multi comorbidities disease’, receiving medical and nursing care for at least 3 months. The researcher first explained the aim of the study to the participants and reassures them that information collected will be treated confidentiality and that it will be used only for the purpose of the research. Then the researcher distributes the questionnaire sheet and observe the hospital environment and nurses performance with elderly patients.

Administrative Design: An official letter requesting permission to conduct the study was directed from the dean of the faculty of nursing Beni-Suef University to director at Beni-Suef university hospital to obtain their approval to carry out this study. This letter included the aim the study and photocopy from data collection tools in order to get their permission and help for collection of data.
Ethical Considerations: The study was conducted with careful attention to ethical standards of research and rights of participants. Verbal consent was taken from each nurse as well as patient to participate in this study. During the initial interview, the purpose of the study and the procedures were explained to the participants. The subjects were assured that all information will be confidential and will be used for the research only to assure the confidentiality of the participants. Participants will be assured that their participation in the study is voluntary and that they can refuse to participate in the study. It will be explained that there are no costs to participate in the study.

Statistical Analysis: Data entry and statistical analysis were done using (SPSS) statistical software package. Quality control was at the stage of coding and data entry. Data were presented using descriptive statistics in the form of frequencies and percentage for qualitative variables; mean and standard deviation for quantitative variable. Qualitative categorical variables were compared Chi-square (X2) test; the hypothesis that the row and column variables are independent, without indicating strength or direction of the relationship, Analysis of variance (ANOVA) test. Statistical significance was considered at (P-value <0.05).

Results

Table (1) shows the distribution of socio-demographic characteristics of studied nurses, the table shows that, the age of the studied sample was with 44.6±9.1. The most of studied nurses are female with 76%. The majority of nurses had 25:35 years (40%). And minority of nurses was more than 45 years with 10%. Related to the educational level, more than half of the studied nurses had technical institute, while only 32% of the studied nurses have university education in nursing.

Table 2: describes the distribution of studied nurses regarding their work place satisfaction. The table reveals that (44%) of the participant reported agreement in the item “In the last year, my work has grown more interesting” (38%) of the participant reported agreement in the item “My job is very meaningful for me”, (60%) of the participant reported partly agreement in the item “In the last year, my work has grown more interesting “My job gives me a lot of satisfaction”. (60%) I of the participant reported partly agreement in the item “have enough support from colleagues”, (40%) of the participant reported agreement in the item “I function well on a busy ward.

Table 3: show that there is a significant relation between nurse’s level of satisfaction and their sex, (58.3%) males were satisfied compared to (15.7) females satisfied. (16.7%) unsatisfied males compared to (28.9%) unsatisfied females. (p<0.05).

Table 4: show that (56%) of participants Promote the patients’ rights to privacy. (54%) of participants. Demonstrate knowledge of the legal boundaries of nursing. (52%) of participants Give emotional support to family of dying patient. (48%) of participants Accept responsibility for the level of care under his/her direction. (46%) of participants Evaluate results of nursing care. On the other hand (6%) of participants Give praise and recognition for achievement to those under his/ her direction, and (16%) of participants Promote the inclusion of patient’s decision and desires concerning his/her care.

Table 5: show that there is a significant relation between nurse’s level of performance and their sex (p<0.05). There is a significant relation between nurse’s level of satisfaction and their education level. Technical institute nurse (29.4%) has high level of performance, compared to (31.3%) of nurses holding bachelor degree have low performance level (p<0.05).

Table 6: show that there is a significant relation between patient’s evaluation of health qual items and their sex (p<0.05) males represent (32.6%) had negative evaluation compared to females (42.6%), on the other hand half of males had positive evaluation compared to (18.5%) of females. there’s no a significant relation between patient’s evaluation of health qual items and their education level (p>0.05). There is a highly statistically significant relation between patient’s evaluation of health qual items and their residence (p<0.05).
Table (1): Distribution of Socio-demographic characteristics of studied nurses:

<table>
<thead>
<tr>
<th>Item</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 25</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>25-35</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>35-45</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>More than 45</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>Female</td>
<td>38</td>
<td>76</td>
</tr>
<tr>
<td>Educational Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical institute</td>
<td>34</td>
<td>68</td>
</tr>
<tr>
<td>Bachelor degree</td>
<td>16</td>
<td>32</td>
</tr>
</tbody>
</table>

Table (2): Distribution of studied nurses regarding their Workplace Satisfaction

<table>
<thead>
<tr>
<th>Statement</th>
<th>Agree</th>
<th>Partly Agree</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>How much you enjoy your job</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• My job gives me a lot of satisfaction</td>
<td>11</td>
<td>30</td>
<td>9</td>
</tr>
<tr>
<td>• My job is very meaningful for me</td>
<td>19</td>
<td>13</td>
<td>18</td>
</tr>
<tr>
<td>• My work gives me an opportunity to show what I’m worth</td>
<td>14</td>
<td>22</td>
<td>14</td>
</tr>
<tr>
<td>• In the last year, my work has grown more interesting</td>
<td>22</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>• It’s worthwhile to make an effort in my job</td>
<td>17</td>
<td>20</td>
<td>13</td>
</tr>
<tr>
<td>Doing your job</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• I have enough time to deliver good care to patients</td>
<td>9</td>
<td>22</td>
<td>19</td>
</tr>
<tr>
<td>• I have enough opportunity to discuss patient problems with colleagues</td>
<td>13</td>
<td>25</td>
<td>12</td>
</tr>
<tr>
<td>• I have enough support from colleagues</td>
<td>15</td>
<td>30</td>
<td>5</td>
</tr>
<tr>
<td>• I function well on a busy ward</td>
<td>20</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>• I feel able to learn on the job.</td>
<td>16</td>
<td>20</td>
<td>14</td>
</tr>
<tr>
<td>• I feel confident as a clinician.</td>
<td>17</td>
<td>17</td>
<td>16</td>
</tr>
<tr>
<td>The people you work with</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>It’s possible for me to make friends among my colleagues</td>
<td>14</td>
<td>20</td>
<td>16</td>
</tr>
<tr>
<td>I like my colleagues</td>
<td>17</td>
<td>23</td>
<td>10</td>
</tr>
<tr>
<td>• I feel that I belong to a team.</td>
<td>15</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>• I feel that my colleagues like me.</td>
<td>13</td>
<td>25</td>
<td>12</td>
</tr>
</tbody>
</table>

Table (3): Association between socio-demographic data of studied nurses and level of satisfaction

<table>
<thead>
<tr>
<th>Item</th>
<th>N</th>
<th>Satisfied (13)</th>
<th>Average (24)</th>
<th>Unsatisfied (13)</th>
<th>X²</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>12</td>
<td>7</td>
<td>58.3</td>
<td>3</td>
<td>25</td>
<td>2</td>
</tr>
<tr>
<td>Female</td>
<td>38</td>
<td>6</td>
<td>15.7</td>
<td>21</td>
<td>55.2</td>
<td>11</td>
</tr>
<tr>
<td>Item</td>
<td>N</td>
<td>Satisfied (13)</td>
<td>Average (24)</td>
<td>Unsatisfied (13)</td>
<td>X²</td>
<td>p</td>
</tr>
<tr>
<td>------</td>
<td>---</td>
<td>---------------</td>
<td>--------------</td>
<td>------------------</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Educational level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical institute</td>
<td>34</td>
<td>9</td>
<td>26.4</td>
<td>17</td>
<td>50</td>
<td>8</td>
</tr>
<tr>
<td>Bachelor degree</td>
<td>16</td>
<td>4</td>
<td>25</td>
<td>7</td>
<td>43.7</td>
<td>5</td>
</tr>
</tbody>
</table>

Table (4): Distribution of studied nurses in relation to The Six Dimension Scale of Nursing Performance.

<table>
<thead>
<tr>
<th>Item</th>
<th>Yes</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Teach a patient’s family members about the patient’s needs by innovative method.</td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td>2</td>
<td>Coordinate the plan of nursing care with the medical plan of care.</td>
<td>18</td>
<td>36</td>
</tr>
<tr>
<td>3</td>
<td>Give praise and recognition for achievement to those under his/her direction</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>Teach preventive health measure to patients and their families.</td>
<td>11</td>
<td>22</td>
</tr>
<tr>
<td>5</td>
<td>Identity and use community resources in developing a plan of care for a patient and his/her family.</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>6</td>
<td>Identify and include in nursing care plans anticipated changes in patient’s conditions.</td>
<td>19</td>
<td>38</td>
</tr>
<tr>
<td>7</td>
<td>Evaluate results of nursing care.</td>
<td>23</td>
<td>46</td>
</tr>
<tr>
<td>8</td>
<td>Promote the inclusion of patient’s decision and desires concerning his/her care.</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>9</td>
<td>Perform technical procedures: e.g., oral suctioning, tracheostomy care, IV therapy, catheter care, dressing changes.</td>
<td>11</td>
<td>22</td>
</tr>
<tr>
<td>10</td>
<td>Adapt teaching method and materials to the understanding of the particular audience: e.g., age of patient, educational background and sensory deprivation.</td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td>11</td>
<td>Communicate a feeling of acceptance of each patient and a concern for the patient’s welfare.</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>12</td>
<td>Seek assistance when necessary.</td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td>13</td>
<td>Help a patient communicate with others.</td>
<td>18</td>
<td>36</td>
</tr>
<tr>
<td>14</td>
<td>Use mechanical devices: e.g., suction machine, glucometer, cardiac monitor, respirator</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>15</td>
<td>Give emotional support to family of dying patient.</td>
<td>26</td>
<td>52</td>
</tr>
<tr>
<td>16</td>
<td>Verbally communicate facts, ideas, and feelings to other health care team members.</td>
<td>22</td>
<td>44</td>
</tr>
<tr>
<td>17</td>
<td>Promote the patients’ rights to privacy.</td>
<td>28</td>
<td>56</td>
</tr>
<tr>
<td>18</td>
<td>Contribute to an atmosphere of mutual trust, acceptance, and respect among health team members.</td>
<td>21</td>
<td>42</td>
</tr>
<tr>
<td>19</td>
<td>Delegate responsibility for care based on assessment of priorities of nursing care needs and the abilities and limitations of available health care personnel.</td>
<td>18</td>
<td>36</td>
</tr>
<tr>
<td>20</td>
<td>Explain nursing procedures to a patient prior to performing them.</td>
<td>19</td>
<td>38</td>
</tr>
<tr>
<td>21</td>
<td>Guide other health team members in planning for nursing care.</td>
<td>16</td>
<td>32</td>
</tr>
<tr>
<td>22</td>
<td>Accept responsibility for the level of care under his/her direction.</td>
<td>24</td>
<td>48</td>
</tr>
<tr>
<td>23</td>
<td>Perform appropriate measures in emergency situations.</td>
<td>21</td>
<td>42</td>
</tr>
<tr>
<td>24</td>
<td>Promote the use of interdisciplinary resource persons.</td>
<td>22</td>
<td>44</td>
</tr>
<tr>
<td>25</td>
<td>Encourage the family to participate in the care of the patient.</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>26</td>
<td>Demonstrate knowledge of the legal boundaries of nursing.</td>
<td>27</td>
<td>54</td>
</tr>
<tr>
<td>27</td>
<td>Demonstrate knowledge in the ethics of nursing.</td>
<td>23</td>
<td>46</td>
</tr>
<tr>
<td>28</td>
<td>Accept and use constructive criticism.</td>
<td>16</td>
<td>32</td>
</tr>
</tbody>
</table>
### Table (5): Association between socio-demographic data of studied nurses and level of performance

<table>
<thead>
<tr>
<th>Item</th>
<th>N</th>
<th>High performance (21)</th>
<th>Low performance (29)</th>
<th>X²</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>12</td>
<td>9</td>
<td>75</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td>Female</td>
<td>38</td>
<td>12</td>
<td>31.5</td>
<td>26</td>
<td>68.4</td>
</tr>
<tr>
<td>Educational level</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Technical institute</td>
<td>34</td>
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<td>29.4</td>
<td>24</td>
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</tr>
<tr>
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<td>11</td>
<td>68.7</td>
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<td>31.3</td>
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</table>

### Table (6): Association between socio-demographic data of the studied sample and their evaluation of health qual items.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Negative38</th>
<th>Average29</th>
<th>Positive33</th>
<th>X²</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Male 46</td>
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<td>32.6</td>
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<td>17.4</td>
<td>23</td>
</tr>
<tr>
<td>Female54</td>
<td>23</td>
<td>42.6</td>
<td>21</td>
<td>38.9</td>
<td>10</td>
</tr>
<tr>
<td>Educational Level</td>
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<td></td>
<td></td>
</tr>
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<td>Illiterate24</td>
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<td>29.2</td>
<td>6</td>
<td>25</td>
<td>11</td>
</tr>
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<td>Primary31</td>
<td>10</td>
<td>32.3</td>
<td>10</td>
<td>32.3</td>
<td>11</td>
</tr>
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<td>27.3</td>
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<td>University12</td>
<td>6</td>
<td>50</td>
<td>4</td>
<td>33.3</td>
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<tr>
<td>Residence</td>
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<td></td>
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<td>Rural67</td>
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<td>25.4</td>
<td>25</td>
<td>37.3</td>
<td>25</td>
</tr>
<tr>
<td>Urban33</td>
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<td>63.7</td>
<td>4</td>
<td>12.1</td>
<td>8</td>
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</tbody>
</table>

**Discussion**

Population aging is a great challenge for the health care systems. Although the health status of older people is improving over time and the life expectancy is increasing, still, with aging, the prevalence of disability, frailty, cancer, and chronic diseases is expected to increase, especially with the large growth in the oldest old group. The older the person is, the more likely to face a compounding of multiple health, psychological and social problems that make accurate medical diagnosis and proper medical management difficult (3).

Elderly people have high risk for functional impairments with inability to perform ordinary activities of daily living and activities related to household management termed instrumental activities of daily living. In addition to the general health services, whether governmental or private, that are available for the use by the elderly, there are other special services for the older people that have developed in Egypt. Changes in the health of older persons were already detectable decades before and should have prompted radical changes in the structure and function of our system of health and social protection at that time. We come to this enormous challenge unprepared and need good quality system to overcome these changes (2). So the current study aimed to assess the quality of health care delivered to old age and factors affecting quality of health care.

Regarding distribution of socio-demographic characteristics of studied nurses, the current study revealed that the most of studied nurses are female. The majority of nurses had 25:35 years. Related to the educational level, more than half of the studied nurses had technical institute.

This result was in agreement with (11) that conducted
entitled “Factors affecting access to oral health care among adults” and found that majority of participants were female, and their experience had experience from 5 to 10 years. Also, this result was in agreement with (12) that conducted entitled “An international comparison of factors affecting quality of life among patients with congestive heart failure” and found that majority of participants had technical institute. Regarding nurses’ work place satisfaction, the current study revealed that nearly half of the participant reported agreement in the item “In the last year, my work has grown more interesting”. More than one third of the participant reported agreement in the item “My job is very meaningful for me”, three fifth of the participant reported partly agreement in the item “have enough support from colleagues”, two fifth of the participant reported agreement in the item “I function well on a busy ward”.

In the same line, this result was accordance with (13) that conducted entitled “Evaluation of factors affecting patient satisfaction with health care services” and found that majority of participants were interested with their work, and had good relationship with others. Conversely, this result was in disagreement with (14) that conducted entitled “Factors affecting patient’s satisfaction in outpatient clinics” and found that majority of participants had poor relationship with others and hadn’t support from member’s organization.

Regarding nurses’ work place satisfaction, the current study revealed that more than one quarter of the participants were satisfied according to work place satisfaction. This result was in congruence with (14) that conducted entitled “Systemic factors affecting the technical quality of healthcare” and found that minority of participants were satisfied about their work place. Conversely, this result was in disagreement with (16) that conducted entitled “Quality indicators of nutritional care practice in elderly care” and found that majority of participants had poor relationship with others and had high satisfaction with their work.

Regarding association between socio-demographic data of studied nurses and level of satisfactions, the current study revealed that there is a significant relation between nurse’s level of satisfaction and their sex.

This result was in congruence with (17) that conducted entitled “Structure and process quality as predictors of satisfaction with elderly care” and found that majority of participants had significant relation between nurse’s level of satisfaction and their gender. Conversely, this result was in disagreement with (18) that conducted entitled “Self-perceived quality of health and satisfaction by elderly seen by the Family Health Strategy team” and found that majority of participants had significant relation between nurse’s level of satisfaction and their ages.

Regarding distribution of studied nurses in relation to the six-dimension scale of nursing performance, the current study revealed that more than half of participants promote the patients’ rights to privacy, demonstrate knowledge of the legal boundaries of nursing and give emotional support to family of dying patient. Nearly half of participants accept responsibility for the level of care under his/her direction, and evaluate results of nursing care.

This result was in agreement with (17) that conducted entitled “Safeness and treatment mitigate the effect of loneliness on satisfaction with elderly care” and found that majority of participants had good relation with their patients. Also, this result was accordance with (19) that conducted entitled “Assessing bus transit service from the perspective of elderly passengers in Harbin” and found that majority of participants keep privacy of their patients and them work with their patients at holistic case.

Regarding distribution of studied sample according to their performance, the current study revealed that more than half of participants had unsatisfied level according to their performance. More than two fifth of participants had satisfied level according to their performance.

This result was in congruence with (20) that conducted entitled “The effects of job satisfaction and ethical climate on service quality in elderly care” and found that half of participants had satisfied level of performance. Conversely, this result was in disagreement with (21) that conducted entitled “Factors Affecting Quality of care in Primary Health Care Centers” and found that majority of participants had unsatisfied level of performance.

Regarding association between socio-demographic data of studied nurses and level of performance, the current study revealed that there is a significant relation between nurse’s level of performance and their sex.

This result was accordance with (22) that conducted entitled “Factors affecting quality of health service and patient satisfaction in community health centers”
and found that majority nurses had high level of performance. Also, this result was in agreement with (23) that conducted entitled “Assessing the Factors Affecting Quality of Health Care Provision at Health Centre” and found that majority nurses had a significant relation between nurse’s level of performance and their gender.

Regarding perception of nurses about management and leadership skills, the current study revealed that three fifth of participants reported that their managers and leaders give them the opportunity to identify rules and regulations. This result was in agreement with (24) that conducted entitled “Psychological and socio-economic factors affecting social sustainability through impacts on perceived health care quality and public health” and found that majority of participants had leader were understood with them.

Regarding perception of nurses about Progress and career advancement, the current study revealed that nearly one third of participants reported that there are good opportunities for continuing education at hospital, three fifth of participants reported that never there are training courses that allow progress and improvement.

This result was supported with (25) that conducted entitled “Staff Nurses’ Perceptions of Their Nurse Managers’ Transformational Leadership Behaviors and Their Own Structural Empowerment” and found that minority of nurses got on training courses at hospital. Conversely, this result was in disagreement with (26) that conducted entitled “Nurses perception of management in one Referral Hospital” and found that majority of nurses got on training courses at hospital.

Regarding perception of nurses about responsibility at work, the current study revealed that half of participants reported that managers and leaders’ responsibilities are known to all, and two fifth of participants reported that never involved in making decisions.

This result was accordance with (27) that conducted entitled Clinical Nurses’ Perceptions of Authentic Nurse Leadership and Healthy Work Environment and found that majority of managers had all responsibility and their nurses not involved in decision making. Conversely, this result was in disagreement with (28) that conducted entitled “How staff nurses perceive the impact of nurse managers’ leadership style in terms of job satisfaction” and found that majority of nurse manager involved their nurses in decision making.

**Conclusion**

The current study concluded that: Nearly half of nurses (48%) had average level of satisfaction and 58% of them had unsatisfied level according to their performance while 42% of them had satisfied level according to their performance. 40% of nurses had average level of perception of management and leadership skills, and 36% of them had negative level of perception, while 24% of them had positive level of perception. 38% of patients had fair level about their evaluation, 33% of them had excellent level about their evaluation to quality of health care, and 29% of them had average level and 41% of them had negative level of satisfaction.

**Recommendation:** In the light of results of this study, the following recommendations were suggested:

- Periodic assessment of nurses’ perception about quality of care of elderly patient.
- Regular implementation of training programs regarding quality of care.
- Provide continuous support for elderly to enhance their quality of care.
- Investigating the effect of quality of care on elderly satisfaction.
- Further studies should be conducted in different settings.

**Ethical Clearance:** Taken from ethical research committee, faculty of nursing Beni-Suef University, Egypt.

**Conflict of Interest:** No conflict of interest

**Source of Funding:** Self-funding

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Effect of Nursing Guideline about Genital Human Papilloma Virus Infection on Knowledge and attitude of Female University Students

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Abstract

Human papillomavirus (HPV) is a DNA tumor virus that is the primary cause of sexually transmitted infections (STIs). The present study aimed to evaluate the Effect of nursing guideline about genital Human papilloma virus infection on Knowledge and attitude of female university students.

Sample Type: A convenience sampling technique. Research design: Quasi-experimental design was used in this study. Setting: at Faculty of nursing in Alexandria University.

Sample Size: Total sample size was two hundred seventy five (275) female students. Data was collected by, 1): An Arabic structured Interviewing Questionnaire. 2) Follow up sheet and 3) likert Scale. Results: the result of the present study findings had revealed that a highly significant improvement in total knowledge and attitude among the studied sample pre–nursing guideline compared to immediate and 6 months post- nursing guideline P = < 0.01. The majority of studied sample satisfied with the advanced knowledge included in the nursing guideline.

Conclusion: The present study findings concluded that a significant improvement among studied sample’s knowledge and attitude after implementation of guideline.

Recommendations: There is a need for awareness campaigns to improve the poor knowledge of female university students in order to change behavior and reduce risk of HPV infection so that they will take the HPV vaccine. As a step towards prevention of cervical cancer.

Keywords: Human papillomavirus-Nursing guideline–knowledge-attitude.

Introduction

Human papillomaviruses (HPV) are the most common sexually transmitted infection(1). Worldwide, 50%-80% of sexually active individuals will acquire an HPV infection in their lifetime. Almost 95% of all cervical cancer cases are linked to HPV and the majority of all HPV-associated morbidity and mortality is due to cervical cancer. According to(10) Human papilloma virus infection cause approximately 5% of all cervical cancers worldwide. There are approximately 530,000 new cases of cervical cancer a year attributable to HPV and 265,700 deaths per year and there are wide disparities in the burden of cervical cancer(8).
(smoking and Alcohol intake), Mode of infection pathway, Long-term use of oral contraceptives, Immunosuppression and Sexually transmitted infections (STI)[15]. The two most common clinically significant manifestations of genital HPV infection are Genital warts that are visualized without magnification, and cervical cellular abnormalities that are detected by Pap test screening[12].

Human papilloma virus infection (HPV), diagnosed through, Pap smear, cytology screening and HPV test. All HPV screening tests right now are being used depending on the identification of viral nucleic acids based on the fact that HPV can’t be cultured[11]. The successful management of HPV infection focused on medical therapy and surgical therapy[2]. Therefore nursing guideline can be applied through different nursing roles (nurse as counselor, nurse as a researcher, and nurse as caregiver/care provider & nurse as educator[9]). Therefore nursing guideline can be applied through different nursing roles (nurse as counselor, nurse as a researcher, and nurse as caregiver/care provider & nurse as educator[3]).

Aim of the Study: was to evaluate the Effect of nursing guideline about genital Human papilloma virus infection on Knowledge and attitude of female university students.

Research Hypothesis: University Female Students who receive the nursing guideline will have high Knowledge and attitude regarding genital Human papilloma virus infection.

Methodology

A. Research design: Quasi-experimental design was used in this study

B. Setting: The study was conducted at Faculty of nursing in Alexandria University.

Sample Type: A convenience sampling technique

Sample size: Total sample size was two hundred seventy five (275), all female students of first and second academic year in faculty of nursing at Alexandria University

• These numbers were determined based on a convenience total number of female students enrolled in first and second academic year (2018-2019)

Sample Criteria: All female University students from the first and the second academic year.

Sample: The sample included all female students from first and second academic year at faculty of nursing in Alexandria University during 1year started from 9/2/2019 to 9/2/2020.

Tools of Data Collection:

Tool I: An Arabic structured Interviewing Questionnaire:

It divided into three parts as follow:

• Part I: assessed student’s general characteristics included in the study as Personal data of the study sample: such as age, level of education, marital status.
• Assess pervious obstetrical and gynecological history.
• Part II: HPV Knowledge Questionnaire
• It was developed by the researcher depending on the literature review. This part was used to assess students’ knowledge regarding genital Human papilloma virus infection and its vaccination that included the following:(definition, method of transmission, Risk factors of Human papilloma virus, method of prevention, complications of it and routine examination, the vaccine and doses of vaccine)

Scoring System for knowledge: The female student’s knowledge would be checked with a model key answer Zero grade would be given to uncorrected answer and one grade would be given to corrected answer. Accordingly the female students total knowledge will be categorized into either satisfactory level of knowledge (>60%), and unsatisfactory knowledge (<60%).

Tool II: Likert Scale: It was developed by the researcher depending on the literature review to evaluate attitude of Females student’s towards human papilloma virus infection before and after using guideline, level of attitude was assigned to each answer representing Agree, Uncertain, and disagree.

Scoring System: The total score of attitude rating scale was 39 grade. each statement was assigned a score according to female students attitude, response were” agree”, “uncertain”, “disagree” and were scored 3, 2 and 1 respectively. The score of the items were summed-up
and total divided by the number of the items, given a mean score for attitude. These scores were converted into a percent score. The attitude was considered positive if score ≥ 80% (score more than 31.2 grade from 39), negative attitude if score > 80% (score less than 31.2 grade from 39).

Supportive material: Nursing guidelines were designed by the researcher based on the identified need post the assessment of knowledge and attitude to increasing perception of female students about genital Human papilloma virus Infection and the importance of the screening and the vaccination.

Content validity and reliability: The tools of data collections were developed by the researcher and reviewed for appropriateness of items and measuring the concepts through jury of three specialized university Prof at faculty of nursing, Ain shams University to assure content of validity of the questionnaire then accordingly to their comments, modification were considered. On the other hand there were Reliability was done by Cronbach’s Alpha coefficient test which r=0.79.

Ethical Consideration:
• The research approval was obtained from Scientific Research Ethical committee in Faculty of nursing at Ain Shams University before starting the study.
• The aim of the study was explained to each student before applying the tools to gain her confidence and trust.
• An oral consent was obtained from each student prior to participate in the study.
• Data was confidential and using coding system for it. The study did not cause any harmful effects on participating students. Each student has right to withdraw from the study at any time.

II- Field work: Would be included preparatory phase, implementation phase, Evaluation phase and follow up phase.

a) Preparatory phase: Reviewing of the current local and international related literature using books, articles and scientific magazines will be done by the researcher to be acquainted with the problem and guided them in the process of tools’ designing of data collection and designed an instructional supportive guideline.

- Administrative Design: An official written approval letter clarifying the purpose of study was obtained from Dean of Faculty of Nursing Ain Shams University and Dean of Faculty of Nursing Alexandria University.

Pilot study: A pilot study was conducted for 10% from total number of sample to evaluate the simplicity and clarity of tools that was used in the study.

b) Implementation phase: At the first the researcher was obtain oral consent after explain aim of the study and explained how to fill the tools.
• The researcher was attended the previous mentioned study setting for five days per week (from 8 am to 2 pm).
• The researcher was interviewed 55 female students nurses/day according to sequence of their attendance in collage and explain the aim of the study to female students nurses (duration of each interview 20 min). The researcher was completed the tool by interviewing the students.
• The assessment phase was started using the data collection tools for 6 months which comply with the nursing guideline to assess female students’ knowledge and attitude related to Human papilloma virus infection
• After the completion of assessment, Nursing guideline was designed and implemented about genital Human papilloma virus infection on perception of female university students’ during five sessions, each session ranged from 20 to 30 mints.

d) Follow-up: Follow up for female students after receiving nursing guideline session to find out the effect of it after 6 month.

IV- Data management and analysis: The appropriate statistical method and tests will be used for analysis of results, presented in tables, figures and graphics as required.
## Results

### Table (1): Number and Percentage Distribution of the studied students according to their General Characteristics. (N=273)

<table>
<thead>
<tr>
<th>General Characteristics</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-</td>
<td>116</td>
<td>16.1</td>
</tr>
<tr>
<td>19- 20</td>
<td>157</td>
<td>57.5</td>
</tr>
<tr>
<td>x 19.1±1.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>200</td>
<td>73.3</td>
</tr>
<tr>
<td>Urban</td>
<td>73</td>
<td>26.7</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>253</td>
<td>92.7</td>
</tr>
<tr>
<td>Married</td>
<td>20</td>
<td>7.3</td>
</tr>
<tr>
<td>Academic Year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First year</td>
<td>120</td>
<td>43.9</td>
</tr>
<tr>
<td>Second year</td>
<td>153</td>
<td>56.1</td>
</tr>
</tbody>
</table>

### Table (2): Gynecological history of the studied students (N=273)

<table>
<thead>
<tr>
<th>Gynecological history regarding associated Problems</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suffering from symptoms during menstruation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>95</td>
<td>34.8</td>
</tr>
<tr>
<td>Yes (178)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strong abdominal cramp</td>
<td>168</td>
<td>94.4</td>
</tr>
<tr>
<td>Bleeding during the course</td>
<td>10</td>
<td>5.6</td>
</tr>
<tr>
<td>History of vaginal infections symptoms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>197</td>
<td>72.2</td>
</tr>
<tr>
<td>Yes (76):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abnormal Vaginal secretions</td>
<td>58</td>
<td>76.3</td>
</tr>
<tr>
<td>Itching</td>
<td>18</td>
<td>23.7</td>
</tr>
<tr>
<td>Redness or swelling of the external genitalia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>12</td>
<td>4.4</td>
</tr>
<tr>
<td>No</td>
<td>261</td>
<td>95.6</td>
</tr>
<tr>
<td>Family history of cervical cancer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>271</td>
<td>99.3</td>
</tr>
<tr>
<td>Yes :</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cervical Cancer</td>
<td>2</td>
<td>0.7</td>
</tr>
</tbody>
</table>
Table (3): Number and Percentage Distribution of the studied students according to their knowledge about the important of early detection & screening tests of genital human papilloma virus infection (HPV) pre, post and follow up application nursing guidelines. (N=273).

<table>
<thead>
<tr>
<th>Students knowledge related to HPV</th>
<th>Pre- application Nursing guidelines</th>
<th>Immediate post-application Nursing guidelines</th>
<th>Follow up after 6 month</th>
<th>Friedman test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Correct &amp; don’t know</td>
<td>Correct &amp; don’t know</td>
<td>Correct &amp; don’t know</td>
<td>X²</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Is early detection of HPV accelerate the process of recovery and reduce the complication of the disease.</td>
<td>48.7 &amp; 51.3</td>
<td>91.6 &amp; 8.4</td>
<td>85.3 &amp; 14.7</td>
<td>10.566</td>
</tr>
<tr>
<td>Diagnostic tests for HPV infection</td>
<td>0.7 &amp; 99.3</td>
<td>74.7 &amp; 25.3</td>
<td>73.3 &amp; 26.7</td>
<td>9.301</td>
</tr>
<tr>
<td>Suitable age for women to start a Pap smear test</td>
<td>4 &amp; 96</td>
<td>88.3 &amp; 11.7</td>
<td>81.3 &amp; 18.7</td>
<td>12.021</td>
</tr>
<tr>
<td>Can HPV infection cause cervical cancer.</td>
<td>1.8 &amp; 98.2</td>
<td>70.7 &amp; 29.3</td>
<td>65.9 &amp; 34.1</td>
<td>7.379</td>
</tr>
<tr>
<td>HPV test used to indicate human papillomavirus vaccine is needed</td>
<td>1.8 &amp; 98.2</td>
<td>50.2 &amp; 49.8</td>
<td>54.9 &amp; 45.1</td>
<td>8.807</td>
</tr>
<tr>
<td>Can be HPV infected both men &amp; women</td>
<td>7 &amp; 93</td>
<td>83.9 &amp; 16.1</td>
<td>76.9 &amp; 23.1</td>
<td>11.396</td>
</tr>
</tbody>
</table>

Table (3): Number and Percentage Distribution of the studied students according to their knowledge about vaccination for genital human papilloma virus infection pre, post and follow up nursing guidelines. (N=273)

<table>
<thead>
<tr>
<th>Students knowledge related to HPV</th>
<th>Pre-Nursing guidelines</th>
<th>*Immediate Post application Nursing guidelines</th>
<th>Follow up after 6 months</th>
<th>Friedman test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Correct &amp; don’t know</td>
<td>Correct &amp; don’t know</td>
<td>Correct &amp; don’t know</td>
<td>X²</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Suitable age for female against HPV vaccination</td>
<td>3.7 &amp; 96.3</td>
<td>69.6 &amp; 30.4</td>
<td>73.3 &amp; 26.7</td>
<td>11.300</td>
</tr>
<tr>
<td>Vaccination take only for protection form HPV</td>
<td>3.7 &amp; 96.3</td>
<td>83.5 &amp; 16.5</td>
<td>86.1 &amp; 13.9</td>
<td>9.556</td>
</tr>
<tr>
<td>How many Doses for used vaccination for protection HPV infection</td>
<td>4 &amp; 96</td>
<td>91.6 &amp; 8.4</td>
<td>91.6 &amp; 8.4</td>
<td>16.584</td>
</tr>
<tr>
<td>Sites of injection for HPV vaccine</td>
<td>12.1 &amp; 87.9</td>
<td>88.3 &amp; 11.7</td>
<td>86.8 &amp; 13.2</td>
<td>10.664</td>
</tr>
<tr>
<td>Side effects of vaccination</td>
<td>3.3 &amp; 96.7</td>
<td>36.6 &amp; 63.4</td>
<td>44 &amp; 56</td>
<td>13.784</td>
</tr>
<tr>
<td>Barrier before vaccination</td>
<td>2.9 &amp; 97.1</td>
<td>51.3 &amp; 48.7</td>
<td>53.1 &amp; 46.9</td>
<td>8.145</td>
</tr>
</tbody>
</table>

Table (4): Percentage Distribution of the studied students according to their attitude about genital Human papilloma virus infection pre and follow up after 6 month nursing guidelines. (N=273)

<table>
<thead>
<tr>
<th>Student attitude</th>
<th>Pre-Nursing guidelines</th>
<th>Follow up after 6 month</th>
<th>Friedman test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Agree &amp; Disagree</td>
<td>Agree &amp; Disagree</td>
<td>X²</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Student believe that, HPV Education should be implemented at school &amp; university</td>
<td>5.8 &amp; 54.6</td>
<td>39.6 &amp; 20.5</td>
<td>42.9</td>
</tr>
<tr>
<td>Student believe that HPV virus is serious and life threatening</td>
<td>7.9 &amp; 43.6</td>
<td>38.5 &amp; 60.4</td>
<td>21.2</td>
</tr>
<tr>
<td>Student attitude</td>
<td>Pre-Nursing guidelines</td>
<td>Follow up after 6 month</td>
<td>Friedman test</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------</td>
<td>------------------------</td>
<td>-------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td>Agree %</td>
<td>Uncertain %</td>
<td>Disagree %</td>
</tr>
<tr>
<td>Student believe that HPV can cause cervical cancer</td>
<td>2.9</td>
<td>57.9</td>
<td>39.2</td>
</tr>
<tr>
<td>Student believe that you are susceptible for the HPV infection and must get the vaccine</td>
<td>9.5</td>
<td>50.2</td>
<td>40.3</td>
</tr>
<tr>
<td>HPV vaccination is not necessary because a Pap test can be done to rule out cervical cancer</td>
<td>35.5</td>
<td>29.3</td>
<td>35.2</td>
</tr>
<tr>
<td>Women are worried to get a Pap test</td>
<td>24.2</td>
<td>38.8</td>
<td>37</td>
</tr>
<tr>
<td>HPV vaccination is important for cervical cancer prevention</td>
<td>23.8</td>
<td>37</td>
<td>39.2</td>
</tr>
<tr>
<td>Student believe that, vaccine may be seen as not a risky</td>
<td>25.5</td>
<td>37</td>
<td>35.5</td>
</tr>
<tr>
<td>Student believe that, HPV vaccination given will be impressed that have sexually active</td>
<td>26.1</td>
<td>53.8</td>
<td>21.1</td>
</tr>
<tr>
<td>Student worry about potential side effects from HPV vaccine</td>
<td>33</td>
<td>30.8</td>
<td>36.2</td>
</tr>
<tr>
<td>Student would recommend this vaccine for my female college friends</td>
<td>30.4</td>
<td>34.8</td>
<td>34.8</td>
</tr>
<tr>
<td>It is preferable to vaccinate both male &amp; woman</td>
<td>26.1</td>
<td>39.6</td>
<td>34.3</td>
</tr>
<tr>
<td>Student are sure that the HPV vaccine is highly effective</td>
<td>39.9</td>
<td>24.9</td>
<td>35.2</td>
</tr>
</tbody>
</table>

Table (1) demonstrate that, 57.5% of the studied students their age ranged between 19-20 years, the mean of age of them was 19.1±1.3 year. In relation to the academic year of the students under study. Moreover, 71.8% of the studied students their family income were not enough.

Table (2) illustrated that 60% of students have obstetric history and 41.7% of them delivered. In addition to, number of abortion among studied students represent 58.3%. Concerning mode of delivery revealed that 40.0% & 60.0% have normal Vaginal Delivery and Lower segment Cesarean Section respectively.

Table (3): demonstrated that, there was a marked improvement in knowledge about screening tests of genital human papilloma virus infection of the studied students post implementation of nursing guidelines with highly statistically significant difference at (P= < 0.01) between pre, post and follow up implementation of nursing guidelines.

Cont.Table (3): showed that, there was a marked improvement in knowledge about vaccination for genital human papilloma virus infection of the studied students post implementation of nursing guidelines with statistically significant difference at (P= < 0.05) between pre, post and follow up implementation of nursing guidelines.

Table (4) revealed that, there was a marked improvement in attitude about genital human papilloma virus infection of the studied students post implementation of nursing guidelines with highly statistically significant difference at (P= < 0.01) & (P= < 0.05) between pre, post and follow up implementation of nursing guidelines.

Discussion
In relation to the general characteristics of the studied students, the current finding revealed that more than half of them were between 19 to 20 years old. Concerning residence, nearly three –quadrant of the studied students from rural area. While, the majority of studied students were single. This finding agree with (4) who conducted a study on knowledge, attitude and practices regarding human papilloma virus among female students at the University of Namibia reported that the majority of participants were nursing students, below 25 years and, single. Concerning gynecological history of the studied students, the current study showed that more than two third of studied students have symptoms during menstruation and the most dominant symptoms were strong abdominal cramp. While more
than two third of sample didn’t have symptoms of vaginal infection. Moreover, the present study was disagreed with (7), who carried out study on Factors Influencing Uptake of Cervical Cancer Screening among Female Health Workers in University of Port Harcourt Teaching Hospital, Rivers State who reported that more than one-tenth had a family history of cervical cancer among young women. This might be because the lack of research studies and health education program introduced to these groups in these areas and the higher incidence rate in Port Harcourt.

In relation to Knowledge about genital Human papilloma virus infection, the present findings revealed that, the majority of the students had poor knowledge about genital human papilloma virus infection (HPV), the important of early detection, screening tests and vaccination for genital human papilloma virus infection before application nursing guideline, which improved drastically immediately post application nursing guideline. This improvement of knowledge might be the effect of the nursing guideline on their knowledge. The findings of the current study are similar to the (13), who had done a study in North Carolina about an educational intervention to improve human papilloma virus (HPV) and cervical cancer knowledge among African American college students, they found that, there was a highly significant improvement of students’ knowledge because students didn’t have knowledge pre intervention compare post intervention, the majority of students reported knowledge of the HPV vaccine with the intervention & students’ knowledge score, correct response rates significantly increased with the intervention.

The present study findings revealed that a highly significant improvement in students’ total attitude scores about genital Human papilloma virus infection after 6 months guideline application compare to pre–application, this improvement of students’ attitude could be explained by nursing guideline that play a major role in health education, promotion and provide a comprehensive, important & complete information about HPV infection. Similar findings were obtained in a study of Human papillomavirus knowledge, attitudes, and vaccination among Chinese college students in the United States (14), who found that utilized guideline was a highly significant improved student’s attitude post application nursing guideline. Moreover, these results are in agreement with a study related to Awareness, knowledge, attitude and practices regarding human papilloma virus among female students at the University of Namibia (4), who stated that there was an improvement in student’s total attitude scores after conduction of nursing guideline and positive attitude towards HPV.

Finally the present study findings highlight attention toward the effectiveness and practicability of the implemented the present study guideline to student’s nurses as a method for continuous updating and improved their knowledge and attitude to promote and improve their competences.

**Conclusion**

In conclusion, based on students’ knowledge and attitude regarding genital HPV infection and its vaccine, the majority of students not knowing and have negative attitude before application nursing guideline. While immediate and follow-up after 6 months application of nursing guideline, there were highly significant improved in knowledge and positive attitude. So the present study hypothesis was significantly approved with the aim of the present study.

**Recommendations:**

In the light of the study results, the study recommended the following:

- There is a need for raise on awareness campaigns to improve the poor knowledge of female university students and reverse the common attitude, adolescents should be provided with statistics showing how prevalent is HPV at an early age, in order to change behavior and reduce risk of HPV infection so that they will take the HPV vaccine. As a step towards prevention of cervical cancer.
- Curriculum development and integrate the topic of Human papilloma virus infection and vaccination to increase students understanding about HPV and to promote positive attitudes towards preventive health behaviors.
- Further researches are needed on a wide scale to assess What factors that affects the knowledge so that, not only young women, but all adolescents students will get inspired to prevent risk of HPV infection and use vaccination.

**Ethical Clearance:** Taken from the Scientific Research Committee at the Faculty of Nursing, Ain Shams University.
Source of Funding: Self

Conflicts of Interest: Nil

References


An Updated Review on Some Neurotoxic Pharmacological Agents Along with their Neurotoxic Mechanisms

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Abstract

This review will provide the vital information about some pharmacological agents which are Neurotoxic. Through this update, Anti-cancer, Anti-bacterial, Analgesic, Psychoactive drug and Anabolic steroid medication are reported briefly regarding their neurotoxic mechanisms. In this review all information regarding neurotoxic drugs is collected from 2020 published work by Web of science, Scopus, PubMed and Google Scholar. It is concluded that all these drugs which the part of our study are neurotoxic. There is need to discover some methods to reduce their toxicity and to avoid the chronic use of these medications.

Keywords: Neurotoxic, Pharmacological agents, Anti-cancer, Analgesic, Antibacterial.

Introduction

Several types of drugs have side effects on brain, some are minimal, and some are toxic. Toxic effects of drug on brain can cause irreversible brain damage sometimes which are very dangerous for mental health, as any living organism can lose its life due severe neurotoxicity¹. In routine treatments we don’t know about some drugs which we are taking has negative impact on our mental health as well as on our nervous system².

Neurotoxicity is a major side effect of many chemotherapeutic drugs used for the treatment of many diseases, including tumors. Toxicity can compromise the quality of life of patients. As per previous reports 84.4% of patients which were affected by lymphoma and treated with chemotherapeutic agents developed a serious neuropathy regarding sensory organs and 43.8% showed polyneuropathy, causing a significantly dangerous for the quality of life³.

Such effects are usually cause spontaneously fade, as doses are high then chances of neurotoxicity are also high⁴. If these drugs are used at high therapeutic levels for longtime, the plasticity of the neurons is affected badly, and the damage becomes irreversible sometimes⁵.

Neurotoxicity is one of the main reasons of drug withdrawal, and the biological experimental method of evaluating neurotoxicity are time taking and arduous. Many Anti-biotic, Analgesic are also showed their neurotoxicity due to their cytotoxic and neurochemical disturbing mechanisms ⁶.

In this updated review, adverse effects of some drugs that cause neurotoxicity are explained individually. These updates are collected from recently published work in 2020. Among these drugs, anti-cancer, anti-bacterial, Analgesic, Psychoactive drug and Anabolic steroid medication are reported briefly. Table 1 is showing summarized report regarding some neurotoxic drugs with their mechanism.

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Table 1: Neurotoxic Drugs with mechanisms

<table>
<thead>
<tr>
<th>Drug</th>
<th>Class</th>
<th>Neurotoxic Mechanism</th>
<th>Year of Publish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bortezomib</td>
<td>Anti-cancer</td>
<td>Apoptosis in PC12 is a cell line derived from a pheochromocytoma of the rat adrenal medulla, that have an embryonic origin from the neural crest that has a mixture of neuroplastic cells and eosinophilic cells.</td>
<td>2020</td>
</tr>
<tr>
<td>Doxorubicin</td>
<td>Anti-cancer</td>
<td>It Interact with nuclear DNA and impairing expression of proteins synthesis, involved in mitochondrial functions</td>
<td>2020</td>
</tr>
<tr>
<td>Cisplatin</td>
<td>Anti-cancer</td>
<td>It also interreacts with DNA, forms crosslinks in between chains and induces apoptosis. It can cause Central and Peripheral neuropathy</td>
<td>2020</td>
</tr>
<tr>
<td>Carboplatin</td>
<td>Anti-cancer</td>
<td>Inhibition of the DNA repair pathways, generation of DNA adducts in brain cells</td>
<td>2020</td>
</tr>
<tr>
<td>Oxaliplatin</td>
<td>Anti-cancer</td>
<td>Alterations in voltage-gated sodium channel kinetics, Potassium channel blockade, Calcium chelation and sensory axonal nerve damage</td>
<td>2020</td>
</tr>
<tr>
<td>Ifosfamide</td>
<td>Anti-cancer</td>
<td>Ifosfamide inhibits the DNA functions and induces cell death.</td>
<td>2020</td>
</tr>
<tr>
<td>5-Fluorouracil</td>
<td>Anti-cancer</td>
<td>Interferences with DNA synthesis; inhibits of thymidylate synthase; blocks of thymidine formation</td>
<td>2020</td>
</tr>
<tr>
<td>Novel Methcathinones</td>
<td>Psychoactive drug</td>
<td>Mitochondrial toxicants whose toxicity is increased by shifting the temperature from 37 to 40.5 °C (Hyperthermia)</td>
<td>2020</td>
</tr>
<tr>
<td>Methotrexate</td>
<td>Anti-cancer</td>
<td>Inhibition of the enzyme dihydrofolate reductase; interference with DNA synthesis, DNA repair, cellular replication, protein synthesis, lipids and myelin metabolism. motor and autonomic neuropathy)</td>
<td>2020</td>
</tr>
<tr>
<td>Cefepime</td>
<td>Anti-Bacterial</td>
<td>Cross the blood brain barrier and cause depressed concentration of consciousness, confusion, aphasia, asterixis, myoclonus, dystonia, seizure in 23.2% population.</td>
<td>2020</td>
</tr>
<tr>
<td>Nandrolone decanoate</td>
<td>Anabolic steroid medication</td>
<td>Oxidative stress, inflammation, and intrinsic and extrinsic apoptosis in the hippocampus and PFC of rats</td>
<td>2020</td>
</tr>
<tr>
<td>Cannabis</td>
<td>Psychoactive drug</td>
<td>Apoptosis in the hippocampus and PFC of rats</td>
<td>2020</td>
</tr>
<tr>
<td>Tramadol</td>
<td>Analgesics</td>
<td>It can trigger the microgliosis and astrogliosis along with neuronal death in the prefrontal cortex</td>
<td>2020</td>
</tr>
<tr>
<td>N-Ethylhexedrone and buphedrone</td>
<td>Novel Psychoactive Substances</td>
<td>Neuro-microglia dysfunctionalities</td>
<td>2020</td>
</tr>
</tbody>
</table>

**Bortezomib:** Bortezomib is an anti-tumor agent that inhibits 26S proteasome degrading proteins. While apoptotic transcription activation in response to bortezomib has also been observed, mechanisms regarding influence on gene silencing mediated regulation by non-coding RNAs remain not fully explained. Bortezomib showed the severe neurotoxicity through apoptosis in PC12 cells. It imparts neurotoxicity regardless of cell density. Some studies also showed that, highest cytotoxicity in low cell density, bortezomib more frequently cause major peripheral neuropathy, only few of studies have reported the effective strategy to prevent its side effect.

**Doxorubicin:** Doxorubicin is the most potent anthraecline antibiotics used for treatment of multiple cancer types including breast cancer therapy. But its efficacy is limited by fatal toxicities associated with therapy causing damage to normal tissues and organs. It Interacts with nuclear DNA, altering the pair base sequence and preventing the topoisomerase-II-mediated DNA repair mitochondrial DNA, impairing expression of proteins involved in mitochondrial functions.

**Cisplatin:** Cisplatin is an anti-cancer drug it interreacts with DNA, forms crosslinks between chains and induces apoptosis. Central or Peripheral neuropathy, 50–85% score of sensory and sensorimotor neuropathy. Oxidative stress, generation of DNA adducts, apoptosis, mitochondrial dysfunction are also among its neurotoxic mechanisms. Cisplatin also react with RNA but the ration of modified molecules to the total number of the
same molecular species in the cell is much higher in the case of DNA molecules, binding of this agent to the DNA is the main cause of its toxicity\textsuperscript{13}.

**Carboplatin:** Carboplatin is widely used agent to treat the various types of cancer. However, a number of severe side effects induced by the nonspecific binding of platinum drugs to normal tissues limit their clinical use\textsuperscript{14}. This drug is also involved in inhibition of the DNA repair pathways, generation of DNA adducts and cause severe neurotoxicity\textsuperscript{3,15}.

**Oxaliplatin:** Oxaliplatin is involved in acute neuropathy upon exposure to chronic peripheral neuropathy, in which sensory axonal nerve abnormal generation of DNA adducts is occurred. Mostly due to alterations in voltage-gated sodium channel kinetics, Calcium chelation and Potassium channel blockade\textsuperscript{3}. Peripheral neurotoxicity is a main toxicity that afflicts up to 90\% of patients with colorectal cancer which are taking oxaliplatin-containing therapy\textsuperscript{16,17}.

**Ifosfamide:** Ifosfamide is an alkylating agent used in the treatment of various solid tumors, including small cell lung cancer, testicular cancer, cervical cancer, and sarcoma\textsuperscript{18}. It is a pro-drug, that after bioactivation, inhibits the DNA functions and cause cell death\textsuperscript{3}. Chloroacetaldehyde (metabolite responsible for neurotoxicity) inducing many damages to the mitochondrial respiratory chain depletion of glutathione level in central nervous system and also creating oxidative stress\textsuperscript{19}.

**5-Fluorouracil:** This drug also reacts with DNA synthesis and inhibits of thymidylate synthase which blocks the thymidine formation. Seldomly sensorimotor polyneuropathy is observed during treatment with 5-Fluouracil\textsuperscript{20}. Maximum doses and combined use of 5-FU with interferon alpha increases the neurotoxicity. It impairs the urea cycle and permits an accumulation of ammonia a transient stagnation of 5-FU catabolites induces neurotoxicity. This drug can increase the cellular thiamine metabolism, inducing a thiamine deficiency\textsuperscript{3,21}.

**Novel Methcathinones:** These are mitochondrial toxicants whose toxicity is increased by transferring the temperature from 37 to 40.5\(^\circ\)C. It can cause apoptosis and necrosis among brain cells\textsuperscript{32}. The activation of proper defense mechanisms like autophagy is necessary to prevent the cell dysfunction and cell death. Mitochondrial toxicity, which is accentuated by hyperthermia, represents an important mechanism of the neural toxicity of these compounds\textsuperscript{23}.

**Methotrexate:** Methotrexate is a folic acid antagonist for the treatment of cancer and rheumatoid arthritis because of its high potency and efficacy\textsuperscript{24}. It inhibits the enzyme dihydrofolate reductase which interference with DNA synthesis, DNA repair, protein synthesis, cellular replication, lipids and cause autonomic neuropathy\textsuperscript{25}. Aseptic meningitis occurs in 10–50\% of patients due to influence of this drug. Disturbances of myelin metabolism, inhibition of glucose metabolism, oxidative stress\textsuperscript{3,26}.

**Cefepime:** Cefepime is an antibacterial drug belongs to cephalosporins, previously its concentrations were determined in 584 individuals. Among 319 individuals with available through concentrations included, the overall incidence of neurotoxicity was 23.2\% (74 of 319 individuals). Maximum cefepime plasma trough concentrations were significantly associated with risk of neurotoxicity\textsuperscript{27}. Possible adverse neurological effects based on the occurrence of neurological signs (altered mental status, depressed concentration of consciousness, aphasia, myoclonus, asterixis, confusion, seizure, dystonia\textsuperscript{28}.

**Nandrolone decanoate with Cannabis:** These are psychoactive drugs. Polydrug use among adolescence is a widespread activity and has enhanced in the last some years\textsuperscript{29}. Most nandrolone decanoate abusers combine its use with cannabis. Abuse of both drugs conferred larger neurotoxic effects than either drug alone that were at least partially attributed to inflammation, oxidative stress, and apoptosis in the hippocampus and prefrontal cortex of brain in rats\textsuperscript{30}.

**Tramadol:** Tramadol is a synthetic analogue of codeine that is prescribed for the treatment of moderate pains as an analgesic\textsuperscript{31}. It has also some side effects including emotional instability and anxiety. It triggers astrogliosis and microgliosis along with neuronal death in the prefrontal cortex\textsuperscript{32}. Behavioral problems and cognitive function impairment are other side effects of tramadol. Previous results indicate that tramadol is responsible for neurodegeneration in the prefrontal cortex through activation of neuroinflammatory response\textsuperscript{33}.

**Cathinones N-Ethylhexedrone and buphedrone:** N-Ethylhexedrone and buphedrone are emerging synthetic cathinones\textsuperscript{34}. Small information about their negative effects within central nervous system. These drugs showed in vivo/in vitro neurotoxicity’s but
enhanced specific N-Ethylhexedrone induced behavioral and neuro-microglia abnormalities.

**Conclusion**

Due to reported neurotoxic mechanisms of all discussed drugs in this review, it is concluded that long term use of these medication can cause brain damaged. There is need to find some method to overcome the neurotoxic effects of all these drugs.

**Source of Support:** We acknowledge USM (Universiti Sains Malaysia) fellowship scheme support for Muhammad Irfan Bashir.

**Conflict of Interest:** No any conflict of interest

**Ethical Declaration:** This is a review article so there is no need to get its ethical approval.

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Effects of Pigeon PEA (Cajanus Cajan) Consumption to Decrease Blood Pressure on Elderly Hypertension in the Region of Barana Health Center of Jeneponto

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Abstract

Hypertension is a high-risk condition that causes of deaths, stroke, and coronary heart disease. This study aims to determinethe effect of giving pigeon pea (Cajanus cajan) baruasa on systolic and diastolic blood pressure of elderly with hypertension.

The research is quasy experimental design with pre-post test group. A total of 36 elderly people with hypertension were divided into intervention group and control group by random sampling. Data were analyzed using Mann-Whitney and Wilcoxon with 95% confidence level.

The results of this study indicate that: There is an effect giving pigeon pea (Cajanus cajan) baruasa on the systolic blood pressure of elderly with hypertension (p = 0.001 <0.05); (4) There is an effect giving pigeon pea (Cajanus cajan) baruasa to the diastolic blood pressure of elderly with hypertension (p = 0.001 <0.05).

The conclusion of this study that consumption of pigeon pea (Cajanus cajan) baruasa can reduce of blood pressure on elderly hypertensive in Jeneponto district.

The suggestions for researcher presumably can further investigate the influence of pigeon pea baruasa on blood pressure in elderly man with hypertension and long storage time (expiration date) of pigeon pea baurasa.

**Keywords:** Cajanus cajan, Blood Pressure, Elderly, Baruasa.

Introduction

Aging is a process of change that is thorough and spontaneous that starts from cooked-childhood, puberty, adulthood young and then declined in the mid to advanced age. The increase in the population of advanced age (elderly) has become the focus of which attracts attention in countries growing because of the numbers of hope alive that maki increase.¹

In 2050 it is estimated that around 75% of the elderly suffer from degenerative diseases with conditions that cannot be active freely.² One of the most common chronic diseases affecting the elderly is hypertensionwhich is “the silent killer” Because of its asymptomatic nature and after several years it causes fatal stroke or heart disease.³⁴

Chinnakali et al. reported that hypertension is a high-risk condition that accounts for 51% of deaths from stroke and 45% of coronary heart disease. Cardiovascular disease is responsible for nearly 17 million deaths worldwide, with hypertension being the main contributor to more than half of these cases, which is about 55%.⁵⁶

Hypertension is associated with an increased risk of coronary heart disease, stroke, peripheral vascular disease, cognitive impairment, kidney problems, and vision problems.⁷ Also, 17-21% of the 60% of hypertension sufferers end in stroke, especially in the elderly.⁸⁹

In Indonesia, 13% of deaths among elderly people in 2002 suffered from hypertension (57.4%). This
The increasing prevalence of hypertension is considered to be a worrying problem so that public awareness and awareness in managing hypertension must be increased.10

The results of the Basic Health Research conducted by interview showed that the national tendency of hypertension had increased, namely by 7.6% in 2007, increasing to 9.5% in 2013. Furthermore, South Sulawesi province also shows a trend of increasing hypertension which is even more rapid than nationally, namely around 5% in 2007 to around 10.5% in 2013.2

In Jeneponto Regency, the number of cases of hypertension throughout 2014 was 21,703 cases.11 One of the health centers with the highest number of hypertension sufferers in the Jeneponto Regency is at Barana Health Center. Based on data obtained from PuskesmasBarana, it shows that the number of hypertension cases was quite high in 2015, namely 12.40% in the group of women ≥18 years.12 This shows that the proportion of the incidence of hypertension in the women group in the working area of the Barana Health Center is higher than the national proportion (9.5%) and even higher than the proportion at the South Sulawesi level of 10.5%.2

Pigeon pea are one of the most abundant local foods in the Jeneponto district. Pigeon pea can be processed into flour which can be used as an application in food ingredients.13 Mollik reports that gude bean (Cajanus cajan) is one of the plants that have the potential to treat hypertension. Pigeon pea (Cajanus cajan) contain minerals such as potassium, magnesium, calcium and are very low in sodium.14 A low sodium diet is one of the treatments for hypertension.15 Pigeon pea (Cajanus cajan) are also rich in antioxidants which have been shown to reduce blood pressure.16 Therefore, researchers are interested in conducting research related to the effect of gudean (Cajanus cajan) consumption on blood pressure reduction in hypertensive elderly in the working area of Barana Health Center, Jeneponto Regency.16

The general objective of this study was to determine the effect of gudean (Cajanus cajan) consumption on blood pressure reduction in hypertensive elderly in the working area of Barana Health Center, Jeneponto Regency.

Materials and Method

This study is a quasi-experimental study with pre-post test design. In this study, the treatment variables were giving Pigeon Peas (Cajanuss cajan) in the form of baruasa cake in the intervention group and giving ordinary new cakes to the comparison group, while the dependent variable was the blood pressure level (systolic and diastolic) of elderly women in the working area of the Barana District Health Center. Jeneponto.

Blood pressure measurements and interventions were carried out in the work area of the Barana Community Health Center, Jeneponto district, from January to February 2017. Gudebaruasa cake is given as much as 4 pieces @ 25 g a day for 1 month. The number of elderly people who were sampled in this study was 36 elderly who were divided into two groups (intervention group and comparison group).

Blood pressure data were obtained from the results of measuring blood pressure in the elderly using a sphygmomanometer. To determine the effect of giving pigeon pea taste and ordinary taste on systolic blood pressure in the elderly before and after the intervention, the Wilcoxon analysis was used. Meanwhile, the hypothesis test to determine the effect of giving a new taste of gudean nuts and ordinary taste on the blood pressure of the elderly in the intervention group and comparison group used Mann Whitney analysis. Likewise, to compare the consumption pattern of the elderly in the intervention group and the comparison group, the Mann Whitney test was used.

Data analysis was performed using SPSS with a confidence degree of 95%, so that if p <0.05, it can be concluded that there is a significant difference/effect.

Results

The characteristics of elderly hypertension include age, education, occupation, and marital status.
Table 1. Distribution of Elderly Hypertension Based on Characteristics at Work Area of Barana Health Center, Jeneponto Regency

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Category</th>
<th>Group</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Intervention</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n (18)</td>
<td>%</td>
<td>n (18)</td>
<td>%</td>
</tr>
<tr>
<td>Age</td>
<td>60 - 64 years</td>
<td>9</td>
<td>50</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>65 - 74 years</td>
<td>9</td>
<td>50</td>
<td>9</td>
</tr>
<tr>
<td>Education</td>
<td>No school</td>
<td>8</td>
<td>44.4</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>4</td>
<td>22.2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Junior High</td>
<td>4</td>
<td>22.2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>High school</td>
<td>2</td>
<td>11.1</td>
<td>15</td>
</tr>
<tr>
<td>Profession</td>
<td>IRT</td>
<td>13</td>
<td>72.2</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Farmer</td>
<td>5</td>
<td>27.8</td>
<td>2</td>
</tr>
<tr>
<td>Marital status</td>
<td>Not Married</td>
<td>2</td>
<td>11.1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>10</td>
<td>55.6</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Widow</td>
<td>6</td>
<td>33.3</td>
<td>3</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2017.

Table 1 shows that there is the same number of elderly aged 60-64 years and 65-74 years, both in the intervention group and the comparison group (50%). Based on the latest education of the elderly, there were more elderly who did not attend school in the intervention group, namely as many as 8 elderly (44.4%). In the comparison group, there were more elderly with senior high school education, namely 15 elderly (83.3%). Based on occupation, there were more elderly who worked as IRT, namely 13 elderly (72.2%) in the intervention group and 16 elderly (88.9%) in the comparison group. Based on marital status, no one was unmarried in the comparison group (0%), and there were 2 unmarried elderly (11.1%) in the intervention group.

The condition of elderly hypertension is divided into 3 categories, namely pre-hypertension, grade 1 hypertension, and grade 2 hypertension.

Table 2. Distribution of Elderly Based on Degree of Hypertension at Work Area of Barana Health Center, Jeneponto Regency

<table>
<thead>
<tr>
<th>Blood pressure</th>
<th>Level</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group</td>
<td>Intervention</td>
<td></td>
<td></td>
<td>Comparison</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td></td>
<td></td>
<td>n (18)</td>
<td>%</td>
<td>n (18)</td>
<td>%</td>
<td>n (18)</td>
<td>%</td>
</tr>
<tr>
<td>Systolic</td>
<td>Pre Hypertension</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>27.8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>140-159 *</td>
<td>6</td>
<td>33.3</td>
<td>8</td>
<td>44.4</td>
<td>12</td>
<td>66.7</td>
</tr>
<tr>
<td></td>
<td>≥ 160 #</td>
<td>12</td>
<td>66.7</td>
<td>5</td>
<td>27.8</td>
<td>6</td>
<td>33.3</td>
</tr>
<tr>
<td>Diastolic</td>
<td>Pre Hypertension</td>
<td>1</td>
<td>5.6</td>
<td>8</td>
<td>44.4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>90-99 *</td>
<td>1</td>
<td>5.6</td>
<td>5</td>
<td>27.8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>≥ 100 #</td>
<td>16</td>
<td>88.9</td>
<td>5</td>
<td>27.8</td>
<td>18</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2017.

Ket. * = Hypertension Grade 1

# = Hypertension Grade 2
Table 2 shows that based on systolic blood pressure, the elderly in the intervention group are mostly in the category of grade 2 hypertension, namely 12 people (66.7%) at the time before the intervention. Meanwhile, after the intervention, more elderly were in the 1st-degree hypertension category, namely as many as 8 people (44.4%). Meanwhile, the elderly in the comparison group were mostly in the grade 2 hypertension category, namely 12 people (66.7%) before the intervention. After the intervention, more elderly remained in the 1st-degree hypertension category, namely 15 people (83.3%).

Also, based on the diastolic blood pressure of the elderly in the intervention group, there were more than 16 people in the category of grade 2 hypertension (88.9%) before the intervention. Meanwhile, after the intervention, more elderly were in the prehypertension category, namely as many as 8 people (44.4%). Meanwhile, all elderly in the comparison group were in the category of hypertension grade 2 (1007%) at the time before the intervention. After the intervention, there were 3 elderly (16.7%) who switched to the category of grade 1 hypertension (table 2).

Table 3. Distribution of Elderly Hypertension according to Results Systolic Blood Pressure Measurement Pre and Post Treatment at Puskesmas Barana, Jeneponto Regency

<table>
<thead>
<tr>
<th>Group</th>
<th>Systolic Blood Pressure</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td></td>
<td>Mean ± SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Intervention</td>
<td>160.56 ± 14.33</td>
<td>145.00</td>
</tr>
<tr>
<td>Comparison</td>
<td>150.56 ± 9.37</td>
<td>151.11</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2017.

n = 18

Table 3 shows that based on the results of the Wilcoxon test, there is a significant effect on changes in systolic blood pressure before and after treatment in the intervention group (p = 0.001 <0.05) with the provision of gudea nut taste. Meanwhile, the comparison group showed an insignificant effect (p = 0.705 > 0.05) after treatment. It can also be seen that there was a decrease in the mean systolic blood pressure in the intervention group, namely 160.56 mmHg to 145.00 mmHg after treatment. Meanwhile, in the comparison group, the elderly actually experienced an increase in the mean systolic blood pressure, namely 150.56 mmHg to 151.11 mmHg after treatment.

Table 4. Distribution of Elderly Hypertension according to Results Diastolic Blood Pressure Measurement Pre and Post Treatment at Puskesmas Barana, Jeneponto Regency

<table>
<thead>
<tr>
<th>Group</th>
<th>Diastolic Blood Pressure</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td></td>
<td>Mean ± SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Intervention</td>
<td>100.56 ± 8.72</td>
<td>88.33</td>
</tr>
<tr>
<td>Comparison</td>
<td>100.00 ± 0.00</td>
<td>101.11</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2017.

n = 18

Table 4 shows that based on the results of the Wilcoxon test, there is a significant effect on changes in diastolic blood pressure before and after treatment in the intervention group (p = 0.001 <0.05) with the provision of gudea nut taste. Meanwhile, in the comparison group, it was shown that the administration of ordinary basics had no significant effect on diastolic blood pressure in elderly hypertensive people (p = 0.527 > 0.05).
It can also be seen that there was a decrease in the mean diastolic blood pressure in the intervention group, namely 100.56 mmHg to 88.33 mmHg after treatment. Meanwhile, in the comparison group, the elderly experienced an increase in the mean diastolic blood pressure, from 100.00 mmHg to 101.11 mmHg after treatment (Table 4).

Table 5. Distribution of Elderly Hypertension Based on Blood Pressure Measurement Results in the Intervention Group and the Comparison Group After Treatment at the Work Area

<table>
<thead>
<tr>
<th>Blood pressure</th>
<th>Group</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intervention</td>
<td></td>
</tr>
<tr>
<td>Systolic</td>
<td>Mean ± SD</td>
<td></td>
</tr>
<tr>
<td></td>
<td>145.00 ± 20.65</td>
<td></td>
</tr>
<tr>
<td>Diastolic</td>
<td>Mean ± SD</td>
<td></td>
</tr>
<tr>
<td></td>
<td>88.33 ± 6.76</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Comparison</td>
<td></td>
</tr>
<tr>
<td>Systolic</td>
<td>Mean ± SD</td>
<td></td>
</tr>
<tr>
<td></td>
<td>151.11 ± 6.76</td>
<td></td>
</tr>
<tr>
<td>Diastolic</td>
<td>Mean ± SD</td>
<td></td>
</tr>
<tr>
<td></td>
<td>101.11 ± 7.58</td>
<td></td>
</tr>
</tbody>
</table>

Source: Primary Data, 2017. 

Table 5 shows that based on the results of the Mann-Whitney test, there is no significant difference in systolic blood pressure between the intervention group and the comparison group with p = 0.077 > 0.05. Meanwhile, there was a significant difference in diastolic blood pressure between the intervention group and the comparison group with p = 0.000 < 0.05.

**Discussion**

Increasing age is closely related to the emergence of hypertensive conditions. This is influenced by the occurrence of arteriosclerotic wear of the main arteries, especially the aorta, and reduced flexibility. The hardening of these arteries with time will become stiffer and stiffer until the arteries and aorta lose their adaptability. Inelastic walls can no longer maintain the smooth flow of blood out of the heart, thus affecting systolic and diastolic blood pressure. 17

Some several metabolic changes and effects increase blood pressure including insulin resistance, increased oxidative stress, increased formation of advanced glycation end products (AGEs), decreased nitric oxide (NO) bioavailability, altered the renin-angiotensin system (RAS) function, and reduced-sodium excretion in the kidneys. These changes can cause endothelial dysfunction due to an increase in cytosol-free calcium vascular, and peripheral vascular resistance which results in hypertensive conditions. 17

In this study, elderly women aged 60-74 years. Elderly women are one who is at high risk of developing hypertension. After entering menopause, the prevalence of hypertension in women is higher than in men. 18 One of the mechanisms for high blood pressure in elderly women is menopause itself. During menopause, there is an increase in plasma renin activity which activates the renin-angiotensin system (RAS). 19 The genetic component of the RAS contributes to certain renin gene polymorphisms associated with hypertension in women aged 40 to 70 years, but this is not the case in men. 20

In dealing with hypertension, various solutions can be taken. However, unlike synthetic chemical drugs, the use of plants has few or no side effects. The use of natural ingredients can also be used in the treatment of hypertension. 20 In this study, the natural ingredients used are Pigeon pea (Cajanus cajan) which are made in the form of adult cakes. Giving goodeanasaas can reduce blood pressure in elderly women who have hypertension, both systolic and diastolic. In systolic blood pressure, the elderly who were given gudea taste for 1 month decreased by an average of 15.56 mmHg or about 9.69%. Meanwhile, the elderly who are given new feelings tend to experience an increase in systolic with an average of 0.55 mmHg or about 0.37%. In this study, it was found that the elderly who consumed the taste of Pigeon Peas had a significant decrease in systolic blood pressure.

Based on diastolic pressure, the elderly who were given pigeon pea flavor for 1 month also experienced a decrease with an average of 12.23 mmHg or about
Meanwhile, the elderly who consumed ordinary foods experienced an increase in diastolic blood pressure by an average of 1.11 mmHg or about 1.11%. In this study, it was found that the elderly who consumed the taste of Pigeon Pea s experienced a significant decrease in diastolic blood pressure. This shows that the use of gude bean flour in baruasa cakes can increase the nutritional content of baruasa and provide the effect of lowering blood pressure that is expected by people with hypertension.

Pigeon Pea is one of the local foods which is quite abundant in production in the place where this research was carried out. Pigeon pea, which are made in the form of baruasa cakes, are also a form of food that is very often consumed by local people. So that there are no problems related to the acceptance of the elderly.

The standard recipe for making gude bean flavoring can yield 700 grams of gude bean flavor (28 pieces @ 25 g/chip). Every 100 g of baruasa cake contains 7.37 mg of iron, 69.76 g of carbohydrates, 9.58 g of protein, 7.75 g of fat, 12.6 g of moisture, 0.31 g of ash, and 4.02 of fiber. gr (Saswini, 2015). Based on the results of research conducted by Saswini (2015), it is estimated that in 1 piece of baruasa cake with a size of 25 g contains about 2.4 g of protein.

Pigeon pea (Cajan cajan) are rich in amino acids, potassium, and antioxidants and are low in sodium. Pigeon pea contain sufficient amounts of essential amino acids, as well as tryptophan which is involved in the treatment of hypertension. Amino acids that are broken down from gude bean protein can increase insulin resistance and glucose metabolism which plays a role in lowering AGEs and oxidative stress. This results in a decrease in vascular intracellular calcium and an increase in NO synthesis which can improve endothelial function and decrease vascular resistance which then has a great opportunity to have a lowering effect on blood pressure.
Pigeon pea also have a good balance of amino acids. Pigeon pea contain phytoestrogens that have an antiangiogenetic activity which can inhibit the formation of new blood vessels. Apart from that, Pigeon Pea s are also a good source of anti-oxidants with a fairly high phenolic content.

Pigeon pea have also been shown to have high antioxidant activity and efficient free radical ability. The main antioxidants in gudean nuts are mainly phenols, phenolic acids, and their derivatives, flavonoids, tools, phospholipids, amino acids, peptides, phytic acid, ascorbic acid, pigments, and sterols. Antioxidants play a big role in inhibiting free radicals and providing protection against hypertension. This anti-oxidant diet has been shown to lower blood pressure, there is a significant difference between systolic and diastolic blood pressure before and after giving a high antioxidant diet compared to a low antioxidant diet. Flavonoids are associated with strong antioxidant activity, inhibition of platelet aggregation, and endothelial function resulting in a decrease in blood pressure.

**Conclusion and Recommendation**

The conclusions are:

1. There was no difference in blood pressure in advertisement with hypertension in the intervention group and the post-treatment group (p = 0.077 > 0.05).
2. There was a difference between diastolic blood pressure and hypertension in the intervention group and the post-treatment group (p = 0.000 < 0.05).
3. There was an effect of the large consumption of akacanggude (Cajanuschajan) on blood pressure in advertising systolic with hypertension (p = 0.001 < 0.05).
4. There was an effect of the large consumption of akacanggude (Cajanuschajan) on diastolic blood pressure with hypertension (p = 0.001 < 0.05).

The recommendations are:

1. Eat new cakes of Pigeon pea that are rich in nutritional content to lower blood pressure.
2. Make gudea fresh taste as a side cake to be consumed during a distraction because it’s easy to make and can be stored for a long time.
3. For future researchers, it is possible to:
4. To examine the effect of gudean taste on blood pressure in elderly men with hypertension.
5. Researching the length of time to store the Gude Bean Baurasa cake (expired date

**Source of Funding:** Author

**Conflict of Interest:** No

**Ethical Clearance:** Yes
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The Implementation of Minister of Health Regulation Number 001 Year 2012 Concerning Individual Health Service Referral System for National Health Insurance Patients InBirobuli Public Health Center, Palu City

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Abstract

Central Sulawesi in 2018 showed the number of outpatient visits as much as 71.8%. The number of outpatient visits to First Level Health Facilities with the highest percentage was Palu City with 711,394 cases. The number of participants of the National Health Insurance in 2019 in Palu City was 476,968 thousand. The highest number of referrals in 13 public health centers in Palu City in 2019, namely the Birobuli public health center with the highest number of per quarter I 1384 and in the second quarter as many as 1172 cases. Type of Research is a qualitative case study approach. The research informants were 7 informants. The results showed that the communication variable between the implementers was quite good in implementing the referral system but sometimes it was not consistent, there were no meetings or meetings to discuss reference standards or referral issues. In terms of infrastructure, resources are good, there is still a lack of medical personnel, there is no training regarding referral standards. The Implementers’ attitude/disposition and knowledge of medical personnel about the referral system are good. Standard Operational Procedures already exist but have not been socialized in every public health center.

Keywords: Implementation; Regulation of Minister of Health; Referral System; National Health Insurances.

Introduction

Health development is directed to increase awareness, willingness, and ability to live a healthy life for everyone so that the highest degree increase can be realized. Everyone has the right to an adequate degree of life for health and for the well-being of himself and his family including the right to food, clothing, housing and health care. Health is one of the basic needs that humans need to survive and make smart and healthy Human Resources (HR) (Soeripto, 2019)(1).

Coverage of membership in Indonesia in order to achieve Universal Health Coverage (UHC) within a period of 3 years has grown quite rapidly. During the 3-year period membership coverage continued to increase, up to 31 December 2016 it reached 171,939,254 inhabitants. The number of participants in 2015 increased by 17.51% compared to 2014 (133,423,653 inhabitants), with an average increase in the number of participants per quarter of 4.38% or 5,841,659 inhabitants. In 2016, the number of participants experienced 9.66% compared to 2015 (156,790,287 inhabitants) with an average increase in the number of participants per quarter of 2.42% or 3,787,242 inhabitants. This shows the continuing
increase in the number of guarantee participants national health (JKN) in Indonesia\(^2\).

Health services in Indonesia are implemented in stages, starting from basic health services by first-level health facilities. Second level health services can only be provided on referral from first level health services. Third level health services can only be provided on referral from second level or first level health services, except in emergencies \(^2\)(\(^3\)).

The first level health facility is expected to optimize its function as a gatekeeper who can control referrals and streamline the cost of health services. Case of referral to secondary services for cases that should be completed in primary services is still quite high which exceeds the value of outpatient referral ratio First, the optimal set by the social insurance administering organization (BPJS), which is 15\(^\%\)\(^2\)(\(^4\)).

Based on the number of references quarter I in 13 public health Centers in palu city in 2019 obtained 3 public health center with the highest number of 3 namely Birobuli 1384, Kamonji public health center 1255, Singgani public health center 1205. And in quarter II obtained 3 public health center with the highest number 3 namely Birobuli public health center as many as 1172 cases, Kamonji public health center as many as 1168, Nosarara public health center as many as 1165. This shows that birobuli health center continues to experience an increase in the number of referrals.

This research was conducted with the aim of explaining the implementation of Minister of Health Regulation Number 001 of 2012 Concerning Individual Health Service Referral System for National Health Insurance Patients in Birobuli, Public health center in palu city.

Method

This research is a qualitative research with a case study approach. The sampling technique in this study used purposive sampling with a total of 7 informants. The study was conducted at the Birobuli Public Health Center in Palu City. Data collection is done by indepth interviews using interview guidelines, observation, and documentation. And using complementary instruments include stationery, recording equipment, cameras, and field notes.

Data presentation techniques in the form of narratives and are equipped with a matrix of research results.

Result and Discussion

Communication between implementers:

Communication that is established between health workers regarding the implementation of the referral system that communication is established between medical personel (doctors) as a determinant of referrals, referral managers who will make online referrals after patients receive services but here are still less than optimal because each medical person is still difficult and feel uneasy (indifferent) where referral managers often get referred patients who should still be able to be handled at the health center but are referred by doctors but the referral manager does not question this because they assume only have authority as input referrals and doctors who still have an understanding that what is the right to give a referral is a medical person (doctor)\(^5\)(\(^6\)).

Hartini (2016) concluded that the referral process, the intensity of communication between referring health workers and referral recipients is very important, because with the condition of emergency patients need to get information in the implementation of both internal referral or hospital readiness in receiving referrals. The intensity of good communication is very helpful for many parties in accelerating the implementation of a good referral process as well. Meetings or meetings that discuss referral standards that there are no meetings or meetings from year to year when there are problems or obstacles regarding the implementation of the referral system in the Birobuli, Public Health center.

The head of the public health center as the one evaluating the implementation of the public health center program simply asked the doctor why the referral was high. And until now there has been no solution how to deal with the problem of high referrals let alone the bureaucracy among the 3 public health center in Palu City whose referral rate is above 15% BPJS standard so this needs to be evaluated or meeting not only between the Public health center Head and the doctor but also with the referral processing.

In Al Shamsi (2018) in Saudi Arabia effective communication between primary and secondary providers is crucial for health care in Saudi Arabian referral systems. This system has several problems, including incomplete reference documents and the excess of patients in some specialist clinics due to referrals. This e-referral system provides accurate and
complete information about referred patients, which shows that the system can improve the Saudi system’s problems with incomplete reference documents. The second outcome that might apply is the Lean Six Sigma principle, which succeeded in reducing inappropriate referrals, thereby reducing density in some specialist clinics.\(^7\)

**Resource:** The number of staff (medical personnel) in the implementation of the referral system in the Bureau of Public Health Bureau that the current number of medical personnel in terms of number still requires one dental nurse to assist dentists in providing services and the lack of referral management because there are two referral processors available in the community. person in charge and one as input. Where every day a referral patient is only inputted by one referral officer with a number of birobulic referrals each day that is high enough so that the burden of the referral officer becomes so heavy that often referrals which from a few days under the house to be inputted so that still need to be added.

Hermiyanty (2019) the doctors at the Singgani Public Health Center in quantity were sufficient enough that in total there were five doctors consisting of four general practitioners and one dentist. According to the Minister of Health Regulation No. 75 of 2014 concerning Public health center for non-hospitalization like this Singgani Public health center, the Public health center must have at least one doctor or primary service doctor, one dentist and dental nurse regarding the availability of doctors is inadequate so as to cause high referral cases.\(^8\)

Setiawaty (2019) said that it must be recognized that the implementation of the tiered referral system was not running optimally. As for the governance procedures, the system was already good. However, the implementation is still problematic. Therefore, improvements need to be made at the First Level Health Facility. The high level of patient visits in First Level Health Facilities must be balanced with improvements in human resources and service infrastructure. The government needs to increase human resources (both in terms of quality and quantity) in first-level health facilities so that it can reduce referral rates.\(^9\)

The availability of infrastructure at the Birobuli, Public health center in palu city Bureau currently uses temporary buildings.\(^4\)(\(^10\))

According to Abdullah (2015) the drugs in the public health center are not intended for certain programs but all may use drugs that are in the public health center, but if specifically the National Health Insurance program (JKN) there are separate funds. The ones responsible for the availability of infrastructure facilities at the public health center are the department health and Local Government. The lack of infrastructure was proposed by each Public health center to the health department based on consumption patterns in each Public Health Center.\(^6\)

**Implementing attitude/disposition:** Knowledge of medical personnel regarding the implementation of the referral system that the knowledge of medical personnel about the referral system is good enough about the flow of referrals, referral mechanisms, and disease codes that exist in the primary care application of the referral agency for social security providers (BPJS).\(^11\)

Indrianingrum (2017) that the understanding of medical personnel about patients coming and then checked and diagnosed according to competence then carried out treatment and patients can return home if during treatment there is no change then referral to the intended hospital. If the patient’s diagnosis is out of competence and first-level health facilities (FKTP) is unable to match their capacity so they can be directly referred to the Advanced Health Facility (FKTL) until they recover or even die, the referral is carried out in stages.\(^12\)

Chabibah (2015) argues that the knowledge of health workers (doctors) at the Public health center about the referral system is very important in implementing the tiered referral in accordance with the provisions.

Role in the implementation of the referral system, namely the division of roles in the implementation of the referral system in the Birobuli, Public health center in palu city is quite good, namely the head of the public health center as the person in charge of evaluating, medical personnel (doctors) who have the right to determine which patients are referred, as well as the referral management who will input referrals to the hospital.\(^13\)

Patients who are referred on their own request or based on their own request are patients who are referred based on medical indications but there are also those
who are based on their own request due to limited infrastructure at the Public Health center.(10)

One factor that causes the high demand for patients to get a referral themselves because they feel they are getting more optimal service at the hospital. This proves their confidence to get services at the health center as a First Level Health Facility (FTKP) decreased and also there are some patients who have had medical treatment before at the hospital doctor asking to be referred to get the same doctor’s services in the RS or known by the term referral deposit. This is the reason for the high number of referrals in the Birobuli, Public health center in palu city.

It was confirmed by Herawati (2017) that twenty-nine Public Health center in Jember Regency stated that the cause of the referral problem was not appropriate due to the wishes of patients requesting a referral. JKN participants who received a referral at their own request ranged from 30%-75%, the reason for patients requesting a referral also a variety of them due to the limitations of drugs given by health centers, limited facilities to the reasons for wanting to get treatment or health services from specialist doctors.(14).

**Organization Structure:** Related to SOP (Standard Operational Procedure) about the referral system at the Birobuli Public Health center, namely the Public health center itself has a Standard Operating Procedure (SOP) but is not socialized to medical personnel either in the registration (administrative) counter, examination room (adult poly, poly child, or poly maternal child health) So that medical personnel (doctors) have never seen the standard operational procedures from the results of interviews conducted.(13)

Hartini’s research (2016) suggests that the standard operating system for referral system is already available and the procedure is a standard operating procedure for referring to other hospitals. Patient referral services other pain both vertically and horizontally by using the Standard Operating Procedure (SOP) of the referral system as a guide and reference.(15)

The flow of the referral system at the Birobuli public health center, namely the referral flow that occurs at the health center in the health community is good enough in accordance with the flow from the arrival of the patient until the examination then until the patient gets a referral at the counter at the first level health facility then to the advanced health facility.

In the Primasari research (2015) where health services were started from primary care facilities as first contact and general practitioners or general dentists as first referrers and if needed further action or treatment could be referred to advanced facilities at the district or provincial level.(13)(12)

**Conclusion**

Communication established between medical personnel is good enough during the implementation of the referral system but sometimes it is not consistent/ changes according to circumstances when implementing the referral system, there are no meetings or meetings that discuss referral standards or discuss referral problems, there is still minimal socialization regarding referral to patients National health insurance that wants to make a referral.

Resources in implementing a referral system at the birobuli public health center still need one dental nurse and one referral officer because there is still a heavy burden felt by current referral processors and the high number of referrals every month, there is no training on standards for medical staff (doctors) yet has been carried out either at the public health center or from the health department, infrastructure planning is good enough as needed but there are still many unused medical devices. Knowledge of medical personnel is good enough about the implementation of the referral system, the role of the head of the public health center as evaluating the implementation of the referral system, medical personnel (doctors) who are entitled to determine referral patients, referral managers who input into the application to rs, some patients are referred at their own request or based on safekeeping patient’s family doctor.Standard Operating Procedure (SOP) of the referral system is available but not socialized at the birobuli public health center, the flow of patient referrals from first level health facilities (FKTP) to type C hospitals.

**Acknowledgements:** The author would like to thank all those who helped in this research process, especially the Head of Birobuli Public Health Center in Palu City.

**Ethical Clearance:** Our study was not directly applied on human, hence ethical clearance was not required.

**Source of Funding:** Self funding.

**Conflict of Interest:** The author declare that he has no conflict of interest.
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Association between Effect Of some Pro-inflammatory and Anti-inflammatory Cytokines before and After Surgical Patients

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Abstract

The aims of our study were to investigate association of some effect of pro- inflammatory and anti-inflammatory cytokines before and after surgical patients through study serum concentration of, TNF-α, IL-2, IL-4, IL-6, IL-10. 35 blood samples were collected from surgical patients (17 male, 18 female) with general anesthesia from Al-Diwaniyah Hospital, Iraq. Samples were taken before surgery (Tpre), the first day (T1), third day (T3) and fifth day (T5) after operative after skin incision. Pro-inflammatory cytokines (IL-2, IL-6, and TNF-α) and anti-inflammatory cytokines (IL-4, IL-10) were quantitatively analyzed by ELISA technique. Our results showed there were no significant difference (p<0.05) in WBCs count, WBCs percentage (neutrophil, eosinophil, basophil, monocytes and lymphocytes), PCV, PCT percentage and HB concentration before (Tpre) and after (T1, T3, and T5) surgical operation. Also the results showed there were a significant decrease in IL-2 concentration in (T1) and (T3) day postoperative surgery compared with (T pre), and returned to the pre-operative values on (T5). IL-6 showed significant increase in first day postoperative (T1), and then decreased the (T3 and T5) compared to the (Tpre), TNFα slightly increased in (T1 and T5) but the difference didn’t significantly. IL-4 didn’t show any significant difference between Tpre, T1, T3 and T5. IL-10 showed a significant increase in (T1) compared with (Tpre), and returned to the preoperative values on (T3) and (T5). We could be conclude the pro- and anti-inflammatory cytokines balanced ratio is essential to regulate the inflammatory responses postoperative. Anti-inflammatory cytokine (IL-10) increased in first day postoperative to suppress excessive effect of pro-inflammatory cytokine (IL-6).

Keywords: Pro-inflammatory, Anti-inflammatory, Cytokines and Surgical Patients.

Introduction

Cytokines are glycoproteins or polypeptidehave hydrosoluble proprieties with rang from 8 to 30 kDa. Several types of body cells produce cytokines from immune cells and at site of injury, through protein kinases that activated by mitogen, unlike hormone, cytokine is not preformed molecule, acting by autocrine and paracrine mechanisms (1). It’s intercellular messengers of immune system, it integrate functions of numerous types of cells in different body parts into a coherent immune responses, and include the interferon’s, the interleukins family, the tumor necrosis factor family, chemokine, adipokines, and mesenchymal growth factors (2). To date about 200 cytokine are recognize. They are categorized according type of cells that producedit either from T helper1 cells Th1 or Th2. Presently categorized a third Th cell subset (Th17) and T regulatory cell (Treg) that showed different cytokines from Th1 and Th2 cells. It secrete IL-22, IL-17, IL-25 and IL-17F. Tr1 secrete IL-5, IL-10 and IFN-γ, in small amount of IL-2 and TGF-β. Tr3 produces mainly TGF-β and small amount IL-10 (3). They are classified according to its secretion into lymphokines (cytokines that are regulate the immune response and secreted by T cell), pro-inflammatory cytokines (which perpetuate and amplify the inflammatory process), growth factors (that promote cells survival and lead to theairways structural changes), chemokines (that are inflammatory cells chemotactic) and anti-inflammatory cytokines (which modify the inflammatory response negatively) (4). Pro-inflammatory cytokines are produce in response to skin wounds, and it regulate functions of immune cells in epithelialization. Pro-inflammatory cytokines, including IL-1, IL-6, IL-17, and tumor necrosis factor (TNF), contribute in the wound healing
inflammatory phase through downstream cascades activating\(^5\). It also promoting cells proliferation and differentiation and mobilizing resident stem/progenitor cells so contribute to the epithelialization phase\(^6\). The anti-inflammatory cytokines control response the pro-inflammatory cytokines so act as immune-regulatory molecules. Cytokines act with cytokine response and specific cytokine inhibitors to regulate the immune response. Their physiologic and pathologic role in inflammation are increasingly recognized. Main anti-inflammatory cytokines include interleukin-1 receptor antagonist, IL-4, IL-6, IL-10, IL-11, IL-13 cytokine receptors for IL-1, TNF α, and IL-18 also function as pro-inflammatory cytokine inhibitors\(^7\). Phenotype change from M1 macrophages (pro-inflammatory) to M2 macrophages (reparative) plays an essential role in the switched of the inflammatory phase to the proliferation phase. Pro-inflammatory cytokines produce from M1 macrophages, such as IL-1, IL-6, and TNF-α, also secrete chemokine to recruit additional leukocytes. On the other hand, anti-inflammatory cytokines, such as IL-13 and IL-4, formation subset of M2 macrophage, that regulate inflammatory response by expressing mediators as decoy IL-1 receptor type 2, IL-10 and IL-1 receptor antagonist, some growth factors to promote synthesis of extracellular matrix, fibroblast proliferation and angiogenesis\(^8,9,10\).

The aims of our study were to investigate the association of some effect of pro-inflammatory and anti-inflammatory cytokines before and after surgical patients through study serum concentration of, TNF-α, IL-2, IL-4, IL-6, IL-10.

**Materials and Method**

**Samples:** (35) blood sample were obtained from surgical patients (17 male, 18 female) with general anesthesia from Al-Diwaniyah Hospital, Iraq. Ethical Clearance were taken from the Hospital and patients prior to collection. Samples were taken before surgery (T pre), the first day (T1), third day (T3) and fifth day (T5) after operative after skin incision used to assay RBC and WBC count. Remnant blood were centrifuged at 3000 rpm, 10 min, the serum were stored at (−15 °C) until used to assay intended cytokines. The background information of subjects such as age, gender, weight, height and duration of surgery (min) were taken.

**Blood Analysis:** RBCs and WBCs were counted, WBCs percentage, Hb, PCV and PCT were evaluated by blood analysis device and done according company instructions.

**Cytokines Assay:** Pro-inflammatory cytokines (IL-2, IL-6, and TNF-α) and anti-inflammatory cytokines (IL-4, IL-10) were quantitatively analyzed by ELISA technique (enzyme-linked immunosorbent assay) and done according company instructions.

**Statistical analysis:** We used a computerized program SPSS to calculated the statistics analysis. The data represented mean ± standard error, LSD used to compare between groups, the signification was accepted at 95% (p>0.05)\(^11\).

**Table (1) Patients characteristics**

<table>
<thead>
<tr>
<th>Clinical data</th>
<th>Male (17) case</th>
<th>Female (18) case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>55.5±33.4</td>
<td>50.3±30.6</td>
</tr>
<tr>
<td>Body weight (kg)</td>
<td>80.4±5.5</td>
<td>65.6±10.2</td>
</tr>
<tr>
<td>Body height (cm)</td>
<td>173.2±6.5</td>
<td>165.1±4.5</td>
</tr>
<tr>
<td>duration of surgery (min)</td>
<td>60.3±22.6</td>
<td>60.1±20.4</td>
</tr>
</tbody>
</table>

Value= mean ± slandered error

**Results**

**Blood analysis:** Results in table (2) show there were slightly decreases in RBCs count in (T1), (T3) and (T5) but the difference didn’t significantly, and there were no significant difference (p<0.05) between WBCs count and WBCs percentage (neutrophil, eosinophil, basophil, monocytes and lymphocytes) before (T pre) and after (T1, T3, and T5) surgical operation. And there were no significant difference in PCV and PCT percentage and HB concentration before (T pre) and after (T1, T3, and T5) surgical operation.

**Serum Cytokines concentration:** Result in table (3) show there were significant decrease (p<0.05) in IL-2 concentration in (T1) and (T3) day postoperative surgery compared with (T pre), and returned to the pre-operative values on (T5). IL-6 showed a significant increase in first day postoperative (T1), and then decreased the (T3 and T5) compared to the (T pre). TNFα slightly increased in (T1 and T5) but the difference didn’t significantly. IL-4 didn’t show any significant difference (p<0.05) between T pre, T1, T3 and T5. IL-10 show significant increase (p<0.05) in (T1) compared with (T pre), and returned to the preoperative values on (T3) and (T5).
Table (2) Blood analysis

<table>
<thead>
<tr>
<th>Examination type</th>
<th>N(35)</th>
<th>T pre</th>
<th>T1</th>
<th>T3</th>
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<tbody>
<tr>
<td>RBCs (10^6/mm)</td>
<td></td>
<td>5.1±0.7a</td>
<td>4.2±0.8a</td>
<td>4.3±0.5a</td>
<td>4.4±0.6a</td>
</tr>
<tr>
<td>WRCs (10^3/mm)</td>
<td></td>
<td>6.2±1.9a</td>
<td>6.3±1.8a</td>
<td>6.3±1.7a</td>
<td>6.3±1.3a</td>
</tr>
<tr>
<td>Neutrophil %</td>
<td></td>
<td>59.8±9.5a</td>
<td>60.5±8.7a</td>
<td>60.8±8.5a</td>
<td>61.3±7.4a</td>
</tr>
<tr>
<td>Eosinophil %</td>
<td></td>
<td>1.8±0.9a</td>
<td>2.1±0.8a</td>
<td>2.4±1.1a</td>
<td>2.3±0.9a</td>
</tr>
<tr>
<td>Basophil %</td>
<td></td>
<td>0.5±0.4a</td>
<td>0.58±0.4a</td>
<td>0.60±0.5a</td>
<td>0.61±0.3a</td>
</tr>
<tr>
<td>Monocytes %</td>
<td></td>
<td>8.1±2.4a</td>
<td>8.7±1.9a</td>
<td>8.8±2.1a</td>
<td>9.5±2.2a</td>
</tr>
<tr>
<td>Lymphocytes %</td>
<td></td>
<td>26.5±6.5a</td>
<td>20.2±7.4a</td>
<td>22.3±6.9a</td>
<td>23.6±6.4a</td>
</tr>
<tr>
<td>PCV%</td>
<td></td>
<td>42±0.04a</td>
<td>38±0.06a</td>
<td>38±0.03a</td>
<td>38±0.09a</td>
</tr>
<tr>
<td>HB (g/dl)</td>
<td></td>
<td>13.3±0.05a</td>
<td>12.1±0.08a</td>
<td>12.2±0.11a</td>
<td>12.3±0.14a</td>
</tr>
<tr>
<td>PCT%</td>
<td></td>
<td>0.15±0.05a</td>
<td>0.22±0.04a</td>
<td>0.19±0.04a</td>
<td>0.18±0.03a</td>
</tr>
</tbody>
</table>

Value= mean± slandered error, Small letters = signification, T pre= before surgery, T1= first day after surgery, T3= third day after surgery, T5= fifth day after surgery

Table (3) Serum Concentration of Various Cytokines Tpre, T1, T3 and T5

<table>
<thead>
<tr>
<th>Cytokine type</th>
<th>T pre</th>
<th>T1</th>
<th>T3</th>
<th>T5</th>
</tr>
</thead>
<tbody>
<tr>
<td>IL-2(pg./ml)</td>
<td>8.33±1.55a</td>
<td>5.55±2.33b</td>
<td>5.59±.99b</td>
<td>9.12±1.78a</td>
</tr>
<tr>
<td>IL-6(pg./ml)</td>
<td>2.13±0.55a</td>
<td>46.55±18.67b</td>
<td>6.66±1.89c</td>
<td>9.34±0.75c</td>
</tr>
<tr>
<td>TNF-α(pg./ml)</td>
<td>5.33±0.45a</td>
<td>6.88±0.77a</td>
<td>4.87±0.89a</td>
<td>6.12±1.22a</td>
</tr>
<tr>
<td>IL-4(pg./ml)</td>
<td>2.22±0.33a</td>
<td>2.04±0.56a</td>
<td>2.78±0.37a</td>
<td>1.99±0.66a</td>
</tr>
<tr>
<td>IL-10(pg./ml)</td>
<td>1.11±0.29a</td>
<td>22.56±19.6b</td>
<td>0.89±0.77a</td>
<td>1.19±0.47a</td>
</tr>
</tbody>
</table>

Value= mean± slandered error, Small letters = signification, T pre= before surgery, T1= first day after surgery, T3= third day after surgery, T5= fifth day after surgery

Fig (1) Diagram show WBCs and RBCs count and WBCs percentage in Tpre, T1, T3 and T5
Fig (2) Diagram show some of blood parameter in Tpre, T1, T3 and T5

Fig (3) Diagram show Serum Concentration of Various Cytokines in Tpre, T1, T3 and T5

Discussion

In the present study we discussed effect of some cytokines before and after surgical operation. Surgical trauma is a psychological and physical stress condition which regulated by a complex mechanisms (immunological, endocrinal and neural)\(^{(12,13)}\). This Surgical trauma induced reactions lead to hyper-inflammatory status that is necessary for host defense and tissues repair. But, this stress responses lead to a transient immunosuppression through provokes alterations in humoral and cellular immunity \(^{(14,15,16,17)}\). In our study used ELIZA technique to assay serum cytokines concentration which is the same technique that used by\(^{(18,19)}\). Also we assay complete blood counts (CBC) before and after surgical operation, CBC during postoperative care is no more predictive than preoperative CBC, due to all patients have normal HB value > 90 gm/dl without dizziness, light-headedness, hypotension, tachycardia, or syncope occurred so all patients not needed blood transfusion.
Our result showed IL-2 decreased significantly in T1 and T3, and IL-6 and IL-10 increased significantly in T1 that agreement with (20). Release of pro-inflammatory cytokines is primary immune response to surgical trauma, this response is balanced by release anti-inflammatory cytokines that preventing an exaggerated activation of the systemic inflammation and immune response (21). Cytokines play important roles in this complex phenomenon’s. IL-6 considered as a pro-inflammatory cytokine controlling the acute inflammatory response, and a strong inducer of protein response in the acute phase, it also have anti-inflammatory properties through inhibiting and down regulating the pro-inflammatory cytokines (22). Pro-inflammatory cytokines are the first factors that produced in response to wound of skin, and it control the immune cells function in epithelialization. Pro-inflammatory cytokines, specially IL-6 and TNF, participate in the inflammatory phase of wound healing by activating cascades downstream (23). Also our results showed increased IL-10 significantly in first day postoperative (T1), moderate immune responses prevent infection and promote wound healing so the pro-inflammatory cytokines at normal levels accelerate normal wounds healing. Extreme pro-inflammatory cytokines production are detrimental, it maybe result in differentiation and deregulated activation of epidermal subcutaneous, that can be observed in metabolic disorders and autoimmune diseases (24). So the anti-inflammatory cytokines (IL-10) prevent the harmful effect of excessive pro-inflammatory cytokines.

Transition of phenotype from pro-inflammatory macrophage (M1) to reparative macrophage (M2) play an essential roles in the transferring from the inflammatory phase to the proliferation phase. Pro-inflammatory cytokines produce from M1 macrophages, such as IL-6, IL-2 TNF-α, and chemokine’s to recruit further leukocytes. On the other hand, anti-inflammatory cytokines, For example IL-4, lead to the formations subset of M2 macrophage, that regulate inflammation by expressing numerous growth factors to promote angiogenesis, synthesis of extracellular matrix and fibroblast proliferation as well as mediators as IL-10 receptor (25, 26, 10). The transition from M1 macrophages to M2 macrophages subset amplified by IL-4, and the increased M2 macrophages number lead to IL-10 elevation (26). IL-2 decrease significantly in T1 and T3, this may be activated monocytes in surgical patients produced large amount of prostaglandin E2 that has a down regulation effects of IL-2 and IL-2 receptors expression (27). In patient undergoing immunosuppression after surgery result in alteration function of monocytes and T cells. Dysfunction of T cell characterized by change in number of peripheral blood lymphocytes, antigens and mitogens induced proliferative response of lymphocytes and impaired synthesis of several anti-inflammatory and pro-inflammatory cytokines include TNFa, IL-2, IL-4, IL-6 and IL-10 (28). Alteration functions of monocytes were reported to include reduced secretion of IL-6 and loss of HLA-DR molecules from cell surface (29). It has been already described that secretion of IL-2 decreased in surgery and this suppression associated with extent of surgical trauma (30). Some anti-inflammatory cytokines such as IL-10 showed to inhibit the induced IL-10 synthesis by monocyte and act as natural inflammatory cytokines antagonist in host protective method (31). IL-10 inhibit several pro-inflammatory cytokines synthesis and reduced the expression of major histocompatibility complex class I on cells presenting antigen, this action is to facilitate antibodies production and stimulated immune response, the enhance IL-10 release after surgery maybe reflects the reactions to limit a pro-inflammatory responses (32).

Conclusion
The pro- and anti-inflammatory cytokines balanced ratio is essential to regulate the inflammatory responses post operative. Anti-inflammatory cytokine (IL-10) increased in first day postoperative to suppress excessive effect of pro-inflammatory cytokine (IL-6).

Ethical Clearance: Nil

Source of Funding: Self

Conflict of Interest: Nil

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In vitro and invivo Study of Banana Peel Extract Anti Toxicity

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Abstract

In this study, extraction of the banana peels were done by two solvent kinds and water. Cytotoxic activity of the extracts were tested by using assay of MTT. Inhibition of cells was 68.2% when banana peel was extracted by hexane, and the effect of its cytotoxicity was the highest at 100 μg/ml. On the other hand, growth inhibition of MCF-7 cells was recorded at this concentration. While, ethanol extract was at the second stage according to its cytotoxicity which reached 54.1% followed by watery extract which showed 46.9%. Antimicrobial activity of banana peel extracts was tested against some pathogenic bacteria and showed the capacity to have a broad range of inhibition activities against isolates E. coli, klebsiellaspp, S. aureus, P. aeruginosa, extracts demonstrated inhibition zones which were greater than 20,10,15 mm against E. coli, klebsiella and staph. spp. respectively, but did not affect P. aeroginosa. Also, experimental animals were exposed to these extracts. It was revealed that NTEC (CNF2) toxin made few chronic inflammatory cells proliferation, hyperplasia of lymphoid tissue and some cases of atrophy in the villi. Current results showed low impact on tissue cells when banana peel extracts were used.

Keywords: Banana peel, anti toxicity, invivo, In vitro.

Introduction

Banana’s peel is known to contain many material that had biological activity and medicinal properties\(^{(1,2)}\). For example, tannins, alkaloids, flavonoids, phlobatannins, terpenoids and glycosides are known to be the bioactive compounds that are usually available in peel of banana. It have anticancer, antioxidant activity, in addition to pharmacological and antibiotic effect\(^{(3,4,5)}\). The present study aimed to prepare extracts of banana peel and assessment the inhibition activity against the cancer cell line Hela cell, MCF-7 and normal cell lines (REF) and estimate their ability to inhibit toxin in vivo.

Material and Method

Extract Preparation: 50g of banana peels were dried in order to obtain powder which was extracted by dissolving with 250 ml n-hexane, ethanol and water, separately. These extracts were dried by using hot plate at 40°C, then were filtrated and dried by a rotary evaporator\(^{(6)}\).

Antimicrobial Assay: The diffusion method was used to determine inhibition effects for banana peels extraction toward many pathogenic bacteria such as Escherichia coli, klebsiellaspp, Staphylococcus aureus, Pseudomonas aeruginosa isolates which were obtained from lab of graduate studies in Biology Department/Sciences College/Baghdad University/ Iraq. Culture media were used to inoculate pathogenic bacteria. Wells were made in the media to inoculate 100 μL of banana peels extracts and incubated at 37°C for 18 hrs. After that measurement of inhibition zones was performed \(^{(7)}\).

Cell lines and growth conditions: MCF-7 (breast cancer), HeLa (cervical cancer) cells and normal cell line (REF) were used to determine the effect of banana peel extracts. These cells were cultured on RPMI and MEM media which were enhanced with penicillin-streptomycin mixture (1%) and FBS (10%). The experimental conditions was 37 °C and incubation at 5% CO\(_2\) \(^{(8)}\).
**Assay of MTT on Cytotoxicity:** Investigation of the extracts cytotoxicity on the adherent cells proliferation in 96-well microtiter plate, procedure was performed according to (9).

**In vivo study**

**Animals:** 18 Male BALB/C mice were used in this study. They were 3-4 weeks old and weighed 20-24 g. Mice were challenged with CNF2(cytotoxic necrosis factor2). All animals were fed on sterile food and water.

**Inoculation procedure:** Two method of animal inoculation were used in this study which were orally and peritoneally injection. Division of the tested animals were done for three groups, each group composed of three mice for each route of inoculation. No mortality of mice were occurred during or after inoculation.

1. First group was exposured to 100 µl of (100 µg/ml) with toxin only.
2. Second group was exposured to 100 µl of (100 µg/ml) toxin +100 µl banana peel extracts (n-hexan).
3. Third group was exposured to 100 µl of normal saline (control group).

10 days post inoculation, mice were killed.

**Determination of Banana peel extracts effect on mice intestine:** histopathological studies were done according to (10).

**Statistical analysis:** SPSS program was used for Statistical analysis(11).

**Results and Discussion**

**Banana Extracts:** Results of the current study demonstrated that the high amount of extract yield was obtained by using water followed by hexane and ethanol respectively (Table 1).

Currently, alcohol and hexane organic solvent were used to prepare extracts. Obtained results revealed that hexan was the best extract in its cytotoxicity on cancer cells which showed 68.2% for McF -7 and 62.3 for Hela cells than the others, followed by ethanolic and watery extracts . These results can be referred to bioactive compounds that are found in the organic extracts such as flavonoids, tannins and alkaloids that are responsible for their activity. While, the water extract contains only glycosides and alkaloids(12,13). On the other hand, these result can be explained by that the solvents that are used have the ability to dissolve compounds that have biological activity more than that gained when water is used(14).

**Antimicrobial activity:** Antimicrobial activity of banana peel extractswas tested against some pathogenic microorganisms, and showed the capacity to have abroad range of inhibition activities against isolates *E. coli, klebsiellaspp, S. aureus, P. aeruginosa,* (table 2) extracts demonstrated inhibition zones which were greater than 20,10,15 mm against *E. coli,klebsiella and staph. spp.* respectively, but did not affect *P. aeroginosa*. Banana peel extracts can inhibit pathogen colonization and consequently prevent contamination. Present investigation exhibited that the chosen extracts of banana peel are great probiotic materials, which concurred with previous study(15).

**Cell viability assay:** cytotoxicity was performed by utilizing MTT technique. As appeared in table (3), increasing of concentrations and incubation period the extracts resulted in decreasing of HeLa and MCF-7 cells viability. Results showed a significant inhibition effect against HeLa (P<0.05) in most incubation periods and concentrations that were used. Highest concentration (100µg/mL) of n-hexan extract caused maximum inhibition effect against MCF-7 in maximum time.

High cytotoxic effect against MCF-7 and Hela was observed when treated with hexane extract which were 68.2% and 62.3% respectively. While, the watery extract and ethanolic one resulted in little inhibition effect against MCF-7 and Hela. Whereas, they had week activity against the normal cell line. Well growing of normal cells was observed in about 94%. An explanation of these results can be due to that the death of cancer cells was occurred by apoptosis which is known to be a controlled event. Production of cytokines that are known to be anti-inflammatory molecules in addition to phagocytosis can lead to this type of cell damage(16).As a result, it was thought that the banana peel had biological activity which may inhibit cancer cell proliferation(17).

**Histopathological studies:** In the histological examination of intestinal and peritoneal sections, it was appeared that CNF2 made few chronic inflammatory cells proliferation, hyperplasia of lymphoid tissue and some cases of atrophy in the villi. While results elicited low effect on tissue cells when banana peel extracts were utilized. These results are accompanied with a previous study which demonstrated that the injection of the toxin
in the peritoneal area led to agglutination of blood veins and decrease in the platelet and finally death of the cells and caused death of the mouse\(^{(18)}\). Additionally, the high doses of CNF2 caused the death by hemorrhagic shock and necrosis in the tissues\(^{(19)}\). Most the toxins from gram negative bacteria stimulate the inflammatory cells to release large amount of TNF and IL-1 which cause tissue necrosis and death. The pathogenic changes which were happened in the cells were removed after removing the causative agent and the cells were returned to normal state\(^{(20)}\).

As appeared in figure (1), section of peritoneal tissue was exposed to toxin caused hyperplasia of lymphoid tissue, while, figure (2) showed severe atrophy of intestinal villi when exposed to toxin. These changes were removed when using toxin in addition to the tested extracts as can be seen in figure (3).

Table 1: Yield of banana peel extracts

<table>
<thead>
<tr>
<th>Banana Part</th>
<th>Solvents</th>
<th>Yield %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peel</td>
<td>Water</td>
<td>77.3</td>
</tr>
<tr>
<td></td>
<td>n-Hexane</td>
<td>58.6</td>
</tr>
<tr>
<td></td>
<td>Ethanol</td>
<td>55.1</td>
</tr>
</tbody>
</table>

Table 2: The inhibitory effect of banana peel extract against pathogenic bacteria

<table>
<thead>
<tr>
<th>Pathogenic bacteria</th>
<th>Susceptibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Escherichia coli</td>
<td>ES</td>
</tr>
<tr>
<td>S. aureus</td>
<td>S</td>
</tr>
<tr>
<td>Klebsiellaspp</td>
<td>I</td>
</tr>
<tr>
<td>P. aeruginosa</td>
<td>R</td>
</tr>
</tbody>
</table>

R = Resistant, S = Sensitive (12-15), Intermediate (7-11), ER = Extra sensitive >16

Table 3: Cytotoxic effects IC\(_{50}\) of banana peel extracts against cell lines

<table>
<thead>
<tr>
<th>Cell line</th>
<th>Solvent</th>
</tr>
</thead>
<tbody>
<tr>
<td>REF</td>
<td>McF -7</td>
</tr>
<tr>
<td>5.5</td>
<td>68.2</td>
</tr>
<tr>
<td>6.2</td>
<td>54.1</td>
</tr>
<tr>
<td>4.8</td>
<td>46.9</td>
</tr>
</tbody>
</table>

Figure (1) Section of small intestinal tissue showing hyperplasia of lymphoid tissue peyer's patch, lymphocyte extension inside the villi when exposed to toxin, Hematoxilin –Eosin stained ×200
Figure (2) Section of small intestinal tissue showing severe atrophy of intestinal villi with its broadening and the crypts atrophied exposed to toxin, Hematoxilin –Eosin stained ×200

Figure (3) Section of small intestinal tissue showing elongation of intestinal villi and look-like normal also the crypt, NFs normal when exposed to toxin after added peel banana, Hematoxilin –Eosin stained ×100

**Conclusion**

The banana peels have Inhibition of cells was 68.2% when extracted its by hexane, and the effect of its cytotoxic was the highest at 100 μg/ml. growth inhibition of MCF-7 cells .and Antimicrobial activity of extracts was tested against some pathogenic bacteria and showed the have of highest inhibition against *E. coli*, inhibition zones which were greater than 20mm Also, in vivo tested results showed low impact on tissue cells when extracts were compared toxin used.

**Conflict of Interest:** No conflict of interest

**Funding:** Self

**Ethical Clearance:** This study is ethically approved by the Institutional ethical Committee.
Reference


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Validation of a Questionnaire on the Factors of University Failure in Morocco

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¹Researcher, ²Professor, Ibn Tofail University, Kenitra, Morocco

Abstract

Objective: The objective of this research is to develop and validate a solid and reasonable scale to measure the failure of students in Morocco.

Material and Method: This is a cross-sectional study, which took place between November 2019 and March 2020. The internal reliability of the questionnaire was checked by calculating the Cronbach's Coefficient Index, and a factor analysis was performed.

Results: The population of our study is 184 students of three masters in teaching and education, University Ibn Tofail of Kenitra-Morocco. The average age at the time of enrollment in the first-year master's degree is 26.59±5.65 years. Regarding gender, we noted that males represent a percentage of 71.2% (n=131), while females represent 28.8% (n=53) with a sex ratio (m/f) of 2.4 (p<0.005). The Cronbach's alpha value for all items was 0.84. Similarly, the calculation of Cronbach's alpha showed homogeneity across the different dimensions of the questionnaire. For the professional curriculum (α=0.93), motivation (α=0.97), educational satisfaction (α=0.93), abandonment of university studies (α=0.96) and non-academic curriculum of students (α=0.87).

Conclusion: Based on the results of our study, we could, therefore, measure the academic failure of students in the education and teaching tradestreams using a questionnaire.

Keywords: Validation, questionnaires, higher education, professional insertion, satisfaction.

Introduction

The Moroccan education system is characterized by the coexistence of the public and private systems and French and Arabic-speaking education. Regarding the Moroccan University cycle, is based on the LMD system (License, Master and Doctorate) is structured around 3 training cycles: License: diploma of Bac+3 level. Master: Diploma of Bac+5 level. And PhD: diploma at Bac+8 level. Indeed, the Moroccan university education system has grown from 780,000 to 900,000 students from the academic year 2016-2017 to 2017-2018¹. However, the university dropout rate is one of the major problems of the Moroccan Ministry of Education and Higher Education. In 2018, according to the minister, more than 25% of the number of new students enrolled in the basic bachelor’s degree drops out after one year of training. Moreover, 43% of students leave the university system without obtaining a university degree, which could be explained by several factors. As far as we know, no Moroccan studies have been carried out to determine the factors of university failure in Morocco. For that reason, we have constructed a questionnaire to determine these factors among students of the master cycle in Morocco²,³,⁴,⁵. The purpose of this study is to test the reliability and the validity of this questionnaire.

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The checking of the internal reliability of the questionnaire was carried out by calculating the Cronbach’s Coefficient Index, then a factor analysis was made.

**Technical Sheet:** A literature review concerning the determinants of motivation, the satisfaction, the abandonment, professional integration allowed us to retain several items. These items have been submitted to experts in the field of university education, and the heads of master training for scientific feedback and to a linguist to judge the comprehensibility of the items as this scale will be intended for an Arabic-French speaking population. The opinion of these experts allowed us to discard 20 items. A total of 44 items were retained. This questionnaire was intended for students who have followed the master’s degree course in education and teaching; it is divided into five dimensions:

- **Professional curriculum (04 items):** The first dimension focuses on the student’s professional background, their experiences before and after the formation.
- **Non-academic curriculum (03 items):** This part is dedicated to the collection of information concerning the student’s non-academic curriculum, certificates and attestations of training.
- **Motivation (07 items):** This part concerns the factors of choice of formation.
- **Satisfaction (04 items):** This fourth item treats the satisfaction of the students of the Master’s degree courses.
- **Abandonment (05 items):** This last part is reserved for students who have abandoned their studies; it deals mainly to the reasons for abandonment.

Besides, we realized a self-questionnaire that covers the socio-demographic and socio-economic information of the participants of this study before and after the registration to the master’s degree.

- **Socio-demographic situation (11 items)**
- **Socio-economic status (06 items)**

Thus we distributed the surveys sheets personally to the students in coordination with pedagogical team. For ethical reasons, we respected the confidentiality of the students’ personal information.

**Statistical Methodology:** In our research, the process of validation of our questionnaire was based on two steps. Initially, we calculated the reliability of the entire questionnaire and scale dimensions using Cronbach’s alpha. Then, exploratory factor analyses were done. All statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS) statistical software, trial version. The data collected were processed and analyzed on an exploratory basis.

In our study, we calculated Cronbach’s alpha to verify the reliability and homogeneity between the items of the measurements scale. An alpha between 0.6 and 0.8 is acceptable for an exploratory study. We also used the Kayser Meyer Olkin (KMO) test. A KMO score less than 0.5 is unacceptable, 0.5 is mediocre, more than 0.6 is acceptable, 0.7 is average, 0.8 is meritorious and 0.9 is excellent, we used Bartlett’s sphericity test for appreciating the potential effectiveness of PCA studied. For a factor analysis to be feasible, the Bartlett test must be significant (p<0.05). Principal Component Factor Analysis (PCA) is the most effective method for synthesizing information and discovering the underlying structure of a concept because it is a method of multivariate data analysis that allows simultaneous exploration of the relationships between several variables of interest.

**Results**

**Socio-demographic and professional profile of our population:** The population of our study made up of 184 students of three masters degrees in teaching and education from the Ibn Tofail University-Kenitra-Morocco. The average age at the time of registration for the first-year master’s degree is 26.59 ± 5.65 years. Concerning gender, we noted that males represent a percentage of 71.2% (n=131), while females represent 28.8% (n=53) with a sex ratio (m/f) of 2.4 (p<0.005). Urban students represent 71.7% (n=132) and rural students represent 28.3% (n=52). Concerning the socio-professional situation, we noted that before the Master’s period, 23.4% (n=43) of the students were working as public officials and 20.7% (n=38) of the students were salaried employees. The socio-demographic characteristics of the students who participated in the survey are presented in Table 1.
Table 1: Socio-demographic and socio-economic profile of our population (n=184)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Number</th>
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<td>Urbain</td>
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<td><strong>Gender</strong></td>
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<td><strong>Socio-professional situation before the Master’s program</strong></td>
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</tr>
<tr>
<td>Public officials</td>
<td>43</td>
<td>23.4</td>
<td></td>
</tr>
<tr>
<td>Salariedemployees</td>
<td>38</td>
<td>20.7</td>
<td></td>
</tr>
</tbody>
</table>

Validation of the questionnaire:

Internal consistency of questionnaire items: The Cronbach’s alpha value for all items was 0.84. Similarly, the calculation of Cronbach’s alpha showed homogeneity across the different dimensions of the questionnaire. For the professional curriculum ($\alpha=0.93$), motivation ($\alpha=0.97$), educational satisfaction ($\alpha=0.93$), abandonment of university studies ($\alpha=0.96$) and non-academic curriculum of students ($\alpha=0.87$). Table 2 shows all of these results.

Table 2: Cronbach’s alpha values of all items and dimensions of the questionnaire

<table>
<thead>
<tr>
<th>Cronbach’s Alpha</th>
<th>Number of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item Sets</td>
<td>0.84</td>
</tr>
<tr>
<td>Professional Curriculum</td>
<td>0.93</td>
</tr>
<tr>
<td>Motivations</td>
<td>0.97</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>0.93</td>
</tr>
<tr>
<td>Abandonment</td>
<td>0.96</td>
</tr>
<tr>
<td>Non-academic curriculum</td>
<td>0.87</td>
</tr>
</tbody>
</table>

Factor analysis: To make a factorial analysis of the questionnaire we took into consideration the value of the KMO index and the Bartlett sphericity test. For our study, the KMO index was $0.85>0.5$ which shows an acceptable value for factor analysis. The Bartlett sphericity test was highly significant.

Table 3: KMO index and Bartlett test

<table>
<thead>
<tr>
<th>Value</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Precision measurement of Kaiser-Meyer-Oklin sampling.</td>
<td>0.85</td>
</tr>
<tr>
<td>Bartlett Sphericity Test</td>
<td></td>
</tr>
<tr>
<td>Approximate Chi-square</td>
<td>5797,51</td>
</tr>
<tr>
<td>ddl</td>
<td>253</td>
</tr>
<tr>
<td>Meaning of Bartlett</td>
<td>&lt;0,00</td>
</tr>
</tbody>
</table>

Factor analysis in the main axes with varimax rotation showed that five factors in the eigenvalues are higher than 1 explain 88% of the total variance. The five dimensions are well defined and distinct on the respective factors: the first factor, which includes four items (EX_1, EX_2, EX_3, EX_4) constituting the professional experience dimension, explains 29.03% of the total variance. The second, with seven items (WORD_1, WORD_2, WORD_3, WORD_4, WORD_5, WORD_6, WORD_7) constituting the dimension of student motivation, explains 21.83% of the total variance. As for the third factor, with four items (SAT_1, SAT_2, SAT_3, SAT_4), explains 14.87% of the total variance, constituting the dimension of student satisfaction with the master’s degree course in Educational and Teaching Professions. For the fourth factor, which includes five items (ABD_1, ABD_2, ABD_3, ABD_4, ABD_5) constituting the dimension that is related to the students’ satisfaction, which explains 13.59% of the total variance. Table 4 represents the cleaned component matrix.
Table 4: Component matrix cleaned

<table>
<thead>
<tr>
<th>Component</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>EX_1</td>
<td></td>
<td></td>
<td></td>
<td>.724</td>
<td></td>
</tr>
<tr>
<td>EX_2</td>
<td></td>
<td></td>
<td>.694</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EX_3</td>
<td></td>
<td>.723</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EX_4</td>
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<tr>
<td>MOT_1</td>
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</tr>
<tr>
<td>MOT_2</td>
<td>.874</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOT_3</td>
<td>.890</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOT_4</td>
<td>.903</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MOT_5</td>
<td>.937</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>MOT_6</td>
<td>.935</td>
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</tr>
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<td>MOT_7</td>
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<td></td>
<td></td>
</tr>
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<td></td>
<td>.877</td>
<td></td>
<td></td>
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<tr>
<td>SAT_3</td>
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<td>.841</td>
<td></td>
<td></td>
</tr>
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<td>SAT_4</td>
<td></td>
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<td>ABD_2</td>
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<tr>
<td>ABD_3</td>
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<td></td>
<td></td>
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<tr>
<td>ABD_4</td>
<td>.787</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>ABD_5</td>
<td>.796</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NA_1</td>
<td></td>
<td></td>
<td></td>
<td>.628</td>
<td></td>
</tr>
<tr>
<td>NA_2</td>
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<td></td>
<td>.764</td>
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</tr>
<tr>
<td>NA_3</td>
<td></td>
<td></td>
<td></td>
<td>.769</td>
<td></td>
</tr>
</tbody>
</table>

Discussion

University formation is one of the most important elements in the economic development of a country. Over the last few years, increasing attention has been paid to the social role and the impact of research carried out in universities. This is confirmed by our study: every year, universities take in new students and graduate others; in this continuous cycle, the quality of education occupies a crucial place. Therefore, increasing the quality of the education system is considered to be the most influential factor in the development of countries. Students acquire, through their academic success, a position in which their maximum internal and external strengths are used to achieve the objectives of higher education and to obtain the necessary conditions for a successful social life. On the other hand, the lack of success in education opens the way to several personal and social problems and deviations from the achievement of the objectives of the education system. In this regard, one of the major problems of higher education establishments is the academic failure of students at all levels of education, which not only leads to a loss of current expenses and time, but also generates psychological, social and family problems for university students. According to studies, this problem is aggravating every year, so that many students are unable to follow the program (academic curriculum) or to complete it on time. UNESCO attributes the concept of academic failure to repetition, early dropout and declining quality of learners’ education.
Concerning our study, to determine the factors of the academic failure of students enrolled in the master’s degree in education and teaching professions, we used Churchill’s method\textsuperscript{20,21} which is used in several areas. The questionnaire that has been developed contains several dimensions to gain a better understanding of the concept of failure. This questionnaire focuses on several dimensions such as academic and non-academic factors, professional career and student motivation, as they are one of the primary factors that cause academic failure according to several studies\textsuperscript{22}.

Various research have determined the relationship between addiction to psychoactive substances (cigarettes, alcohol...)\textsuperscript{23} and university failure\textsuperscript{24} that we didn’t mention in our study for socio-cultural reasons. Similarly, a study made by an American University among people who committed suicide indicated that academic failure was the most common cause of their death\textsuperscript{25}. Various studies have shown that personality factors, motivation, interest, satisfaction, loneliness, the expectation of success, and family circumstances can affect the level of academic success in universities. In a comprehensive approach, the factors involved in academic failure can be classified into three categories, (i) individual factors (components such as having a goal, motivation, anxiety, method of study, intelligence, attention, planning, emotional and mental conditions, lack of attendance, motivation, anxiety, method of study, intelligence, attention, planning, emotional and mental conditions and the lack of class attendance, emotional and mental conditions and the lack of class attendance), (ii) internal organizational factors (professional characteristics of instructors, space and appropriate facilities and equipment) (iii) external organizational factors (parents’ level of education and how they cope with students’ academic failure, socio-economic status of families and uncertain career prospects)\textsuperscript{26,27,28}. These factors are in harmony with the dimensions of our questionnaire.

**Conclusion**

This study aims to identify the factors that affect academic failure from students in the master’s cycle in teaching and education and the professional integration of students. Our future work is no w oriented towards calculating the results of this experiment. This will allow us to have a view on the university failure rate in Morocco.

**Remerciements:** We would like to thank all the students who participated in the study, as well as the Dean of the Faculty of Sciences of Kénitra and the Dean of the Faculty of Letter and Human Sciences of Kénitra for authorizing us to use the data from the APOGEE system.

**Ethical Clearance:** No

**Source of Funding:** Evaluation of training systems for teaching and education in Morocco - Towards a new perspective for the validation of prior learning. Ibn Khaldun Program to Support Scientific Research in the Human and Social Sciences – IK/2018/50

**Conflict of Interest:** Nil

**Reference**


Nutrient Content and Acceptability of Biscuits Substitutes from Flour of Mackerel Fish (Rastrelliger Kanagurta L)

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Abstract

Mackerel (Rastrelliger kanagurta L) is widely available and contains nutrients. This fish has potential for prevention malnutrition problems in Indonesia, especially in South Sulawesi Province, but their utilization is not optimal. The aims of this study was to determine nutrient content and acceptability biscuits substitutes from flour of mackerel fish. The design of this study was experimental by making biscuits through substitution with mackerel fish flour and divided into four concentration formulas, F0 = 0%, F1 = 5%, F2 = 10%, F3 = 15%. Each biscuit was subjected to a acceptability test using the organoleptic test method using hedonic scale. Analysis of protein content using the Kjehdal method, fat content using the shoxlet method, carbohydrates content using the Luff Chroll method and minerals content using with AAS. The results of this study that substitution of mackerel flour reduced the acceptance of biscuits, although the decrease was not significant in terms of color (p = 0.061) and texture (p = 0.356). A significant decrease in the acceptability score was seen in the aroma aspect (p = 0.001) and the taste aspect (p = 0.000). F1 biscuits are the best formula, having a carbohydrate content of 62.49%, 18.35% fat, 10.72% protein, 10.83 mg/L zinc and 230.95 mg/L iron. The substitution of mackerel flour does not affect for acceptability of the color and texture aspects, but affects for aroma and taste, especially if the concentration of the addition is too high. Protein, iron, and zinc levels increased in the biscuits formula that was substituted for mackerel fish meal.

Keywords: Biscuits, acceptability, nutrient content, mackerel.

Introduction

Mackerel (Rastrelliger kanagurta L) is a potential natural resource, widely available in South Sulawesi and has the potential for essential nutrients, especially omega 3 and omega 6 which function for growth and development. Some of the advantages of mackerel are relatively cheap price, high availability so that it is easy to obtain, and has a high nutritional value. Mackerel contains high enough nutrients, functions for growth and maintains a healthy body. Every 100 grams of mackerel fish contains 22 g of protein, 3.4 g fat, 20 mg calcium, 200 mg phosphorus, 1 g iron, vitamin A 30 SI and vitamin B1 0.05 mg(1). On the other hand, mackerel is a perishable foodstuff that requires further handling and processing(2,3)

The use of mackerel fish as long as it is still limited for consumption through food dishes. Currently, mackerel fish has not been used optimally because it has not been found in mackerel that is practical and liked by children(4). The group of children who are prone to malnutrition generally has a low fish consumption habit so it is necessary to diversify the processing of fishery products, for example through the manufacture of fish meal. Diversification of fishery product processing will increase the added value of fresh fish and reduce the perishable nature of fresh fish(5). The addition of fish meal to a food product will increase the nutritional value of the product(6). One of the efforts to increase consumption of mackerel in Indonesia is by processing...
it into local food which is generally consumed by the public. One of the local foods that is often consumed is biscuits. Biscuits are usually consumed as a snack. Biscuits with a mixture of flour and fish have better quality than biscuits without fish mixture.

Biscuits are a popular snack, especially for children, with a variety of flavors, textures and styles. Biscuits have become one of the choices in nutritional interventions in Indonesia, given their dry nature so they have a relatively long shelf life, easy to distribute, practical and commonly consumed by people, especially people with nutritional vulnerabilities. In addition, making biscuits is relatively simple and can be enriched with various additives\(^7,\,8\). The basic ingredients for making biscuits consist of wheat flour, fat or oil and sugar so that the nutritional content is incomplete, especially protein and micronutrients such as vitamins and minerals\(^9\).

Based on these problems, it is necessary to develop alternative foods to prevent nutritional problems. This aims of this study to determine nutrient content and acceptability of biscuit substitutes of mackerel fish flour as an alternative additional food for children under five or pregnant women who experience in malnutrition.

### Materials and Method

**Research Design:** This study was experimental designed to assess the best acceptability and nutritional content of biscuit products based on the substitution of mackerel fish flour. The formulation of the concentration of mackerel flour substitution is grouped into four parts, namely: 0% concentration (F0), 5% concentration (F1), 10% concentration (F2) and 15% concentration (F3). The four groups of biscuits were then tested for acceptance and analysis of the nutrient content of carbohydrates, fats, proteins, calcium, zinc and iron.

**Research Place:** Processing of mackerel fish flour, making biscuits and acceptance tests were carried out at the Food Technology Science Laboratory (ITP) and the Organoleptic Test Laboratory on Nutrition Department of Makassar Health Polytechnic. The analysis of the nutritional value of biscuits was carried out at the Laboratory of Animal Feed Chemistry, Faculty of Animal Husbandry, Hasanuddin University Makassar.

<table>
<thead>
<tr>
<th>Material</th>
<th>Unit</th>
<th>Material Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>F0</td>
</tr>
<tr>
<td>Wheat flour</td>
<td>Gram</td>
<td>100</td>
</tr>
<tr>
<td>Mackerel fish flour</td>
<td>Gram</td>
<td>0</td>
</tr>
<tr>
<td>Margarine</td>
<td>Gram</td>
<td>50</td>
</tr>
<tr>
<td>Fine granulated sugar</td>
<td>Gram</td>
<td>65</td>
</tr>
<tr>
<td>Egg yolk</td>
<td>Gram</td>
<td>2</td>
</tr>
<tr>
<td>Milk powder</td>
<td>Gram</td>
<td>20</td>
</tr>
<tr>
<td>Cornstarch</td>
<td>Gram</td>
<td>5</td>
</tr>
<tr>
<td>Room butter</td>
<td>Gram</td>
<td>6</td>
</tr>
<tr>
<td>Vanilla</td>
<td>Sdt</td>
<td>½</td>
</tr>
<tr>
<td>Baking soda</td>
<td>Sdt</td>
<td>½</td>
</tr>
<tr>
<td>Cocoa powder</td>
<td>Gram</td>
<td>10</td>
</tr>
<tr>
<td>Salt</td>
<td>Sdt</td>
<td>½</td>
</tr>
</tbody>
</table>

Description: Sdt = teaspoon

**Procedure of Making Fish Flour and Biscuits:**
The process of making mackerel fish flour is as follows: (1) select fresh mackerel, clean its scales, fins, gills and guts; (2) put the fish in a basin and then give it and soak it in lime solution for about 15 minutes; (3) steam with lemongrass for about 30 minutes; (4) the fish is drained...
by leaving it in the open air. The fish is shredded into small sizes and separated from the bones; (5) shredded fish meat is then dried using an oven at a temperature of 550°C for ± 24 hours; and (6) the dried meat dregs are immediately ground and sieved to obtain a fine fish meal.

The process of making mackerel fish flour substitution biscuits is carried out in the following order: (1) weigh 50 g of margarine, mix 65 g of powdered sugar; (2) Mixer until well blended, then add 2 egg yolks then mixer again; (3) add 100 g of wheat flour, 6 g of vegetable fat (room butter), ½ tsp of salt, 5 g of cornstarch, 20 g of powdered milk and ½ tsp of vanilla, Mixer until blended; (4) Add the mackerel fish flour; (5) Stir evenly then add 10 g of cocoa powder; (6) weigh the dough 6 g per part, then print; (7) bake in oven 155°C for 15 minutes; and (8) puffed fish biscuits are ready to be served.

Data Collection Method: The assessment of the acceptance of biscuits is assessed based on organolopetic tests on aspects of color, texture, aroma and taste. The test uses an instrument in the form of a Hedonic scale with a score of 1-4, namely 1 = dislike, 2 = dislike, 3 = like and 4 = very like. The test was carried out by 35 semi-trained panelists from the Department of Nutrition, Health Polytechnic of Makassar who had programmed the Food Technology course.

Analysis of the nutritional value of biscuits, namely protein content using Kjehdal method, fat content using Shoxlet method, carbohydrates content using Luff Chroll method, minerals content (calcium, iron and zinc) using AAS (Atomic Absorption Spectrophotometry) method.

Data Analysis: Acceptability data in categorical form were analyzed using the Chi Square test. The scoring data were analyzed using the one-way Anova test and the Kruskal-Wallis test, to determine differences in acceptance scores. If the statistical test results are significant, then further analysis is carried out using the Tukey test.

Results and Discussion

Acceptance of Biscuits:

Table 2: Percentage (%) of Panelists’ Likeness Level in Each Biscuit Formula Based on the Receiving Aspect

<table>
<thead>
<tr>
<th>Acceptability</th>
<th>F0</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Really like</td>
<td>22.8</td>
<td>5.7</td>
<td>5.7</td>
<td>8.6</td>
<td>0.163</td>
</tr>
<tr>
<td>Like it</td>
<td>68.6</td>
<td>77.1</td>
<td>74.3</td>
<td>68.6</td>
<td></td>
</tr>
<tr>
<td>Do not like</td>
<td>8.6</td>
<td>17.1</td>
<td>20.0</td>
<td>22.8</td>
<td></td>
</tr>
<tr>
<td>Do not like</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Texture:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Really like</td>
<td>11.4</td>
<td>5.7</td>
<td>5.7</td>
<td>5.7</td>
<td>0.319</td>
</tr>
<tr>
<td>Like it</td>
<td>60.0</td>
<td>77.1</td>
<td>60.0</td>
<td>28.6</td>
<td></td>
</tr>
<tr>
<td>Do not like</td>
<td>28.6</td>
<td>17.2</td>
<td>34.3</td>
<td>60.0</td>
<td></td>
</tr>
<tr>
<td>Do not like</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5.7</td>
<td></td>
</tr>
<tr>
<td>Aroma:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Really like</td>
<td>17.1</td>
<td>0</td>
<td>2.9</td>
<td>2.9</td>
<td>0.000</td>
</tr>
<tr>
<td>Like it</td>
<td>74.3</td>
<td>45.7</td>
<td>45.7</td>
<td>25.7</td>
<td></td>
</tr>
<tr>
<td>Do not like</td>
<td>8.6</td>
<td>54.3</td>
<td>51.4</td>
<td>71.4</td>
<td></td>
</tr>
<tr>
<td>Do not like</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Taste:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Really like</td>
<td>37.1</td>
<td>2.8</td>
<td>5.7</td>
<td>8.5</td>
<td>0.000</td>
</tr>
<tr>
<td>Like it</td>
<td>54.3</td>
<td>54.3</td>
<td>42.9</td>
<td>34.3</td>
<td></td>
</tr>
<tr>
<td>Do not like</td>
<td>8.6</td>
<td>42.9</td>
<td>51.4</td>
<td>54.3</td>
<td></td>
</tr>
<tr>
<td>Do not like</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2.9</td>
<td></td>
</tr>
</tbody>
</table>

F0 = 0%, F1 = 5%, F2 = 10%, and F3 = 15% substitution of mackerel fish meal
Chi Square test results showed that the substitution of mackerel fish flour did not affect the panelists acceptance of color (p=0.068) and texture (p= 0.407) of biscuits. The substitution of mackerel fish flour influenced the panelists preference in the aspect of aroma (p=0.000) and taste (p=0.000) of biscuits. The higher concentration of the mackerel fish flour substitution, the less the panelists expressed their preference for the aroma and taste aspects of the biscuits.

Table 3: Acceptability Score for each Biscuit Formulation

<table>
<thead>
<tr>
<th>Acceptability</th>
<th>Treatment</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F0</td>
<td>F1</td>
</tr>
<tr>
<td>Color</td>
<td>3.14</td>
<td>2.88</td>
</tr>
<tr>
<td>Texture</td>
<td>2.82</td>
<td>2.89</td>
</tr>
<tr>
<td>Aroma</td>
<td>3.08</td>
<td>2.46</td>
</tr>
<tr>
<td>Taste</td>
<td>3.28</td>
<td>2.60</td>
</tr>
<tr>
<td>Combined</td>
<td>3.08</td>
<td>2.71</td>
</tr>
</tbody>
</table>

F0 = 0%, F1 = 5%, F2 = 10%, and F3 = 15% substitution of mackerel fish meal

Table 2. shows that the standard biscuits or without mackerel flour (F0) have the highest acceptance score for the aspects of color, texture, aroma and taste. Substitution of mackerel flour reduced the acceptance of biscuits, although the decrease was not significant in terms of color (p = 0.061) and texture (p = 0.356). A significant decrease in the acceptability score was seen in aroma aspect (p = 0.000) and taste aspect (p = 0.000). The higher the concentration of the mackerel fish flour substitution, the lower acceptance score in both aspects.

Based on the results of the organoleptic test from the aspects of color, texture, odor, and, taste (table 1), it shows that the biscuits most favored by the panelists were the F1 formula with a concentration of 5% mackerel fish flour. This is made clear by the data from the results of the favorite score in table 2 which shows that a biscuit has the highest score is the F1 formula, both in terms of color, texture, aroma, and taste. Based on the results of statistical analysis, it shows that there is no difference in the level of preference for the panelists in the aspect of color and texture between formula F0 and other formulas. However, the data distribution of the level of preference and the value of the organoleptic test results showed that the high concentration of mackerel fish flour reduced the preference value of the panelists on the color and texture of the steak.

The result is in line with our previous research on the development of local snacks in South Sulawesi through the addition of snakehead fish flour and development of rice bran cookies and mackerel fish meal. The addition of high snake head fish affects the organoleptic quality of local snacks. Likewise, when we developed cookies with the addition of bran flour (25%) and mackerel (10%) it resulted in the same conclusion that the use of this formula did not affect the acceptability of the color and texture aspects.

Our previous research also only recommended a 5% concentration of snakehead fish meal, so as not to change the color and texture of the snacks from the original.

The same result was also reported by Adele,2020(12) the addition of 20% tilapia fish meal had no effect on the results of the organoleptic test from the aspects of color and texture. The bread that substitutes tilapia fish flour to 20% has the same color and texture as bread without tilapia flour. Likewise with (Sitti Patimah, et all, 2019) the addition of 15% flying fish meal is the most preferred in terms of color, texture, aroma and taste. In the research, Patimah used a combination formulation of flying fish meal (Hyrundichthysoxycephalus) and barley flour (Setaria italica).

Substitution of mackerel flour will not really affect the color of the biscuits because the basic ingredients use more flour and sugar. These materials will experience browning due to the roasting process, so that the appearance of the color of each type of biscuit is relatively the same(14).
The addition of mackerel flour made the textual biscuits softer so that the liking score for the texture aspect was slightly reduced in the F3 formula. However, the addition of mackerel flour with formula F1 has a better texture score than formula F0. The addition of fish meal in high concentrations will reduce binding capacity. Wheat flour contains gluten that binds the dough. Gluten has the ability to bind and expand dough in the manufacture of pastries such as biscuits\(^\text{(15)}\). Wheat flour is a source of gluten. whereas fish flour does not contain gluten\(^\text{(16)}\). The addition of mackerel fish meal that is too high can affect the texture of the biscuits, causing the appearance of being less attractive, soft, easily crushed so that it can affect the panelists’ acceptance of the texture of the product. odor and taste are sensory indicators that determine consumer acceptance of food products\(^\text{(10)}\). The number of panelists who said they like and really like F1 biscuits was low, namely the aroma aspect of 45.7% and the taste aspect of 57.1%. The preference percentage decreases in formula F2 and formula F3. The criteria for receiving a good product are based on the results of the organoleptic test if the preference level reaches 75%\(^\text{(14)}\). The results of the Kruskal-Wallis analysis showed that there were differences in the acceptability score on aroma aspect (p = 0.000) and taste aspect (p = 0.000) between formulas. Further analysis with the Tukey Test shows that the standard formula (F0) is significantly different from F1, F2 and F3, both in terms of aroma and taste. Substitution of mackerel flour in biscuit-making can affect the receptivity of aroma, and taste. Fish have a specific aroma and are difficult to remove. The distinctive smell of fishy fish creates an unfavorable aroma to snacks, there by reducing acceptance\(^\text{(6)}\). The results of this study are in line with what was found by (Purwani, 2017) that the recommended addition of mackerel fish flour for making biscuits is 5%\(^\text{(2)}\). The addition of fish meal more than 5% will reduce acceptance in terms of odor and taste. The smell of food is an important sensory indicator in determining taste. The smell of food forms an important and fundamental sensory signal for taste. Aroms serves as a signal that a food is fit for consumption or not, even before the food is seen. Whether you like a food or not, can be known only by smelling its aroma, even without seeing what the food looks like\(^\text{(10,17)}\). The data of this study also showed the same result that there was a correlation between the preference score for the aroma aspect and taste aspect (p = 0.000). The preference for the aroma aspect affects the taste aspect. The addition of recommended mackerel fish flour to preserve the taste of the biscuits is only 5%. Additions that exceed this concentration will cause rejection of the product\(^\text{(2)}\). Levels of Nutrients:

Table 4: The nutritional value of the biscuits of each formula

<table>
<thead>
<tr>
<th>Nutrients</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F0</td>
</tr>
<tr>
<td>Carbohydrate (%)</td>
<td>66.62</td>
</tr>
<tr>
<td>Fat (%)</td>
<td>21.14</td>
</tr>
<tr>
<td>Protein (%)</td>
<td>9.48</td>
</tr>
<tr>
<td>Calcium (%)</td>
<td>0.34</td>
</tr>
<tr>
<td>Zinc (mg/L)</td>
<td>10.50</td>
</tr>
<tr>
<td>Iron (mg/L)</td>
<td>225.11</td>
</tr>
</tbody>
</table>

F0 = 0%, F1 = 5%, F2 = 10%, and F3 = 15% substitution of mackerel fish meal

The protein content of biscuits ranged from 10.72% (F1) - 13.6% (F3), higher than biscuits without a mixture of mackerel fish flour (F0). The higher the concentration concentration of mackerel fish flour, the higher protein content of biscuits. Compared to biscuits that use tuna flour, the results we get have a higher protein content. The protein content of tuna fish flour biscuits at a concentration of 10% was only 11.47% while the results we obtained reached 12.8%\(^\text{(18)}\). However, the results we obtained were lower than the findings of (Sitti Patimah, et all, 2019) which reported that the protein content of mackerel reached. (Sitti Patimah, et all, 2019) used a formula of mackerel fish flour mixed with millet flour which has high protein content. Likewise (Mudjajanto, et all,2015) found that the protein content of flying fish flour biscuits (20 grams) with chocolate flavor was 20.01%.

The development of biscuit products can be an alternative for providing additional food for both children under five and pregnant women. South Sulawesi is classified as an area where pregnant women suffer from malnutrition, especially chronic energy shortages. It is also hoped that the provision of additional food in the form of biscuits can prevent low birth weight (LBW) in babies who are still a health problem in this area\(^\text{(5,19,20)}\).
Conclusion

1. The substitution of mackerel flour in biscuits does not affect the acceptability of color and texture aspects, but it will affect for aroma and taste, especially if the concentration of the addition is too high.

2. The recommended substitute for mackerel fish flour is 5%. Concentrations that exceed this amount will reduce the aroma and taste.

3. Substitution of mackerel fish flour can increase biscuit nutrients, especially protein, iron and zinc.

Ethical Clearance: Taken from Health Polytechnic of Makassar

Source of Funding: No Funding

Conflict of Interest: Nil

Reference


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Effect of Educational Guidelines on Lifestyle Modification and Clinical Outcomes for Patients Undergoing Coronary Artery Bypass Grafting Surgery

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Abstract

Background: Coronary artery bypass grafting (CABG) is one of the most common interventional procedures used worldwide to treat coronary artery disease. Despite patient expectations of the immediate benefits of CABG, some symptoms persist for weeks after hospital discharge, compromising the ability to return to a pre-surgery functional status.

Objective: The study aims to evaluate the effect of educational guidelines on lifestyle modification and clinical outcomes for patients undergoing coronary artery bypass grafting surgery.

Method: A quasi-experimental design was utilized for the study. A purposive sample of 60 patients undergoing coronary artery bypass grafting surgery.

Results: There were highly statistically significant differences between the control and the study group subjects regarding a satisfactory level of total knowledge post implementation the educational guidelines at P value < 0.001, while there were highly statistically differences between the control and the study group subjects regarding the lifestyle behaviors post implementation of the educational guidelines at P< 0.001. Moreover, there were statistically significant differences regarding total outcomes among control and study group subjects post educational guidelines.

Conclusion: Implementation of the educational guidelines has highly significant positive effect on lifestyle modification and clinical outcomes for the studied patients undergoing CABG surgery.

Keywords: Lifestyle modification, CABG surgery, patients’ outcomes.

Introduction

Coronary artery bypass grafting (CABG) is a procedure used to help improve and save the lives of thousands of coronary artery disease patients every year. About 90% of patients experience significant improvement after CABG surgery (Martin & Turkelson 2016)[7].

Worldwide, each year more than 300,000 patients undergo (CAPG) surgery. Approximately one-fifth of them will have recurrence of coronary heart disease symptoms within the first 5 years. This risk increases with age and is higher among women. Up to 30% will have angina in the first postoperative year, increased risk for myocardial infarction, and greater need for reoperation (Saboula, Hussein & Habouh, 2020)[8].

After CABG surgeries healthy lifestyle was associated with significant reductions in the incidence of recurrence of coronary heart disease and clinical risk factors, including diabetes, hypertension, and hypercholesterolemia. Adhering to a healthy lifestyle is associated with a lower risk for complications, including coronary heart disease, stroke, sudden cardiac death and infections. Thus, promoting adherence to a healthy lifestyle has the potential to not only substantially reduce the burden of post-CABG patients but could be a simple, but important, strategy to lower overall morbidity and premature death in cardiac patients (Ali, Yasir, Sherwani, Fareed, Arshad, Abid & Muhammad 2017[2]).
Method

In the present study, a quasi-experimental design was utilized. The study was conducted at cardiac outpatient clinics, inpatient units and post open heart intensive care unit in Academic institute for heart surgery affiliated to Ain Shams University Hospital, Cairo, Egypt. A purposive sample of 60 postoperative patients undergoing coronary artery bypass grafting’ surgery, from the previously mentioned setting (the sample will be divided into a study group and control group). The study subjects were selected according to certain inclusion criteria. Type I error with significant level alpha (α) = 0.01 (confidence level 99%). The inclusion criteria were (1) Adult patients, from both genders, prepared to CABG surgery, with no neurological or mental disorders, (2) Patients who are able to comprehend instructions, (3) Patients who are not exposed to any educational or learning experience previously related to CABG surgery, (4) Patients who will agree to participate in the study.

Tools of data collection include (A) Patients’ interviewing questionnaire which divided into three parts; socio-demographic data of patients undergoing CABG surgery; medical health profile of patients; and patients’ knowledge regarding coronary artery disease, CABG surgeries, lifestyle modification and self-care after CABG surgery. It was developed by the researcher after reviewing the recent and related literatures (Wadie, Shaheen & Nashat 2013[12]; Hinkle & Cheever 2018[6]). Regarding scoring of patients’ knowledge assessment questionnaire, the correct answer had got one score while the wrong one had got zero. The scores of each statement were summed up giving a total score, then the total score for all the knowledge questionnaire were calculated and categorized as follows; scores less than 45 (< 75%) was unsatisfactory and scores equal or more than 45 (≥75%) was satisfactory. (B) Lifestyle Indicator questionnaire was a standard tool adapted from (Godwin, Streight, Dyachuk, Hooven, Ploemacher, Seguin & Cuthbertson 2008[5]) to assess patient’ lifestyle behaviors pre-educational guidelines and two months post educational guidelines, including diet, exercise, alcohol consumption, smoking habits, life stress and medication habits, lifestyle total score on a scale of 0 to 12, were categorized as unhealthy (0-4), intermediate (5-8), or healthy lifestyle (9-12). (C) Patient’ outcomes assessment questionnaire was adapted from (Schroter and Lamping 2004[10]) to assess patient’ outcomes after CABG surgery two and six months post educational guidelines, including symptoms, physical, psychological and cognitive functioning, and the adverse effect of CABG, responses were scored as Yes or No, the responses Yes answer had got one score while the No answer had got zero. Total responses were summed and the sum was expressed as a Percentage, so that 100% were the worst possible score while 0% was the best possible score.

The phases of data collection started by selecting patients who are met the inclusion criteria. The aim and nature of the study was explained to patients. Patients’ interviewing questionnaire and lifestyle indicator questionnaire were filled by all the patients (study and control groups’ subjects) before the guidelines implementation within 30 to 40 minutes for every patient. The educational guidelines was delivered only for study group subjects, patients’ interviewing questionnaire and lifestyle indicator questionnaire were filled again by all the patients two months after the guidelines implementation. Patient› outcomes assessment questionnaire» were filled two month and six months after the guidelines implementation. Data collection process continues for a period of eight months starting from January 2020 to August 2020.

Statistical Analysis: Data were transferred into SPSSfor window, version 20.0 Armonk, NY: IBM Crop. Quantitative data were presented as mean and standard deviation (SD) to present normally distributed continuous variables. A chi-square test $\chi^2$ was used to compare categorical data to determine the differences before and after implementation of lifestyle modification module. The significance of the observed difference was obtained at P value $\leq 0.05$.

Results

1. Patients’ characteristics: Regarding the socio-demographic characteristics of patients under the study, the mean age of the study group was (54.86±5.03), while the mean age of the control group was (54.57±4.25) with no statistically significant differences between them. Regarding the gender, the current study showed that 93.3% of the study group and 90% control group were males with no statistical differences between them. As regard marital status, 86.7% of the study group and 93.3% control group were married. In addition 90% of the study group and 83.3% control group didn’t have enough income for treatment.
2. **Patients’ knowledge:** This study revealed that the satisfactory level of knowledge during pre-educational guidelines phase has no statistical significant relation between study and control group subjects including patient knowledge regarding CAD, patient knowledge regarding CABG, patient knowledge regarding lifestyle modification, patient knowledge regarding self-care after CABG. While the satisfactory level of knowledge during post-educational guidelines phase has high statistical significant relation between study and control group subjects including diet (P<0.001), exercise, smoking, stress and medication at (P<0.001), while alcohol consumption have no significance.

Regarding the satisfactory level of total knowledge, the current study showed that 36.7% of the study group subject and 30% of the control group subjects had a satisfactory level of total knowledge pre implementation of the educational guidelines. While 93.3% of the study group subjects had a satisfactory level of total knowledge post implementation the educational guidelines with highly statistically significant differences between them (P< 0.001).

3. **Patients’ lifestyle behaviors:** Regarding the lifestyle behaviors, table (1) shows that, the lifestyle behaviors during pre-educational guidelines phase has no statistical significant relation between study and control group subjects including diet, exercise, alcohol consumption, smoking, stress and medication adherence with (P >0.05). While the lifestyle behaviors during post-educational guidelines phase has high statistical significant relation between study and control group subjects including diet (P<0.001), exercise, smoking, stress and medication at (P<0.001), while alcohol consumption have no significance.

4. **Patients’ outcomes:** Concerning patients’ total outcomes two months post-educational guidelines table (2) revealed that there were highly statistical significant relation between study and control group subjects regarding the effect of patient’ condition on total outcomes namely psychological functioning and satisfaction (P <0.001), also there were significant statistical relation on outcomes namely physical functioning and symptoms (p=0.017-P=0.038), while there were no statistical significant relation between study and control group subjects regarding the effect of patient’ condition on total outcomes namely cognitive functioning and adverse effect post CABG (P> 0.05). While concerning patients’ total outcomes six months post-educational guidelines there were highly statistical significant relation between study and control group subjects regarding the effect of patient’ condition on psychological functioning and satisfaction (P <0.001), while there were no statistical significant relation between study and control group subjects regarding the effect of patient’ condition on symptoms, physical functioning, cognitive functioning and adverse effect post CABG (P> 0.05).

<table>
<thead>
<tr>
<th>Table (1): Comparison between study and control group subjects regarding lifestyle behaviors pre and post educational guidelines.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Diet</td>
</tr>
<tr>
<td>Unhealthy</td>
</tr>
<tr>
<td>Intermediate</td>
</tr>
<tr>
<td>Healthy</td>
</tr>
<tr>
<td>Exercise</td>
</tr>
<tr>
<td>Unhealthy</td>
</tr>
<tr>
<td>Intermediate</td>
</tr>
<tr>
<td>Healthy</td>
</tr>
</tbody>
</table>
### Table (2): Percentage distribution of the study and control groups subjects regarding their total outcomes two and six months post educational guidelines.

<table>
<thead>
<tr>
<th>Items of outcomes</th>
<th>Effect of patient’s condition on</th>
<th>2 Month post education</th>
<th>6 Month post education</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control N = 30</td>
<td>Study N = 30</td>
<td>Chi-square</td>
</tr>
<tr>
<td>Symptoms</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Physical functioning</td>
<td>16</td>
<td>53.3</td>
<td>7</td>
</tr>
<tr>
<td>Psychological functioning</td>
<td>11</td>
<td>36.7</td>
<td>1</td>
</tr>
<tr>
<td>Cognitive functioning</td>
<td>3</td>
<td>10.0</td>
<td>0</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>16</td>
<td>53.3</td>
<td>0</td>
</tr>
<tr>
<td>Adverse effects Post -CABG</td>
<td>12</td>
<td>40.0</td>
<td>6</td>
</tr>
<tr>
<td>Total outcomes</td>
<td>10</td>
<td>33.3</td>
<td>2</td>
</tr>
</tbody>
</table>

>0.05 Non significant <0.05* significant <0.001** High significant
Discussion

Regarding the socio-demographic characteristics of patients under the study, the finding of this study revealed that the mean age of the study group was (54.86±5.03), while the mean age of the control group was (54.57±4.25) with no statistically significant differences between them.

These results are in agreement with Fakhry, Balbaa, Senna, and Saleh, (2020), who studied “Timing of coronary artery bypass grafting surgery after acute myocardial infarction that was conducted in Kasr Al-Ainy University Hospitals”, and mentioned that the mean of age of patient undergoing CABG surgery was (58.4 ± 7.3) years.[4]

In addition, the current study showed that the majority of the study group and control group were males with no statistical differences between them. This might be due to the elevation of the incidence of coronary artery disease among males than females. These results are similar to the results of Abd Allah, Bakr, Abdallah Abdelrahman, Taha and Kamel, (2020), in a study titled “ Preoperative left stellate ganglion block: Does it offer arrhythmia-protection during off-pump CABG surgery? A randomized clinical trial” that was conducted in Assiut, Egypt, and reported that the majority of study subjects were males.[1]

Regarding the satisfactory level of total knowledge, the current study showed that about one third of the study group subject and less than one third of the control group subjects had a satisfactory level of total knowledge pre implementation of the educational guidelines. While the majority of the study group subjects had a satisfactory level of total knowledge post implementation the educational guidelines with highly statistically significant differences between two groups. This result is in accordance with Safabakhsh, Arbabisarjou, Jahantigh, Nazemzadeh, Rigi, and Nosratzehi, (2016), who mentioned that Health Promotion Program (HPP) were effective on life style changes and health promotion in patients after CABG[9].

It was observed from the current study that the effect of patient’ condition on total outcomes among control group subjects more than the effect on study group subjects with statistically significant difference, which mean that the control group subjects was suffering the worst outcomes than the study group, this difference might be related to the effect of implementation the educational guidelines on the study group subjects. This result is similar to Alkan, Topal, Hanedan,andMataraci, (2018), who mentioned that the nursing education and implementation of healthy lifestyle behaviors can influence the outcome[2].

Conclusion

Implementation of the educational guidelines has highly significant positive effect on lifestyle modification and clinical outcomes for the studied patients undergoing CABG surgery, which support the study hypothesis.

Acknowledgements: The researchers want to thank all patients who are agreed to participate in the study.

Ethical Clearance: Institutional ethical committee obtained for the study.

Source of Funding: Self

Conflict of Interest: None

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Dental Medicine Students Perception on the Effectiveness of Problem Based Learning (PBL) Class Using Online Learning Method

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¹Undergraduate Student, Faculty of Dental Medicine, Universitas Airlangga, ²Graduate Student of Health Administration and Policy, Faculty of Public Health, Universitas Airlangga, ³Department of Dental Public Health, Faculty of Dental Medicine, Universitas Airlangga

Abstract

Background: The main concern of universities is regarding the quality and effectiveness of education. A total of 32 dentistry faculties in Indonesia have implemented Problem Based Learning (PBL) classes in their learning curriculum. Some dentistry faculties have actively used student-centered learning method, and are no longer teacher-centered. According to the results of the 2017 Indonesian Internet Service Providers Association, the prevalence for Indonesian (Undergraduate/Diploma) students as Internet users reached 79.23%.

Purpose: To describe the perception of Universitas Airlangga Faculty of Dental Medicine students on the effectiveness of the Problem Based Learning (PBL) class using the Online Learning method.

Method: Data was collected from the distribution of questionnaires to students of Universitas Airlangga, Faculty of Dental Medicine semesters 1, 3, 5, and 7. Then a descriptive statistical test was conducted.

Results: The percentage of respondents who considered effective Problem Based Learning (PBL) classes using online learning method was 52.4%, very effective at 5.8%, very ineffective at 2.9%, no opinion at 14.6%, and ineffective at 24.3%.

Conclusion: The majority of Universitas Airlangga Faculty of Dental Medicine students have an effective perception of the Problem Based Learning (PBL) class using the Online Learning method.

Keywords: Effectivity perception, Problem Based Learning (PBL), online learning, dental medicine students.

Introduction

The quality and effectiveness of education is the main concern of universities. Lately, several dentistry schools have actively used student-centered learning method, no longer teacher-centered¹. A total of 32 dentistry faculties in Indonesia have established PBL classes in their learning curriculum. The problem faced by students at this time is the lack of use of technology and only refers to Problem Based Learning. Thus, the knowledge gained is limited. According to the results of the Indonesian Internet Service Providers Association Research, internet user penetration based on the latest education level in 2017, the prevalence for Indonesian students reached 79.23%.

The Problem Based Learning (PBL) model is one of the learning models that leads to problem solving
which is expected to hone students’ critical thinking skills. Problem Based Learning (PBL) has actually been developed more than 40 years ago as a reaction to the problems and limitations of traditional teaching approaches. PBL is expected to help students to develop thinking skills and problem solving skills. Students with problem based learning learning strategies have greater motivation and learning strategies compared to education using collaborative learning learning strategies.

In the Indonesian Dentist Competency Standards, graduates of the dentistry study program are prepared to produce competent and skilled and professional human resources in providing services to the community. For this reason, universities must be able to shape the mindset of students.

**Material and Method**

The research method is the path or way taken in connection with research conducted and has systematic steps. Research method can be interpreted as a scientific way to obtain valid data with the aim to be found, developed, and proven, a knowledge that can be used to understand, solve, and anticipate problems. The research method includes research procedures and techniques. By mastering research method, not only can solve various research problems, but also can develop the field of science that is involved.

Research design or design is a plan about collecting, processing and analyzing data systematically and directed so that research can be carried out efficiently and effectively in accordance with its objectives. Meanwhile, according to Pressman, the design is a series of procedures to translate the results of the analysis of a system into a discussion of programming to describe in detail how the system components are implemented. While the notion of building is the activity of creating or replacing or improving existing systems both in whole or in part.

This research is a descriptive study using quantitative research method, namely research by finding information about existing symptoms, clearly defined objectives to be achieved, planning how to approach it, and collecting data as material for making reports. In this study the authors wanted to know the effectiveness of learning based on program learning (PBL) with online learning learning method for students of the Faculty of Dental Medicine, Universitas Airlangga. The research variables that will be examined in this study are divided into two variables namely, the dependent variable (X) consisting of one variable, namely the perception of Faculty of Dental Medicine Universitas Airlangga students about the effectiveness of PBL learning while the independent variable (Y) consists of one variable, the online learning method.

The research location is a place or region where the research will be conducted. Research activities certainly require a location that will be used as a background to obtain the data needed to support the achievement of research objectives. Determination of the location of this study related to the presence of data or information in accordance with the objectives of the study. The research conducted took place at the Faculty of Dental Medicine Universitas Airlangga, Surabaya City. This research was conducted for approximately two weeks.

Data collection method is one aspect that plays a role in the smoothness and success in a study. In this study the data collection method used was a questionnaire or questionnaire. Questionnaire or questionnaire is a data collection technique through forms that contain questions submitted in writing to a person or group of people to get answers or responses and information needed by researchers. This study uses a questionnaire or questionnaire, the list of questions is structured with the form of multiple choice questions (Multiple Choice Questions) and closed questions (Close Question).

The population is the whole subject of research. If someone wants to examine all elements in the research area, then the research is a population study or population study or census study. Population is a generalization area consisting of objects or subjects that have certain qualities and characteristics determined by researchers to be studied and then drawn conclusions. The population of our study was preclinical students of the Faculty of Dental Medicine Universitas Airlangga, which consisted of batches of 2016, 2017, 2018 and 2019.

The sample is part of the number and characteristics possessed by the population. If the population is large, and researchers may not study everything in the population, for example due to limited funds, manpower, and time, then researchers can use samples taken from that population. What is learned from the sample, the conclusion can be applied to the population. For that the sample taken from the population must be representative or represent.
**Sample Formula:**

\[
n = \frac{4 \cdot z^2 \cdot \pi \cdot (1 - \pi)}{W^2}
\]

**Note:**

- \(\pi\) = the proportion of events/prevalence rates if unknown is considered to be 50% = 0.50
- \(W\) = width of deviation (maximum = 10-20% = 0.1-0.2)
- \(\alpha = 0.05 \cdot w \cdot z\) (adjusted SD) = 1.96

From this formula, the sample size is 38,416. A study can be said to be valid if the number of samples can represent the population. So, it can be concluded that in order for this study to be valid, the minimum number of samples that we had to get to the preclinical students of the Faculty of Dental Medicine, Universitas Airlanggawas 39 samples.

In the process of this study, data collection was obtained by distributing questionnaires related to emotional responses to respondents to be investigated, namely Universitas Airlangga Faculty of Dental Medicine students. The research instrument used was a questionnaire or google questionnaire using the Likert scale. Likert scale is a measurement scale developed by Likert and has 4 or more items of a question that are combined to become a score/value that represents the nature of an individual, including knowledge, attitudes and behavior9.

Likert scale will be used with the aim of evaluating the implementation of educational programs by analyzing the perceptions of students who have followed and run an existing education program at the Faculty of Dental Medicine, Universitas Airlangga, namely Problem Based Learning (PBL) using online learning method. The research instrument used was a questionnaire or questionnaire with the following scores: very effective (score 5), effective (score 4), no opinion (score 3), not effective (score 2), and very ineffective (score 1).

In this study, data analysis that can be done is descriptive data analysis. Descriptive data analysis is performed as the first stage for further data analysis, but if the research form does not include random research or analytic research, only descriptive data analysis can be carried out on the data that has been collected. In this data analysis, the data will be packaged in the form of frequency tables, along with mean, median, and mode tables. Data in the form of scores will be arranged with the percentage of survey responses from the lowest to highest scores in the table.

**Result**

To obtain data from a distribution of at least 100 questionnaires, the research was conducted online which was directed directly to undergraduate education students in semester 1, 3, 5 and 7 of the Faculty of Dental Medicine, Universitas Airlangga, Surabaya, who were undergoing PBL classroom education using online learning method.

### Table. 1. Cross tabulation of respondents’ characteristics distribution and the effectiveness of PBL classes with online learning method.

<table>
<thead>
<tr>
<th>Respondents Characteristic</th>
<th>Total %</th>
<th>Effectiveness of PBL classes with online learning method (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Effective</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>15,5</td>
<td>56,2</td>
</tr>
<tr>
<td>Female</td>
<td>84,5</td>
<td>51,7</td>
</tr>
<tr>
<td><strong>Class of Study</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2016</td>
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</tr>
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</tr>
<tr>
<td>2018</td>
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</tr>
<tr>
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<tr>
<td>textbook</td>
<td>6,8</td>
<td>57,1</td>
</tr>
</tbody>
</table>
The number of preclinical students in semester 1, 3, 5, and 7 of the Faculty of Dental Medicine of Universitas Airlangga, Surabaya who are more female (84%) compared to male students (15.5%), this can be seen from table 1.

This study was aimed at the four youngest batches at the Faculty of Dental Medicine, Universitas Airlangga, Surabaya, namely the batch of 2016, 2017, 2018 and 2019. From the number of respondents participating in each class, the highest percentage was found in the 2017 class of 26.2%, followed by class of 2018 that is equal to 25.2%. As for the 2016 and 2019 batches they have the same percentage of 24.3%. From these results it can be concluded that the majority of respondents were from the class of 2017 and the lowest respondents in the class of 2016 and 2018.

From the data table above illustrates that the media most widely used by respondents are “Smartphones” (57.3%), and the least used media by respondents are “Smartphones and Laptops” (1.0%) and “Laptops and textbooks” (1.0%). From this data it can be concluded that respondents use smartphones more, and rarely use other online media in PBL classes.

Online learning based PBL classes implemented at Dental Medicine, Universitas Airlanggawas considered effective by respondents to support learning during lectures. This can be seen from the table data above that the percentage of respondents considers effective PBL-based online learning classes that is equal to 52.4% and very effective 5.8%, very ineffective 2.9%, no opinion 14.6%, and ineffective 24.3%.

Discussion

This research is a survey conducted in the area of the Faculty of Dental Medicine of Universitas Airlangga regarding students’ perceptions of the effectiveness of the Problem Based Learning (PBL) class using online learning method. The purpose of this study was to determine the effectiveness of the Problem Based Learning (PBL) class using online learning method in Universitas Airlangga Faculty of Dental Medicine students. This research also has benefits, namely as a basis for perfecting the Problem Based Learning (PBL) program in various universities in Indonesia.

In this study shows that the most widely used media by respondents for online learning in the Problem Based Learning (PBL) class is “smartphone” which is 57.3% followed by “laptops” by 33.0%, “textbooks” by 6.8%, “smartphones and laptops” by 1.0%, and “textbooks and laptops” by 1.0%. This is due to a survey conducted by the Indonesian Internet Providers Association, showing nearly half of internet consumers prefer smartphones or tablets.

A survey conducted in 2017 involving 2,500 responses showed 44.16% of them claimed to access the internet through a smartphone or tablet, while 4.49% claimed to access cyberspace through computers or laptops. The survey was corroborated by the percentage of smartphone or tablet ownership which reached 50.08% in Indonesia. Only 25.72% of the internet users in Indonesia who have a computer or laptop.

In addition, this study also showed that the number of students at the Faculty of Dental Medicine at Universitas Airlanggawas dominated by the female population compared to men as indicated by the results of respondents who filled out the questionnaire. The amount can be accumulated in the form of percent, 84.5% for women and 15.5% for men. The sexes also differ in terms of attention, ability, views and others. This can be due to the influence and nature of the tradition on the sex. It is this physical and psychological state that can influence differences in perceptions between women and men.

In this study, it showed that Universitas Airlangga Faculty of Dental Medicine students who considered online Problem Based Learning (PBL) classes effective 52.4%, 5.8% highly effective, 2.9% highly ineffective, no opinion 14.6%, and ineffective 24.3%. This is because Problem Based Learning (PBL) can stimulate open-mindedness and encourage students to do more critical and active learning because they are invited to learn through problems that arise and how to solve these problems. Automatically students get knowledge as well as how to apply it. The Problem Based Learning (PBL) method also challenges students so that they can get satisfaction by discovering new knowledge for themselves through online learning method.

This study shows that the number of students of the Faculty of Dental Medicine, Universitas Airlangga has many correspondents that are almost the same for each generation. There were 25 correspondents from the class of 2016, 27 correspondents from the 2017 class, 26 correspondents from the class of 2018, and 25 correspondents from the class of 2019. Most of the
correspondents filled out the questionnaire of their own volition, filling in the questionnaire online. However, the possibility of differences in the amount of participation per class is also related to differences in free time and willingness to fill in the existing questionnaire.

Conclusion

The majority of Universitas Airlangga Faculty of Dental Medicine students have a perception that Problem Based Learning (PBL) using the Online Learning method is effectively to apply.

Conflicts of Interest: There are no conflicts of interest.

Source of Funding: Self-Funding

Ethical Clearance: Approved

Reference

Estimation of Difference in Rate of Healing of Contusions in Diabetic, Hypertensive and Anemic Persons by Subjective and Objective Analyses

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Abstract

Background and Objectives: Age of injuries have several medicolegal implications including assault, abuse, criminal conjectures etc. Contusions are wounds characterized by effusion of blood into tissue spaces caused by forceful impact of blunt objects. Its colour changes reflect the natural healing process, though these changes do not occur uniformly and depend on the size of contusion, age and physique of the person and also presence or absence of diseases. This study was aimed at estimating the delay in healing of contusions in diabetic, hypertensive and anemic persons by gross examination and objective analyses including examination under Woods lamp, magnification of digital photograph, and histologic changes to validate the age as per available history.

Method: This is an autopsy based prospective study over a period of 1 year (Feb 2015-Feb 2016), involving 50 cases of contusions conducted in Department of Forensic Medicine, Govt Medical College Calicut. The data obtained were analysed by SPSS software version 18. Comparison of different components, the level of correlation between various variables and significance of association were determined, and sensitivity and specificity of various method of analyses in determining the age of wounds were established.

Conclusion: Grossly, contusions were red < 24 hours old, bluish black on day 2, greenish on day 3 and yellow on day 7 as was seen in magnified digital photograph.

There is increasing positive agreement between colour of wound assessed from magnified digital photograph and period of survival from day 1 to day 5-6 and decreases thereafter in normotensives, hypertensives and non diabetic subjects whereas it drops drastically after 7 days in diabetics.

The association between colour of contusion under Woods lamp and survival period increased from day 1 to reach maximum on 5-6 days.

There is significant positive association between presence of hypertension, as in diabetes, and histological delay in healing of contusions whereas no significant association was found with anemic status.

Keywords: Anemic; contusion; diabetic; digital photography; healing; histopathology; hypertensive; Woods lamp.

Introduction

A wound is a disruption of the normal structure of tissues caused by the application of force to the body, the interpretation of which may have significant medico legal implications including the incrimination...
or exclusion of a suspect as the perpetrator of a crime. The evaluation of any tissue injury is thus an essential component of practice of Forensic Medicine.

The mechanical principles involved in production of wounds have been described by Moritz. Contusions are wounds characterized by effusion of blood into tissue spaces caused by forceful impact of blunt objects. Its colour changes reflect the natural healing process, though these changes do not occur uniformly and is modified by both systemic and local host factors like genetic disorders like Ehler Danlos syndrome, hormones, size of contusion, age and physique of the person and also presence or absence of diseases like diabetes, anemia, malignancy, drugs, malnutrition, obesity, systemic infection, status of liver functions, blood dyscrasias etc.

The age of a contusion may be ascertained roughly from colour changes that commence at the periphery and extend inwards towards the centre from 18 to 24 hours after its infliction. Estimation of age of wound by visual inspection alone is subjective and susceptible to variation in perception, but previous studies have shown that it may be possible to determine age of wound by complementing the direct observation with magnified digital photography. These colour changes are due to the disintegration of the red blood cells and staining of the haemoglobin set free by the action of enzymes from tissues. It is red on the first day, appear blue, bluish black on day 3, greenish on day 7, and yellowish on day 10. These findings are in accordance with the observations made by Bernard Knight where contusions appeared red on first day, blue or bluish black in 2-4 days, greenish by 5th to 6th day and yellowish by 7-12 days of infliction.

Camps also found the contusions were red immediately after infliction; were greenish 4-5 days after infliction of injury and yellowish in 7-10 days.

Similar were the observations made by Dimitrova and Georgieva L et al who found that bruises were predominantly red on day 1, blue on day 3, greenish colour was noted on day 4-6, yellow colour emerging on day 7 and dominant from day 7 to 14.

Observations made in the current study were in complete agreement with the findings obtained by Adelson and also by Camps.

Polson and Gee similarly found that bruise was red up to 24 hours, purple black in 1-3 days, green till 7 days and yellow up to 2 weeks thereafter.

Moritz A R found brown discoloration of contusions older than 24 hours, whereas Spitz U and Fisher R S noticed brown colour by the end of first week, unlike in the current study where a specific brown discoloration was not found in contusion at any stage of healing.

Similar were the findings obtained on magnification of digital photographs. T. Stephenson and Y. Bialas noted red colour in photograph of an injury <1 week old, and they found that shades of green and yellow suggest injury is at least 24 to 48 hours old, whereas in the current study it was noted that red colour was seen predominantly in contusions <24 hours old, bluish black on days 2 and 3.

Barciak et al stated that the accuracy of ageing of a bruise to within 24 hours of its occurrence is less than 50%. It was found by them that recent bruises showed colours of red, blue, purple and older bruises showed yellow, brown and green discolourations.

Histological analysis of contusions for correlations with survival period in the current study showed that in contusions <24 hours old, the predominant feature was infiltration of red blood cells into the wound. By day 2 there was neutrophilic predominance, in 3 days there was prominence of lymphocyte infiltration. By 4 days or more presence of macrophages were noted and pigments were noted at the earliest on day 5, collagen fibres from 6 days onwards and complete re-epithelisation was noted from day 7.

Results and Discussion

In the current study, on gross examination, the predominant colour of contusion with survival period <24 hours was red, bluish black from 2-3 days, greenish on day 3, yellowish on day 7. All the contusions on day 10 were yellowish. These findings are in accordance with the observations made by Bernard Knight where contusions appeared red on first day, blue or bluish black in 2-4 days, greenish by 5th to 6th day and yellowish by 7-12 days of infliction.
The earliest evidence of appearance of fibroblasts was on day 8 and a level of high density fibroblasts was attained by day 10. Jayson and Payne found that neutrophils if found it denotes post infliction interval of approximately 15 hours up to several months after wound infliction. Macrophages were noted from 3 hours to 3 days. However Raekellio and Heplap found only few lymphocytes in wounds aged 12 hours, whereas Betz P found spot like lymphocyte infiltrates at the earliest after about 1 week.

Ishida Y, Kimura A and Takayasu et al found that there were no fibrocytes detected in contusions of age less than 3 days. They were detected initially in wounds aged 4 days and the number increased with age of contusion. There was a maximum of fibrocytes during days 9-14. Their observation was that number of fibrocytes over 10 indicated wound age between 9 and 14 days.

There was excellent correlation between the period of survival and histopathological findings. There was increasing delay in histopathological evidence of healing of contusions subjects with survival period 6 days or more.

In the present study, no significant association was found between the haemoglobin value and histopathological delay in healing of contusion. Pavlidis et al carried out a retrospective analysis of 89 patients and found that anemia was not associated with wound dehiscence.

Khanbai et al found that decline in haemoglobin value had association with poor wound healing.

It has long been known historically that iron is essential for healthy skin, mucous membranes, hair and nails. The role of iron in the skin and cutaneous wound healing was studied by Wright and Richards et al. They found that anemia can lead to increased iron concentration in cells especially macrophages and this could have a detrimental effect on healing. Iron deficiency without inflammation is likely to affect one of later stages of wound healing such as remodeling.

In this study, it was found that there is significant positive association between presence of hypertension and histological delay in healing of contusion than by gross examination. Similar was the finding in diabetic cases. Ahmed and Mooar et al examined the influence of hypertension on the length of time required until a wound is dry. They found that the wounds of hypertensive patients tended to require approximately 2 days longer to dry than those of normotensive patients though precise mechanisms underlying the delay in wound healing were unknown. It could be because aspirin and other NSAIDs commonly used as cardioprotective medications have effects on the clotting cascade.

Diabetes mellitus is associated with delayed healing as a consequence of microangiopathy. In adequate blood supply usually caused by arteriosclerosis or venous abnormalities that retard venous drainage also can cause impaired healing. Hormones such as glucocorticoids have anti-inflammatory effects that influence various components of inflammation and inhibit collagen synthesis.

Though it was stated by V.K. Hughes and N.E.I. Langlois et al that alternative light source was unable assist in determining the age of bruise in their study, it was found to delineate the subtle colour changes in the contusions of grossly greenish colour in the current study, which was in accordance with observations of Vogele E, Pierce M.C and Bertocci G, who stated that the margins of the wound could be better visualized by this method. The association between colour of contusion by Woods lamp examination and survival period assessed by this study increased from day 1 to reach maximum on 5-6 days then declined. Kappa agreement test showed good agreement.

There was increasing correlation between colour of the contusion by magnification of digital photography with that of survival period till 5-6 days and decreased thereafter. There was moderate agreement by Kappa agreement test.

There was increasing positive agreement between colour of wound assessed from magnified digital photograph and period of survival from day 1 to day 5-6 and decreased thereafter in non diabetic subjects. Whereas in diabetic subjects the positive correlation drops drastically after day 7. There was moderate agreement between the colour of contusion by magnification of digital photograph and period of survival in non diabetic subjects while the agreement was poor in diabetic subjects.

The maximum agreement between survival period and colour of contusion by Woods lamp examination was found on 5-6 days for non diabetic subjects. There was good agreement by Kappa agreement test. In
diabetic subjects also it was maximum on 5-6 days, but the agreement was wapoor.

There was moderate agreement between the colour of contusion by magnified digital photograph and survival period in normotensive subjects which was maximum on 5-6 days after sustaining the injury, as was in hypertensive subjects. There was no difference noted considering the hypertensive status of subjects of the study.

There was no difference in agreement considering colour of contusion by Woods lamp examination and period of survival with respect to hypertensive status of subjects.

**Conclusion**

- On gross examination, contusions were red when <24 hours old, bluish black on day2, greenishcolour appearedat the earliest on day3, and yellow on day7.
- Histology of contusions <24 hours showed red blood cells, neutrophils on day2, lymphocytes on day3, macrophages from day4, pigments from day5, collagen fibres from 6 days, complete re-epithelisation from day7, fibroblasts from day8, which increased in density on day9 and10.
- There was excellent correlation between the period of survival, colour by gross examination and histopathological findings.
- There was increasing histopathological delay in healing of contusions subjects with survival period 6 days or more.
- There was no significant association between the haemoglobin value and histopathological delay in stage of healing of contusion.
- There was significant positive association between presence of hypertension and histological delay in healing of contusion than by gross examination.
- There was positive correlation between presence of diabetes mellitus and the delay in healing of contusion by histopathology examination than by gross examination.
- There was increasing correlation between colour of the contusion assessed by magnification of digital photography with that of survival period till 5-6 days.
- There was increasing positive agreement between colour of wound assessed from magnified digital photograph and period of survival from day1 to day 5-6 when it reaches the maximum and decreases thereafter in non diabetic subjects.
- In diabetic subjects the positive correlation drops drastically after day7.
- There was moderate agreement between the colour of contusion by magnified digital photograph and survival period in normotensive subjects which was maximum on 5-6 days, as was in hypertensive subjects.
- By Woods lamp examination, the exact colour of the contusion could be precisely made out. 2% of greenish discolorated contusion was found to be bluish black in colour and 4% of greenish coloured contusions were found to have a yellowish discolouration when examined under Woods lamp illumination.
- The association between colour of contusion when examined under Woods lamp illumination and survival period increased from day1 to reach maximum on 5-6 days then declined.
- The age of contusions were determined, its correlation to various factors analysed, difference in rate of healing with respect to different disease conditions evaluated, and sensitivity and specificity of various method were assessed. It was concluded that an array of subjective and objective analyses can be used to establish the age of wound and assess the rate of healing.

**Highlights:**

- Excellent correlation between age of contusion, gross and histology finding.
- No significant association between anemia and histological delay in healing.
- Significant positive association between hypertension and histological delay in healing.
- Positive correlation between diabetes mellitus and histological delay in healing.
- Increasing correlation between age of contusion and colour with digital photography and Woods lamp examination till 5-6 days.
Table 1: Haemoglobin value and difference in stages of healing

<table>
<thead>
<tr>
<th>Difference category</th>
<th>2 or more days</th>
<th>0 or 1 day difference</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hb</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>0 (&gt; 10 gm %)</td>
<td>Count % within Hb</td>
<td>6</td>
<td>18.2%</td>
</tr>
<tr>
<td>1 (&lt; 10gm %)</td>
<td>Count % within Hb</td>
<td>4</td>
<td>23.5%</td>
</tr>
<tr>
<td>Total</td>
<td>Count % within Hb</td>
<td>10</td>
<td>20.0%</td>
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</table>

Table 2: Hypertension and different rates of healing

<table>
<thead>
<tr>
<th>Difference category</th>
<th>2 or more days</th>
<th>0 or 1 day difference</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 (Absent)</td>
<td>Count % within HTN</td>
<td>4</td>
<td>11.4%</td>
</tr>
<tr>
<td>1 (Present)</td>
<td>Count % within HTN</td>
<td>6</td>
<td>40.0%</td>
</tr>
<tr>
<td>Total Count % within HTN</td>
<td></td>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>

Table 3: Diabetes mellitus and difference in rates of healing

<table>
<thead>
<tr>
<th>Difference category</th>
<th>2 or more days</th>
<th>0 or 1 day</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>DM</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>0 (Absent)</td>
<td>Count % within DM</td>
<td>1</td>
<td>2.7%</td>
</tr>
<tr>
<td>1 (Present)</td>
<td>Count % within DM</td>
<td>9</td>
<td>69.2%</td>
</tr>
<tr>
<td>Total</td>
<td>Count % within DM</td>
<td>10</td>
<td>20.0%</td>
</tr>
</tbody>
</table>

Table 4: Colour of wound by digital photography and survival category

<table>
<thead>
<tr>
<th>DP colour</th>
<th>Survival category</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.00 &lt; 24hrs</td>
<td>2.00 2-4d</td>
</tr>
<tr>
<td>1 (Red)</td>
<td>Count % within Survival category</td>
<td>6</td>
</tr>
<tr>
<td>2 (Bluish Black)</td>
<td>Count % within survival category</td>
<td>2</td>
</tr>
<tr>
<td>3 (Green)</td>
<td>Count % within Survival category</td>
<td>0</td>
</tr>
<tr>
<td>4 (Yellow)</td>
<td>Count % within survival category</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>Count % within survival category</td>
<td>8</td>
</tr>
</tbody>
</table>
## Table 5: Colour of contusion by Woods lamp and survival category

<table>
<thead>
<tr>
<th>WL color</th>
<th>Survival category</th>
<th>1.00 &lt; 24hrs</th>
<th>2.00 2-4d</th>
<th>3.00 5-6d</th>
<th>4.00 7-15d</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Red)</td>
<td>Count</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>% within Survival category</td>
<td>75.0%</td>
<td>.0%</td>
<td>.0%</td>
<td>.0%</td>
</tr>
<tr>
<td>2 (Bluish Black)</td>
<td>Count</td>
<td>2</td>
<td>12</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>% within Survival category</td>
<td>25.0%</td>
<td>80.0%</td>
<td>.0%</td>
<td>11.1%</td>
</tr>
<tr>
<td>3 (Green)</td>
<td>Count</td>
<td>0</td>
<td>3</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>% within Survival category</td>
<td>.0%</td>
<td>20.0%</td>
<td>100.0%</td>
<td>38.9%</td>
</tr>
<tr>
<td>4 (Yellow)</td>
<td>Count</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>% within Survival category</td>
<td>.0%</td>
<td>.0%</td>
<td>.0%</td>
<td>50.0%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>8</td>
<td>15</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>% within Survival category</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

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### Declaration of Interests:

None

### Funding/Grants:

None. This research did not receive any specific grant from funding agencies in public, commercial or not-for-profit sectors

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Study to Compare Anxiety, Depression and Alcohol Use between Manhole Workers and Other Class Four Municipality Workers

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Abstract

Background: Working conditions has serious effect on person’s mental and physical health. Manhole workers work in very demanding and inhuman environment. Many studies shown prevalence of depression, anxiety and substance abuse in people involved in manual cleaning work.

Methodology: Total 100 class IV workers from which 50 manhole workers and rest 50 were other class IV, were studied in a single centric cross-sectional study. The scales used were AUDIT, HAM-A, HAM-D.

Statistical Analysis: Scores obtained were computed using basic descriptive statistics as well as computerized statistical software.

Results: Compared to other class IV workers, more numbers of manhole workers were having significant and more severe anxiety, depression and substance abuse.

Conclusions: This study provides insight about mental health of somewhat neglected class of societies.

Keywords: Class IV, Manhole workers, Anxiety, Depression, Substance abuse.

Introduction

The World Health Organization defines mental health as a platform of establishing an individual’s realization of potentials, coping with real life stresses and working productively, thereby making a significant contribution towards individual communities.(¹)

It needs to be recognized amongst the mental health employees in government sectors. It also symbolizes an important determinant in their overall health. Inadequate work environment including unnecessary stress and declining mental health may affect their ability to contribute both in their personal and professional lives. (²)

Work-related stress is reason for occupational ill health, poor performance and human mistakes. Stress can affect body, thoughts, feelings and behavior. Stress can contribute too many health problems, like increased blood pressure, cardiac issues, obesity etc. as well as psychological effects such as anxiety and depression, loss of concentration and poor decision making.

Mild pressure can be motivating but when it becomes excessive, it can produce stress.

Manhole workers and other class IV workers have to work under stressful conditions. They perform a valuable service to our communities by collecting garbage and removing it to proper disposal areas. The job is physically as well as psychologically demanding. Sanitation workers work in any weather conditions. There is also a significant injury risk associated with the job. Social stigmatization is also high because of their job referred as unclean or lowly in community.

The following can be the reason for work related stress in manhole workers:(²)

- Relationship problems with superiors;
• Bureaucratic constraints;
• Relationship problems with colleagues;
• Performance pressure
• Poor job prospects including the type of work done and the conditions exposed during work;
• High demand for performance: Unrealistic expectations add considerable amount of stress within the employees. which, sometimes, puts unhealthy and unreasonable pressures on the employee, can be a tremendous source of stress and suffering. Increased workload, more hours of duty and increased performance pressure all the time, lead to physical and emotional fatigue amongst the employees. Increased travels and prolonged separation from family members also indulge in being stressors;
• Job insecurity: Employees face major stressors in association with their jobs, regarding the involvements of economic instabilities, takeovers and their successive counter pressures in their workplaces.
• Other job stressors are uncomfortable working conditions, no control over work process and monotony. If work role ambiguity is decreased, the job strain will reduce and will eventually reduce work-related psychological disorders like anxiety disorders.\(^2\)

Work pressure can lead to mental health problems like depression and anxiety in manhole workers and other class IV workers, and also can be associated with more alcohol use.

Depression is a mood disorder indicated by constant decline in mood or markedly decrease in the achievement of pleasure for a period of two or more weeks. It influences both workers and organizations negatively. It also interferes with routine activities and has negative effect on quality of life, the functional skills in the workplace, can cause decreased productivity, along with increased consumption of alcohol and tobacco.\(^3\)

The understanding and screening of alcohol abuse in the population and workers is very important for the prevention of risky behavior and to reduce the psychological and physical negative effects due to the hazardous assumption. Thus, excessive alcohol consumption can be evaluated with the help of the Alcohol Use Disorders Identification Test for Consumption (AUDIT-C) scale, which is instead a shorter, modified component of the AUDIT instrument.\(^4\)

Thus, there is a need to address the correlates of stress and its associated psychiatric morbidities especially in manhole workers with alcohol use, to prevent it from assuming epidemic proportion. As far as my knowledge, there is no such study done in class IV workers in urban area of western India. This study is therefore aimed, to identify depressive and anxiety symptoms in association with sociodemographic variables and patterns of alcohol intake in the manhole workers and other class IV workers in semi- government and government organization of urban area.\(^5\)

Aims And Objectives:
• To evaluate sociodemographic variables among manhole workers and other class four workers and compare it with alcohol use.
• To evaluate and compare alcohol use pattern among manhole workers and other class four workers.
• To evaluate and compare anxiety among all manhole workers and other class four workers and to compare level of anxiety among alcohol users of both groups.
• To evaluate and compare depression among manhole workers and other class four workers and to compare level of depression among alcohol users of both groups.

Materials and Method

This study is community-based, cross-sectional observational study conducted for one year in these semi government and government organization of the urban area, Ahmedabad.

Total 100 workers were included in the study, fifty from each group. One group was manhole workers and second group was other class four workers working in semi government and government organization.

Aged between 18-55 years and permanent workers with experience of more than 2 years were included in the study.

Workers who were on psychiatric treatment and those who did not give consent, were not included in the study.

Subjects were given informed consent forms and educated about the study.
Sociodemographic data was collected and then the following scales were applied to the sample size for assessment:

1. Alcohol Use Disorder Identification Test (AUDIT)
2. Hamilton - Anxiety rating scale
3. Hamilton - Depression rating scale

**Alcohol use disorder identification test:** It is an internationally approved screening test. It helps to denote the implications of alcohol dependency, harmful and as well as hazardous drinking. It is a 10-item questionnaire, usually completed within a duration of two minutes. Every question is scored from zero to four, scored from zero to four. Harmful or hazardous alcohol consumption is considered when the total score is equal to or more than 8. An individual is considered alcohol dependent, when the score is equal to or more than 13. Alcohol consumption is considered non-harmful or non-hazardous, when the total score is less than 8.\(^{(6)}\)

**Hamilton anxiety rating scale:** This scale helps to see the severity correlates of various anxiety symptoms. It consists of 14 items, measuring both somatic and psychic anxiety. The reliability of the scale has been acceptable.

Every item is evaluated on a scale of 0 to 4, with a total score being within the range of 0 to 56. Values less than 17 denote mild anxiety. Values ranging from 18 to 24 denote mild to moderate anxiety, whereas values ranging from 25 to 30 denote moderate to severe anxiety.\(^{(7,8)}\)

**Hamilton Depression Rating Scale:** It is a widely used scale to assess depression worldwide. Developed in 1960 by Dr. Max. Hamilton of the University of Leeds, England, the scale has been a standard in variety of trials. The scale consists of 17 items. The scale emphasizes upon the physical and melancholic symptoms of depression. A 21-item version of the scale is also available. Interpretation is by a Likert scale of either 0 to 4 or 0 to 2. Scores can range from 0 to 54. A score of 0 – 7 denotes normal findings. Score between 8 – 13 denotes mild form of depression. Scores between 14 – 18 denotes moderate form of depression. Severe form of depression is indicated when the scores range between 19 – 22, whereas scores more than or equal to 23 denote very severe form of depression.\(^{(9)}\)

**Statistical Analysis:** Statistical analysis was done for the study by chi-square test, student-t test, proportion and mean. The SPSS trial version and the Microsoft excel version of 2007, were used for statistical analysis.

**Result**

1) **Sociodemographic Variables:**

A) **Age:**

Study data from Graph-1 shows out of 100 workers. Mean age is 36.21±6.64 years. Minimum age is 24 and maximum is 52 years. 27% were from age 20-30, 52% were from 31-40 and 21% from >40 years. Out of 50 manhole workers, 30% were from 20-30 years, 48% from 31-40 years and 22% were from >40 years of age. Data shows that as age increases, audit score also increases. Pearson’s correlation \(p=0.005\) (significance).

**Correlations:**

<table>
<thead>
<tr>
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<th>Age</th>
<th>Audit score</th>
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<tr>
<td>Age</td>
<td>Pearson Correlation 1</td>
<td>.365**</td>
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<td>Sig. (2-tailed) .005</td>
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<tr>
<td>Audit score</td>
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<td>Sig. (2-tailed) .005</td>
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<td>N</td>
<td>57</td>
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</tbody>
</table>

**.** Correlation significant at 0.01 level (2-tailed).
B) Education:

Data shows out of 100 workers, 74% were educated (primary school-34%, middle school 30%, high school 10%) and 26% were illiterate. Out of 50 manhole workers 28% were uneducated, 36% were having education up to primary school, 28% were having up to middle school and only 8% were having education up to high school. While out of 50 other class IV workers 24% were uneducated, 32% were having education up to primary school, 32% were having up to middle school and only 12% were up to high school. Our study findings don’t reveal any statistical significant difference regarding education in both groups.

C) Marital Status: Out of 100 workers, 81% were married, 7% were unmarried and 12% were divorced. In Manhole workers, 78% were married, 2% were unmarried and 20% were divorced. In Other class IV workers, 84% were married, 12% were unmarried and 4% were divorced. This shows that divorce is more in manhole workers, around 5 times more, as compared to class IV workers. Data is statistically significant (p=0.011).

D) Socioeconomic Status: Out of 100 workers, 14% were from the lower class, 72% were from the lower-middle class, while 14% were from the upper-middle class. In manhole workers, 16% were from the lower class, 74% were from the lower-middle class, whereas 10% were from the lower-middle class middle class. In other class IV workers, 12% were from the lower class, 70% were from the lower-middle class, while 18% were from the upper-middle class. Our study does not show any significant difference amongst both groups regarding the socioeconomic status.

II) Alcohol Pattern among Study Population:

A) Prevalence of Alcohol Consumption Among Workers:

In our study 57%, workers are taking alcohol as compared to 43% workers who have never consumed alcohol. Country made liquor was used by 40% of manhole workers and by 20% of other class IV workers. Manhole workers (68%) consume more alcohol, both country and English liquor, in comparison to other class four workers (46%) which is statistically significant.

B) Audit Category of Workers Having Alcohol:

Prevalence of alcohol is 57% in study population. Manhole workers are having 34% and other class IV workers are having 23% of alcohol use. 71% of manhole workers and 52% of other class four workers are having alcohol dependence.

C) Alcohol Frequency Per Week: In our study, manhole workers consume more alcohol in more than 3 days per week in comparison to other class four workers. Manhole workers have 4.62±1.82 days and other class IV workers have 3.96±1.71 days.

D) Money Spending Per Week (Inr) Among Workers Taking Alcohol: In our study 79% manhole workers and 65% other class four workers spend less than thousand INR per week behind alcohol, while 21% manhole workers and 35% otherclass four workers spend more than thousand INR per week.
E) Hours Spent for Alcohol Use Per Week among Workers Taking Alcohol: In our study, manhole workers spend more hours with an average of 13.5 hours for alcohol use per week in comparison to other class four workers who spent only 9 hours per week. (stat. sig. p=0.004)

Pearson’s correlation between audit score and hours spent for alcohol use shows high significance (p=0.000)

Correlations:

<table>
<thead>
<tr>
<th></th>
<th>Audit score</th>
<th>Hours spent behind alcohol</th>
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<tr>
<td><strong>Audit score</strong></td>
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<td>Pearson Correlation</td>
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<td><strong>Hours spent behind alcohol</strong></td>
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**Correlation significant at 0.01 level (2-tailed).**

F) Duration of Years Spent for Alcohol Consumption: According to data, manhole workers have 12.32±4.45 years spent for alcohol consumption and other class IV workers have 11.0± 6.63 years. Pearson’s correlation between years of alcohol and age shows significant result as age progresses use of alcohol consumption increases. Workers who has hazardous pattern of drinking show significant result of more years behind alcohol.

G) Hazards of Alcohol: Our results show more problems that are psychological in manhole workers (38%) in comparison to other class four workers (17.64%). The difference is not statistically significant, which could be because of small sample size. Our result also shows more physical problems in manhole workers (44.11%) in comparison to other class IV workers (21.73%). Same in medico legal issues, manhole workers were having 26.47% in comparison to other class IV workers were having 17.39%.

In occupational hazards, manhole workers (32.35%) and other class four workers (21.73%) almost equal results.

H) Factors Associated with Alcohol Use:
In our research 35% manhole workers and 39.2%, other class four workers admit that they have craving for alcohol. Data is not statistically significant. While 29.94% manhole worker and 56.6% other class IV, workers go through deaddiction.

I) Use of Other Substances in Alcoholic Workers: In our research 94%, alcoholic manhole workers have also use of nicotine as compared to 82% other class four workers had nicotine use along with alcohol. Use of sedatives is 29.4% in MANHOLE workers who also consumes alcohol and only 17.1% other class four workers having use of alcohol. Data is not statistically significant. So my study finding shows clearly that more number of alcoholic manhole workers are using concomitant nicotine (94% vs. 82%) and sedatives also (29.41% vs 17.4%) in comparison to other class IV workers. (though it is not statistical significant). In total population 74%, workers were having tobacco use and only 14% have sedatives use.

4) Assessment of Severity of Anxiety among Both Groups of Workers: My study shows, 32% manhole workers as compared to 14% of other class IV workers experiencing severe anxiety symptoms, which is statistically significant difference (p=0.004).

B) Severity of Anxiety among Workers Having Alcohol: In our research, use of alcohol and anxiety has a significant correlation. Mainly in manhole workers, 47% of them shows severe anxiety with concurrent alcohol use as compared to 26% of other class IV workers had severe anxiety. (stat. sig. p=0.04).

III) Depression:

A) Depression in Both Groups of Worker: In our research, 72% of manhole workers and 44% of other class
four workers are having depression in study population. (STAT SIG. P=0.024) Among all workers 38% manhole workers showing severe depression as compared to only 16% other class four workers. (STATSIG.P=0.024). So this result shows that manhole workers having more depression than other group. (p=0.024)

B) Depression in Both Groups of Workers Taking Alcohol: As my study, result suggests 94% alcoholic manhole workers and 78% alcoholic other class IV workers are having significant depression. (Statistically significant. (p=0.000). It means that only 5.88% manhole worker and 21.73% other class IV workers having concurrent alcohol use not having depression. 55% manhole workers and 34% other class four workers have severe depression who consume regular alcohol. This result is statistically significant. (p=0.000)

Discussion

One hundred workers from the semi-government and government organization of urban area, in Ahmedabad were interviewed for general socio-demographic profile and for depression, anxiety, prevalence, and pattern of alcohol use by using semi-structured assessment instrument.

Our study results show that as age increases, audit score also increases. Pearson’s correlation p=0.005(significance).Our findings are similar to the studies done by Wan-ju-chang et al(10) shows that alcohol drinkers were having 42±9.2 years of age and According to Ghosh et al (11), The consumers’ mean age accounted for 31.4±10.8 years. Though sociodemographic variables like age, education and socioeconomics tat us are not showing any statistical significant difference, the result is significant for marital status.

In manhole workers 20% were divorced as compared to only 4% other class IV workers were divorced. This shows that divorce is more in manhole workers as compared to class IV workers. Data is statistically significant (p=0.011), similar data found in other studies by Yingting Xiao et al (12) and Thomas Lund et al (13) showed that people who work as waste collectors and working in municipality had a high rate of divorce (22.25%) and (19.2%) respectively.

Most of the workers (86%) were having low education and low income. This could be because of high expenses as compared to their income. Number of family members and number of earning members has significant importance in their overall income. Similar results were found in studies by Scarlett et al (14) and Vaidya et al (15) which also show that lower socioeconomic status is related to sanitation job.

Manhole workers (68%) have more alcohol use, both country and English liquor in comparison to other class four workers (46%) which is statistically significant. Reason of more country made liquor used by workers may be ban on alcohol in Gujarat. The consumption and sale of alcohol is banned in Gujarat with regards to the ideological context of Mahatma Gandhi. (16) It has further led to a proliferation of illegal liquor dens, whose home-made brew is mostly consumed by those from low income families like manhole workers who can’t afford high priced drinks available outside the state(17) A study done by Rangamani S et al(18), shows intake of alcohol was away of coping with cleaning filthy sewage which is inhuman task and to forget their physical problem,similar to our findings.

Manhole workers consume more alcohol in more than 3 days per week in comparison to other class four workers. Manhole workers have 4.62±1.82 days and other class IV workers have 3.96±1.71 days. Similarly, a study by Wechsler H et al shows, that workers consumed alcohol one to two days in a week, in the past one year, with heavy drinking, adding up to consumption of more than 5 drinks in about 50% of all males. Further, this was correlated with adding up to more than 4 drinks in every occasion, once a month, amongst 32.5% of all females. However, fort he previous year about 14.3% abstained from alcohol. Some respondents reported in past month consumed alcohol just before going to work or after work. Thus, after-work or non- workday drinking is highly significant. (19) Compared to manhole workers other class IV workers spend more money as compared to manhole workers. This could be due to good quality type of liquor used by them. This variable has not been studied in previous studies.

In our study manhole workers spend more hours with average of 13.5 hours for alcohol use per week in contrast to other class four workers who spent only 9 hours per week. Pearson’s correlation between audit score and hours spent for alcohol use shows high significance (p=0.000). Studies suggest that increasing audit score in manhole workers implies hazardous type of drinking. In addition, it may be one of the major reasons for increased hours spent for alcohol use in manhole
workers. There were no studies, which considered this particular variable. Similar findings and reasons might be reason for more hours spent in alcohol consumption by manhole workers than other class IV workers.

Our results show more problems that are psychological in manhole workers (38%) as compared to other class four workers (17.64%). This could be because of small sample size, more alcohol dependence. Our result also shows more physical problems in manhole workers (44.11%) in contrast to other class IV workers (21.73%), this may also be due to small sample size. Similarly, manhole workers were having more medico legal issues in contrast to other class IV workers. According to Poldugro et al One of key factor in some instances of crime is substance abuse. There is no study showing hazards of alcohol among manhole workers and other class four workers. But Schoepf et al found that more deaths in hospital admitted patients with alcohol dependence are due to different medical co-morbidities.

Study result shows that most of the alcoholic workers have more frequency of consumption of alcohol and because of that, they deny for craving because of constant availability of alcohol. Manhole workers were having less craving as they use to get alcohol more frequently than other class IV workers do. David J. Drobes et al found that Craving for alcohol is common among alcohol-dependent people. While 29.94% manhole worker and 56.6% other class IV, workers go through deaddiction. That shows less motivation among manhole workers to quit alcohol. This could be because of their working condition lead to use of alcohol due to dirt and unhygienic environment.

Our study finding shows clearly that more number of alcoholic manhole workers are using concomitant nicotine (94% vs. 82%) and sedatives also (29.41% vs 17.4%) in contrast to other class IV workers. (though it is not statistical significant).

Meanwhile, Barret et al has proposed important relation between smoking and enhancement of pleasurable impacts over drinking. Further, Rose et al has inversely demonstrated that pleasure from cigarette smoking can be enhanced by consumption of alcohol. A similar study also reports that pleasurable effects can be obtained through interaction between alcohol and the nicotinic receptors.

Study showed statistically significant number manhole workers in contrast to other class IV workers experiencing severe anxiety symptoms. Similar studies by Fleming et al and Hasin et al were showing same results. The reason associated could have been because of the fact that manhole workers are more prone towards developing serious accidents in the form of experiencing falls or slips, oxygen deprivation, asphyxiations, entrapments, heat strokes, explosions and even dangerous gas poisonings. That can produce more anxiety compared to streets weepers. Because of their work, they are socially isolated and untouchable in many places in India. That also shows significant anxiety symptoms related to their social disgrace. In our study, more numbers of manhole workers showed severe anxiety with concurrent alcohol use compared to other class IV workers. Similar result by Hasin etal reports that alcohol dependence is significantly associated with anxiety disorders in comparison to alcohol abuse. Gentil et al showed panic disorder typically has a relatively large association with AUDs (odds ratio [OR] = 1.7–4.)

Result shows that manhole workers having more depression than other group. (p=0.024) As my study, result suggests 94% alcoholic manhole workers and 78% alcoholic other class IV workers are having significant depression. According to MM Darshan et al Gavin et al (life style, economical and physical hazard, social stigma, occupational risk factors and jobs tress have great impact on their psychological risk factors. They also state that use of substance and comorbidities has important effect on their poor lifestyle.

Conclusion
Manhole workers in comparison to other class IV workers are significantly involved with considerable inhuman and hazardous working circumstances. Their working environment compels them to be more prone towards developing anxiety, depression and substance related disorders, especially alcohol use disorders. Thus, Government bodies must look deeper into the varied aspects of conflicted areas regarding improvisation of sanitation, physical health and mental health oft he workers, thereby inflicting a cover over previous loopholes in current action.

Limitations of the Study:
1. It is a cross sectional study and not a prospective study. Hence, this study is not applicable for
analyzing behavior over a period of time and also does not help in determining cause and effect either.

2. All workers had reported use of alcohol subjectively; hence there are possibilities that some of the workers might not be revealing complete truth and details about alcohol use.

3. The sample size is small, thereby increasing the errors and reducing the power of the study.

4. In our study only from urban area, semi government and government organization were considered so further study is required for finding out alcohol use pattern and anxiety/depression in class four workers in private sector and also in rural area.

**Ethical Clearance:** Taken from Institutional Ethics Committee

**Source of Funding:** Self

**Conflict of Interest:** Nil

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An Epidemiological Analysis of Deaths Due to Burns in Newly Married Females

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Abstract

Death due to burns is a major public health problem worldwide. Most cases occur in middle and low-income countries. In India, deaths due to burns are commoner in women than in men. Fire is easily available weapon for suicide and homicide and it can also cause accidental deaths. Death due to burns in newly married female is a common incident in our country and major fraction of such deaths happen as a result of dowry harassment or killing for not giving dowry. Our study aimed to identify some of the epidemiological factors in deaths due to burns in newly married females in and around Pondicherry. Out of 48 cases during the study period, 24 victims were in the age group of 22-25 years and 26 women died within 3 years of marriage. The majority of the cases occurred in less educated and homemaker wives and were living in a joint family. Major reasons or motive behind deaths were dowry harassment and torture, and quarrel with husband or in-laws. The most common manner of such deaths was suicidal followed by accidental.

Keywords: Burns; newly married females; dowry deaths; cooking accidents.

Introduction

Violence against the female is a global public health issue and violation of human rights of a woman. India has already entered into the so-called digital era, but Indian women are frequently exploited and victimized even after the continuous campaigns for equality and social justice.

Burns is a major public health problem. It is estimated that around 180,000 deaths occur annually due to burns. Major portion of such deaths occur in low- and middle-income countries. When we come to India more than 10,00,000 people are moderately or severely burnt every year. The incidence is more common in females than in males. The increased risk for females is associated with cooking in open fire, unsafe kerosene cooking stoves, loose clothing which can ignite easily, self directed violence or interpersonal violence. The fire is easily available weapon for both suicide and homicide.1

There are so many reported cases of suspicious death of newly married females. Burns is a major cause of such deaths in newly married females and could be of any manner.2, 3, 4 In many cases burns in newly married females claimed as stove burst or cooking accidents by husbands and in-laws, and later, it may be converted into the homicide or suicide-related to dowry issues. So our law suggests that any suspicious death of a woman within seven years of her marriage should be considered as a case of dowry death unless proved otherwise by the accused.5

Only a few studies are conducted to analyze various
factors of death due to burns in newly married females. In this study we tried to explore some epidemiological aspects of deaths due to burns in newly married females brought for the autopsy to the department of Forensic Medicine and Toxicology, JIPMER, Pondicherry during the study period.

**Materials and Methods**

This is an epidemiological descriptive study. All female deaths due to burns within seven years of marriage from January 2014 to June 2015, reported in the Department of Forensic Medicine, subject to inclusion and exclusion criteria were selected for the study.

**Inclusion Criteria:** Autopsy on newly married female deaths due to burns within seven years of marriage.

**Exclusion Criteria:**

1. The autopsy on unidentified female bodies
2. The autopsy on decomposed female bodies

Age, duration of married life, time and place of occurrence, type of family, occupation, educational status and socio-economic status of victim, occupation of victim’s husband, reason behind death and manner of death were the parameters under study. A descriptive study was conducted to address the study objectives. All cases of married female deaths due to burns within seven years of marriage brought in the department of Forensic Medicine and Toxicology, JIPMER for autopsy in which all inclusion and exclusion criteria satisfied during the study period were considered eligible for the study.

After receiving the inquest report given by the investigating officer, the history of the case is obtained from the police personnel. The hospital records referred, in the hospital admitted cases. The history of the case from the relatives also recorded. A detailed external and internal examination carried out and the viscera for toxicological analysis and organ bits for histopathological examinations were taken as per the case.

All the data were analyzed using Microsoft excel sheets.

**Ethics:** The study was approved by the Institutional Ethics Committee, JIPMER

**Results**

The total number of cases autopsied during the study period from January 2014 to June 2015 (18 months) were 1254 cases, of which 36.36% (n=456) cases constituted female deaths. In these 456 cases, 65 cases (5.18% of total autopsies) were newly married female deaths. But only 48 cases (3.82% of total autopsies) were female deaths due to burns within seven years of marriage. The age group of the cases brought to our hospital was ranging from 19 – 38 years. About half of them (50%) were in the age group of 22 -25 years (Fig no.1). About 56.17% (n=26) of them died within 3 years of marriage and 87.5% died within 5 years of marriage. Only 3 cases occurred within a year of marriage (Table no.1).Most of the incidences occurred in the rural area (87.5%) as compared to urban (12.5%). About 62.5% of them were living in joint family and rest were from the nuclear family (37.5%). About two-third of burns (66.7%) happened during night hours (i.e. 6 pm-6 am) and rest (33.33%) during the daytime.

We noticed that 66.67% of them were coming from low-income families and 31.25% from middle-income families. Only 2.1% were high-income families. About 25% (n=12) of them had upper primary level, 52.68% (n=25) high school level, 16.67% (n=8) higher secondary level of education. Only 6.25% (n=3) were graduates. None of them were professionals or postgraduates. None of them were illiterates or lower primary level (Fig.no.2). Out of 48 deceased women, 40 were homemaker wives, 5 were daily labourer, and 3 employed in private firms.

From our study, we observed that about 56.25% of victim’s husbands were daily labourers followed by 22.92% own business runners and 14.58% employed in the private/government sector. About 6.25% of them were without any jobs (Fig.no.3). The reason/motive behind death is illustrated in Table no.2. Out of 48 cases, 28 cases were suicidal, 18 accidental, and 2 homicidal cases. But at the end of our study, some of the cases got altered to different manners on inquiry to the police station by phone calls. Two suicidal cases got altered to homicides, and two accidental cases got altered to one homicide and one suicide.

**Discussion**

Indian law states that any suspicious death of a married woman within 7 years of her marriage is considered to be a case of dowry death unless proved otherwise by the defendants.\(^5\) The age of victims in 50% of women was between 22-25 years. Singh J et al. also found that 37% of dowry death cases occurred in 22-25
Women in 2-3 years of marriage constituted the single most vulnerable group from our study (29.16%). Srivastava AK et al. observed as 60% of women died within three years of marriage and were similar to our study (56.17%). As per Radhika RH et al., this was found to be increased to 73.3%. The reasons for the fewer number of cases in the first year of marriage may be the pressure from her parents to adjust or maybe her silent suffering to cope with the situation. But at one point they feel so agitated and may commit suicide.

In our study, most of the incidents occurred in rural areas (87.5%) as compared to the urban area. Darji JA and Radhika RH observed the cases from the rural area as 57% and 56% respectively. The increased percentage in our case may be due to the higher number of the rural population in our study area. Most of them (62.5%) were living in a joint family and these findings were comparable to the study by Nuchhi UC et al., Mohanty S et al. and Arora P et al. About two-third of burns happened during night hours. Agnihotri A et al., Nuchhi UC et al. and Mohanty S et al. also observed a higher rate of incidents in night hours.

Most of them were from a low-income family and the results were comparable with the findings of Sinha US et al. and Das RK et al. About half of them studied only up to high school level and one fourth only up to upper primary level. None of them were professionals or postgraduates. Arora P et al. and Nuchhi UC et al. also got similar observations. In our study None of the victims were illiterates and the reason may be the increased facility and incentives for education in our study population. Majority of them were homemaker wives and the findings were similar to the studies by Srivastava AK et al. and Sinha US et al.

In 25% of the cases, there was definite harassment and torture for dowry and in 31.25% of the cases, there was a quarrel with spouse or in-laws for demanding cash or kinds from her family, alcoholism of husband, and harsh behaviour of husband and in-laws. These two were the main reasons behind the deaths. Srivastava AK et al. and Arora P et al. also noticed similar findings. About 40% of the cases claimed to be accidental burns. At this point, we have to emphasize the observation made by McCoid CH that the alleged “cooking accidents” may not be true every time which can be homicide or suicide. The victims’ relatives won’t go for further legal proceedings as they are from poor socioeconomic status, less educated and they won’t get back their daughter.

In our study, about 58.3% of cases were suicidal burns followed by 37.5% accidental burns and 4.1% homicidal burns. The findings of Mohanty S et al., Radhika RH et al. and Darji JA et al. were matching with our findings. But Shaha KK et al. noticed that about 55% of dowry deaths due to burns were homicides. During our study, we experienced contradictory statements from relatives or attendants of the deceased in many accidental deaths to raise the suspicion of foul play. As shown before, some of the suicides and accidents got altered to homicides and suicides. There may be more alterations in IPC/CrPC sections after the study period as in many of the cases judicial actions not yet started. One of the reasons for this delay is high caseloads in our courts and police stations.

Fig. No. 1: Shows the age-wise distribution of deaths due to burns in newly married females.
Fig. No. 2: Shows the educational status of victims in deaths due to burns in newly married females

Table No. 1: Shows the duration of married life in deaths due to burns in newly married females.

<table>
<thead>
<tr>
<th>Serial No.</th>
<th>Duration of married life in years</th>
<th>Number of cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&lt; 1</td>
<td>3</td>
<td>6.25</td>
</tr>
<tr>
<td>2</td>
<td>1-2</td>
<td>8</td>
<td>16.67</td>
</tr>
<tr>
<td>3</td>
<td>2-3</td>
<td>14</td>
<td>29.17</td>
</tr>
<tr>
<td>4</td>
<td>3-4</td>
<td>13</td>
<td>27.08</td>
</tr>
<tr>
<td>5</td>
<td>4-5</td>
<td>3</td>
<td>6.25</td>
</tr>
<tr>
<td>6</td>
<td>5-6</td>
<td>4</td>
<td>8.33</td>
</tr>
<tr>
<td>7</td>
<td>6-7</td>
<td>2</td>
<td>4.17</td>
</tr>
</tbody>
</table>
Table No. 2: shows the reason/motive behind deaths due to burns in newly married females.

<table>
<thead>
<tr>
<th>Serial No.</th>
<th>Alleged reason/motive behind the death</th>
<th>Number of cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Quarrel with spouse/in-laws or both</td>
<td>15</td>
<td>31.25</td>
</tr>
<tr>
<td>2</td>
<td>Accidental</td>
<td>19</td>
<td>39.58</td>
</tr>
<tr>
<td>3</td>
<td>Dowry harassment and torture</td>
<td>12</td>
<td>25</td>
</tr>
<tr>
<td>4</td>
<td>Infertility</td>
<td>1</td>
<td>2.08</td>
</tr>
<tr>
<td>5</td>
<td>Illness</td>
<td>1</td>
<td>2.08</td>
</tr>
</tbody>
</table>

**Conclusion**

In this article, we tried to find out the magnitude of dowry deaths due to burns in the study population. This study may be only the tip of an iceberg. Also, many of the cases are not reported as dowry death due to poor education and lack of money to go for further legal action. In our study, only very few of the victims were well educated with a good job and from high socioeconomic status. This shows the importance of women empowerment by educating and helping her to get into a good occupation by the parents and relatives than simply marrying off her away with a huge dowry. Maintaining gender equality while rearing the children plays an important role in reducing such incidents. Proper premarital counselling of both spouses with an added education of the girl about her rights will also make an impact in decreasing such events.

**Conflicts of Interest:** Nil

**Source of Funding:** No fund utilized for the study.

**Reference**


Inflammatory Enlargement of the Gingiva: A Case Report

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Abstract

Background: Gingival enlargement is one of the frequent features of gingival diseases. Inflammation of the gingival tissues can be induced by diverse method. All changes in gingival tissues express with some degree of inflammation. In some cases, where gingival enlargement could be the primary sign of potentially lethal systemic diseases, a correct diagnosis of these enlargements could prove life saving for the patient or at least initiate early treatment and improve the quality of life. Pertinent management depends on precisely diagnosing the origin of enlargement. The aim of publishing this case report is to present the clinical, histopathological features and treatment of inflammatory gingival enlargement which disturbed the aesthetics and masticatory function of the patient.

Method: A 20 year old female patient reported with a chief complaint of swelling in the gums of teeth in lower front region. The enlargement was soft and friable and bleeding spontaneously making it difficult for the patient to maintain adequate personal oral hygiene. Surgical therapy was carried out to provide a good aesthetic outcome.

Conclusion: No recurrence was reported. Gingival overgrowth is unaesthetic, and may interfere in mastication and speech; hence a thorough understanding of the pathogenesis is essential for management.

Keywords: Inflammatory, Hyperplastic, Gingiva, Enlargement, Local factors, Electrosurgery, Histopathology.

Introduction

Oral mucosa is persistently subjected to external and internal stimuli and therefore manifests a continuum of diseases that range from developmental to reactive, inflammatory to neoplastic.1 For almost four millennia the clinical manifestations of gingival diseases have been noted by mankind. It was not until the last half of the 20th century that our views about the nature of gingival diseases began to emerge, there has been growing acceptance that gingivitis does not represent a single disease but rather a spectrum of diseases that are the outcome of a variety of different processes. Although inflammation of the gingival tissues can be induced by diverse method (e.g. trauma, chemical agents, temperature extremes, ionizing radiation, viruses, fungi, immune defects, etc.), at this time gingival diseases are considered to be disease entities that are initiated by dental plaque and are restricted to gingival tissues.2

All changes in gingival tissues express with some degree of inflammation. Pertinent management depends on precisely diagnosing the origin of enlargement. However, the skills of a clinician are put to test when arriving at a particular diagnosis among the myriad of gingival enlargements that can be classified according to etiologic factors and pathologic changes, according to location and distribution and/or according to the degree of enlargement.3 Indices are important for quantification of the extent and severity of gingival overgrowth. For example, the degree of gingival enlargement can be scored as follows:4

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Grade 0: no signs of gingival enlargement

Grade I: enlargement confined to interdental papilla

Grade II: enlargement involves papilla and marginal gingiva

Grade III: enlargement covers three-fourths or more of the crown.

When a patient with gingival enlargement is seen, the initial assessment is made by careful visual examination of abnormalities of gingival contours, texture, and color, which are compared with normal standards. Visual inspection is accompanied by a detailed medical history to exclude potential systemic factors and conditions. An accurate assessment is critical for planning the method of therapy and the maintenance phase.

**Case Report:** A 20 year old female patient reported to the Department of Periodontology, Subharti Dental College and Hospital, Meerut with a chief complaint of swelling in the gums of teeth in lower front region. Local factors, like plaque and calculus were present. The gingiva seemed to be markedly enlarged – Grade III gingival enlargement. The enlargement appeared diffused, red and spongy. The gingiva was soft and friable with a smooth, shiny appearance with probing depth of more than 5 mm and generalized spontaneous gingival bleeding on probing (Fig 1). There was no drug or systemic history reported. Also, there was no familial history present. A provisional diagnosis of inflammatory gingival enlargement was made.

On the first visit, scaling and root planing were performed and the patient was counselled regarding the maintenance of her oral hygiene. Chlorhexidine 1.2% mouthwash was prescribed and warm saline rinses were advised along with it. The patient was recalled in 14 days. On the basis of the existing enlargement, gingivectomy with electrosurgery was planned (Fig. 2, 3, 4). A written informed consent was obtained before the surgical procedure. Residual plaque and calculus were removed followed by thorough root planing (Fig. 5).

The excised tissue was sent for histopathological examination (Fig. 6). Haemotoxylin and eosinstaining showed proliferation of basal junctional epithelium along with inflammatory cells and fluid, and vascular engorgement (Fig. 7). The features were suggestive of inflammatory epithelial hyperplasia.

The patient was given post-operative instructions and prescribed antibiotic and anti-inflammatory drugs TDS for 5 days. Chlorhexidine mouthwash was continued twice daily for 3 weeks. Patient was recalled after 10 days for check-up (Fig. 8).

The patient has been kept on maintenance since and no recurrence has been seen in subsequent follow up visits.
Discussion

Gingival overgrowth varies from mild enlargement of isolated interdental papillae to uniform marked enlargement affecting either one or both the jaws. Although different types of inflammation may be features of a specific diagnosis, inflammation per se is not a diagnosis in itself. More specifically, the clinical presence of an inflammatory response should not necessarily be considered a sign of disease. At the other end of the spectrum, the absence of clinical signs of inflammation may not exclude the presence of an ongoing inflammatory process evident at a histologic level. For example, during cigarette smoking, the gingival inflammatory response to plaque accumulation on teeth will be muted, despite distinct gingival host-response patterns.

The predilection for attachment loss at inflamed gingival sites may be dependent on the susceptibility and responsiveness of the individual to the inflammatory insult. Moreover, specific types of inflammatory responses in the gingiva are necessary to initiate destruction of the connective tissue attachment apical to the cemento-enamel junction. The inter-relationships between health and gingivitis and periodontitis are complex and depend upon a symbiotic or a dysbiotic biofilm and the proportionality of the host’s immune-inflammatory response and its ability to resolve inflammation.

Differential diagnosis of gingival enlargement with thorough dental and medical history, examination and identification of etiologic factors is required to make an informed decision regarding the treatment plan of the patient for a successful resolution of the condition.
Conclusion

Gingival overgrowth is unaesthetic, and may interfere in mastication and speech. To prevent attachment loss and destruction of periodontal tissue, dealing with gingivitis and gingival enlargement by appropriate local therapeutic intervention is essential. A thorough knowledge of gingival overgrowth and the patient's systemic and oral medical histories are critical for designing the treatment and maintaining outcomes.

References

A Review of Literature on Parenting Styles, Parental Competence and Emotional Intelligence among College Students

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Abstract

Parenting styles and competence predict many aspects of the children’s well-being. Studies indicate that parents present the first learning environment for their children before joining schools, and that the impacts they have to their children may influence their children up to college level. Although many studies have been conducted on the impacts of parenting style and parental competence on emotional intelligence, majority of these are mainly in the context of Western or Asian countries and little, or none in the context Nigeria, particularly, in urban area of Anambra State. Therefore, the general objective of the study is to conceptualize the relationships of parenting style and parental competence on emotional intelligence of college students in urban area of Anambra state, Nigeria.

Keywords: Parenting styles, Parental competence, Emotional intelligence, Students, Family.

Introduction

In spite of the massive strides of[1] and other professionals,[2] and[3] among others argued that it is not intelligence quotient (IQ) however emotional intelligence that determines one’s fulfillment in lifestyles. The person that is high on emotional intelligence is found to be better in managing the conditions of life than person who has low stages of emotional intelligence. Due to this fact emotional intelligence is the potential to understand, apprehend, and manipulate one’s emotion; its miles thought to be a vital determinant of a scholar’s behavioral disposition. The manner mother and father discipline their children ends in deep and lasting outcomes for the child’s emotional life. A harsh remedy has its implication and empathic expertise does too. An extant literature on how mother and father treat their kids suggests a few mother and father as being indifferent to their kids whilst some display warmth.[3]

In line with[4] the connection among affective and emotional elements of parental behavior and the child’s emotional adjustment is family and subculture specific. This brings to light the importance of the own family as a good deal studying occurs via interplay between a child and his own family contributors specifically the dad and mom. The family is hence the bedrock for the boom of emotional intelligence.

As[5] rightly pointed out “own family is our first faculty for emotional learning. A close emotional bonding and good enough conversation between youngsters and parents with clear variations for behaviour can make kids emotionally and socially competent, accountable, and independent and assured”. Consequently, emotional intelligence is closely associated with parenting and the age, sex and gender of the children.

Parenting refers to the aspects of raising a toddler and there are several styles often employed by parents to
raise their children. Parenting style is therefore a mental assemblies that is described as well-known techniques used by dad and mom to deliver up their youngsters.

**Effects of Parenting Styles on Emotional Intelligence:** Parenting styles have been investigated for many years.[6] Some authors have revealed that parenting styles has significant effects on the development of emotional intelligence among the children.

As demonstrated by Baumrind, studies rely on four parenting styles: authoritarian, authoritative, permissive, and uninvolved.[7] The typology presented by Baumrind is frequently used by studies because it covers various styles of parenting that range from authoritative (giving more attention) to the neglectful styles (giving less attention to the children). In addition, this typology represents a combination of two child rearing approaches, which include behavioural control and acceptance, which are affected by both temperament of children and parents.

[8] examined the relationship between the parenting styles and emotional intelligence, which was developed in two stages. In the first stage, the study examined the mothers’ positive or negative parenting styles and their relationships with the emotional intelligence of the children. In the second stage, the study examined the permissive, authoritarian, authoritative, and uninvolved parenting styles, and how they relate to the development of emotional intelligence among the children.

[9] conducted a study on the cultural perspectives on the parenting, trait emotional intelligence and mental health. The study findings revealed that there was a positive effects of authoritative parenting styles on the children’s mental health is often mediated through the children’s trait emotional intelligence. On the other hand, the study found that authoritarian parenting style present a weak relationship with the children’s trait emotional intelligence, and that other parenting dimensions become insignificant when other parenting styles are accounted for.

**The Types of Parenting Styles:**

**Authoritative Parenting Style:** According to[10], the qualities of authoritative parenting represent responsive, demanding, supportive, and guidance. In fact, the parents with the authoritative parenting style often show highest levels of support and children to their children[10]. Similarly,[11] argue that authoritative parents demonstrate understanding of their children’s feelings and often teach them on how to regulate themselves and provide guidance for them to learn from any mistakes they may make as they grow to adulthood. Indeed, they are able to resolve the activities of their children in proper ways and assist them in resolving the problems in their lives.[6] They often demonstrate warmth, are emotionally supportive, and are responsive for their children[12] often encourage open communication in order to enable both parties to be satisfied with each other.

Authoritarian parents also encourage their children to be independent and develop their own identities, however, they also provide boundaries and rules for their children[13]. As a result of the guidance provided to the children after their parents set guidance and rules, the children tend to consistently follow them, authoritative parents recognise and set expectations that are appropriate for the children’s developmental stages in their lives. Parents are always firm with the rules and offer clear reasons to their children concerning the reasons to follow them, and are open to discussion of particular problems[9]. Therefore, there is often a two-way communication that exist between the children and their parents that assists in the development of good child-parent relationship[14]. Therefore, it can be argued authoritative parents often treat their children with respect and provide reasons of rewarding or punishing them.

The previous studies indicate that authoritative parenting styles are effective since parents treat their children in warm ways[15]. This is because two-way discussion between the children and their parents is helpful in minimizing any problem that may occur. In addition, most studies indicate that well-being outcomes happen children are brought up by authoritative parenting styles[16]. These wellbeing outcomes that often happen in families by the authoritative parenting styles may decrease the levels of depression and stress among the children; hence, they are more likely to feel respected, happy, and appreciated by their parents. In this regard, the studies concerning the parenting styles indicate that authoritative parenting styles that combines support and warmth elements is mostly considered to be fulfil the needs of the children development[12] and assist them to develop psychological wellbeing among the children. In this regard,[6] found that there was a positive influence of authoritative parenting styles that exist across ethnicity, gender, socioeconomic status, family structure and time.
Authoritative parenting style has a positive and significant influence on the development of the children’s behaviour and empathy [17]. In this regard, [18] reveal that authoritative attributes shown by parents such as monitoring, affection, and stability have a positive impacts children’s emotion. Also, one multi-wave longitudinal study examined by [20] on the relationship between authoritative parenting styles, child emotional and development and styles found that these children who perceive authoritative parenting exhibited higher empathy towards both positive and negative emotions. In another study, [8] examined the children’s effortful control and their externalising behaviour and found that parenting styles that displayed elements of empathy such as more warmth and less punishment towards their children indicated more effortful control and displayed fewer externalising problems over two or four years later. Therefore, it can be argued that children often learn to feel empathy from their authoritative parents compared to other parenting styles.

Authoritative parenting style has also been found to have minimized the cases of depression symptoms. For instance, [6] examined whether authoritative parenting styles during adulthood relates with young adult depression four years later. The study outcomes revealed that authoritative parenting during childhood is negatively related with young adult depression symptoms. Similarly, [5] found that the children from authoritative parents scored lower on depression in relations with the children that were nurtured using other parenting styles. The authors distinguished between fathering and mothering and its effects on emotional development of children. In this regard, they looked at paternal and maternal parenting and the variations the wellbeing of the children in terms of self-esteem, life satisfaction, and depression. Furthermore, [3] found that authoritative parenting styles reduce the possibility of developing depression among the children. Therefore, in can argued that authoritative parenting styles leads to lower depression among the. In other studies, it is revealed that the children nurtured by authoritarian parents are better able to develop social competence. In this regard, when authoritatively nurtured children grow up, they become adults who are ready to adjust within their communities and are aware of what is acceptable [6]. In addition, Baumrind found that authoritative parenting style that leads to better adjustment in the community, although the children in the authoritative homes are from an individualistic culture since such authoritative homes receive responsiveness and acceptance from their parents that assist children in the development of social competence. This social competence trend among the children of authoritative parents has been found with children as young as preschool, who have been found to demonstrate higher social competence compared to the children with permissive, authoritarian, and uninvolved parenting styles [21]. Once children develop social competence, they become capable of adapting to various adjustments in their lives. In addition, [22] found that supportive and warmth parenting styles were critical in increasing self-esteem and development of positive attitudes among the adolescents. Consequently, by demonstrating greater self-esteem and positive attitude, children have the ability to socially interact with others because they have the confidence to relate with other people.

Overall, children who live with authoritative parents seem to have an advantage in developing their social competence and social adjustment skills compared to children raised under different parenting styles. Also, the study conducted on the parenting styles and the children’s behaviours determined that the children with authoritative parents indicated more responsibility unlike the children raised from the families where different parenting styles were used [18]. Concerning the academic achievement of the children, [17] suggested that children from authoritative parents showed higher academic achievement, scoring higher on their academic pursuit, particularly, in math and language, unlike children who receive less attention from their parents. Therefore, it can be argued that authoritative parenting styles encourage children to develop a sense of responsibility to themselves and the wider community. Similarly, authoritative parents are able to motivate their children to study hard and achieve higher success in their education.

**Authoritarian Parenting Style:** The impacts authoritarian parenting styles have also received a lot of attention in literature, especially its impacts emotional intelligence in children. For instance,[13]

Who examined the relationship between parenting and delinquency suggested that authoritarian parents showed low responsiveness and warmth, but demonstrated high control over their children. Authors argue that authoritarian parenting style attempt to control, shape, and evaluate the attitude and behaviour of their children in accordance to a set of principals they
offer. These parents tend to be strict and conservative in nature. In this regard, children are offered with little choice and are often expected to orders provided by their parents[17]. Also, these parents are considered to be having expectations, and their children are not expected to disobey their parents at any given time.

[13] describes authoritarian parents as those who often monitor the behaviour of their children. Similarly, [2] described it as “parents attempt to manage or control children’s behaviour” (p. 3296). Barber further determined behavioural control as the act of the parents’ monitoring their children’s activities and behavioural outside the home. For instance, these parents always want to know where their children are and what they might be doing. In addition, as part of parental control, such parents also get involved in decision-making for their children. In this regard, children do not have the opportunity to make a decision on what they want; hence become less self-confident in their lives [8]

The relationship between authoritarian parenting style and the children’s life satisfaction has also been examined in the previous studies. For instance, in a study conducted by [21], it was revealed that the children’s life satisfaction decreased when they were nurtured by authoritarian parenting fathers. In addition, [22] indicated that the element of punitive and control nature of the authoritarian parenting may make the children to feel dissatisfied and unhappy with their lives. Therefore, it can be argued that authoritarian parenting styles may lead to minimal life satisfaction among the children.

Overall, authoritative parenting styles present less desired effects on children than authoritative parenting. This parenting style has been found to increase depression, as well as delinquency among the adolescents and children. Also, evidence from the studies reviewed indicate that authoritarian parenting leads to lower self-esteem and life satisfaction among the children and limit the ability of the children to think and make their own decisions. The practice of authoritarian parenting of ignoring the significance of considering the thoughts of children may lead to depression among the children. In addition, the children nurtured by authoritarian parenting often develop less responsibility since their parents make their decisions for them to follow, hence the children only depend on the parents in almost everything. Therefore, since authoritarian parenting is demanding, harsh, and strict, the children from these families often develop delinquent behaviour.

Permissive Parenting Style: Permissive parenting style has also reported significant impacts on the development emotional intelligence. For example, according to [6] permissive parents present non-punitive, affirmative, and acceptance behaviour towards the need’s actions and desires of the children. Studies have reported negative and positive elements of permissive parenting on emotional intelligence. For instance, [24] indicated that permissive parenting styles present greater support and responsiveness for their children, whereas at the same time presenting little or low control over their children. Also, [25] emphasized that permissive parents are more liberal and offer full autonomy to their children and support whatever the children like doing. These parents are accepting and nurturing in nature and are also responsive to the wishes and needs of their children. Also, permissive parents encourage their children to do what they like doing.

[20] present that permissive parents provide their children with freedom to act without setting limits and monitoring. In this regard, these parents hope that by providing their children with freedom, the relationship with their children would become stronger [21]. Therefore, the children nurtured by permissive parents often regulate and plan their own activities at a younger age without much parental attention. Similarly, [7] stated that since the children the children of the permissive parents always independently do their activities, these children are perceived to be more responsive and mature. [5] also insisted that while parents with permissive parenting style are considered to be responsive to their children, they often fail in setting boundaries and expectations for their children. However, it has been reported that permissive parenting style is considered to be potentially unsafe for their children because it is unsuccessful in the development of good judgement among their Children authoritative mothers. On the other hand, [6] argued that permissive parents presented both negative and positive impacts on the children’s emotional intelligence. Besides, [7] argued that permissive parents are more supportive of what their children want to be done and the attitude led to lower depression among the children. In contrary to these findings, [19] indicated that permissive parenting leads to depression among the children because when their parents are too lenient and allow their children to what the children wish to do, the children lack the focus and might end up doing something inappropriate. Therefore, it can be argued that permissive parenting is appropriate and may result into more problematic behaviours among the children.
Overall, it can be argued that permissive parenting styles contribute to antisocial and depression behaviour among the children. In this case, parents with permissive parenting style are too tolerant and lenient of their children’s actions without necessarily setting limits. Consequently, this situation may lead to children lacking the ability to differentiate between what is bad and good for them. They are often inconsistent and relaxed in the provision of feedback to their children, which may lead to the situation where the children feel confused with regards to what is good and bad for them. Also, in permissive families, children often think that they can do what they want to do and do not learn to respect anything. Therefore, the literature review presented in this section alludes to the fact that permissive parenting style may not be appropriate in the development of the children’s emotional intelligence children

Uninvolved Parenting Style: Uninvolved parenting styles have been reported in literature as a common phenomenon, leading to significant impact on the development of emotional intelligence. For instance, \( [23] \) carried out a meta-analysis on the relationship between parenting style and delinquency. The study findings revealed that uninvolved parenting style represent the parents who presented low control and low support for their children. In fact, they show low control, low responsiveness and warmth to their children, and pay less attention and offer little or no care \( [24] \). According to the authors, these parents may appear to be disconnected, low on sensitivity, undemanding, and not often set limits for their children. They also do not pay any attention to the opinion and emotions of their children. However, such parents may be emotionally unsupportive for their children, but may still provide their children with basic needs like shelter and food. As a result, the children being nurtured by uninvolved parents pay feel that some aspects of their parents’ lives are more important than they actually are. According to \( [25] \), the parents with uninvolved parenting styles demonstrate detached behaviours towards their children; hence the children may feel disengaged when their parents were uninvolved and spend less time with them

Overall, uninvolved parenting style present negative impacts on life satisfaction, depression, aggression, delinquency, antisocial behaviour, and attitudes. It can be argued that uninvolved parenting style mostly appears to worsen the psychological development of the children, even though such children may show good relationship with their peers. Moreover, the children who are nurtured by uninvolved parenting style may often develop low self-esteem and depression. In this regard, they may think that their parents do not actually care about them; hence they are free to do what they desire. Also, they may think that their parents have no or little monitoring on their behaviour. Therefore, it can be argued that uninvolved parenting styles may disadvantage the children’s ability to develop emotional intelligence, which may lead to the development of antisocial behaviour and aggression among the children

Effects of Parental Competency on Emotional Intelligence: Parenting involves numerous parenting activities, behaviours, and duties that are directed towards protection, care, child rearing and nurturing \( [26] \). This refers to a feeling that can be simultaneously stressful and satisfying in nature. In this regard, the feeling of satisfaction often depends on the level at which a parent is satisfied with their relationship with children and their own parental role \( [27] \). It can be described as a feeling of affinity for a particular role, reward, and fulfilment, rather than a feeling of dissatisfaction that is attributed by a sense of manipulation, imposition of excessive control, as well as frustration. The levels of satisfaction often depend on the parental assessment of the behaviour of the children. In this case, when a parent estimates that the changes in the development of the children are consistent with their relationships with their children, parental satisfaction is higher; hence indicating the extent of parental competency \( [28] \). Conversely, a feeling of stress and dissatisfaction can have negative impacts on the parental role, which may ultimately reflect on the development of the circumstances of hindrances within the family environment \( [28] \). This dissatisfaction by the parental role significantly influences the reduced parental competency, whereas higher satisfaction may positively affect the experience of the parental competence.

Parental competence can be described as an experience of an individual’s own ability to resolve the day-to-day challenges in the child nurturing. The assessment of parental competence can be done through measuring the degree at which the parent feels confident in their own parental role. In this regard, parents who feel that they are confident in their own behaviour and trust, their abilities are often more motivated in meeting the expectations. In order to experience control over the challenges of parenting, it is imperative that parents set realistic child development excitations.
Conclusion

Competency-based approaches are increasingly perceived as a central strategy for the improvement of effective care and enhance the development of emotional intelligence. We can argue that parenting is an act of providing for and supporting the intellectual, emotional, physical, as well as social development of the children from infancy to adulthood. The author further proposes that parenting competence is a learned ability geared towards effectively nurturing children by performing the required tasks through demonstrable skills, knowledge or abilities, behaviours or practices, attitudes, attributes, and clusters of these elements associated with the positive outcomes in children.

Ethical Clearance: Taken from Universiti Putra Malaysia Ethics Committee (JKEUPM).
Ref no- JKEUPM-2020-370.

Source of Funding: Self

Conflict of Interest: Nil

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Green Biosynthesis of Silver Nanoparticles Using *Gallium aparine* Green Part Extract and Anti-skin Cancer Activity

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**Abstract**

**Background:** Galium aparine has a long history of use as an alternative medicine and is still used widely by modern herbalists. It is a fabulous diuretic that is often taken to treat skin problems. It treats many problems such as seborrhoea, eczema, psoriasis. It also acts as a great detoxifying agent in life-threatening ailments like cancer. Skin cancer is the most common type of cancer in light skinned populations around the world.

**Aim:** The aim of the study was to evaluate the anticancer efficacy of greensynthesised silver nanoparticles (AgNPs) of *Gallium aparine* extract.

**Method:** The green part of the plant *G.aparine* extracted with ethanol 70%, then divided into four fractions to prepare stable AgNPs.

**Results:** Several tests were performed to examine the extracts and AgNPs, including SEM,FTIR and UV-VS. Scanning electron microscope(SEM)micrographs showed that the diameters range of AgNPs formed were from 35-110 nm.Fourier transform infrared (FTIR) shows that there were two functional groups, the aromatic (C=C) and hydroxyl (– OH), groups may be involve in the fabrication of AgNPs. UV-VS shows that there were a peaks at 298,448, 534, 606, 648, for nanoscale petroleum ether extract. These peaks may beindicate the synthesis of AgNPs. Different concentrations (6.225 - 400 µg/ml), of petroleum ether extract and its green AgNPswere tested as anti-skin cancer, the nanoparticles had appositive effect against cancer, the IC50 for the petroleum ether extract was 730.2 and 116.5 of normal cell line (WRL 68) and cancer cell line (A375), respectively;while the IC50 for the AgNPs of *Gallium aparine* extract was 294.4 and 77.03of normal cell line (WRL 68) and cancer cell line (A375)respectively.

**Discussion:** This indicates that the *G. aparine* extract is a good biological carrier for synthesizing silver nanoparticles which has potential for various biomedical and pharmaceutical applications.

**Conclusion:** AgNPs have been successfully synthesized using *G. aparian* extract, The nanoparticles have shown good anticancer activity towards human skin cancer cells.

**Keywords:** Gallium aparine, AgNPs, Green Synthesis,WRL 68, A375.

**Introduction**

*Galium aparine* has a long history of use as an alternative medicine and is still used widely by modern herbalists as diuretic and to treat skin problems. It treats many problems such as seborrhoea, eczema, psoriasis, wounds, skin problems and ulcers. It also acts as a great detoxifying agent. The infusion is used to treat liver, bladder and urinary problems and cancer(¹).

Skin cancer is the most common type of cancer in light skinned populations around the world(²). Skin cancers are mainly divided into melanoma,
and nonmelanoma skin cancers (NMSCs), the latter including basal and squamous cell carcinomas (BCC and SCC, respectively). Melanoma is responsible for most of the cancer related mortalities, and NMSCs are typically described as having a more benign course with locally aggressive features. Nevertheless, they represent “the most common type” of cancer in humans and they can result in significant disfigurement, leading to adverse physical and psychological consequences for the affected patients (3).

Nanotechnology is the science that deals with the processes that occur at a molecular level and of nano length scale size which involves the tailoring of materials at the atomic level to attain unique properties that can be suitably manipulated for the desired applications (4).

Nanoparticles, usually ranging in dimension from 1-100 nanometers (nm), have properties unique from their bulk equivalent and are related to the decrease in the dimensions of the materials to the atomic level (5). Nanosilver has many medical applications including diagnosis, treatment, drug delivery, coating tools and medical devices (6). This study was aimed to test the effect of petroleum ether synthesised nanoparticles of G. aparine on skin cancer in vitro.

Materials and Method

Plant Materials: The green parts of Galium aparine plant were collected in February 2019 from Al-Jadriya University site, Baghdad. The plants were dried in shadow and then grinded by electric grinder to a fine powder and stored in an airtight container until used.

Extraction: The extract was prepared according to the method of Ozaki (7) with some modification. The extract was prepared by dissolving 50 gm of plant materials with 500 ml of ethanol (70%). The extract is placed in a flask and covered with aluminum foil. It was placed on a hot plate with a stirrer without heat for 6 hours, filtered after that then the ethanol was removed through rotary evaporator and the extracted material was divided into four fractions of petroleum ether, ethyl ether and butanol, and the remainder was the fraction dissolved in water (aqueous) using separatory funnel. The extraction materials were added according to the volume-to-volume ratio (1:5. ethanol: solvent). It was repeated three times for each fraction to obtain the largest amount of the extract, then in each stage the petroleum ether, ethyl ether and butanol were disposed by rotary evaporator and water by means of the oven at a temperature of 40°C.

Biosynthesis of AgNPs: The procedure of AgNPs synthesis was modified from Awwad (8). The nanoscale extract (petroleum ether, aqueous) was prepared by dissolving 40 mg of the extract in 10 mL of deionized water and 1 mL tween 20. Silver nitrate was prepared in three concentrations (1 molar (0.0051 g AgNO3), 2 molar (0.0102 g AgNO3), 4 molar (0.0244 g AgNO3)) in 29 ml of water. The extract with silver nitrate in different molarity was placed in a beaker on the hot plate with magnetic stirring at a temperature of 40 °C, until the color changed to reddish brown which indicates the biosynthesis of the AgNPs.

Characterization of AgNPs:

Scanning electron microscope (SEM): A scanning electron microscope (SEM, Shimadzu) was employed to analyze the morphology of the nanoparticles that were formed. The Morphological characterization of the samples was done using mira3 Tescan for SEM analysis. The samples were dispersed on a slide and then coated with platinum in an auto fine coater. After that, the material was subjected to analysis (9).

Fourier Transform Infra-Red (FTIR): Identification of possible biomolecules of G. aparine responsible for the reduction and stabilization of silver nanoparticles was recorded using (Bruker VERTEX-70) FT-IR spectrophotometer in the range of 3500–1000 (10), and compared with standard chart. The characterization of functional groups on the surface of AgNPs by plant extract was investigated by FTIR analysis and the spectra was scanned in the range of 4000--400 cm-range at a resolution of 4 cm. The sample used in this analysis was in their native liquid form during the analysis (8).

UV–visible spectroscopy: Absorbance spectra of AgNPs solution were measured by UV - VIS double beam spectrophotometers (Shimadzu). All spectra were measured at room temperature in a quartz cell with 1 cm optical path. Deionized distilled water was used as a blank. The absorption was taken from (200-800nm). Some samples became too concentrated and they were diluted 1:10 in deionized water (11).

Cell Line:

A375Cell Line: Cultures of human malignant melanoma (A375 cell line, ATCC number CRL-1619)
were examined at (passage 5) were grown in the supplemented culture medium consisting of Dulbecco’s modified Eagle’s medium with L-glutamine and phenol red (DMEM; Sigma-Aldrich, D5796), supplemented with 10% heat-inactivated fetal bovine serum (FBS; Biochrom GmbH, S0615), 1% penicillin-streptomycin mixture (Sigma-Aldrich, P4333), and 1% Amphotericin B (Sigma-Aldrich, A2942). Cell cultures were incubated at 37°C in 5% CO2. When confluent, cells were washed three times with DPBS, detached using TrypLE Express™ (Gibco Invitrogen, INV 12605028, 4 to 5 ml/175 cm2 tissue culture flask), and seeded at 4 × 10^4 cells/ml in 3.3 cm2 diameter tissue culture dishes which contained 3 ml of supplemented DMEM and were so further incubated for 24 hrs to allow for attachment.

**WRL 68 Cell Line:** The human liver cell line WRL 68 exhibits morphology similar to that of hepatocytes and liver primary cultures. Cells have been shown to secrete albumin and alpha-fetoprotein and express liver-specific enzymes, such as alanine aminotransferase (12).

**MTT Cytotoxicity Assay:** A confluent A375, WRL 68 Cell Line monolayer with the cell density of 4 × 10^4 cells/well was seeded in 96- well plates. After incubation at 37°C in a 5% CO2 incubator for 24 h, 100 µL of each two-fold serially diluted extract (concentrations ranging from (6.250,12.5,25,50,100,200, 400 mg/mL) µg/mL) in maintenance medium (DMEM with 1% FBS) was added to the wells. Medium control (blank medium) and cell control (cells without extract treatment) were also incorporated in the same plates. The plates were incubated for another 72 h at 37°C in a 5% CO2 incubator and the cell viability was evaluated using the MTT colorimetric assay as described by Mosmann(13) with some modifications. A 20 µL of MTT solution (5 mg/mL in phosphate buffered saline (PBS)) was pipetted into each well followed by a 3-hour incubation period at 37°C in the 5% CO2 incubator. Seventy percent of the mixture was then removed and 150 µL of dimethyl sulfoxide was added to the wells to dissolve the MTT formazan. The absorbance was determined at 575 nm using a microplatereader (Bio-rad, Germany). Results were obtained from three independent experiments.

**Results and Discussion**

**Synthesis and Characterization of silver nanoparticles (AgNPs):** Silver nanoparticles were prepared by the green method and characterized by using Scanning Electron Microscope (SEM), UV - VIS spectroscopy, Fourier transform infrared spectroscopy (FTIR) . The four extracts acted as a reducing agent, which reduces metallic silver to nanosilver and hence the color changed. The AgNPs extracts exhibit light brown color, this could be attributed to the of surface plasmon vibrations. Ag2+ ions of silver nitrate are found to be reduced to Ag0 atoms(14). Krithiga(15) reported that the AgNPs exhibited striking colors, from colorless to yellowish brown.

1. **Scanning Electron Microscopy (SEM):**

Scanning electron microscope was employed to analyze the sizes of petroleum ether and aqueous AgNPs table (1). SEM analysis shows that the *G.aparnie* plant has a tremendous capability to AgNPs which were uniformly distributed with an average size ranged from 61-86 and this agreed with (16).

**Table 1: Scanning Electron Microscopy (SEM) of petroleum ether and aqueous extracts (1, 2, and 4 molar)**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Avg. Diameter</th>
<th>&lt;=10% Diameter</th>
<th>&lt;=50% Diameter</th>
<th>&lt;=90% Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>76.52 nm</td>
<td>45.00 nm</td>
<td>75.00 nm</td>
<td>100.00 nm</td>
</tr>
<tr>
<td>B2</td>
<td>86.82 nm</td>
<td>60.00 nm</td>
<td>85.00 nm</td>
<td>105.00 nm</td>
</tr>
<tr>
<td>B4</td>
<td>64.66 nm</td>
<td>35.00 nm</td>
<td>65.00 nm</td>
<td>85.00 nm</td>
</tr>
<tr>
<td>E1</td>
<td>82.56 nm</td>
<td>45.00 nm</td>
<td>80.00 nm</td>
<td>110.00 nm</td>
</tr>
<tr>
<td>E2</td>
<td>61.50 nm</td>
<td>45.00 nm</td>
<td>60.00 nm</td>
<td>70.00 nm</td>
</tr>
<tr>
<td>E4</td>
<td>66.71 nm</td>
<td>40.00 nm</td>
<td>65.00 nm</td>
<td>85.00 nm</td>
</tr>
</tbody>
</table>

B1: 1molar AgNO3 petroleum ether extract, B2: 2molar AgNO3 petroleum ether extract, B4: 4molar AgNO3 petroleum ether extract. E1: 1molar AgNO3 aqueous extract, E2: 2molar AgNO3 aqueous extract, E4: 4molar AgNO3 aqueous extract.

The 4 molar AgNO3 petroleum ether was selected for the anticancer test and for further examination, because it had less than 65 nm average size table (1) and the best antioxidant capacity (17).
2. Visual observation and UV-vis spectral study:
Formation and stability of prepared AgNPs in deionized water was approved by UV-Vis spectrophotometer during a range of 200-800 nm of wavelength. Figure (2) shows the UV-Vis spectrum collected from the reaction medium after one hour. As shown in Fig.2 A and B, there were peak at 298,448, 534, 606, 648, for nanoscale petroleum ether extract, Fig.2 B. All these peaks indicated the synthesis of AgNPs. There were peaks at 462,624, 654 for Natural petroleum ether extract, Fig.2 A.

![Figure 2. UV-vis spectra showing absorption of](image)
(a) Natural petroleum ether extract (b) nanoscale petroleum ether extract

3- Fourier Transform Infra-Red (FTIR) of *G. aparine* extracts:
The extract petroleum ether contained the highest antioxidants and was the best standard for nano (64.66) and therefore it was tested for this examination. Results of the FTIR spectra of the petroleum ether and aqueous extract of *G. aparine* revealed the presence of different functional groups such as phenolic– OH group stretching, Aromatic C=C, (Table 2). shows the infrared spectra for the petroleum ether and aqueous *G. aparine* extract.

<table>
<thead>
<tr>
<th>I.R. Frequencies of Aqueous fraction</th>
<th>I.R. Frequencies of petroleum ether fraction</th>
<th>I.R Frequencies Standard Groups (cm⁻¹)</th>
<th>The Functional Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>3335.81</td>
<td>3380.17</td>
<td>3650-2500</td>
<td>Phenolic– OH group stretching</td>
</tr>
<tr>
<td>1632.61</td>
<td>1642.46</td>
<td>1680-1620</td>
<td>Aromatic C=C</td>
</tr>
</tbody>
</table>

Viability assay (MTT): Cytotoxicity results of A375 cell viability after 48 hours of treated with various concentrations of petroleum ether fraction (6.250 to 400 μg/mL). Petroleum ether fraction resulted in a decrease in cell viability in a dose-dependent manner, and the nano petroleum ether of *G.aparnie* extract solution resulted in a significant decrease in the survival rate of A375 cells in dose dependence (P < 0.0001) and 75% cell death rate at 400 μg/mL, while IC50 was at 77.03 μg/mL and the petroleum ether extract was significantly higher IC50 at 116.5 μg/mL Figure (3) (A,B).

![Viability assay](image)
For normal cell line WRL-68 the same figure shows that petroleum ether fraction shows weak and moderate cytotoxicity on normal cell line WRL-68 and the IC50 730.2 μg/mL, while less Cytotoxicity with IC50 at 294.4 μg/mL for AgNPs. These results indicate potent Cytotoxicity and antitumor activity of petroleum ether extract, AgNPs sits potential as an anticancer agent. Based on the results obtained from the Cytotoxicity assay, G. aparine petroleum ether AgNPs is the most potent extract in A375 and might suppress cancer cell proliferation or induce cancer cell undergoing apoptosis that lead to cell growth-inhibition.

**Conclusions**

It has indicated several areas for further research which are necessary to support the data presented here: AgNPs have been successfully synthesized using G. aparine extract; the nanoparticles have shown good anticancer activity towards human skin cancer cells. Synthesis nanoparticles method is easy, eco-friendly and efficient in developing different multifunctional nanoparticles which could be useful in environmental and nanomedicine applications.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of Omar Hasnawi Hamdi Shurook M.K. Saadedin and Iqbal Harbi in Iraq

**Conflict of Interest:** Non

**Funding:** Self-funding

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Application of Colaizzi’s Method of Data Analysis in Phenomenological Research

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Abstract

Background: Phenomenology is a research method intended to explore the experiences of people as they live in different phases of their life. Aim: This paper aimed to explore the Colaizzi’s method of descriptive data analysis to articulate the experiences of women living with Ischemic heart disease (IHD).

Method: By using the actual research data, the technique of Colaizzi’s data analysis was used to extract, organize and analyze the data.

Results: Colaizzi’s strategy was effectively utilized in identifying significant statements from the transcribed verbatim and meanings were formulated. From these formulated meanings clusters of themes and themes were derived which eventually helped in the development of thematic map of experiences of women with Ischemic heart disease (IHD).

Conclusion: Colaizzi’s step of data analysis in descriptive phenomenology was effectively utilized in this research that facilitated in reflecting the experiences of IHD patients.

Keywords: Colaizzi’s data analysis, Phenomenology, Ischemic heart disease (IHD), Lived experience.

Introduction

Phenomenology comes from the academic disciplines of Philosophy and psychology. Phenomenology can be divided into descriptive phenomenology created by Husserl1 and interpretive- hermeneutic phenomenology created by Heidegger.2 The design used in this study was descriptive phenomenological design.

There are four steps in descriptive phenomenology. They are bracketing, intuiting, analyzing and describing. Bracketing is the process of identifying and holding in abeyance the preconceived beliefs and opinions about phenomena under study. Intuiting occurs when researchers remain open to the meanings attributed to the phenomena by those who have experienced it. Phenomenological researchers then proceed to the analysis phase i.e. extracting significant statements, categorizing, and making sense of the essential meanings of the phenomenon. Finally, the descriptive phase occurs when researchers come to understand and define the phenomenon.1-3

Step 1: Obtaining a general sense of each Transcript: In the study of lived experience of women with IHD, the researcher personally conducted the interviews, which helped to gain a holistic sense pertaining to the entire experiences of the participants. The audiotapes were read three to four times and attempted to comprehend the thought processes and the feelings of the participants. This was suggested by Colaizzi (1978)3 that the investigator should read the audiotape many times in order to clearly understanding the content.

Step 2: Extracting significant statements: As per Colaizzi (1978), the researcher then extract significant phrases and statements from the transcript that together

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form a whole meaning of the experience. I read and reread the transcript and analyzed each transcript to identify significant statements from the transcript. These statements were written separately for each participant and coded as transcript page number and line number.

This was given to a peer group member for checking to obtain clarity of thoughts and suggestions were incorporated. Table 1 illustrates some of the statements extracted from the interviews.

Each of the transcripts were read and re-read, in order to obtain a general sense about the whole content

Significant statements that relate to the phenomenon under study were extracted from transcripts

Formulated meanings were derived from significant statements

Organization of formulated meanings in to clusters of themes and themes

Integration of the findings into an exhaustive description

Description of the fundamental structure of the phenomenon

Validation of the findings from the study participants

**Figure 1: The steps of Colaizzi’s Phenomenological Data Analysis**

**Table 1: Examples of Significant statements**

<table>
<thead>
<tr>
<th>Significant statements</th>
<th>Participant</th>
<th>Transcript Page No</th>
<th>Line No</th>
</tr>
</thead>
<tbody>
<tr>
<td>She said “It (pain) started early morning at 4 O’Clock, I went to the bathroom came back and lied down. When I was stretching, I felt like some pain from here (Chest) like something obstructing”.</td>
<td>A</td>
<td>2</td>
<td>22</td>
</tr>
<tr>
<td>“Symptoms started as burning in the chest (netherichil) and breathing difficulty…. That day it was severe distress and I was not getting breath. Initially pain was not so severe, … it started around 05.00 O’ clock in the evening;….. While mopping, it had started suddenly, immediately I sat down, it was unbearable, was localized to chest only, not radiating, such a kind of distress, I tried to walk,… I water the plants, which made bit relief”.</td>
<td>C</td>
<td>19</td>
<td>3</td>
</tr>
<tr>
<td>“That day I was walking to neighbourhood house (brother’s house) for voting. Then all over I started getting pain, just like something scratching, like pricking with a throne”.</td>
<td>F</td>
<td>31</td>
<td>27</td>
</tr>
<tr>
<td>“While coming back from a marriage function, … “Symptoms started when I was bending myself and mopping the floor. Suddenly I got a strangulating pain from the chest. Then I stopped mopping. I had back pain too. The pain was like someone pressing tightly, not associated with vomiting and headache”.</td>
<td>I</td>
<td>49</td>
<td>3</td>
</tr>
<tr>
<td>“I did not have many difficulties afterwards (after the procedure, PTCA). Later I remember they are taking something from here….That was really a terrible experience to lie still with this pain”</td>
<td>J</td>
<td>52</td>
<td>3</td>
</tr>
</tbody>
</table>
Step 3: Formulation of meanings: In this step, Colaizzi (1978) recommends that the researcher attempts to formulate more general restatements or meanings for each significant statement from the text. Meanings were formulated from the significant statements and discussed with the same peer group member. As per Husserl (1960) bracketing is essential because this will help to avoid misinterpretation about the participant’s views. These formulated meanings were then coded and categorized and were given to expert researcher to check for the correctness of these processes and consistency of the meanings. Table 2 illustrates how significant statements were converted into formulated meanings.

<table>
<thead>
<tr>
<th>Significant Statements</th>
<th>Formulated Meanings</th>
</tr>
</thead>
<tbody>
<tr>
<td>She said “It (pain) started early morning at 4 ‘O Clock, I went to bathroom came back and lied down. When I was stretching, I felt like some pain from here (Chest) like something obstructing”. ....“Symptoms started when I was bending myself and mopping the floor. Suddenly I got a strangulating pain from the chest. Then I stopped mopping. I had back pain too. The pain was like someone pressing tightly, not associated with vomiting and headache”.</td>
<td>Pain experience was so severe that prevented the patient to perform the activities of daily living and household chores.</td>
</tr>
<tr>
<td>“Pain started from chin. It is like tightening, when I climb up the stairs….. ECG and TMT all are normal. Still I had pain… Sometimes when I walk, there is no pain. Only sometimes I am getting the pain”. “Now sometimes I have some pain over the teeth and near the jaw and no palpitation”.</td>
<td>Pain was not confined to a single point. It kept on radiating from chest to chin, and then to teeth and jaw, which is typical of heart attack.</td>
</tr>
<tr>
<td>I asked about whether there is any kidney problem, She said, “I don’t know sir…I have edema on my legs. When I get up early morning, there is puffiness on my face, then everyday asks why this”.</td>
<td>Patient had associated medical conditions such as kidney problems and henceedema on face and legs which worsened the general condition.</td>
</tr>
</tbody>
</table>

**Table 2: Examples of formulated meanings from significant statements**

Step 4: Organization of formulated meanings into clusters of themes and themes: After obtaining formulated meanings from significant statements, the researcher arranged them into clusters of themes. These theme clusters then shrunk into emergent themes which was depicted in Table 3. All these themes are internally convergent and externally divergent; which implies that each “formulated meaning” was coming only from one theme cluster. These clusters of themes and the final themes were then given to the peer group member as well as to the expert researcher for checking its accuracy. Table 3 shows the process of constructing the first theme “Experience of pain” through integrating various clusters of themes. The thematic map developed for this study was displayed in Table 4.

**Table 3: Developing clusters of themes and themes from formulated meanings**
Table 4: Thematic Map

<table>
<thead>
<tr>
<th>Theme Cluster</th>
<th>Emergent Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agonizing Pain</td>
<td>Experience of Pain</td>
</tr>
<tr>
<td>Fluctuating symptoms</td>
<td></td>
</tr>
<tr>
<td>Associated symptoms</td>
<td></td>
</tr>
<tr>
<td>Ambiguous diagnosis</td>
<td>Disease Focus</td>
</tr>
<tr>
<td>Doctor Shopping</td>
<td></td>
</tr>
<tr>
<td>Medication overload</td>
<td></td>
</tr>
<tr>
<td>Familial tendency</td>
<td></td>
</tr>
<tr>
<td>Co morbid conditions</td>
<td></td>
</tr>
<tr>
<td>Fear of recurrence</td>
<td>Anxiety</td>
</tr>
<tr>
<td>Fear of impending death</td>
<td></td>
</tr>
<tr>
<td>Irrational reasoning</td>
<td></td>
</tr>
<tr>
<td>Shock from the loss of loved ones</td>
<td></td>
</tr>
<tr>
<td>Anxiety about of loved ones</td>
<td></td>
</tr>
<tr>
<td>Financial constraints</td>
<td>Stumbling blocks</td>
</tr>
<tr>
<td>Burdened family</td>
<td></td>
</tr>
<tr>
<td>Activity restriction</td>
<td></td>
</tr>
<tr>
<td>Disturbance in daily routines</td>
<td></td>
</tr>
<tr>
<td>Natural disasters</td>
<td></td>
</tr>
<tr>
<td>Joy of togetherness</td>
<td>Sparkle of Joy</td>
</tr>
<tr>
<td>Pleasant memories</td>
<td></td>
</tr>
<tr>
<td>Family support</td>
<td>Support system</td>
</tr>
<tr>
<td>Social support</td>
<td></td>
</tr>
<tr>
<td>Spiritual support</td>
<td></td>
</tr>
<tr>
<td>Previous experience</td>
<td>Break down barriers</td>
</tr>
<tr>
<td>Learning to cope various ways</td>
<td></td>
</tr>
<tr>
<td>Adjustment as per the need of the situation</td>
<td></td>
</tr>
</tbody>
</table>

Step 5. exhaustively describing the phenomenon:
In the fifth stage of analysis, the researcher integrates all the resulting ideas into an exhaustive description of the phenomenon. This was achieved by combining all the theme clusters, emergent themes and formulated meanings into a description to create an overall structure. It is then presented to the experts to confirm its completeness and its reflection to the experiences of women with IHD. 6-8

Step 6. describing the fundamental structure of the phenomenon: In this step, findings were reduced to avoid repetitions and to make a clear and concise description of phenomenon. In my research study, this was depicted as a conceptual framework which contained all the dimensions of lived experience of women with Ischemic heart disease.

Step 7. returning to the participants to validate the findings from the study participants: This step aimed to validate study findings using “member checking”. This is the final stage of data analysis which involves returning to the participants for a follow up interview, to elicit the representativeness of the emerged phenomenon with their experience.9-11

Conclusion
The purpose of this paper was to disseminate the researcher’s reflection and experiences while analyzing this phenomenological study by using Colaizzi’s method. Even though there are many studies used Colaizzi’s method as a tool for their analysis, the steps for conducting an actual research with illustrations were very few. Hence the researcher tried to unveil the processes involved in analysis using this method.

Conflict of Interest: There is no conflict of interest.

Source of Funding: Self

Ethical Clearance: Institutional ethics committee approval was obtained from IEC, Malabar Medical College hospital and research centre (No. MMC & RC/IEC/2017).

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Lived Experience of Women with Ischemic Heart Disease (IHD): A Pilot Study on Phenomenology

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²Professor, Yenepoya Nursing College, Yenepoya (Deemed to be University), Mangalore, Karnataka, India

Abstract

Background: IHD has been regarded as a universal burden. Even though women are sheltered from this dreadful disease during their reproductive years to a certain extent, the incident is almost similar in both genres after menopause. Since women are regarded as the centre of domestic chores in our home settings, any bodily ailments affecting her directly impact the synchrony of a family.

Aim: This study aimed to describe lived experience of women with IHD to offer a deeper understanding in caregivers, which will help them while taking care of patients and further it will act as a guide to nursing practice.

Objective: To explore the lived experiences of women with IHD

Settings and Design: Setting of the study was Malabar Medical College Hospital and Research Centre. Qualitative study, in which descriptive phenomenological design was used for the study.

Materials and Method: The sample of the study included 10 women with Ischemic heart disease who underwent CABG or PTCA from Malabar Medical College Hospital and research centre, Calicut. In depth interviews were conducted within one month to one year of their disease condition. Interviews were recorded and audio files were transcribed. Colaizzi’s method was used to direct data analysis and the structure of the phenomenon was formulated.

Statistical Analysis used: N Vivo software version (9) was used for the study.

Results: Significant statements were extracted from the transcribed verbatim and meanings were formulated. Total of seven main themes and several subthemes were emerged; the themes were 1. Pain perception. 2. Fear of impending death. 3. Anxiety 4. Stumbling blocks. 5. Support system. 6. Breakdown the barriers.

Conclusion: The study reflected the pain and sufferings underwent by the patients during the disease process and the factors that helped them for the recovery and their insights to live along with this dreadful disease in their later life.

Keywords: Ischemic heart disease (IHD), lived experience; Phenomenology.

Introduction

Ischemic heart disease (IHD) is considered as the leading cause of death in the United States, responsible for 635,260 cardiac deaths in 2016¹. Although heart disease is sometimes regarded as a man’s disease, almost as many women as men expire each year of heart disease. In spite of the augmented awareness measures taken over the past decades, only about half (56%) of
women recognize that heart disease is their number 1 killer\textsuperscript{2,3}. Considerable amounts of quantitative research are available, which addresses the treatment modalities especially pharmacologic management\textsuperscript{4}. Several quantitative studies have also examined the psychological impact of women after a cardiac event\textsuperscript{5,6}. However, few qualitative studies were found that address the personal experience of living with this dreadful disease and its subsequent impact on the quality of life of the survivors. A literature review revealed scanty information available on the lived experience of women with IHD even though one study, Moeini\textsuperscript{7} used phenomenology as a method to explore the lived experiences of women. Similar studies could not be found elsewhere which pressured the researcher to take-up this area for the detailed enquiry.

**Materials and Method**

A qualitative study, descriptive phenomenological design was used for the study. Sampling adopted was Purposive sampling. In-depth interviews of 10 women who were diagnosed with Ischemic heart disease and underwent either CAGB or PTCA with or without stent, and who met the inclusion criteria were selected for the study.

**Inclusion Criteria:** Patients included were those with Ischemic heart disease who was physically stable and who could speak Malayalam and recall the experiences and had an episode of documented cardiac arrest and survived after hospitalization.

**Exclusion Criteria:** Patients excluded were those who were diagnosed with psychiatric disorder, organic brain damage or any other co morbidities that could affect their communication and who were not oriented and conscious.

**Ethical Considerations:** Administrative permission was obtained from Institutional ethical committee, Malabar Medical College Hospital and Research centre. A written informed consent was obtained from the participants.

**Procedure for data collection and data analysis:** Data were collected at the homes of the Ischemic heart disease (IHD) patients from July 2018 till July 2019. Data collection and data analysis was done simultaneously. To analyze the data Colaizzi’s\textsuperscript{8} Phenomenological method was followed. Every sentence and paragraph was scrutinized for extracting significant statements. Formulation of meaning was done by taking each significant statement making sense of it in participants own terms. Hidden meanings were uncovered. The process was repeated for each interview and the data was coded for the emergence of themes. Common patterns were extracted. The data was given for validation and submitted to experts in the field of qualitative research to derive the meanings of each statement. The derived themes and subthemes were discussed with some of the research participants in order to check the validity. Essential themes common to majority of the participants were identified and the structure of the phenomenon was developed.

Statistical Method: N Vivo software version (9) was used for the study.

**Results**

The analysis is organized under the following headings

- **Section 1: Frequency and percentage distribution of sample characteristics**
- **Section 2: Derivation of themes and subthemes**
- **Section 3: Description of phenomenon of lived experience of women with Ischemic heart disease**

**Section 1: Frequency and percentage distribution of sample characteristics**

<table>
<thead>
<tr>
<th>Sample Characteristics</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in Years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41-50</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>51-60</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>61-70</td>
<td>5</td>
<td>50</td>
</tr>
<tr>
<td>71-80</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hindu</td>
<td>6</td>
<td>60</td>
</tr>
<tr>
<td>Muslim</td>
<td>4</td>
<td>40</td>
</tr>
</tbody>
</table>

**Educational Status**

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No formal education</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>Primary</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Upper Primary</td>
<td>2</td>
<td>20</td>
</tr>
</tbody>
</table>
The data in Table 1 shows that majority of the participants were in the age group of 61-70. A greater part (60%) of them was Hindus. While considerable numbers (40%) of the participants had upper primary education, a few (20%) did not even have formal education. A majority of the participants were married (70%) and a few were widows (20%). A huge majority (90%) was unemployed and there was only one professional. With regard to associated medical condition, while equal numbers of participants were affected with both hypertension and diabetes (60%), a very few (10%) had kidney disease. Regarding diagnosis, a considerable number (30%) are equally affected either DVD or TVD together with CAD. On the topic of procedure underwent, majority (50%) had PTCA with stent and very few (10%) had CAG with PTCA. Patients with CABG and primary PTCA shared an equal number (20%).

### Sample Characteristics

<table>
<thead>
<tr>
<th>Sample Characteristics</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary</td>
<td>4</td>
<td>40</td>
</tr>
<tr>
<td>Graduate</td>
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<td>10</td>
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</table>

### Marital Status

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>7</td>
<td>70</td>
</tr>
<tr>
<td>Widowed</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>Divorced</td>
<td>1</td>
<td>10</td>
</tr>
</tbody>
</table>

### Occupation

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployed</td>
<td>9</td>
<td>90</td>
</tr>
<tr>
<td>Professional</td>
<td>1</td>
<td>10</td>
</tr>
</tbody>
</table>

### Associated Medical Condition

<table>
<thead>
<tr>
<th>Associated Medical Condition</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTN</td>
<td>6</td>
<td>60</td>
</tr>
<tr>
<td>Diabetes</td>
<td>6</td>
<td>60</td>
</tr>
<tr>
<td>Kidney disease</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>No other conditions</td>
<td>1</td>
<td>10</td>
</tr>
</tbody>
</table>

### Diagnosis

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAD, TVD</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>CAD, DVD</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>CAD, Unstable Angina</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>CAD, Inferior wall MI</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>CAD, Dislipedemia</td>
<td>1</td>
<td>10</td>
</tr>
</tbody>
</table>

### Procedure Underwent

<table>
<thead>
<tr>
<th>Procedure Underwent</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CABG</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>PTCA with Stent</td>
<td>5</td>
<td>50</td>
</tr>
<tr>
<td>Primary PTCA</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>CAG, PTCA</td>
<td>1</td>
<td>10</td>
</tr>
</tbody>
</table>

Section 2: Derivation of themes and subthemes:
The purpose of the study was to explore the experience of women with Ischemic heart disease in order to offer a deeper understanding in nurses about the mental agonies of the patients during their disease process which later help them while taking care of patients and it will act as a guide to nursing practice.

1. **Perception of Pain:** This theme described the physical distresses expressed by the participants during the acute stage of illness. The symptoms varied from mild to severe in intensity. Most of the participants ventilated the worst episode of pain they had experienced.

   **The Subthemes Were:**

   **Agonizing Pain:** Each participant described the severity of pain differently. Majority of them had said it was unbearable and associated with sweating, headache and breathing difficulty. It started while they are doing some activities. The subtheme could better be understood by the following narration.

   **Participant A:** “…When I reached hospital, there was full of sweat and also I had strangulating pain. They gave me a tablet, then injection and asked me to lie down. The pain was like something kept on my chest; as like I am not able to swallow”.

   “…Pain started early morning at 4 ‘O Clock, I went to bathroom came back and lied down. When I was stretching, I felt like some pain from here (Chest) similar to obstructing with something”.

   **Fluctuating Symptoms:** The symptoms in the beginning stages were not consistent. Many of the participants had expressed they thought the pain was associated with gas trouble. Also some patients experienced some unusual symptoms such as Jaw pain, tooth pain, syncope and a feeling of block inside them.

   **Participant A:** “That day, while the pain had started I did lots of work and was about to go for cleaning the courtyard of our nearby house (where used to go for household work) ….I started getting pain, I thought it was gas and had normal medicine for gas trouble, also I had ‘Jeera’ and water... Later I had one more tablet for gas, but pain did not subside”.

   **Fear of impending death:** This theme revealed the inherent fear embedded in the patient during the acute stage of illness. They were aware that this is a
life threatening disease and had already witnessed some other family members lost their life during the course of illness.

**Participant A:** I asked how the pain had started during the initial period. She replied “I didn’t know it was ‘this’ pain, so I was not afraid. After knowing this, I thought I may die, anyway my grandfather and all died due to this only....after the third attack, he had gone.

**Anxiety:** This theme described the various fears the patients encountered during their disease process. They are mainly the fear of resuming the disease and the anxiety about the future of their loved ones.

**Anxiety about future of loved ones:** Some of the patients expressed their fear that their absence may affect the future of their children. One of the participant said she had only one daughter and she was anxious about her future. Another participant was not feeling good as her children were not having proper job.

**Participant D:** ......Regarding hindering factors of recovery, “mainly worries related to recurrence, also thought about daughter, since she is the only child, I should be healthy for taking care of her”.

**Fear of being burden to the family:** This subtheme explains the patients fear that they may be a burden to the family which is evident from their words.

**Participant A:** “....... We cannot stay with children always. Even if they won’t mind, others (Daughter in Laws) may not like what we speak at times and that will be difficult. Now I am conscious, later when I am not in my full senses, I don’t know what will happen”.

**Stumbling Blocks:** There were various hindering factors that prevented patients from getting a peaceful recovery.

**Financial constraints:** This subtheme explains the financial difficulties encountered by the patients which prevent them even from seeking medical intervention on time.

**Participant A:** “Thus we went there (Hospital); they told the operation is “Bypass”. Also they asked why you didn’t do it from IQURAA. I said the problem was with money. I have no money, my husband had expired”.

**Mobility Restriction:** Few of the participants were finding it difficult to adhere to the imposed restriction in their mobility due to illness.

**Participant A:** “Now I have one concern I got an elder sister who had cancer, I couldn’t travel through bus, so I am not able to visit her often”.

**Participant D:** ....She ventilated her fear of travelling alone. “After this, I have not travelled alone”.

**Daily Routine Disturbances:** This subtheme explains the difficulties experienced by the participants in their day today activities due to disease condition such as resuming her job, social activities, yoga classes etc.

**Participant A:** “Because of this disease, I could not go for work that I was doing previously. Also I doubt whether I will ever be able to do”.

**Participant G:** “I used to go for yoga, before sickness and was performing almost all “asanas”, now I practice only very few of them, others like ‘Suryanamaskara’ I can’t do nowadays”.

**Support System:** This theme explains the support systems available for the participants. They are mainly family, social and spiritual support.

**Family Support:** This subtheme tries to unveil the help that the participant received from the family members during acute stage of illness. It is seen that all of them had ventilated that they received help from family which aid in a speedy recovery.

**Participant A:** “My children helped me to come back to normal life. Since they know I couldn’t do any work, they only helped for everything. They bring water for bath. I take half cup of water and pour (on my body). She (daughter) used to dry the hair”.

“Regarding support, mainly it is my children... I have 6 daughters and one son. My children are staying nearby here”.

**Social Support:** This subtheme tried to explain the support the participants are receiving from the society they live. As we are aware health is not only a physical entity, but also a state of physical, mental and social well being, support from society is very much needed for the speedy recovery of the patients.

**Participant B:** “Things that helped my recovery; help from my neighbours, not in work, but in terms of their love. There are lots of neighbour’s, 10-11 families. Either side of the road, houses are aligned in both sides of the road. All of them were very friendly. They visit
me often. “Regarding social activities, I am active in Kudumbasree. ... While in competitions, I won’t participate for running and jumping, but I will be there to facilitate everything”.

**Spiritual support:** This subtheme tried to explain how faith in god helped the patients to overcome their struggles and it acted as pillar and supported them during their acute stage of illnesses.

**Participant A:** “We have success and failures in our life. This is because god is testing us (by giving sufferings). This means that we should be more close to god. I even asked doctor whether I can take ‘nombu’ (Fasting prayer). But he said, I can’t as there is tablet to be taken in the afternoon. He suggested putting up with it after completing the medicines. It is like when I borrow some money, I have to repay it to you, similarly, the ‘nombu’ that are missed once, has to be compensated later”.

**Learning to cope various ways:** This theme tried to describe the various coping strategies adopted by the participants in order to overcome their worries.

**Participant J.:** “Though I am a person with lots of tension, this time I was courageous. Still I am wondering from where I got that power. Maybe I thought it is for ‘me’, not for any of the family members. If it is for anyone in the family I would have more concerned. My husband is not as courageous as I am.”

**Section 3:** Description of phenomenon of lived experience of women with

**Ischemic heart disease:**

The phenomenon that is emerged out of the analysis of the experience of women with Ischemic heart disease was “To live is to suffer; to survive is to find some meaning in the sufferings”.

Ischemic heart disease is a life threatening condition both for men and for women. As the women are cornerstone in the family, diseases affecting them will have a great impact in the harmonious functioning of the family. Mostly these women may not be able to resume their role after the disease process. The model in Figure 1 explains the interrelationship of all the themes and subthemes as a closed system connected to each other to form to emerge a phenomenon, “To live is to suffer; to survive is to find some meaning in the sufferings”. We cannot distinguish physical and mental agonies separately. They are the collective entity. Living with heart disease is a suffering, but we have to search the ways by which we could cope with these sufferings and lead a life to its maximum potential in the later years of life.

![Conceptual model explaining the phenomenon of lived experience of Women with Ischemic Heart Disease](image-url)
Discussion

The study revealed the lived experience of women with IHD as a complex, life changing actuality involving dynamic interplay between physical, psychological, social, spiritual and economic dimensions based upon phenomenology. Even though six themes were described as conceptually distinct, they are not separate entities. But rather, are synthesised with one another in the expressive version of the lived reality. There were several common themes emerged in similar studies. For instance, ‘fear of impending death’ was described by some other phenomenological studies such as ‘lived experience of terminally ill women on home hospice care’ and ‘adjusting to a recurring breast cancer’. Other themes such as ‘pain perception’ was found out in ‘a study of Korean women suffering from Rheumatoid arthritis’ and the theme ‘anxiety’ in ‘spouses of patients with a left ventricular assist device before heart transplantation’. The theme ‘Learning to cope with various ways’ was found in ‘a study of lived experience on patients on dialysis’ and subtheme ‘spiritual support’ was detailed in a study on ‘Spiritual coping mechanisms in chronically ill patients’. One of the limitations of this study could be the small sample size which makes the findings difficult to generalize. Sampling adopted for the study was purposive, where randomization is not done, hence couldn’t generalize the findings to a wider population. Recommendation could be to conduct a mixed method research which augments the benefits of an integrated approach to strengthen the study.

Conclusion

With regard to themes, it is understood that having affected with a major cardiac disease is a stressful experience for patients and possess various doubts during the disease process. This necessitates nurses to take effort to address their concerns and prepare them to adjust and adapt to the challenges imposed by the illness and to live a life as fruitfully as possible. Studies describing lived experience of such patients would definitely help nurses to have an insight into their problems and attend their needs effectively.

Acknowledgement: We would like to thank Deputy Director PhD Programme, Former guide and Principal, Doctoral committee members, my colleagues Dr. Deeksha, Dr. Greeni, Yenepoya (Deemed to be University) and Chairman and IEC members, Malabar Medical College Hospital and Research centre, Calicut for their valuable support and guidance.

Conflict of Interest: There is no conflict of interest.

Source of Funding: Self

Ethical Clearance: Institutional ethics committee approval was obtained from IEC, Malabar Medical College hospital and research centre (No.MMC & RC/IEC/2017).

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9. Grumann MM, SPIEGEL D. Living in the face of death: interviews with 12 terminally ill women on


The Barrier to Access Health Insurance for Maternity Care: Case Study of Female Workers in Indonesia

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Abstract

Female workers are one of the vulnerable groups during childbirth. The study is aimed at analyzing the barrier to access health insurance for maternity care among female workers in Indonesia. The samples employed were female worker in childbearing age who had given birth in the last 5 years. The sample size was 18,061 female workers. The variables analyzed included health insurance, healthcare childbirth, type of place of residence, age, education, employment, marital, parity, wealth, know the danger signs of pregnancy, and antenatal care. Determination of determinant by the binary logistic regression. The research results show that female workers who perform maternity care in non-healthcare facilities have 1,142 times the possibility of having health insurance than female workers who perform maternity care in healthcare facilities. It was found that the younger you are, the more likely you are not to have health insurance. Meanwhile, the lower the education and the poorer the female worker, the higher the possibility of not having health insurance. Married female workers have 0.531 times the chance of having health insurance compared to divorced/widowed female workers. Finally, a female worker that doesn’t know the danger signs of pregnancy has 1,076 times the chance of having health insurance than the richest female worker that knows the danger signs of pregnancy. It was concluded that 7 barriers to access health insurance among female workers in Indonesia, namely doing maternity care in non-healthcare facilities, younger age, poor education, single (never in union/divorced/widowed), poor, and don’t know the danger signs of pregnancy.

Keyword: Female worker, health insurance, maternity care, maternal health.

Introduction

Maternal Mortality and Child Mortality is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes1.

Maternal Mortality is unacceptably high. About 295,000 women died during pregnancy and childbirth in 2017. The vast majority of these deaths (94%) occurred in developing countries, and most could have been prevented2. Maternal Mortality and Child Mortality in Indonesia is still high, the Maternal Mortality Rate (MMR) in Indonesia ranges from 305 (Supas) to 359 (Susenas) per 100,000 live births. Incidence of multifactorial maternal mortality rate The biggest contributor, about 75% of maternal deaths, is contributed by direct causes, namely bleeding, infection, hypertension, complications of childbirth, and unsafe abortion3.

Nowadays, Female contribute the macroeconomic actively. Female employees actively participate in social labor and become a force that can’t be ignored in the
workplace. Their experience at the workplace affects their well-being, not only at work, but at home and as members of their households and communities. Female workers and their babies have health risks. The access to health services to maintain their health is important for female workers. A study conducted on 437 female workers in Sidoarjo Indonesia showed that 63.3% percent of births were assisted by a midwife, 34.3% were assisted by a doctor and 2.3% were assisted by a traditional birth attendant. Meanwhile in India, the Accredited Social Health Activist (ASHA) program in India, is to understand the role of community health workers in retaining women in a series of maternity care. ASHA in the community encourages positive health care seeking behavior throughout maternity care.

Insofar as the perceived support received upon arrival of women in health care facilities for different services, namely antenatal, intranatal and postnatal care, the study found that hospitals and health care facilities have different ways of admitting women to hospital. Health facilities for this service. On the one hand, the majority of participants indicated that acceptance of antenatal care services was more supported and accessible. In addition, it was also stated that as far as ANC services were concerned, initial information on childbirth preparedness, family planning and the importance of breasts impressed most women. The three barriers for female worker to increase breastfeeding rates were: breastfeeding substitutes marketing practices, the lack of lactation rooms in workplaces, and local customs that may hamper breastfeeding according to recommendations. Optimizing maternity protection programs may result in increased breastfeeding rates.

An exploratory qualitative study in Ethiopia showed that there are twelve homeless mothers who gave birth during childbirth in the last 12 months and 10 health care providers revealed that homeless women did not use any of the basic maternity health care services, namely antenatal care, skilled midwives, and postnatal care. This is due to a lack of premises and permanent awareness, and fear of stigma and discrimination. Other factors related to socio-cultural, socio-economic and health care contribute to the non-use of health services. The utmost success in maternal health will arise if maternal health care services are an unparalleled source for women’s healthcare solutions for any problem related to childbirth. Health advocates worldwide claim that even though maternal services are provided, women’s utilization of such services has not been ascertained.

The National Health Insurance is a form of commitment by the Indonesian government to expand access to quality maternal and child health services (KIA), especially for the poor through the birth insurance program (Jampersal), and later in 2014, the National Health Insurance (JKN) introduction. The JKN had an impact on a major restructuring of the public health insurance system by combining all types of public health insurance schemes into JKN, including the combination of benefits including antenatal care, childbirth and postpartum care. The main objective of JKN is social protection to ensure that all people can fulfill their basic needs for proper health.

There are vulnerabilities in female reproduction include not to get pregnant while working, not having a baby during the contract period, greater wage discrimination for men, including work benefits, such as children and family, less than maximum menstrual and pregnancy leave, harassment, and sexual violence, the lack of lactation room in workplace. The employers display unfavourable attitude towards the employment of childbearing age group women in the first place and pregnancy at workplace. The study is aimed at analyzing the barrier to access health insurance for maternity care among female workers in Indonesia.

**Materials and Method**

**Data Source:** The study employed raw data from the 2017 Indonesian Demographic Data Survey (IDHS) for analysis. The IDHS uses stratification and multistage random sampling to select the required sample. The unit of analysis in this study was female workers of childbearing age (15-49 years), who had given birth in the last 5 years in Indonesia. The sample size used was 18,061 women.

**Data Analysis:** The dependent variable in this study is health insurance ownership. Health insurance ownership is the respondent’s recognition of any type of health insurance. Health insurance ownership is divided into two categories, namely owning and not having.

This study involved 9 independent variables. The nine variables are type of place of residence, type of place of maternity care, age groups, education level, marital status, parity, wealth status, knowledge of the danger of pregnancy, and completeness of antenatal care (ANC). The type of place of residence is divided into 2 categories, namely urban and rural. The type of place of maternity care is divided into 2 categories, namely...
non healthcare facility and healthcare facility. The age
groups were divided into 5 years interval. Education
level consists of 4 categories, namely no education,
primary, secondary and higher. Employment status is
divided into 2 categories, namely no employment and
employment. Parity is divided into 2 categories, namely
primiparous (≤ 1) and multiparous (> 1).

Wealth status is determined based on the wealth
index calculation. Wealth index is a composite
measure of a household’s cumulative living standard.
The wealth index is calculated using easy-to-collect
data on a household’s ownership of selected assets,
such as televisions and bicycles; materials used for
housing construction; and types of water access and
sanitation facilities. The wealth index is divided into 5
categories, namely poorest, poorer, middle, richer, and
richest. Ownership of health insurance is divided into 2
categories, namely having no and owning.

Know the danger of pregnancy is the respondent’s
knowledge of the dangers of prolonged labor, vaginal
bleeding, fever, convulsions, baby in wrong position,
swollen limbs, faint, breathlessness, tiredness, and
others. Know the danger of pregnancy is divided into 2
categories, namely not knowing and knowing. ANC is a
respondent’s visit to get antenatal care during pregnancy
at a health care facility. The ANC completeness variable
was divided into 2 categories, namely <4 visits and ≥ 4
visits.

Since all the variables involved in this study are
dichotomous variables, the chi square test was used at
an early stage to see if there were significant differences
in health insurance ownership. In the final stage, binary
logistic regression is used to determine the barrier
to access health insurance among female workers in
Indonesia. All statistical analyzes were carried out using
SPSS 22 software.

**Results and Discussion**

Table 1 is descriptive statistics of health insurance
ownership among female workers in Indonesia. It can
be seen that all female workers predominantly live in
rural areas and choose to give birth in non-healthcare
facilities. This condition applies to female workers who
have or do not have health insurance.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Health Insurance Ownership</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Place of residence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Urban</td>
<td>5784</td>
<td>48.1%</td>
</tr>
<tr>
<td>- Rural</td>
<td>6234</td>
<td>51.9%</td>
</tr>
<tr>
<td>Place of maternity care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Non-healthcare Facilities</td>
<td>7727</td>
<td>64.3%</td>
</tr>
<tr>
<td>- Healthcare Facilities</td>
<td>4291</td>
<td>35.7%</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 15-19</td>
<td>59</td>
<td>0.5%</td>
</tr>
<tr>
<td>- 20-24</td>
<td>585</td>
<td>4.9%</td>
</tr>
<tr>
<td>- 25-29</td>
<td>1817</td>
<td>15.1%</td>
</tr>
<tr>
<td>- 30-34</td>
<td>3257</td>
<td>27.1%</td>
</tr>
<tr>
<td>- 35-39</td>
<td>3531</td>
<td>29.4%</td>
</tr>
<tr>
<td>- 40-44</td>
<td>2179</td>
<td>18.1%</td>
</tr>
<tr>
<td>- 45-49</td>
<td>590</td>
<td>4.9%</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- No education</td>
<td>348</td>
<td>2.9%</td>
</tr>
<tr>
<td>- Primary</td>
<td>3339</td>
<td>27.8%</td>
</tr>
</tbody>
</table>
Based on the age group, the two categories of health insurance ownership were dominated by female workers in the 35-39 age group. Based on the education level, the two categories of health insurance ownership are dominated by female workers with secondary education. Meanwhile, based on marital status, the two categories of health insurance ownership are dominated by married female workers.

Table 1 informs that based on wealth status there is two categories of health insurance ownership that are dominated by the poorest female workers. Based on parity, the two categories of health insurance ownership are dominated by multiparous female workers. Meanwhile, based on knowledge of the danger signs of pregnancy, both categories of health insurance ownership are dominated by female workers who know of the danger signs of pregnancy. Finally, based on ANC visits, both categories of health insurance ownership were dominated by female workers who made ANC visits <4 times during pregnancy.

Table 2 is the result of Binary logistic regression of health insurance ownership among female workers in Indonesia. Statistical analysis in this final stage is to determine the barrier to access health insurance among female workers. As a reference, the chosen category have health insurance.
Table 2. Binary logistic regression of health insurance ownership among female workers in Indonesia (n=18,061)

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Health Insurance Ownership: Don’t Have</th>
<th>Sig.</th>
<th>OR</th>
<th>Lower Bound</th>
<th>Upper Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place of residence: Urban</td>
<td></td>
<td>0.081</td>
<td>0.936</td>
<td>0.869</td>
<td>1.008</td>
</tr>
<tr>
<td>Place of residence: Rural</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Place of maternity care: Non-healthcare Facilities</td>
<td>***0.000</td>
<td>1.142</td>
<td>1.061</td>
<td>1.230</td>
<td></td>
</tr>
<tr>
<td>Place of maternity care: Healthcare Facilities</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Age: 15-19</td>
<td></td>
<td>0.212</td>
<td>1.330</td>
<td>.850</td>
<td>2.081</td>
</tr>
<tr>
<td>Age: 20-24</td>
<td></td>
<td>***0.000</td>
<td>1.816</td>
<td>1.486</td>
<td>2.220</td>
</tr>
<tr>
<td>Age: 25-29</td>
<td></td>
<td>***0.000</td>
<td>1.940</td>
<td>1.634</td>
<td>2.303</td>
</tr>
<tr>
<td>Age: 30-34</td>
<td></td>
<td>***0.000</td>
<td>1.394</td>
<td>1.183</td>
<td>1.644</td>
</tr>
<tr>
<td>Age: 35-39</td>
<td></td>
<td>*0.015</td>
<td>1.223</td>
<td>1.040</td>
<td>1.440</td>
</tr>
<tr>
<td>Age: 40-44</td>
<td></td>
<td>0.522</td>
<td>1.057</td>
<td>.892</td>
<td>1.252</td>
</tr>
<tr>
<td>Age: 45-49</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Education: No education</td>
<td></td>
<td>***0.000</td>
<td>3.479</td>
<td>2.833</td>
<td>4.271</td>
</tr>
<tr>
<td>Education: Primary</td>
<td></td>
<td>***0.000</td>
<td>3.038</td>
<td>2.701</td>
<td>3.418</td>
</tr>
<tr>
<td>Education: Secondary</td>
<td></td>
<td>***0.000</td>
<td>3.034</td>
<td>2.736</td>
<td>3.364</td>
</tr>
<tr>
<td>Education: Higher</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Marital: Never in union</td>
<td></td>
<td>0.155</td>
<td>0.311</td>
<td>0.062</td>
<td>1.558</td>
</tr>
<tr>
<td>Marital: Married/Living with partner</td>
<td></td>
<td>***0.000</td>
<td>0.531</td>
<td>0.457</td>
<td>0.616</td>
</tr>
<tr>
<td>Marital: Divorced/Widowed</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Wealth: Poorest</td>
<td></td>
<td>*0.035</td>
<td>1.143</td>
<td>1.010</td>
<td>1.295</td>
</tr>
<tr>
<td>Wealth: Poorer</td>
<td></td>
<td>***0.000</td>
<td>1.463</td>
<td>1.295</td>
<td>1.652</td>
</tr>
<tr>
<td>Wealth: Middle</td>
<td></td>
<td>***0.000</td>
<td>1.344</td>
<td>1.193</td>
<td>1.514</td>
</tr>
<tr>
<td>Wealth: Richer</td>
<td></td>
<td>***0.000</td>
<td>1.394</td>
<td>1.240</td>
<td>1.566</td>
</tr>
<tr>
<td>Wealth: Richest</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Know the danger signs of pregnancy: No</td>
<td></td>
<td>*0.037</td>
<td>1.076</td>
<td>1.005</td>
<td>1.152</td>
</tr>
<tr>
<td>Know the danger signs of pregnancy: Yes</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: *p <0.05; **p <0.01; ***p <0.001

Table 2 shows that female workers who perform maternity care in non-healthcare facilities have 1,142 times the chance of having health insurance than female workers who perform maternity care in healthcare facilities (OR 1.142; 95% CI 1.061-1.230). The result showed that doing maternity care in non-healthcare facilities is a barrier to accessing health insurance among female workers in Indonesia. Otherwise, another previous study informed that having health insurance is a determinant of maternity care in healthcare facilities\textsuperscript{15}. Table 2 shows that female workers in the 20-24 age groups were 1,816 times more likely to have health insurance than female workers in the 45-49 age groups (OR 1.816; 95% CI 1.486-2.220). Meanwhile, female workers in the 35-39 age groups were 1,223 times more likely to have health insurance than female workers in the 45-49 age groups (OR 1.223; 95% CI 1.040-1.440). There is a tendency that younger age is a barrier to accessing health insurance among female workers in Indonesia. In general, age is also known as a predictor of maternity care in healthcare facilities\textsuperscript{15}. Getting older, it is assumed that the more they understand the risks of doing maternity care in non-healthcare facilities\textsuperscript{16}. 
Table 2 shows that no education female workers have a 3,479 times chance of having health insurance than female workers with higher education (OR 3.479; 95% CI 2.833-4.271). Meanwhile, female workers with secondary education have 3,034 times the chance of having health insurance than female workers with higher education (OR 3.034; 95% CI 2.736-3.364). In education aspect, Poor education is a barrier to access health insurance among female worker in Indonesia. Better education provides a better understanding of health risks\textsuperscript{17,18}.

Table 2 shows that a married female worker is 0.531 times more likely to have health insurance than a divorced/widowed female worker (OR 0.531; 95% CI 0.457-0.616). Marital status such as single (divorced/widowed) is a barrier to access health insurance among female worker in Indonesia. This situation is very risky for women living in Indonesia. In the cultural context in Indonesia, being pregnant without having a husband is a disgrace, so that single women tend to keep their pregnancy secret, do not make ANC visits, and do not carry out maternity care in healthcare facilities\textsuperscript{19}.

Table 2 shows that the poorest female worker was 1,143 times more likely to have health insurance than the richest female worker (OR 1.143; 95% CI 1.010-1.295). Female workers in the richest category had 1,394 times the chance of having health insurance than the richest female workers (OR 1.394; 95% CI 1.240-1.566). The analysis shows that poor in wealth status is a barrier to access health insurance among female worker in Indonesia. Several previous studies have also found that this kind of socioeconomic disparities also applies to access to health facilities in general\textsuperscript{20,21}.

Table 2 shows that a female worker that doesn't know the danger signs of pregnancy has 1,076 times the chance of having health insurance than the richest female worker that knows the danger signs of pregnancy (OR 1.076; 95% CI 1.005-1.152). This study found that don't know the danger signs of pregnancy is a barrier to access health insurance among female worker in Indonesia. Female worker’s ignorance about the danger sign of pregnancy is in line with poor in education and wealth\textsuperscript{22}. The combination of such conditions will further strengthen female workers not to have health insurance.

**Conclusions**

Based on the results of the analysis, it can be concluded that there are 7 barriers to access health insurance among female workers in Indonesia. The seven barriers to do maternity care in non-healthcare facilities, younger age, poor education, single (never in union/divorced/widowed), poor, and don’t know the danger signs of pregnancy.

**Acknowledgments:** The author would like to thank the ICF International, who has agreed to allow the 2017 IDHS data to be analyzed in this article.

**Source of Funding:** Directorate of Research and Community Services Society, Directorate General of Research and Development Strengthening Ministry Research, Technology and Higher Education of the Republic of Indonesia

**Conflict of Interest:** The authors declare no conflict of interest, financial or otherwise.

**Ethical Clearance:** The 2017 IDHS has received ethical clearance from the National Ethics Commission. Utilization of the 2017 IDHS data in this study has been permitted by ICF International through its website: https://dhsprogram.com/data/new-user-registration.cfm.

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Effects of COVID-19 and Recommended Practices: 
Case Report

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Abstract

Objectives: Over the past one year, the effect of 2019-nCoV is drastically increasing and affecting entire 
human population. Due to these pandemic situations, people are facing many health-related problems which 
includes life threatening fears, heart problems, taking more unneeded medicine and most importantly critical 
thinking which leads to mental stress. This paper proposes the different possible strategies which help the 
people for avoiding these issues.

Case Presentation: An approach for delivering a possible strategy on avoiding human health issues due 
to COVID-19 is done by the successful collection of reports from many infected people. The information 
from physical examination to successful treatment stages were analyzed from different infected patients 
and reported. Here, we reviewed the methodologies adopted for preventing the spread of corona virus from 
various origin and have listed the characteristic features of its behavior based on the real case reports.

Method: The different age group patients are reviewed and possible relevant characteristic points on the 
important protocol, treatment procedure, steps to control the spread of this virus, guidelines to avoid other 
health issues and maintaining body health for fighting COVID-19 were collected and presented in the form 
of case reports.

Conclusion: The different techniques which are presented in this paper help the patients as well as people 
in the world to face the pandemic situation very effectively mainly to live with COVID-19. This paper also 
presents the prospective study and summarizes the effects of corona virus in human health based on the 
infected patients experience. The systematic review on the characteristics of corona virus will provide a 
strong guideline to the people to identify and face the critical situation in very informative manner.

Keywords: 2019-nCoV, COVID-19, Mental Stress, Treatment, Medicine.

Introduction

Over the last few months, many patients are 
suffering and severely affected due to novel corona virus. 
The nature of this virus is that it spreading from one 
origin to another origin mainly passed through infected 
respiratory droplets and people having repeated contact 
with infected person. The report says that, corona virus 
on human body from infection to symptom identification 
can be upto 14 days (incubation period). In healthcare 
networks, there are many diseases which have been 
treated well by our doctors and medical personnel’s in 
very effective ways. These diseases are spreading and 
affects the human environments based on its unique 
nature. As of now, the effect induced by this coronavirus 
may vary from mild symptoms to severe symptoms. The 
severe effect of this virus affects the patient’s respiration 
system. The first corona virus in human (CoV) were 
observed in the year 1965 and causing many problems 
to the human such as respiratory problems, issues 
on gastrointestinal, and neurological infections. The 
different families of CoV were listed in the papers are 
generally affecting human’s respiration and associated 
with common cold issue\cite{1,2}. But in the year 2003, it was 
identified that the coronavirus causes the severe acute 
respiratory syndrome among the humans and notified, it 
may create an epidemic disease to the world. The report 
says that, in the year 2012, new coronavirus affected
many people which is considered to be a global threat. Recently, in the month of December 2019, patient with respiratory problem have been admitted and reported in Wuhan, Hubei province, China. The patient was tested and found their clinical identification with respect to disease looks like normal pneumonia. Due to severe respiratory issue, later it was identified as severe acute respiratory syndrome coronavirus. It was identified by the Chinese Center for Disease Control and Prevention (CDC) by patient clinical data from the throat swab sample. The World Health Organization (WHO) has given the name of this virus as 2019-nCoV and declared the public health emergency due to spreading of corona virus in the month of January 2020. The effect of coronavirus disease mainly creating the problem of pneumonia which are very similar to SARS and MERS. Currently, the main symptoms presented by patients with 2019-nCoV are fever, cough, myalgia, fatigue, expectoration, headache, and gastrointestinal symptoms such as diarrhea. This new 2019-nCoV belongs to beta-CoV type and to the subgenus Sarbecovirus. The International Committee on Taxonomy of Viruses (ICTV) has given the name of this virus as SARS-CoV-2 and the induced disease as COVID-19.

In the present situation, due to lack of medicine, the important identical procedure to stop this virus spreading is to follow the safety measures such as wearing a medical mask, proper rest and ventilation, avoiding unnecessary travels in the crowd, drink more water and take healthy foods. The most important way to control the spread of this virus is to stay home. But, the long term staying at home creates many health problems. The people are facing different kinds of health issues during the period of COVID-19 pandemic situations. Due to the threat of this virus nature, people are forced to think differently when they are staying at home. This leads to mental stress and heart problems among the populations. Therefore, there is necessary to report the effect of coronavirus and provide an essential guideline to the society to fight this virus. This paper provides the necessary information’s on various approaches and method applicable for fighting COVID-19 through different case reports. The analysis of these case reports will help the society to recognize and manage the situation very effectively. The reminder of this paper is organized as follows: section 2 presents a brief information’s extracted from COVID-19 infected patients. Section 3 presents the detailed discussion and caution steps towards fighting COVID-19.

**Case Reports:** COVID-19 is the life-threatening disease which is spreading all over the world. The symptoms of the disease vary from human to human and also the effects of COVID-19 differ for each person. The severity of the disease depends on the age and health condition of the person. For young stage people, the severity is very low unless they have other chronic diseases like asthma, Chronic Obstructive Pulmonary Disease (COPD), tuberculosis and more breath related problems. For the aged people, the severity of the disease will be seen high. Many cases reported with common symptoms of loss of taste and anosmia or loss of smell which lasted nearly for a week or more. Some of them faced high fever and tiredness. The detailed review of the patients experiences and relevant information’s extracted from different patients were reported in this section. Here, the different number of patient’s information’s were collected form the age group between 20 to 68 in the region of south Tamil Nadu, India.

**Case Report 1:** The different case is about young male persons from the age of 20 to 45 with healthy condition. They faced the common symptoms of fever, loss of taste and smell. Once the test got positive for COVID-19, they were hospitalized and they have given medicine to reduce the fever alone. Once the temperature is reduced, they don’t feel any other symptoms other than loss of taste and smell. After a week, they slowly regain their taste and smell. The test is taken again after reducing temperature which shown negative. The treatment given for them is only healthy diet and steam intake for three time per day. They have been quarantined for 14 days and asked for take rest at home.

**Case Report 2:** These cases are about young female persons of age 20 to 45 with healthy condition. Along with the common symptoms, they faced drowsiness, low back pain and abdominal pain which lasted for a week. They also faced continuous cough and breathing trouble for three to five days. They have given nebulizers for easy breath. CT scans were taken to know about the functioning of lungs. Some of them got their lung infected and have taken treatment for improving the lung function.

**Case Report 3:** These cases are young person of age 20 to 45 with some sort of chronic diseases. At starting, they have the common symptoms alone. But later, they faced severe breathing trouble along drowsiness and vomiting. Nebulizers were given to make them comfort in breathing and medication were given. Nearly two weeks, they were given nebulizers continuously. Even
though medicines were properly given, the situation gets worsen. The respiratory system got severely affected. Nebulizers didn’t support them for their breathing. They couldn’t move of their own and lost their consciousness. They were moved to ventilators and nearly they went to comma stage. Treatments were taken continuously. After a week, they got consciousness and just able to move their fingers and shifted to Intensive care unit (ICU). Day by day, they got some improvements in their body and started to stand on their legs with the help of nurses. Physiotherapy has given for strengthening their hands and legs. Nearly after two months, they were able to do their own needs. Even after two months they are not fully recovered. They are facing difficulties like cough, tiredness and comfortless in walking.

**Case Report 4:** These cases are aged people from 45 to 65 with healthy condition. They have all the common symptoms along severe cough, breathing trouble, back pain and abdominal pain. Legs got swollen and body got too weak. They were facing difficult to take food. They feel nausea while intaking foods and medicine. Treatments were given according to their age and the ability to withstand with the medicines. Blood pressure and glucose level were continuously monitored. Most of their blood pressure got increased due to the fear about COVID-19. Proper guidance where given to them to get relax during the difficult situation. They were given healthy diets and asked to get complete rest for two weeks even though they got negative test result. Continuous monitoring is needed for them at least for a month because of getting stress may lead to other related diseases like brain related issues and cardiovascular problems.

**Case Report 5:** These cases are aged people from 45 to 65 with some chronic diseases. They feel very uncomforted during this situation. They have severe cough and breathing trouble along with body pain. Blood pressure got increased due to tension, glucose level is increased due to the diet and different medicine intake for breathing trouble. Sugar level and blood pressure varies drastically to its minimum and maximum level. Alternative medicines were given to reduce the pressure and sugar level. Nebulizers were given continuously for avoiding breathing trouble. It is very difficult to withstand with COVID-19 for them especially above the age of 60.

Table 1: Summary of status of various characteristic features of COVID-19

<table>
<thead>
<tr>
<th>Case Report</th>
<th>Case 1</th>
<th>Case 2</th>
<th>Case 3</th>
<th>Case 4</th>
<th>Case 5</th>
<th>Case 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>20</td>
<td>42</td>
<td>38</td>
<td>45</td>
<td>56</td>
<td>64</td>
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<tr>
<td>Gender</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Previous Medical History</td>
<td>Wheezing</td>
<td>Chronic Asthma</td>
<td>Healthy</td>
<td>Healthy</td>
<td>Heart bypass</td>
<td>Diabetics</td>
</tr>
<tr>
<td>Cause of spread</td>
<td>Unknown</td>
<td>Unknown</td>
<td>From husband</td>
<td>Travel</td>
<td>Shopping</td>
<td>Gatherings</td>
</tr>
<tr>
<td>Starting symptoms</td>
<td>Cough and fever</td>
<td>Wheezing and fever</td>
<td>Fever</td>
<td>Loss of taste and smell</td>
<td>Drowsiness</td>
<td>Fever</td>
</tr>
<tr>
<td>Stages</td>
<td>Risk</td>
<td>Risk</td>
<td>Normal</td>
<td>Mild</td>
<td>Mild</td>
<td>Mild</td>
</tr>
<tr>
<td>Common symptoms</td>
<td>Loss of taste and smell</td>
<td>Loss of taste and smell</td>
<td>Loss of taste and smell</td>
<td>Loss of taste and smell</td>
<td>Loss of taste and smell</td>
<td>Loss of taste and smell</td>
</tr>
<tr>
<td>Admitted date</td>
<td>August 16</td>
<td>June 24</td>
<td>June 27</td>
<td>September 22</td>
<td>September 15</td>
<td>September 2</td>
</tr>
<tr>
<td>Days in ICU</td>
<td>16</td>
<td>11</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ventilator period</td>
<td>7</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Discharge date</td>
<td>September 20</td>
<td>July 14</td>
<td>August 4</td>
<td>October 5</td>
<td>September 25</td>
<td>October 4</td>
</tr>
<tr>
<td>Test taken</td>
<td>Blood sugar level, Blood pressure, CT and MRI scans, X-ray for chest</td>
<td>Blood sugar level, Blood pressure, X-ray and CT scan</td>
<td>Temperature</td>
<td>CT scan</td>
<td>Blood sugar level, Blood pressure, X-ray</td>
<td>Blood sugar level, Blood pressure, X-ray and CT scan</td>
</tr>
<tr>
<td>Effects</td>
<td>Wheezing, Pneumonia, lungs got affected, Comma stage for 6 days</td>
<td>Wheezing</td>
<td>Fever</td>
<td>Wheezing, lungs got affected, abdominal pain</td>
<td>Cough, variation in blood sugar and pressure level, fever</td>
<td>Cough, variation in blood sugar &amp; pressure level, body pain and breathing trouble</td>
</tr>
</tbody>
</table>
Discussions

The different study on the analysis of 2019-nCoV provides the necessary guidelines to the society. Although, this virus is spreading very fast in all over countries and affecting many people in very effective manner. In such pandemic situations, there is a huge demand for knowing a complete guideline to live with this virus. The different researchers from various bio and engineering domains of science have been started their research long back to develop the vaccine to treat this virus. Until then, we as a people need to be follow the instructions given by their government. Currently, the test for COVID-19 is performed through RT-PCR test by collecting nasopharyngeal swabs. Here, the test can be done by the cycle threshold (Ct) based on the symptom’s onset per day. Meaning of the cycle threshold indicates replication cycles count for producing a fluorescent signal. As per the literature, the value below 40 is reported as positive PCR. This value may be reduced for severely infected patients. In this paper, we were compiled and reported the necessary information’s on the starting phase of corona virus, life at hospital, effect of corona virus after treatment in table 1. The information’s provided in this paper is collected from different patients infected by this coronavirus. This will help the entire society to know the nature of this virus and able to handle the situations very confidently if infected.

Possible criteria for COVID-19 infection: Fig.1 shows the possible criteria which leads more chance of getting infection from the affected patients. It is very important for the society to avoid these possible key features. This will help to control the spread of this virus among the population. The report shown in table 1 indicated that the unwanted shopping, gatherings more than one hundred peoples and non-necessary travel leads more choice for getting the infections and also giving way to spread this virus to human society.

---

<table>
<thead>
<tr>
<th>Case Report</th>
<th>Case 1</th>
<th>Case 2</th>
<th>Case 3</th>
<th>Case 4</th>
<th>Case 5</th>
<th>Case 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>Medication for fever, cough, nebulizers, improvement for lung functioning and physiotherapy</td>
<td>Medication for fever, cough, nebulizers, improvement for lung functioning</td>
<td>Medicine to reduce fever, steam intake for 3 times per day and healthy diet</td>
<td>Nebulizers and healthy diet</td>
<td>Insulin, Nebulizers and healthy diet</td>
<td>Insulin, Nebulizers and healthy diet</td>
</tr>
<tr>
<td>After COVID-19</td>
<td>Strength less in body</td>
<td>Continuous cough</td>
<td>Normal</td>
<td>Abdominal pain</td>
<td>Light cough</td>
<td>Continuous cough</td>
</tr>
</tbody>
</table>

---

Fig. 1 Criteria to avoid COVID-19 infection during Pandemic situations
Safety measures considered for COVID-19 infection: From the data observed from the infected patients, it is noticed that the given safety measures will provide an efficient control scheme to live with this coronavirus. The important safety measures listed in Fig.2 enable us to move forward with day by day activities with coronavirus.

Fig. 2 Safety measures to live with COVID-19

Stages of COVID-19 in patient health: The effect of COVID-19 in infected patient varies with respect to individual body conditions. The case reports from section 2 clearly indicated the effects of COVID-19 for different age groups and their health conditions. The entire life period of the infection is categorized into four main stages as shown in Fig.3.

Fig. 3 Health illness level variation with time

Based on the case reports presented in this paper, the medical providers have given the best treatment to fight with this virus. According to the research on the coronavirus and published literature papers, the medicines recommended for treating this virus and controlling the effect of its impact on human health under growth stage phase 1, 2 are mainly Remdesivir, Chloroquine, Arbidol and Kaletra, lopinavir/ritonavir, nucleoside analogues,
neuraminidase inhibitors and peptide EK17,8,9. Also, the infected patient admitted in the hospital were provided healthy foods to boost their body immunity. From this, it was observed to take healthy food help to control the effectiveness of this virus.

**Recommended best practices:** Based on the information’s gathered from different infected patients, it is recommended that given health support measures will provide enough support to face these pandemic situations very effectively. Due to this pandemic, many people are affected by various health issues such as cardiovascular problems, increasing blood pressure, high range of blood glucose level, improper handling of food habits, mental stress, unwanted thinking which leads to critical illness. The research has been started for developing the vaccine for this virus by investigating the dynamic features of this virus. This novel coronavirus can create a problem as multi organ infections in various animals and humans specific to respiratory tract infections. Finally, it leads to respiratory failure towards death. Therefore, it is necessary to prevent the spread of this virus among the human population and also follow safety measures to safe ourselves. As per the information given by scientific and medical community, no vaccine has been successfully developed for fighting this virus. This will develop a fear inside human mind and reduced their ability to perform their duties. In order to help the society, we are reviewed the different infected patients and listed some of the recommended activities which are listed in Fig.4. These steps help to improve your health in physically and mentally. These approaches will strengthen your mind and allow you to perform your thinking in positive manner which leads to successful life in this pandemic situation.

**Fig. 4 Recommended best practices to live with COVID-19**

1. **Spending time**
   - To continue to work with others, spending time to talk with everyone based on your work

2. **Round robin scheduling**
   - Plan to schedule your days with activities and maintain round robin scheduling approach to deal very day.

3. **Living with happy**
   - To live with happy environments. Share your thoughts to family members and feel more comfortable

4. **Maintain body health**
   - Perform routine exercises at home at least 30 minutes per day and drinking more water, taking healthy foods.

5. **Avoid mental stress**
   - Perform yoga daily to avoid mental stress and play games or doing your interested activities

6. **Balancing health conditions**
   - Avoid late taking food and maintain health diet to support your body health at balance conditions

7. **Creating awareness**
   - Know the importance of wearing mask, face shield, hand gloves, hand wash and have practice to use it
Conclusion

This paper highlighted the case reports from infected patients and provide the necessary guidelines to the society to live with this COVID-19. The effects induced by this virus becomes very critical in human life. The different stages of COVID-19 by infected patients were compiled and reported as useful information’s to follow by the people to fight COVID-19. This will help the society to know more details about infection effects, treatment procedures and life at hospital. Based on these case report, it is concluded that effect of this virus can be controlled very easily through the pre-medicine at hospital centers and following the effective health safety measures mentioned in this paper will help to control the spread of 2019-nCoV.

Acknowledgement: The authors thanks all the participants to provide their experiences and suggestions to the society for fighting COVID-19.

Ethical Approval: Not applicable

Patient Inform Consent: While preparing a case report and for publication patient’s informed consent has been taken.

Conflict of Interest: The Author declares that there are no conflicts of interest.

Funding: Not applicable

References

Assessment of Women’s Satisfaction with Childbirth Experience after Utilization of Pain Management Practices at Al-Elwyia Maternity Teaching Hospital

Rabea Mohsen Ali

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Abstract

A quasi-experimental study conducted on non-probability of (30) women whom admitted to Al-Elwyia Maternity Teaching Hospital suffering from labor pain for the period of (4th July 2018 through 24th October 2018). The results show that the highest percentages of non-pharmacological method used was frankincense oil, and related to women perception of labor pain they are assessed high as general, and they are accounted 24(96.0%). The study concluded that women’s satisfaction with childbirth experience after utilization pain management practices’ items showed good status, since highly evaluation was obtained, and that reflected the positive site of effectiveness for the intervention which were applicable indeed. So that construction continuous education program about non-pharmacological pain management practices to all midwife working in delivery room and department of maternity is need.

Keywords: Assessment, satisfaction, childbirth, Pain Management.

Introduction

Childbirth is an important life event in women’s life, and it is a multifaceted experience. The mother’s satisfaction during the birthing process is the most frequently reported indicator in the evaluation of the quality of maternity services. A positive birth experience is associated with an increased mother-child bond, maternal abilities, and contributes to her sense of accomplishment and self-esteem (1).

Methodology

A quasi-experimental study design was conducted on purposive sample, of (30) women whom admitted to Al-Elwyia Maternity Teaching Hospital suffering from labor pain. Study implemented for the period of (4th July 2018 through 24th October 2018). Data collection will be gathered by application one of non-pharmacological method include: (frankincense, jasmine, & olive oils), massage, body movement and change position (squatting, side-lying, & standing), breathing technique, and therapeutic touch), and by used questionnaire format which consisted of two parts, including non-pharmacological method Birth Satisfaction Scale (BSS-R), which is a 10-item, self-report scale that was reduced from the original 30-item BSS. Descriptive and inferential statistical analyses were used to analyze the data.

Results

Table (1): Type of Pain Management Method Uses

<table>
<thead>
<tr>
<th>No.</th>
<th>Items</th>
<th>Yes</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Essential Oils</td>
<td>17</td>
<td>56.6%</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Side-Lying Position &amp; Breathing</td>
<td>4</td>
<td>13.3%</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Squatting Position</td>
<td>4</td>
<td>13.3%</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Massage</td>
<td>1</td>
<td>3.3%</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Massage &amp; Standing position</td>
<td>1</td>
<td>3.3%</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Therapeutic Touch &amp; standing</td>
<td>1</td>
<td>3.3%</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Breathing Technique</td>
<td>1</td>
<td>3.3%</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Therapeutic Touch &amp; side-lying position</td>
<td>1</td>
<td>3.3%</td>
<td></td>
</tr>
</tbody>
</table>

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e-mail: rabea_ali@ymail.com
Table (1) results show that “Essential Oils” method have recorded the high and first ordered method, and accounted (56.6%), then followed with “Squatting Position, and Side-Lying Position & Breathing” method, and accounted (13.3%), Massage, Massage & Standing position, Therapeutic touch & Standing, breathing technique, & side lying position accounted (3.3%).

Table (2): Women’s Satisfaction with Childbirth Experience after utilization Pain Management Practices

<table>
<thead>
<tr>
<th>No.</th>
<th>Items</th>
<th>Groups</th>
<th>F</th>
<th>%</th>
<th>MS</th>
<th>RS%</th>
<th>Ass.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I came through childbirth virtually unharmed (unscathed).</td>
<td>Yes</td>
<td>3</td>
<td>10.0%</td>
<td>0.100</td>
<td>10.0</td>
<td>L</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>27</td>
<td>90.0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>I thought my labor was excessively long.*</td>
<td>Yes</td>
<td>7</td>
<td>23.3%</td>
<td>0.766</td>
<td>76.6</td>
<td>L</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>23</td>
<td>76.7%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>The delivery room staff encouraged me to make decisions about how I wanted my birth to progress.</td>
<td>Yes</td>
<td>30</td>
<td>100%</td>
<td>1.000</td>
<td>100</td>
<td>H</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>0</td>
<td>0.00%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>I felt very anxious during my labor and birth.*</td>
<td>Yes</td>
<td>8</td>
<td>26.7%</td>
<td>0.733</td>
<td>73.3</td>
<td>L</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>22</td>
<td>73.3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>I felt well supported by staff during my labor and birth.</td>
<td>Yes</td>
<td>30</td>
<td>100%</td>
<td>1.000</td>
<td>100</td>
<td>H</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>0</td>
<td>0.00%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>The staff communicated well with me during labor.</td>
<td>Yes</td>
<td>28</td>
<td>93.3%</td>
<td>0.930</td>
<td>93.3</td>
<td>H</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>2</td>
<td>6.7%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>I found giving birth a distressing experience.*</td>
<td>Yes</td>
<td>26</td>
<td>86.7%</td>
<td>0.133</td>
<td>13.3</td>
<td>H</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>4</td>
<td>13.3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>I felt out of control during my birth experience.*</td>
<td>Yes</td>
<td>2</td>
<td>6.7%</td>
<td>0.933</td>
<td>93.3</td>
<td>L</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>28</td>
<td>93.3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>I was not distressed at all during labor.</td>
<td>Yes</td>
<td>8</td>
<td>26.7%</td>
<td>0.266</td>
<td>26.6</td>
<td>L</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>22</td>
<td>73.3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>The delivery room was clean and hygienic.</td>
<td>Yes</td>
<td>30</td>
<td>100%</td>
<td>1.000</td>
<td>100</td>
<td>H</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>0</td>
<td>0.00%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Items reversed measuring scale (i.e. Negative Response), and that revere an assessments scores.

Table (2) shows that results show that women’s satisfaction with childbirth experience after of utilization pain management practice’s items, concerning study group assigned that the observed responses regarding positive items numbers (3, 5, 6, and 10) and are high as assessed generally, and they are accounted 4(40.0%), while left over item number (1 & 9) has low assessment, and accounted 2(20%). In relation to negative items numbers (2, 4, and 8) are low assessed generally, and they are accounted 3(30.0%), while left over item number 7 “I found giving birth a distressing experience” has high assessed, and accounted 1(10%). In sum, it could be concluded that women’s satisfaction with childbirth experience after utilization pain management practice’s items showed good status, since highly evaluation was obtained, and that reflected the positive site of effectiveness for the intervention which were applicable indeed.

**Discussion**

**Nonpharmacological Method:** The researcher depended on WHO recommendations when using method of non-pharmacological pain management which included breathing technique, changing position, massage, aromatherapy and other techniques used for healthy pregnant women requesting pain relief during labor depending on a woman’s preference. Especially when some women prefer changing positions which include squatting, side-lying position and standing. These positions help relieve pain, and speed labor.
Then as observed in this study the researcher teaches woman how to apply breathing technique based on evidence-based studies\(^{(4 \& 5)}\). Relative to use of massage technique. The massage increasing the production of endorphins in the body that reduce the transmission of signals between nerve cells and thus lower the severity of pain\(^{(6)}\). Finally, the researcher attempted to use aromatherapy for women due to that the researcher noted the uses of these aromatherapy have many benefit such as promoting relaxation, decrease anxiety and reduce labor pain\(^{(4, 7 \& 8)}\).

**Assessing Women’s Satisfaction with Childbirth Experience:** The results observed that the most important experience in the life of women, who want to play a central role in childbirth process is giving birth to a child. In addition, the satisfaction derived from this experience is extremely important for her, her baby’s health and development of positive family support. Such that, adverse childbirth experience can lead to many problems as postpartum depression, posttraumatic stress disorder, tendency to miscarriage, preference for cesarean delivery, negative feelings against baby, difficulty in adaptation to maternal role, breastfeeding problems, and in addition it will have an effect on a woman’s interpersonal relationships, and her wellbeing emotionally and physically\(^{(9 \& 10)}\). Women’s satisfaction is effected by many factors including medical care, health care professionals, her hospital room, and her relationship with her environment; however studies performed have emphasized critical importance of integrated approach\(^{(11)}\). The importance of the approach to pain during labor, and continuity of care were indicated for the popularization of normal vaginal delivery which makes pregnancy, labor, and childbirth a favorable experience for the mother\(^{(12)}\). Moreover, the control concept differentiates from one woman to another and some of them are anxious around controlled along of labor, while other their anxious include the shared in decisions related to labor process. As a consequence, letting woman to decide the decisions and informed choices are essential factors that made woman sense convinced with the labor process\(^{(13)}\). Therefore, a copy with pain by using technique of non-pharmacological pain relief is one factor that link to gratify with labor process. Because that woman who faced low level of labor pain has positive level of satisfaction of birth versus those with intense level of pain in labor\(^{(10)}\).

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** Is obtained from the Ministry of Health/Al-Russafa Health Directorate (Al-Elwyia maternity teaching hospital), and All laboring women participants in the research - have been approved before the questionnaire is started.

**Recommendations:** The study recommended Construction continuous education program about non-pharmacological pain management practices to all midwife working in delivery room and department of maternity.

**References**

8. Chauhan K., Rani S., BansalP.: Effectiveness of olive oil back massage on reduction of labor pain


A Study to Evaluate the Effectiveness of Structured Instructional Program on Practice Regarding Selected Home Based Newborn Care among Mother Under Cesarean Section in Baghdad Teaching Hospital

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Abstract

The study aims to evaluate the Effectiveness of Structured Instructional Program on Practice regarding Selected Home based Newborn Care among Mother under Cesarean Section. A quasi-experimental study design was conducted during the period of (15th January 2014 through 15th May 2014) on non-probability of (100) women (50) of them were a control group and (50) were the study group whom admitted to maternity department at Baghdad Teaching Hospital in Baghdad city. A questionnaire was used as a tool of data collection Descriptive & Inferential statistical analyses were used to analyze the data. The result of study indicate that highest percentages of study and control groups were in age group (20-34) years old, most of them illiterate, read and write, and primary schools graduates, housewife, from “urban area”, the control and study groups accounted (62%), and (68%) at (3-4) (5-6) pregnancy. (38%) & (50%) in control and study groups respectively are registered at (3-4) deliveries, and reported none abortion at (82%) and (84%) in control and study groups respectively .Also there are highly significant differences concerning the instructions care for their children during the postpartum period after cesarean section at the study group, as well as extremely good effectiveness for the instructions. The study recommended that nurses should teach women delivered by cesarean section the principle practice regarding newborn care, also recommended on mass media to take an action to keep the mother informed about practice regarding newborn care.

Keywords: Effectiveness, Practice, Newborn Care, Cesarean Section.

Introduction

The days and weeks following childbirth—the postnatal period—are a critical phase in the lives of mothers and newborn babies. Most maternal and infant deaths occur in the first month after birth: almost half of postnatal maternal deaths occur within the first 24 hours, and 66% occur during the first week. The World Health Organization (WHO) recently updated global guidelines on postnatal care for mothers and newborns through a technical consultation process.

The new guidelines address the timing and content of postnatal care for mothers and newborns with a special focus on resource-limited settings in low- and middle-income countries.

Methodology

A quasi-experimental study design was conducted on purposive sample, (100) women delivery by cesarean section in Baghdad teaching hospital. 50 Women considered as (study group) and another 50 women were control group whom admitted to Baghdad teaching Hospital. Study implemented for the period of 15th January 2014 through 15th May 2014. Data collection will be gathered by application session to women post
cesarean section regarding home based newborn care which were designed and scheduled for approximately (60-90) minutes for each woman, and by used questionnaire format which consisted of three parts, Descriptive and inferential statistical analyses were used to analyze the data.

**Results**

**Table (1): Distribution of Socio - Demographical Characteristics variables in the studied groups**

<table>
<thead>
<tr>
<th>Socio-Demographics Variables</th>
<th>Groups</th>
<th>Control</th>
<th>Study</th>
<th>C.S. ((*)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>C.C.</td>
</tr>
<tr>
<td>Age Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 - 19</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>C.C.=0.182</td>
</tr>
<tr>
<td>20 - 24</td>
<td>13</td>
<td>26</td>
<td>11</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>25 - 29</td>
<td>14</td>
<td>28</td>
<td>10</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>30 - 34</td>
<td>12</td>
<td>24</td>
<td>19</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>35 - 39</td>
<td>6</td>
<td>12</td>
<td>6</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>40 - 44</td>
<td>4</td>
<td>8</td>
<td>2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Education level of wife</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>14</td>
<td>28</td>
<td>15</td>
<td>30</td>
<td>C.C.=0.133</td>
</tr>
<tr>
<td>Read and write</td>
<td>14</td>
<td>28</td>
<td>14</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>Primary school</td>
<td>15</td>
<td>30</td>
<td>14</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>Intermediate school</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Secondary school</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Institute</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>College and more</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Occupation status of wife</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>House wife</td>
<td>46</td>
<td>92</td>
<td>44</td>
<td>88</td>
<td>C.C.=0.142</td>
</tr>
<tr>
<td>Employee</td>
<td>3</td>
<td>6</td>
<td>6</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Student</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>Residency</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>6</td>
<td>12</td>
<td>9</td>
<td>18</td>
<td>C.C.=0.189</td>
</tr>
<tr>
<td>Urban</td>
<td>32</td>
<td>64</td>
<td>36</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td>Sub Urban</td>
<td>12</td>
<td>24</td>
<td>5</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

(*)HS: Highly Sig. at P<0.01; NS: Non Sig. at P>0.05

Table (1) shows that the majority of the studied groups are reported at the age ranged (20 – 34) yrs. and they are accounted 39(78%) and 40(80%) at the control and the study groups respectively. Regarding level of “Education-wife”, the greater number of them illustrated low levels of education, such as illiterate, read and write, and primary schools, and they are accounted for 43(86%) and 43(86%) at the control and the study groups respectively. In addition to that, levels of “Occupation–wife”, the greater number of them illustrated “House wife”, and they are accounted for 46(92%) and 44(88%) at the control and the study groups respectively. With respect to the subjects of “Residency”, the majority of the sample are urban and they accounted for 32(64%) and 36(72%) at the control and the study groups respectively.
Table (2): Distribution of the Reproductive Information in the studied groups

<table>
<thead>
<tr>
<th>Reproductive Information</th>
<th>Groups</th>
<th>Control</th>
<th>Study</th>
<th>C.S. (*)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Gravid</td>
<td>1 - 2</td>
<td>11</td>
<td>7</td>
<td>22</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>3 - 4</td>
<td>19</td>
<td>27</td>
<td>38</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>5 - 6</td>
<td>12</td>
<td>12</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>7 - 8</td>
<td>7</td>
<td>2</td>
<td>14</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>≥ 9</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

| Number of Parity         | < 2    | 16     | 11    | 32       | 22      |
|                          | 3 - 4  | 19     | 25    | 38       | 50      |
|                          | 5 - 6  | 14     | 12    | 28       | 24      |
|                          | ≥ 7    | 1      | 2     | 2        | 4       |

| Number of Abortion       | Non Abortion | 41     | 42    | 82       | 84      |
|                          | one time    | 5      | 5     | 10       | 10      |
|                          | two times   | 3      | 3     | 6        | 6       |
|                          | three times | 1      | 0     | 2        | 0       |

(*) HS: Highly Sig. at P<0.01; S: Sig. at P>0.05; NS: Non Sig. at P>0.05

Table (2) shows that “Number of Gravid”, the vast majority of the two groups are registered at second and third groups, and they are accounted 31(62%), and 39(68%) in the control and the study groups respectively. Relative to subject’s “Number of Parity “, the vast majority of the two groups are registered at second group, and they are accounted 19(38%), and 25(50%) in the control and the study groups respectively. Relative to subject’s “Number of abortion “, the vast majority of the two groups are registered at none abortion, and they are accounted 41(82%), and 42(84%) in the control and the study groups respectively.

Table (3): Evaluate the effectiveness of the instructions care (for their newborn) during the postpartum period after Cesarean section

<table>
<thead>
<tr>
<th>Items</th>
<th>Sample</th>
<th>GMS</th>
<th>SD</th>
<th>RS</th>
<th>P-v.</th>
<th>T test</th>
<th>d.f.</th>
<th>P-v.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crying Baby</td>
<td>Control</td>
<td>2.34</td>
<td>0.23</td>
<td>77.9</td>
<td>0.263</td>
<td>-12.8</td>
<td>98.0</td>
<td>0.000 HS</td>
</tr>
<tr>
<td></td>
<td>Study</td>
<td>2.91</td>
<td>0.21</td>
<td>97.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The newborn’s environment after delivery</td>
<td>Control</td>
<td>2.14</td>
<td>0.23</td>
<td>71.5</td>
<td>0.080</td>
<td>-16.6</td>
<td>95.7</td>
<td>0.000 HS</td>
</tr>
<tr>
<td></td>
<td>Study</td>
<td>2.86</td>
<td>0.20</td>
<td>95.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily hygiene</td>
<td>Control</td>
<td>1.34</td>
<td>0.39</td>
<td>44.8</td>
<td>0.531</td>
<td>-19.1</td>
<td>98.0</td>
<td>0.000 HS</td>
</tr>
<tr>
<td></td>
<td>Study</td>
<td>2.73</td>
<td>0.33</td>
<td>91.0</td>
<td></td>
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</tr>
<tr>
<td>Maintaining the health of the umbilical cord</td>
<td>Control</td>
<td>1.68</td>
<td>0.27</td>
<td>56.0</td>
<td>0.002</td>
<td>-24.1</td>
<td>84.8</td>
<td>0.000 HS</td>
</tr>
<tr>
<td></td>
<td>Study</td>
<td>2.80</td>
<td>0.18</td>
<td>93.3</td>
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<td>To maintain the baby’s temperature</td>
<td>Control</td>
<td>2.75</td>
<td>0.58</td>
<td>91.7</td>
<td>0.000</td>
<td>-3.0</td>
<td>49.0</td>
<td>0.004 HS</td>
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<td>Study</td>
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<td>0.00</td>
<td>100</td>
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<tr>
<td>Protect the newborn from infection of the respiratory system</td>
<td>Control</td>
<td>1.80</td>
<td>0.35</td>
<td>60.1</td>
<td>0.763</td>
<td>-7.1</td>
<td>98.0</td>
<td>0.000 HS</td>
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<td>0.34</td>
<td>76.3</td>
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<td>Newborn Nutrition</td>
<td>Control</td>
<td>1.74</td>
<td>0.23</td>
<td>58.0</td>
<td>0.686</td>
<td>-23.8</td>
<td>98.0</td>
<td>0.000 HS</td>
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<td></td>
<td>Study</td>
<td>2.84</td>
<td>0.24</td>
<td>94.7</td>
<td></td>
<td></td>
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<tr>
<td>Evaluate the effectiveness of the instructions (for the newborn)</td>
<td>Control</td>
<td>0.41</td>
<td>0.12</td>
<td>40.6</td>
<td>0.000</td>
<td>-11.9</td>
<td>56.5</td>
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<td></td>
<td>Study</td>
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<td>0.07</td>
<td>4.00</td>
<td></td>
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</tbody>
</table>
Table (3) The results shows that a highly significant differences at $P<0.01$ had illustrated between the studied groups with highly improvements due to effectiveness of the instructions care for their children during the postpartum period after Cesarean section at the study group, as well as extremely good effectiveness for the instruction

**Discussions**

**Regarding to Socio Demographic Characteristic:**

(Table 1): The results show that the highest percentages (78%) & (80%) respectively for both control and study groups are (20-34) years old. This finding is in agreement with a study that found that the mean age of mothers was 26.8 years. Most of the mothers (61.4%) were in the age range of (20-24) years. The highest percentages (86%) respectively for both study and control groups are illiterate, read and write, and primary schools graduates. This finding is in agreement with study that finds that the lowest educated had the highest risk of cesarean section, followed by the medium educational mothers, and the differences gradually increased during 1967–2004. The height significances in occupational status of wife, are “Housewives”, and they are accounted (92%) & (88%) at control and study groups, respectively this finding is constant with study that found that factors such as educational and occupational status, family type, place of residence and economic status were found to be insignificant, the vast majority (64%) and (72%) for both control and the study groups respectively study that found the residence association between enhancement of knowledge was non-significant and highest percent (54%) of respondents were from rural areas.

**Reproductive Information in the studied:**

In relation to Gravid, the control and study groups accounted (62%), and (68%) respectively at (3-4) (5-6) pregnancy. Relative to “Parity « (38%) & (50%) in control and study groups respectively are registered at (3-4) deliveries. In relation to number of abortion reported none at (82%) and (84%) in control and study groups respectively. these finding in agreement with study that shows significant association between parity and the level of knowledge and practices followed and was found that Multipara mothers had better practices compared to postnatal mothers.

**Effectiveness of the instructions care (for their newborn):** Table (3) The results shows that a highly significant differences at $P<0.01$ had illustrated between the studied groups with highly improvements due to effectiveness of the instructions care for their newborn during the postpartum period after cesarean section at the study group, as well as extremely good effectiveness for the instructions. These instructions are in agreement with recommendations of world health organization (WHO) that include “appropriate clothing of the baby for ambient temperature, which means one to two layers of clothes more than adults, and use of hats/caps. The mother and baby should not be separated and should stay in the same room 24 hours a day”. And it recommended about cord care which include “cord should be clean, dry for newborns born in health facilities and at home in low neonatal mortality settings. Use of chlorhexidine in these situations may be considered only to replace application of a harmful traditional substance, such as cow dung, to the cord stump due to it place newborns at in-creased risk for omphalitis”. Also the WHO recommended that the use of sterile cotton wool soaked in either methylated spirit, chlor-hexidine or gentian violet (1%) to clean the cord is however still being practiced widely especially in developing countries where infection rates are high. In relation to newborn’s nutrition it recommended that all babies should be exclusively breastfed from birth until 6 months of age. Mothers should be counselled and provided support for exclusive breast feeding at each postnatal contact. Also The findings agreement with descriptive studyin Iraqi (2011) at Kirkuk governorate that instruction about breast feeding which includes (Starting breastfeeding for the baby, colostrum, the best position for mother while feeding and Duration of breastfeeding) are extremely good effectiveness. In addition is agreement with another Iraqi study (2012) at Baghdad governorate which ensure that health workers providing breastfeeding support & receive education appropriate to their role in breastfeeding in order to develop the knowledge, skill and attitude to implement breastfeeding policy & to support lactating mothers. And breastfeeding counseling for women during pregnancy and after childbirth especially who have cesarean section which has important role on maintenance of breastfeeding up to 6 months. Multiple behaviors that, if initiated during the postpartum period, would promote the health of both the new mother and baby, and have an impact on the mother and newborn’s health after delivery need to be initiated earlier—during pregnancy or at the time of labor or delivery. A descriptive cross sectional study was conducted in pediatric unit concluded that education of women were the important factors associated with a good practices.
in breast feeding and thermal care practices however in cord care and newborn hygiene were poor (13). Finally, Study conduct in Nepal (2012) Successful development and implementation of a newborn care package of these mostly behavior change strategies will require cultural and contextual adaptation and emphasis during the antenatal period, at birth, through the neonatal period. To reduce infections and improve developmental outcomes, and to increase appropriate care that could contribute to substantial reduction in neonatal mortality (14).

**Recommendation:** The study recommended that nurses should teach women delivered by cesarean section the principle practice regarding newborn care, also recommended on mass media to take an action to keep the mother informed about practice regarding newborn care.

**Conflict of Interest:** Nil

**Source of Funding:** The source of funding is self

**Ethical Clearance:** is obtained from the Ministry of Health/Al-Russafa Health Directorate (Baghdad Teaching Hospital), and All laboring women participants in the research-have been approved before the questionnaire is started.

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Group Assignments: Perception of Undergraduate Nursing Students

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Abstract

Group assignments introduce the students to be effectively work in teams. Students demonstrate their knowledge while learning to appreciate the perspective of others. The aim of this study is to explore the nursing students’ perception of group assignments. It is descriptive correlational study using self-administered questionnaire consist of 14 items assessed the perception of group assignment. The sample size was 230 nursing student from colleges of nursing in governmental and private universities in Jordan. The overall mean of students’ perception was 3.63 which is neutral. There is no relationship between student perception of group assignments and the academic year as the p value = (0.699) greater than 0.05. In conclusion, this study serves nursing programs in identifying the specific factors that adds difficulties to the students’ abilities to work in teams so as to build their competencies that will serve them in their future career because team work considered as a vital nursing care delivery system in many facilities.

Keywords: Group assignment, Nursing, Perception, Students, Undergraduate.

Introduction

Group assignment at educational establishments is now taken into consideration as one of the first-rate procedures for growing student conversation talents and obtaining information. Therefore, it is the best approaches for developing students’ communication skills and acquiring knowledge. Nuuyoma study revealed that interaction of members engaging in group assignments would develop basic skills, like communication and critical thinking. Institutions work seems to provide instructors in a powerful way to interact college students to growth the undertaking of the responsibilities that students benefit revel in of running to offer college students the opportunity for collaborative operating. However, not everything is positive, so it needs to be considered in the context of the program the level, the nature of the evaluation, student characteristics and so on. However, there are many challenges while using these techniques because of the student perception of unfairness and making group work fully effective is challenging.

Collaborative learning, which is often used interchangeably with cooperative learning, group learning, peer learning, learning community, constructive learning, has become a common practice in schools. Students are divided into small groups to learn knowledge, to explore an assigned topic, or to complete cases, projects and group assignments, to answer a few challenging questions, or to engage in an exchange of ideas, and share some insights with group members. Collaborative learning is believed to provide a more comfortable and supportive learning environment than solitary work, foster critical thinking skills, develop individual accountability, increase levels of reasoning and positive interdependence, improve problem-solving strategies, internalize knowledge content. One research indicates that, regardless of subjects, students who work in groups achieve better results and are more satisfied with their learning experiences than those who do not work in collaborative groups. Other benefits of this collaborative learning include promoting retention rates, transferring knowledge, providing counseling to students with cognitive, physical, social, and emotional problems, and enhancing their intercommunication skills. It reflects and responds to the needs of workplaces in industries where team building, cooperation and collaboration are highly emphasized. Therefore, the collaborative learning approach prepares students in problem-solving in a collaborative way and provides them with experiences which could be utilized in their future careers.
Tani’s study found that there were many contributing factors for Asian students’ silence in group participation, such as cultural influences, teacher-student relationships, the composition of the group members, and teaching approaches. However, Tani concluded that these factors were minor when compared to another key factor: when students’ participation in group work was tied up with assessment. It was the anxiety and lack of understanding of the system of reward and punishment as demonstrated from group assignments that brought about Asian students’ silence.  

Michele, et al. study revealed that to increase student participation within the gaining knowledge system, a small group studying have grown to be more and more popular in present day’s curriculum. One kind of small group learning is team-based learning, which incredibly new instructional approaches in health care training. Same study validated that team-based learning is a powerful coaching strategy for huge groups of students. A key detecting from Michele, et al. study is that, contrary to tutors’ perception that students overwhelmingly dislike group assignments given, simply over half of the respondents indicated that they prefer group assignments. Different key findings consist of: most of the people of the respondents feel that they could examine extra by doing organization work, specifically in phrases of the development of team work and verbal exchange competencies. An extensive sort of communication techniques have been worried for operating on institution assignments, and additionally for person assignments while looking for input and guide from peers. This suggests that the college need to additionally explore and facilitate using these structures. To inspire truthful contribution and enhance the group performance, college students have evolved some of strategies: inspire participation, have organization meetings, use peer strength, share ideas, percentage statistics, proportion workload, and set deadlines. College students do see each advantages and downsides of group paintings. At the same time as the most important blessings often noted are: use peer electricity, percentage workload, extra enter, and expand.  

Interpersonal and crew work competencies, learn from peers, and boom self-assurance, the biggest drawbacks are: uneven contribution, terrible commitment, bad time control, and low capacity and contribution. It is acknowledged that the survey become carried out among students of one university most effective and it may have had biased consequences. But, as students generally have common traits it’s far believed that the findings from this observe must be applicable to students’ agencies of other training establishments. In addition paintings could cover greater targeted comparison among the perceptions of undergraduate and postgraduate college students.  

Likewise, Lázaro, et al. study revealed that team work creates surroundings in which college students have the possibility to develop social skills which include the ability to clarify and mediate differences and construct new understandings and to learn themselves with the aid of interacting with others, all vital sides of forming value Systems. Many investigations concluded that team work contributes to encouraging interest inside the topic, facilitating resourcefulness and interdependence in learning, and developing skills together with problem identity and evaluation, the exploration of solutions, teamwork, interpersonal communication and challenge management. Moreover, others argued that group work complements motivation, depth of thought processing and degree of success when compared to person paintings.  

The benefits to students of group work have been demonstrated both in general and in specific contexts. For example, Mello identifies major benefits of group work: (1) students can gain an insight into group dynamics; (2) ‘they can tackle a more comprehensive assignments; (3) ‘interpersonal skills can be developed; (4) students are more exposed to others points of view’; and (5) be more prepared for the commercial world. Group work has the potential significantly to improve student engagement, performance, scores and retention, Gibbs clarify that in his review of many literature that groups create better work than do individuals. But this performance of the group also depend on the number of group member, teacher experience in setting the tasks, students’ motivation, and evaluation mechanisms of the group work. On the other hand group assignment can have negative impact on students’ performance related to many reasons according to many literatures. If the student will create their own group members they will chose based on friendship and common interest. This will end up leading to off- assignment behavior. Also, if allow student pick them self they will chose them selfin a similar level and knowledge and will end up with a result similar to others submitted in class previous to the group activity. One of the goals for group assignment is to raise student thinking and to challenge them. If the outcome is a product similar to what has previously
been established, there is in fact no increase in achievement.\textsuperscript{15} Group assignment is when small group of students work together to maximize their own and each other’s learning.\textsuperscript{16} They point out that individual accountability may be completed where groups are kept to a small number. On the other hand, if groups are large, individual effort can be less.\textsuperscript{16} Also gender effects on student performance with group work, but most of these effects are inconsistent across different studies according to Gibbs with the exception that female students on average more than male students performance.\textsuperscript{14}

Group assignment can be hard work emotionally and intellectually. Sometime students want to have time, ability and motivation to work via the levels of forming, norming, storming and performing, on which group work gives rise, faced with difficult group dynamics caused by conflicting personalities, a group may also never attain the stage of efficaciously performing a task through a unified effort.\textsuperscript{14} Due to the character of working in teams, team participants can sometimes discover that they’re now not working successfully, which negatively impacts on their grades, development, and their ability to be successful.\textsuperscript{15}

Worldwide there are many studies discussed the issue of group work and group assessment as well. However, there have been limited studies that investigate the group assignment design.\textsuperscript{14} Even more, there is no study done in Jordan discussing the perception of nursing students regarding group assignments. It is hoped that the outcomes of this study can contribute to increase body of knowledge regarding the issue. In addition the results of this study will help nursing colleges and programs to improve the quality of higher education to be congruent with contemporary teaching and assessment strategies. Regarding the students, this study results can be helpful in recognizing the specific factors that add difficulties to the students’ abilities to work in teams so as to build their competencies that will serve them in the future career because team work considered as a vital nursing care delivery system in many facilities. And the beneficiaries of this research study are measuring students’ perception with group assignment that will help to solve student problem with it and to know the challenges facing the students toward group assignments.

This study will provide analyses for the findings from questionnaire survey of students’ perceptions of group assignments at college of nursing in governmental and private universities in Jordan at undergraduate levels. The aim of this study is to raise practical issues that faculties and instructors need to consider in designing and carrying out group assessment with a view to overcoming the drawbacks, and amplifying the benefits, of such work, and to improve students’ engagement and performance in these activities.

Specifically, this study will answer the following questions:

1. What is the profile of the nursing students in terms of?
   1.1. Age
   1.2. Academic year
   1.3. Gender

2. What is the students’ perception of group assignment?

3. Is there a significant correlation between the academic year and students’ perception?

Materials and Method

Research Design: The research design was descriptive correlational to get a picture of current thoughts, feelings, or behaviors in a given group of people.\textsuperscript{17}

Setting and Sample: This study was conducted in Governmental and private universities colleges of nursing in Jordan. The sample size of (200) participants was estimated for this study using G power analysis computer program developed by Faul, et al., with a medium effect size 0.15, power of 0.8, and \( \alpha \) (the risk of Type I error) at 0.05.\textsuperscript{18} The sampling method was convenient snowballing sampling, the inclusion criteria of the target sample was nursing students who is currently registered in the program from first to fourth year.

Research Instruments: Nursing students’ perception of group assignment questionnaire developed by Daba, Ejersa and Aliyi was utilized.\textsuperscript{19} It consists of 2 sections. First section asked the students about demographic characteristics, which are age, gender and academic year. The second part consists of 14 items to assess the students’ perception about group assignments, 6 items which present advantages of group assignment that accordingly reflect a positive perception and 8 disadvantages that reflect negative perception. It is 5 point Likert scale; started from 1 strongly agree, to 5 strongly disagree. The tool was translated into Arabic.
to avoid misunderstanding by the students (Table 1). Then, the tool was given to panel of experts of academic member who assured face validity and the content is fit the study purpose and culturally suitable. After that reliability of the tool was tested by pilot study. The reliability Chronbach alpha was (0.89).

**Data Gathering Procedure:** The Questionnaire was electronic self-administered distributed to the students who were recruited through groups on Whatsapp, Face book and through snowballing the students recruit their friends. The data was collected in the period between Marchs to May/2020.

**Ethical Considerations:** The IRB approval was obtained from university where the researchers work in code number of the permission (12598). In the beginning of the electronic questionnaire the purpose of the study, the risk and benefit of voluntarily participating in the study were mentioned. Participants were reassured of confidentiality and anonymity. The participants had the right to withdraw from the study at any time they want without any consequences.

**Statistical Analysis:** Data were analyzed using SPSS (version 22). The significance level was set at .05. A number of data analysis procedures were used including means, standard deviations, and frequencies. Pearson’s correlation coefficient was the statistical tool selected to assess the relation between student perception of group assignment and the age, gender, and academic year.

**Results and Discussion**

The questionnaire was distributed to 250 students to get the intended sample of 200, the response rate was high (n=230, 92%). The average age of participants is 20 (SD = 3.8). Most of the sample age is ranged between 20 and 24 years old. Of the students, 40.1% (n = 92) were males, while 59.9% (138) were females. Almost equal responses were received from student in different academic year including (about 57 to 24.7% per year), and 49.7% (n = 114) were enrolled in private universities compared to 50.3 (116) in governmental universities.

Data in Table (1) showed the frequencies and percentages of students’ perception on the group assignments for highest and lowest ranked individual items. The overall students’ perception to group assignment was with a mean of 3.54 out of 5 which is considered as neutral perception regarding group assignment in relation to advantages with a mean of 3.5 and disadvantages of group assignment with a mean of 3.51. The highest positive response of group assignment was for item “It gives me a chance to share ideas with others”. The highest negative response was for “Some members do not participate”.

The item (It gives me a chance to share ideas with others) took the greatest positive mean response, this may be due to the chance of sharing opinions and ideas between students when they are not under the supervision of the instructor and have their privacy in the storming phase of group work, accordingly they are not expected the instructor to give comments or evaluate their ideas. Also, religion and culture encourage people to work collaboratively, and sharing ideas, everyone is improving scientifically at the same time which then allows them all to reach higher levels of expertise even faster, in addition, by expressing opinions new thoughts and ideas that have never been offered before may develop. The more minds that come together and from all different backgrounds, the better they are able to come up with new and unexpected outcomes. When sharing happens, everyone is able to boost productivity at a faster pace. This result is similar to Bentley, & Warwick who supported that shared workload and ideas, leads to improve grades. On the other hand, the highest negative item is (some members do not participate) this result may be due to poor back ground knowledge and lack of skills among some group members, also, some members have lack of interest to accept the responsibility for their learning, and lack of social relationship between some students may effects the participation. Also, some students have low self-esteem which may result in avoidance of interaction and communication. Also that, some members depends on other members who work better. This result is similar to Daba, Ejersa and Aliyi.

Of the total respondents 87 students reported their strongly agreement that it is difficult to get together outside the class and this may be due to lack of time because university libraries close at maximum 07:00 pm that may not give the students the chance to meet after school hours to work on assignments in quite suitable place. Also, some students’ study schedules are loaded that will prevent the students from meeting in the university campus to work on assignments. And in many cultures especially in the Middle East there are many social barriers related to meeting after school hours particularly if the students in the same group are from different genders, traffic and lack of suitable places
for academic meetings. This result is similar to the result of Feichtner and Davis. 20

First lowest mean item is when (Group members do not respect my opinion) which is negative item but this reflect a positive perception clarify that the students respect each other’s even if they not agreed in ideas, Also this result may be due cultural effect which encourages people to respect each other regardless their age, nationalities, religion and race. The second lowest mean item is (I prefer group work than other types of assignments), many students disagreed with this item because there is a lot of evaluation tools that are more equitable and doesn’t take much time. Also, some students don’t prefer group assignments because of their independent personalities which make them tend more to work by their own, additionally, some students learn more from individual evaluation tools. 21 The 3rd lowest item is (It adds burden work on me), Although this item is a disadvantage of group assignment but not many students agreed with it which is considered as a positive perception about group assignments, and this is because they divide the assignment between them equally. Also, usually professors put deadlines for the submission so they feel obligated to finish the work. Researches identify the benefit for academics and instructors in setting group work assignments in that these can significantly reduce workload.19, 21

Table 1: Descriptive results of highest and lowest ranked three items of students’ perception of group assignments (N= 230)

<table>
<thead>
<tr>
<th>Items</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Not sure</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. It gives me a chance to share ideas with others</td>
<td>7</td>
<td>9</td>
<td>27</td>
<td>92</td>
<td>95</td>
<td>4.13</td>
<td>.974</td>
</tr>
<tr>
<td>2. It motivates me to learn from work</td>
<td>21</td>
<td>21</td>
<td>47</td>
<td>86</td>
<td>55</td>
<td>3.58</td>
<td>1.208</td>
</tr>
<tr>
<td>3. I learn better from group interaction than lecture</td>
<td>18</td>
<td>28</td>
<td>48</td>
<td>74</td>
<td>62</td>
<td>3.58</td>
<td>1.226</td>
</tr>
</tbody>
</table>

Total mean 3.5 1.21

Table (2) showed that there is no correlation between student perceptions and the academic year as the p value = (0.668) greater than 0.05. So the hypothesis is rejected.

Table 2: Correlation between students perception and academic year (n=230)

<table>
<thead>
<tr>
<th>Academic year</th>
<th>Students’ perception</th>
<th>Avg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>1</td>
<td>-0.028</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.668</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>230</td>
<td>230</td>
</tr>
</tbody>
</table>
This result is compatible with Daba, Ejersa and Aliyiand contradicted with Bentley & Warwick studies. The result may due to students’ engagement in group assignment since they were in the elementary, middle and high school so the level of study is not an affecting factor. Besides that, students have past experience in group assignments at university because it is mandatory since first academic year. Also, Middle East culture and all religions give privileges for teamwork so it is programmed since childhood that teamwork is important and promotes individuals’ interdependency as a member in the society.

Since the results of this study suggest that group work is satisfying somewhat to students, we recommend encouraging students from early academic year to participate in group work. Get instructor inputs and clear instructions prior to and during the group assignment, and evaluated the team in a more fair and straightforward way. Establishing training courses to qualify students on how to form groups and deal with group members, also training courses for self-promotion, self-esteem and improving good communication.

**Conclusion**

The study aimed to assess students’ perception of group assignments and investigate the correlation between their perception and academic year. The general mean result was neutral perception regarding group assignments. Students liked group assignments most because it gives them a chance to share ideas with others and didn’t like it most because some members do not participate in the work. Therefore, group assignment is a powerful method in improving student’s skills that are relevant to both group and individual work. Also it reinforce skills they need in the professional world such as solving problems, share diverse perspectives, pool knowledge and skills and developing their self-esteem.

**Conflict of Interest:** The author declares no conflicts of interest.

**Source of Funding:** This research received no specific grant from any funding agency, commercial entity, or not-for-profit organization.

**References**


Impact of Lifestyle Modification Module on Adherence to Therapeutic Regimen of Children and Adolescents with Beta Thalassemia Major

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Abstract

Healthy lifestyle behaviors are important for thalassemic children and adolescents to prevent disease-related complications and improve quality of life. This study aimed to evaluate the effect of lifestyle modification module on adherence of children and adolescent suffering from beta-thalassemia major. Design: A quasi-experimental design was utilized to conduct the study. Sampling: A purposive sample comprised of 80 children & adolescents with beta thalassemia major. Tools: I-Interviewing questionnaire, II-Children adherence tools: It was used to assess children and adolescents’ adherence with: (a) Medication (Morisky), (b) Therapeutic regimen (diet, physical exercise, and follow up). (c) Levels of perceived stress, (d) Sleep quality domains and developed intervention lifestyle modifications module.

Results: This study revealed that more than three quarter had satisfactory knowledge about ß-TM post lifestyle modification module implementation and the majority of children and adolescents with ß-TM were adherent to taking medicines yesterday post module implementation.

Conclusion: There were significant improvements of knowledge and adherence of the studied children and adolescents with ß-TM to therapeutic regimen post the lifestyle modification module application and there were positive correlations between all variables of the studied children and adolescents with ß-TM.

Keywords: Children–Adolescents-Adherence-Therapeutic Regimen–Beta-thalassemia major.

Introduction

Beta-thalassemia major (ß-TM) is the most common hemoglobin disorder in the world and thalassemia major stand among the most severe forms(1). Despite the life-saving nature of long-term blood transfusion, iron toxication due to dysregulated cellular iron metabolism is the leading cause of prolonged complications in children and adolescents with ß-TM(2).

A healthy lifestyle is important for everyone. For children and adolescents living with ß-TM, is especially important to know that a healthy lifestyle means “managing the disorder”, as well as making healthy choices. Other healthy choices a children and adolescents with thalassemia should consider include keeping vaccinations up-to-date, eating nutritious meals, exercising, and developing positive relationships (3).

Hematologic nurse plays an important role in thalassemia management. Thus, facilitating the children care. Pediatric nurse for the children & adolescents with ß-TM must have a basic understanding of the disease (4).Clearly, nursing assessment should be done based on subjective and objective data to formulate the nursing diagnosis for the particular child and to implement nursing interventions(5).

Beta thalassemia major is a major public health problem in Egypt with particularly high incidence due to strong cultural preference for consanguineous
marriages\(^6\). It has been estimated that 1000 children out of 1.5 million live births are born annually with thalassemia major; in multicenter studies, the carrier rate in Egypt was reported to range from 5.3 to \(\geq 9\)% and a gene frequency of 0.03 \(^7-9\).

**The aim of the study:**

This study aims to evaluate the effect of lifestyle modification module on adherence of children and adolescent suffering from beta-thalassemia major, through the following:

1. Assessing children and adolescents knowledge about \(\beta\)-TM.
2. Assessing adherence to therapeutic regimen of children and adolescents with \(\beta\)-TM.
3. Developing and implementing lifestyle modification module for children and adolescents with \(\beta\)-TM.
4. Evaluating the effect of lifestyle modification module on children and adolescents knowledge and adherence to therapeutic regimen.

**Research Hypothesis:**

The implementation of lifestyle modification module will affect positively on knowledge and adherence of children and adolescents with beta-thalassemia major to therapeutic regimen.

**Research Design:**

A quasi-experimental design was utilized to conduct the study.

**Subjects and Method**

**Technical design:** The technical design was included research setting, subjects and tools for data collection.

**Research Setting:** This study conducted at Hematology Outpatient Clinics in Children’s Hospital affiliated to Ain Shams University which found in the 4\(^{th}\) floor. There is a caravan for blood transfusion in the ground floor. In addition to 3 inpatients wards in the 2\(^{nd}\) floor in the mentioned hospital.

**Research Subjects:** A purposive sample of children and adolescents was selected according to certain inclusion criteria. The sample size was determined statistically by power analysis considering the total number of \(\beta\)-TM children and adolescents in the previously mentioned setting along 2 years from 2015 till 2017. Accordingly, the sample size was 80 children and adolescents.

**Inclusion Criteria:**

The study subject was selected according to the following inclusion criteria:

1. Children and adolescents with \(\beta\)-TM aged 10 years to 18 years.
2. Children and adolescents have long duration of \(\beta\)-TM (9 years & more).

**Tools for data collection:**

Data was collected using the following Tools:

I- Pre designed questionnaire: pre/post module:
It was developed in a simple Arabic language by the researcher after reviewing the related literatures and reviewed by supervisors; it was consisted of three parts:

**Part 1:** It concerned with characteristics of the study subjects, as follows:

a. Characteristics of the studied children and adolescents including: Age, gender, education level, ranking and residence.

b. Characteristics of caregivers including: Relation, age, level of education and working.

**Part 2:** It concerned with knowledge of the children and adolescents about \(\beta\)-TM, it composed of 26 questions to assess level of knowledge of the children and adolescents regarding \(\beta\)-TM.

**Part 3:** History of studied children and adolescents regarding \(\beta\)-TM.

**Part 4:** It concerned with evaluating informational needs of studied children and adolescents about \(\beta\)-TM which composed of (12) questions.

II - Children adherence tools: The following tools were used to assess children and adolescents’ adherence with: (a) Medication (Morisky), (b) Therapeutic regimen (diet, physical exercise, and follow up). (c) Levels of perceived stress, (d) Sleep quality domains.

**a. Morisky Medication Adherence Scale (MMAS) – Revised:** It was adapted from Morisky et al.\(^{10}\) and modified by the researcher to assess the children adherence toward medication regimen; it consisted of 8 questions.
III - Perceived Stress Scale (PSS): It was adapted from Cohen, Kamarck & Mermelstein (11) and modified by the researcher to assess the studied children and adolescents’ levels of stress. The scale consisted of 10 questions.

IV - Sleep Quality Scale (SQS): It was adopted from Yi, Shin & Shin (12) and modified by the researcher to assess the studied children and adolescents’ sleep quality. It consisted of 28 items, the SQS evaluates six domains of sleep quality: (1) daytime symptoms, (2) restoration after sleep, (3) problems initiating, (4) maintaining sleep, (5) difficulty waking, and (6) sleep satisfaction.

Part 5: Effect of the disease on daily living activities of the studied children and adolescents which composed of (10) statements.

Operational Design:

Field Work: The actual field work was carried out over a period of 9 months from the beginning of January 2019 up to the end of September 2019. The researcher was available in the study setting 4 hours for 2 days/week by rotation according to children and adolescents with ß-TM appropriate time. The actual field work was divided into four phases:

1-Assessment phase: (2 months): In this phase, the researcher used the constructed tools for collecting data related to knowledge of children and adolescents about ß-TM (pre-test).

2-Planning phase: (1 month): The module was designed on the light of the determined objectives and literature review which was modified to meet the actual children and adolescents needs.

3-Implementing phase: (4 months): At the beginning the researcher disseminated the lifestyle modification module and explained to the children and adolescents how to use the module. The researcher was available 2 days (Saturday and Sunday/week, 4 hours a day.

4-Evaluating phase: (2 months): The same tools were used after the implementation phase of lifestyle modification module an indicator to determine the level of children and adolescents’ knowledge.

Validity: Tools of this study were judged by a panel of seven expertise and they were professors of pediatric nursing. The necessary modifications were done according to experts’ opinion to ensure validity of the content.

Reliability: The reliability was conducted for the developed tools. The reliability was scaled as follows: <0-0.25 weak reliability, 0.25-0.75 moderate reliability, 0.75-<1 strong reliability and 1 is optimum. The reliability for this questionnaire was 0.81.

Exploratory phase: A pilot study was carried out during November 2018 involved 10% (8 of children and adolescents with beta thalassemia major) of the total study sample. The result of the data obtained from the pilot study helped in removing of some repeated questions related to knowledge to avoid duplication of questions and then all children involved in the pilot study were included of the study sample.

Administrative design: Approval was obtained through an issued letter from Dean of Faculty of Nursing, Ain Shams University to the Hospital Director of the previously mentioned settings and the researcher was explaining aim of the study and its expected outcomes.

Statistical Design: The data obtained was organized, analyzed, and presented in the form of tables and figures using the Statistical Package for Social Sciences (SPSS) version 20. Qualitative variables were presented in the form of frequencies and percentages; quantitative variables was presented in the form mean and SD. Qui square and Fishers Exact tests were used to test the significance of results obtained. Statistical significant difference was considered at P < 0.05.

Ethical considerations:

The ethical considerations in the study included the following:

All the gathered data was used for research purpose only. The study sample was informed about the purpose and expected outcomes of the study and they was assured that the study is harmless and their participation is voluntary and they have the right to withdraw from the study at any time and without given any reason. They were assured also that anonymity and confidentiality were guaranteed.

Results

This study was designed to identify the impact of lifestyle modification module on adherence to therapeutic regimen of children and adolescents with beta thalassemia major.
Table 1: Distribution of the studied children and adolescents with β-TM according to their characteristics (n=80).

<table>
<thead>
<tr>
<th>Characteristics of children &amp; adolescents</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 &lt;13</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>13 &lt;16</td>
<td>34</td>
<td>42.5</td>
</tr>
<tr>
<td>16-18</td>
<td>30</td>
<td>37.5</td>
</tr>
<tr>
<td>Mean±SD</td>
<td>14.25±2.84</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>34</td>
<td>42.5</td>
</tr>
<tr>
<td>Female</td>
<td>46</td>
<td>57.5</td>
</tr>
<tr>
<td>Level of education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>26</td>
<td>32.540</td>
</tr>
<tr>
<td>Preparatory</td>
<td>32</td>
<td>27.5</td>
</tr>
<tr>
<td>Secondary</td>
<td>22</td>
<td></td>
</tr>
</tbody>
</table>

Table (1): shows that, more than two fifth (42.5%) of the studied children aged from 13 to <16 years with a mean age 14.25±2.84 years and more than half (57.5%) of them were females. Moreover, this table reveals that, two fifth (40%) of the studied children had preparatory education, less than two thirds (62.5%) of them were from rural areas.

Figure 1: Percentage distribution of the studied children and adolescents with β-TM according to their total knowledge about beta thalassemia major pre/post module (n=80).

Figure (1) shows that more than three quarter (78.75%) had satisfactory knowledge about β-TM post lifestyle modification module implementation compared to pre module implementation the proportion was more than two fifth (43.75%) and this reflected statistical significant difference between pre and post lifestyle modification module implementation P - value <0.001.
Table 2: Distribution of the studied children and adolescents with β-TM according to their adherence to medication regimen pre/post module (n=80).

<table>
<thead>
<tr>
<th>Adherence to Medication regimen</th>
<th>Pre</th>
<th>Post</th>
<th>Chi-square</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Sometimes forget taking medicines</td>
<td>55</td>
<td>68.8</td>
<td>77</td>
</tr>
<tr>
<td>Over the past two weeks, one dose of medicines not taken</td>
<td>56</td>
<td>70</td>
<td>76</td>
</tr>
<tr>
<td>Ever cut back or stopped taking medicines without telling physician</td>
<td>50</td>
<td>62.5</td>
<td>79</td>
</tr>
<tr>
<td>Sometimes forget to bring medicine when travel or leave home</td>
<td>49</td>
<td>61.3</td>
<td>78</td>
</tr>
<tr>
<td>Taking medicines yesterday</td>
<td>28</td>
<td>35</td>
<td>79</td>
</tr>
<tr>
<td>Sometimes stop taking medicine when feeling like the disease’s symptoms are under control</td>
<td>41</td>
<td>51.3</td>
<td>75</td>
</tr>
<tr>
<td>Felling hassled about sticking to the treatment plan</td>
<td>33</td>
<td>41.3</td>
<td>76</td>
</tr>
</tbody>
</table>

Table (2): clarifies that the more than half (52%) of studied children and adolescents with β-TM were adherent to taking medicines yesterday pre lifestyle modification module implementation module compared to post module implementation the percentage was the majority(98.8%). This table reflect that there were highly statistical significant difference as P - value <0.001.

Table 3: Distribution of the studied children and adolescents with β-TM according to their adherence to diet regimen pre/post module (n=80).

<table>
<thead>
<tr>
<th>Adherence to diet regimen</th>
<th>Pre</th>
<th>Post</th>
<th>Chi-square</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Eat meals regularly</td>
<td>42</td>
<td>52.5</td>
<td>38</td>
</tr>
<tr>
<td>Drink milk and dairy products</td>
<td>41</td>
<td>51.2</td>
<td>39</td>
</tr>
<tr>
<td>Eat wheat, oats, rice and maize</td>
<td>24</td>
<td>30</td>
<td>56</td>
</tr>
<tr>
<td>Drink tea with meals</td>
<td>42</td>
<td>52.5</td>
<td>38</td>
</tr>
<tr>
<td>Replacing high red meat with iron with white meat</td>
<td>66</td>
<td>82.5</td>
<td>14</td>
</tr>
<tr>
<td>Eat foods that contain vitamin C in a small amount</td>
<td>41</td>
<td>51.2</td>
<td>39</td>
</tr>
<tr>
<td>Refrain from eating foods that contain iron</td>
<td>66</td>
<td>82.5</td>
<td>14</td>
</tr>
<tr>
<td>The appetite is affected after blood transfusion and treatment</td>
<td>39</td>
<td>48.7</td>
<td>41</td>
</tr>
</tbody>
</table>

Not significant p>0.05 *Significant p<0.05 **Highly significant p<0.001
Table (3): shows that the more than fifty (52.5%) of the studied children and adolescents with β-TM were adherent to drink tea with meals pre lifestyle modification module implementation, in contrast this proportion increased to the majority (98.7%) were adherent respectively post module implementation. This reflected highly statistical significant difference pre/post lifestyle modification module implementation.

Table 4: Distribution of the studied children and adolescents with β-TM according to their adherence to physical exercise regimen pre/post module (n=80).

<table>
<thead>
<tr>
<th>Adherence to physical exercise</th>
<th>Pre</th>
<th>Post</th>
<th>Chi-square</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practice exercises regularly</td>
<td>40 (50)</td>
<td>50 (62.5)</td>
<td>2.540</td>
<td>0.111</td>
</tr>
<tr>
<td>Walking daily</td>
<td>48 (60)</td>
<td>57 (71.3)</td>
<td>2.244</td>
<td>0.134</td>
</tr>
<tr>
<td>Take a break in case of fatigue</td>
<td>56 (70)</td>
<td>73 (91.3)</td>
<td>11.563</td>
<td>&lt;0.001**</td>
</tr>
<tr>
<td>Feeling any symptoms after walking exercise</td>
<td>48 (60)</td>
<td>68 (85.0)</td>
<td>12.539</td>
<td>&lt;0.001**</td>
</tr>
<tr>
<td>After exercise feeling good mood and enjoy a deep and quiet sleep</td>
<td>48 (60)</td>
<td>62 (77.5)</td>
<td>5.702</td>
<td>0.017*</td>
</tr>
<tr>
<td>Cannot participate in school activities because of the shyness of the change in form due to illness in front of classmates</td>
<td>32 (40)</td>
<td>67 (83.8)</td>
<td>32.456</td>
<td>&lt;0.001**</td>
</tr>
<tr>
<td>Get bored practice simple exercises to renew activity</td>
<td>48 (60)</td>
<td>63 (78.8)</td>
<td>6.619</td>
<td>0.010*</td>
</tr>
<tr>
<td>Exercise is often the only way to remove stress</td>
<td>56 (70)</td>
<td>64 (80.0)</td>
<td>2.133</td>
<td>0.144</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Yes</th>
<th>No</th>
<th>X²</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>50</td>
<td>40</td>
<td>30</td>
<td>75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>%</td>
<td>62.5</td>
<td>50</td>
<td>37.5</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X²</td>
<td>8.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&lt;0.005</td>
</tr>
<tr>
<td>P-value</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&lt;0.005</td>
</tr>
</tbody>
</table>

Table (4): reveals that less than three fourths (70%) of studied children and adolescents with β-TM were adhered to take a break in case of fatigue pre lifestyle modification module implementation, in contrast this proportion increased to the majority (91.3%). As well as less than two thirds (60%) of the studied children and adolescents with β-TM hadn’t participate in school activities because of the shyness of the change in form due to illness in front of classmates pre lifestyle modification module implementation, vice versa post module implementation the percentage was decreased to the few (16.3%) of them with P- value <0.001** post module implementation. This table reflected highly statistical significant difference pre/post lifestyle modification module implementation.

Figure 2: Percentage distribution of the studied children and adolescents with β-TM according to their total adherence to follow up in outpatient clinic pre/post module (n=80).
Figure (2) indicates that the majority (92.5%) were adherent to follow up regimen post lifestyle modification module implementation compared to more than half (76.25%) pre module implementation and this reflected statistical significant difference between pre and post lifestyle modification module implementation P - value <0.001.

**Discussion**

A healthy lifestyle is a maintaining control over all lifestyle behaviors that might influence one’s health and well-being and organizing daily life activities by choosing appropriate behaviors of their own accord\(^\text{(13)}\). Healthy lifestyle behaviors and activities primarily include spiritual development, personal health responsibility, physical activity, diet, interpersonal support, and stress management\(^\text{(14-15)}\).

Beta thalassemia major has a negative impact on the lifestyle due to the effects of the disease and its treatment, not only affecting children’s physical function but also their social, emotional, and school function, leading to impaired lifestyle. Similar conditions also affected their family members, such as sadness, disappointment, hopelessness, stress, depression, and anxiety about their children’s lives\(^\text{(16)}\).

The Role of the hematologic nurse, to give the child and adolescent time to express feelings and fears to ‘be there’ for the child and adolescent, to support and encourage, to reassure and to calm. Early social services consultation to address financial and social issues is mandatory\(^\text{(17)}\).

The findings of the present study showed that two fifth of the studied children were preparatory school. This finding disagreement with Hisam et al.\(^\text{(18)}\) and reported that regarding education status of studied subject having more than two fifth primary educations. Moreover, this finding was not supported by Ali, El-Bilsha & Mohamed,\(^\text{(19)}\) who carried out a study entitled “Coping Strategies among Children with Thalassemia” and mentioned that more than half of the studied thalassemic children not entered school.

The results of the present study revealed that slightly less than two thirds of the studied children and adolescents from rural area. This could be attributed to the fact that rural areas face a problem of deficient quality health care services and health care providers. This shed the light on the importance of strengthening the rural areas with proper health care services in order to fulfill their residences needs of effective and efficient health services. The same results could be attributed to the high prevalence of poverty and illiteracy among rural population. This finding was in accordance with Gharaibeh et al.\(^\text{(20)}\) who mentioned that less than two thirds of children from rural area. However, these findings were similar to a study done by Abusaad & Sarhan,\(^\text{(21)}\) this study revealed that most of studied children were from rural areas.

As regard to total knowledge about ß-TM of the studied children and adolescents, the results of the present study illustrated that more than three quarters had satisfactory knowledge about ß-TM post lifestyle modification module implementation compared to less than half of them pre module implementation and this reflected statistical significant improvement between pre and post lifestyle modification module implementation (P-value <0.001). This may be attributed to the absence of in-service training program in the hospital and there was no motivation for the children and adolescents to improve their knowledge and increased awareness of children and adolescents about ß-TM after module implementation.

These findings came in line with that of Abu Samra et al.\(^\text{(22)}\) reported that there was an extremely significant statistical improvement in relation to the studied children’s knowledge score pre-program and post-program implementation. Previously, this result comes in accordance with that Armeli et al.,\(^\text{(23)}\) found that B-thalassemia education program in Italy appear to have dramatically increased awareness of the disorder. Recently, this finding was in agreement with Zaghamir et al.\(^\text{(24)}\) reported that there was statistically significant improvement of children’s knowledge. Subsequently, statistically significant improvement of children’s quality of life at follow up compared with pre-intervention phase. In the same context Bazpour et al.,\(^\text{(25)}\) stated that before intervention the mean of knowledge score was in the weak level in the two groups but immediately after and a month after intervention it reached to the good level in the experimental group.

Regarding medication regimen, the results of the current study revealed that the more than half of studied children and adolescents were adherent for taking medicines yesterday pre lifestyle modification module implementation module compared to post module implementation the percentage were the majority and
this reflect that there were highly statistical significant improvement(P-value <0.001). It could be due to the children and adolescents recognition of the dangerous complications of medication dose forgetting after module implementation. This results was in accordance to those of Komatsu, Yagasaki & Yoshimura,\(^{26}\) reported that the majority of children with \(\text{\(\beta\)-TM}\) adherence to medication regimen. In general patients are considered to be adherent if the \(\geq 80\%\) of prescribed medication is taken timely and at an appropriate dose without missing dose or extra dose. In the same context, Aboelela et al.\(^{27}\) found that thalassemic children’ adherence to iron chelation therapy were significantly improved after implementation of the multidimensional intervention.

Concerning adherence to diet regimen, the findings of the current study revealed that more than three fourths of studied children and adolescents were adhered to diet regimen post lifestyle modification module implementation compared to more than half pre module implementation and this reflected statistical significant improvement between pre and post lifestyle modification module implementation. It could be due to that the children and adolescents do not adhered to diet regimen because they are not aware of the importance of its following and after implementing the module their awareness increased with respect to following adherence to diet regimen. As well as this result agree with that of Bazpour et al.\(^{25}\), who reported that significant effect in the experimental group immediately after and a month after intervention on nutrition adherence were increased in the post-test taken from the experimental group.

Concerning study of children and adolescents adherence to physical exercise, the findings of the current study reported that less than three fourths of studied children and adolescents were adhered to take a break in case of fatigue pre lifestyle modification module implementation, in contrast this proportion increased to the majority and this reflected highly statistical significant improvement pre/post lifestyle modification module implementation. This findings was in accordance with that of Elalf et al.\(^{28}\) reported that the studied children and adolescents took a break when felt fatigue and limit physical activities and their exercise capacity because many patients did not come regularly for blood transfusion and thus were suffering from anemic consequences and the presence of physical complications.

Regarding total adherence to follow up, the findings of the current study revealed that the majority were adhered to follow up regimen post lifestyle modification module implementation compared to more than half pre module implementation and this reflected statistical significant improvement between pre and post lifestyle modification module implementation. This finding was supported by Biswas et al.\(^{29}\) reported that caregivers of thalassemia patients had significantly higher and regular visit to the hospital.

**Conclusion**

Based on results of the current study, it can be concluded that there were significant improvements of knowledge and adherence of the studied children and adolescents with \(\text{\(\beta\)-TM}\) to therapeutic regimen post the lifestyle modification module application and there were positive correlations between all variables of the studied children and adolescents with \(\text{\(\beta\)-TM}\).

**Conflict of Interest:** Nil

**Source of Funding:** Self

**References**


Effect of Prolonged Overdose Sorbitol and Aspartame Administration on Serum Lipid Profile: Experimental Finding

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²Lecturer, Thi-Qar General Directorate of Education. Iraq

Abstract

The aim of this study was to investigate the effect of Prolonged Overdose Sorbitol and Aspartame Administration on serum Lipid Profile levels in female Rats. Blood samples were obtained from (18) adult female rats that treated with (100 mg/day) of sorbitol and (18) rats that treated with of Aspartame for 30 days, as well as (18) healthy rats that were given (Normal Saline) for 30 days as a control group. They divided into three groups as the following: Sor Group:- Included eighteen female rats that treated with (100 g/day) of sorbitol, Asp Group:- Included eighteen female rats that treated with (100 g/day) of Aspartame control Group:- Included (18) healthy rats that was given (Normal Saline) for 30 days. Results: the results in this study showed no significantly different (p≤0.05) in (TC), (TG), (HDL), (LDL), (VLDL) levels in the treated group with Asp in comparison with control group while serum (TG) and (vLDL) showed significant increase (p≤0.05) in treated group with Sor in comparison with control group, also the study reveals significant increase (p≤0.05) in serum (TG) and (vLDL) in treated group with Sor in comparison with treated group with Asp while there were no significant different (p≤0.05) in serum (TC), (HDL), levels in the group that treated with Sor in comparison with group treated with Asp and control group. In conclusion: The use of overdoses than permissible of sorbitol and aspartame for a prolonged period leads to disturbance of lipid profile levels, but it is statistically imperceptible.

Keywords: Aspartame, Artificial Sweetener, Lipid profile, Sorbitol.

Introduction

Artificial sweeteners: are used as sugar substitutes called “zero” or “light” beverages, foodstuffs, pharmaceuticals, and it is used by consumers to acquire a sweet taste without increasing caloric intake., is a low calorie option for people who should or need to limit their sugar intake, or energy control¹,²,³ are can be divided into two large groups:(a) nutritive sweeteners such as “sorbitol” which has a systematic name d-glucitol, is a 6-carbon sugar alcohol, Its sweetness equals 60 % that of sucrose.⁴,⁵. It is widely accepted by the food and pharmaceutical industries as nutritive ingredient because of its ability to improve the taste and shelf-life of regular food. Sorbitol is partially absorbed into the body from the gastrointestinal tract and metabolized by the liver mainly as fructose and non-absorbed part is metabolized by colonic bacteria.⁶,⁷. The initial steps in sorbitol metabolim in the liver, its uptake by liver cells and conversion to glucose is independent of insulin, but the subsequent use of glucose by the muscle and adipose tissues is influenced by insulin.⁸,⁹ this polyol can be naturally found in apples, pears, peaches, apricots and nectarines as well as in dried fruits, such as prunes, dates and raisins and in some vegetables and (b) non-nutritive sweeteners such as “Aspartame”which has (L-aspartyl- L-phenylalanine methyl ester) also known as “Nutra Sweet” is one of the most popular synthetic artificial sweeteners.¹². They are characterized by a minimum caloric value at the used doses, so they give dietetic character to foodstuffs which they are added to and when aspartame is ingested it is broken down.

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in the digestive tract into ordinary food components. It is hydrolyzed in the intestinal lumen to aspartic acid (which makes up approximately 40% of the molecule), phenylalanine, (which makes up approximately 50% of the molecule) and methanol by proteolytic and hydrolytic enzymes. Aspartame is known to have a ‘clean sweet taste’ and is white crystalline powder that is colourless when dissolved. It is a compound 200 times sweeter than sugar, considered as a low-calorie sweetener (4 kcal/g) and can be used as a tabletop sweetener or in frozen desserts, gelatins, beverages and can be used as a tabletop sweetener or in frozen desserts, gelatins, beverages. Aspartame is known to have a ‘clean sweet taste’ and is white crystalline powder that is colourless when dissolved. It is a compound 200 times sweeter than sugar, considered as a low-calorie sweetener (4 kcal/g) and can be used as a tabletop sweetener or in frozen desserts, gelatins, beverages.

Aspartame can be metabolized by enzymes in the intestines to the amino acids phenylalanine, (which makes up approximately 50% of the molecule), and aspartic acid (which makes up approximately 40% of the molecule), and methanol by proteolytic and hydrolytic enzymes. A ‘weak review’ found no effect of artificial sweeteners on lipid parameters related to the consumption of artificially sweetened beverages. A single study reported a positive association between the consumption of these beverages and an increase in TG concentrations associated with a lowering of HDL-C.

Epidemiological studies have shown that elevated concentrations of total cholesterol especially LDL-cholesterol in the blood are powerful risk factors for atherosclerotic cardiovascular diseases (CVD), including ischaemic heart disease and stroke also for the development of other health disorders such as metabolic syndrome, type 2 diabetes mellitus and hypertension. Dyslipidaemia is a metabolic disturbance which stimulates insulin resistance in adipose and muscle tissues then results in free radicals, which contribute to oxidative stress. The formation of these free radicals and end products, and subsequent oxidative stress causes damage to endothelial tissues. The dysfunction of endothelial tissue can stimulate atherosclerotic events on blood vessels, which can progress to cardiovascular diseases. Dyslipidaemia becomes atherogenic when there is combined elevation of TG and (LDL-c), and decreased (HDL-c) in the blood.

HDL-cholesterol and LDL-cholesterol are two main groups of plasma lipoproteins that are involved in lipid metabolism and the exchange of cholesterol, cholesterol ester and triglycerides between tissues. Numerous population studies have shown an inverse correlation between plasma HDL-cholesterol levels and risk of cardiovascular disease, implying that factors associated with HDL-cholesterol protect against atherosclerosis. Some of these factors appear to have antioxidant and anti-inflammatory effects which may obviate processes that initiate atherogenesis. In Western countries, it was estimated that 45% of heart attacks were due to abnormal blood lipids. Between (2007-2017), the Global Burden of Diseases, Injuries, and Risks Factors Study (GBD) reported that the number of ischaemic heart disease deaths attributed to high LDL-C increased 20.7% and the majority of observational studies showed no effects on lipid profile related to artificial sweeteners. Two studies reported that replacing sugars with aspartame reduced plasma triglyceride concentrations but the data are too limited to conclude that artificial sweeteners have a beneficial effect on lipid profile.

Therefore, the aim of this study is to highlight the effect of continuous and prolonged administration of disallowed doses of sorbitol and aspartame on blood lipids concentrations in laboratory rats.
Animals and Method

**Design of Study:** Eighteen healthy adult female rats weighing (1200-1300 g) of (18-24) weeks old were used for the present study. All animals were maintained under standard laboratory conditions (12h light: 12h night cycle (LD) at 22 ± 2 °C and relative humidity 45-55%. The animals were fed with normal laboratory diet and allowed to drink water ad libitum. All the experimental procedures conducted in the animal house of Biology Dept/College of Science/Thi-Qar University. Animals were housed in iron boxes bedded with wooden chips, during the experimental period. Six animals were kept in each box and they were housed.

Experimental animals were divided into three groups (18 female rats in each group) upon the following designed:

- **Control group:** Control (normal) that were given (Normal Saline) for 30 days
- **Sor group:** Rats were daily treated with (100 g/day) of sorbitol for 30 days
- **Asp group:** Rats were daily treated with (100 g/day) of sorbitol for 30 days.

**Collection of Blood Samples:** Three mL of blood were drawn from each animal of experimental groups, after being anesthetized with a (diethyl ether) sniffing, dissecting it, and drawing blood directly through the heart puncture method. The sample was transferred into clean tube, left at room temperature for 15 minutes for clotting, centrifuged at 3000 (rpm) for 10 minutes, the serum samples were separated and stored at (-20°C) for later measurement of biochemical parameters, unless used immediately.

**Determination of Biochemical Parameters:** Several considerable methods were used to measure the studied parameters. It is notable that all measurements were duplicated for each sample. Serum total cholesterol (TC), triglycerides (TG) and HDL-cholesterol were estimated by enzymatic colorimetric method. The used reagents were supplied by Biolabo (France), LDL was calculated according to ‘Friedwald’ formula. Non-HDL was measured by subtracting HDL from TC as: [LDL(mg/dl) = Total cholesterol – (HDL + VLDL)]. and VLDL concentrations were measured as follows : [VLDL(mg/dl) = serum TG/5]

**Statistical Analysis:** Statistical analysis was done using the software (Excel, 2010) the results were expressed as mean ± standard deviation (mean ± SD). One way (ANOVA-single factor) was used to compare parameters in different studied groups. P-values (P ≤ 0.05) were considered statistically significant (t= 2.131).

**Result and Discussion**

**Serum Lipid Profile Concentrations:** Recently, concerns have been raised about the safety of artificial sweeteners that are commonly used as substitutes for sucrose in many diet products. Therefore, in our study, we tried to examine the effects and biochemical variations on lipid profile (serum total cholesterol, triglycerides, HDL and LDL-Cholesterol) in blood and tissues of experimental rats treated with high dose of Sorbitol and Aspartame. Data showing the effect of sweeteners in Table 1.

Table (1) showed the results of serum lipids and lipoproteins levels. Serum cholesterol (TC) levels were no significantly different (p≤0.05) in the treated groups with Sor and with Asp in comparison with control group.

Serum triglyceride (TG) and (vLDL) levels were significantly increase in (Sor treated groups) in comparison with (Asp treated group) and control group (p≤0.05) as shown in table (1). No significant variations were observed in the levels of TG and vLDL in the Asp treated groups when the comparison with control group.

Serum (HDL) levels shown no significant difference (p≤0.05) in Sor and Asp treated groups in comparison with control group.

Serum (LDL) level were significantly increased in (Sor treated groups) in comparison with (Asp treated group) and control group (p≤0.05) as shown in table (1). Additionally no significant variations were observed in the levels of sLDL in the Asp treated groups when the comparison with control group.

Through the results of our current study, we notice that there is no significant difference in serum (TC, TG, HDL, LDL,vLDL) in (Asp treated group) comparison with control group, in agreement with results recorded by Sharma et al.,49 and Moreover, Osfor & Elias50 reported the same effect for 12 weeks. Also, his is consistent with other studies shown that administered a over dose of 500 mg aspartame and the results showed no significant change after 2 weeks’ in blood cholesterol and triglyceride. caused a decrease
in lipid peroxidation, plasma cholesterol, triglycerides, and low density lipoprotein cholesterol, and an increase in high-density lipoprotein cholesterol. On the other hand disagree with Prokić et al that referred to chronic exposure to aspartame induced changes in lipid metabolism and could be involved in the development of hypercholesterolemia. Dhingra et al also mentioned that: of the 20 randomised controlled experimental studies analysed, aspartame consumption had no effects on triglycerides or cholesterol concentrations for periods ranging from (13 to 28) weeks. Compared to a caloric sweetener (sucrose or fructose), of five studies, two showed a modest significant, improvement in lipid profile (TG and/or total cholesterol) in the group that received aspartame, still with no differences compared to the placebo.

Also from the results of our work, sorbitol was shown significantly increase in Serum triglyceride (TG) and vLDL levels in comparison with control group (p≤0.05), this may agree with jang et al., mention of the long-term consumption of artificial sweeteners might induce atherosclerosis via modifying Apo A-1 and cause protein cleavage, which is associated with loss of antioxidant ability and impairment of phospholipid binding ability. Apo A1 structure modification could lead to the production of dysfunctional HDL-cholesterol.

The results disagree with Hamdy et al., its indicated that sucrose or aspartame was significantly increased level of cholesterol and triglycerides during the experiment in comparison to untreated group. While similar results were also described by Singleton et al. who mentioned that Serum triglycerides increased after consumption of the drink sweetened with glucose and fructose, but not aspartame, indicating that unlike glucose and fructose, aspartame does not enhance postprandial lipemia following lipid loading while Marko et al., study revealed that (treatment with Asp) caused an increase in the concentrations levels of cholesterol, LDL-cholesterol, as well as a decrease in the levels of serum HDL-cholesterol, As for Mohammed m et al.

The mechanism of hypo-cholesterolemic and hypo-lipidemia effect may be backed to reduced total cholesterol synthesis by the saccharin repressed in vivo liver enzymatic activity of acetyl-CoA synthetase; and mitochondrial citrate exchange leading to a reduction of available cytoplasmic acetyl-CoA, which is required for the synthesis of cholesterol and fatty acids. High levels of lipids are associated with atherosclerosis and predispose to cardiovascular disease. Increase level of HDL-C is associated with fewer problems with cardiovascular diseases and vice versa. It is very clear that an increase in HDL-C level could potentially contribute to reversal of process of atherosclerosis, this is because high level of HDL-Cholesterol protects endothelial cells from the cytotoxic effects of oxidized LDL-C. It represents the ability of HDL-C to protect against heart disease. On the other hand oxidized atherogenic lipoprotein, namely oxidized LDL-C is taken up by immune system cells, which becomes engorged to foam cells. This foam become trapped in the wall of the blood vessels and contributes to the formation of atherosclerosis plaques that cause arterial narrowing and lead to heart diseases, therefore HDL-C has antioxidant and anti-inflammatory effects that prevent the atherogenic formation.

The significant body weight losses with high sweetener may be a consequence to the hypotriglycereolemia and hypo-cholesterolemic effect as revealed by a decrease in total serum cholesterol especially with the high dose treated groups. This results are in agreement with the results obtained by Dib et al. who reported a significant reduction in body weight of rats [50%] and lipid levels after administration of a 14-day artificial sweetener. Though, the present results are in contrary with that obtained by Polyák et al., als act on accelerated bile excretion of cholesterol metabolites and increased the fecal excretion of the cholesterol, triglycerides, neutral lipids, and phospholipids thus, the liver and plasma lipoprotein lipid contents including, cholesterol, triglycerides, and LDL-cholesterol were markedly reduced by . Thus its act as antihyperlipidemic, so it consider of health benefit.

Moreover liver acetyl-CoA carboxylase, phosphatidate phosphohydrolase, and (glycerol-3-phosphate acyl trans-ferase) activities were markedly reduced. Suppression of these enzymes would lead to a reduction of triglyceride synthesis. Cyclic AMP (cAMP) is formed from ATP by adenyl cyclase at the inner surface of cell membranes and acts as an intracellular second messenger. C-AMP activates phosphorylase that triggers glycogenolysis, gluconeogenesis so induce hyperglycemia. Also adenyl cyclase, activates hormone-sensitive lipase that produces lipolysis and converting triglyceride into free fatty acid and glycerol.
The increasing health awareness among people has led to the growth of the sweetener industry. However, despite approvals from various regulatory bodies some section of the audiences is still wary of using them. The adverse effects seen in animal studies are hard to ignore. Although “natural” does not mean safe, healthy or non-toxic the safety concerns over artificial substitutes has led to an increased demand for plant based alternatives.70

Table 1: Serum lipid profile concentrations in all studied groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>No.</th>
<th>TC (mg/dl) Mean ±SD</th>
<th>TG (mg/dl) Mean ±SD</th>
<th>HDL (mg/dl) Mean ±SD</th>
<th>LDL (mg/dl) Mean ±SD</th>
<th>VLDL (mg/dl) Mean ±SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sor</td>
<td>18</td>
<td>70.83±9.77</td>
<td>57±18.54</td>
<td>31.83±7.73</td>
<td>27.6±12.79</td>
<td>11.4±3.71</td>
</tr>
<tr>
<td>Asp</td>
<td>18</td>
<td>60±8.51</td>
<td>38.5±10.26</td>
<td>41.67±10.39</td>
<td>10.63±5.31</td>
<td>7.7±2.05</td>
</tr>
<tr>
<td>Cont.</td>
<td>18</td>
<td>64.83±5.58</td>
<td>33.5±2.63</td>
<td>43.5±11.19</td>
<td>14.63±6.62</td>
<td>6.7±0.53</td>
</tr>
<tr>
<td>LSD</td>
<td>18</td>
<td>10.98</td>
<td>16.62</td>
<td>13.32</td>
<td>11.95</td>
<td>3.32</td>
</tr>
</tbody>
</table>

Note: Each value represents mean ± S.D values with non-identical superscript (a, b or c …etc.), were considered significantly differences (P ≤ 0.05).

-No: Number of Cases.
-S.D.: Standard deviation.
-LSD: Least Significant Difference.
-Cont.: Control group.
-Sor: Rats group treated with overdose of Sorbitol.
-Asp: Rats group treated with overdose of Aspartame.

Figure (1): Serum TC levels in all studied groups
Figure (2): Serum TG levels in all studied groups

Figure (3): Serum HDL levels in all studied groups
Conclusions

The use of overdoses than permissible of sorbitol and aspartame for a prolonged period leads to disturbance of lipid profile levels, but it is statistically imperceptible.

Ethical Clearance and financial support: Lastly the ethical approval for this study was issued by the ethical commettee of college of science of Thi-Qar university. Moreover there was a financial support from college of science in Thi-Qar university.
Conflict of Interest: Nil

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Evaluation of a New Green Zirconium Nanoparticle from Lemon and Peel Extract Antioxidant and Anticancer Activity

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Abstract

Objective: This study was planned to synthesize a novel green Zirconium nanoparticles (ZrNPs), from lemon/and lemon peel with zirconium salt and test its bioactivity against free radicals, and certain cancer cell lines (MCF-7).

Materials and Method: Lemon/peel extracts were prepared, mixed with water and heated to 80 °C, and filtered. The zirconium nanoparticles were synthesized using (ZrCl3) solution which was added to the filtrate (juice and peel) in 1:1 proportion, and UV-Visible was taken. Different concentrations were prepared to study their activity. DPPH assay against free radicals and cytotoxicity against MCF-7 cell line were measured.

Results: UV-Visible absorbance of lemon peel/and lemon NPs was carried out and it was found that NPs gave peaks at 457 and 478 nm, while lemon NPs gave peak at 217, and 270 nm. Antioxidant activity of all the solutions were carried out, it was found that the peel and juice nanoparticles gave the highest scavenging activity % in all concentrations at 800, 600, 400, and 200 µg/ml which were 93, 78, 57, and 20% respectively. The activity against MCF-7 cancer cell line, the highest inhibition percentage effect (95.16) showed by NPs + Peel, while the lowest effect was 18.42.

Conclusion: Novel NPs were synthesized form ZrCl3 and lemon extract/and lemon peel, it was found that the last one is more active against free radical and MCF-7 cell line.

Keywords: Green zirconium NPs, lemon, peel extract, antioxidant, anticancer.

Introduction

Fruit peels were unnecessary as predictable throw away in the manufacturing of fruit juice and waste our resource and this will also cause contamination troubles(1).

Green synthesis of metal nanoparticle is a technique to reduce the production of by products, poisonous solvents, chemical reagent, which have unhelpful and negative effect on the health of human and the environment (2). Diverse of procedures, method, and protocols were planned to produce nano metallic particles. At present, the researchers are focusing on two major approaches that can be applied to prepare, synthesize, and produce these nanoparticles (3).

A. The top-down by which the nanoparticles were synthesized according to its size to reduce the bulk materials using lithographic or mechanical technique such as grinding and machining (4).

B. Bottom-up which build small materials into larger, such as synthesis of chemical compounds (5).

Though, the major successful method and technique is the bottom-up, which allow to control the shape and the size of the nanoparticles molecule while it is grow up, this can be achieved through controlling the condition of the nanoparticles synthesis, such as temperature, pressure, pH of the reaction, time, concentration of the raw materials, etc. the application of the synthesized nanoparticles will be determined upon the characteristics, specification, and the composition of them(6). The contains of lemon peel consider as a biodegradable
In this study a novel green Zirconium nanoparticles (ZrNPs) were synthesized from lemon peel with inorganic zirconium salt and test its bioactivity against free radicles, and against certain cancer cell lines (MCF-7).

Materials and Method

Preparation of juice extract powder-reducing agent: Lemon extract prepared, while the lemon peel was separated, dried, grind into powder separately. 20 g of grinded powder lemon peel were placed with 20 ml of lemon juice and topped up to 1000 ml with de-ionized water. The mixture was heated to 80°C in water bath, filtered, and the filtrate was stored for further use.

Synthesis of Zirconium-lemon peel nanoparticles: 0.01 M of zirconium chloride (ZrCl₃) solution was added to the lemon juice and to the filtrate (juice and peel) in 1:1 proportion. The colored solutions and color changed as shown in figure 1, the solution then was kept at 4 °C.

DPPH (2, 2-Diphenyl-1-picrylhydrazyl)/ Free Radicals (DPPH) Assay: The DPPH assay was done according to Garcia et al. 2012 method (8), with some modifications. The colors changes were measured spectrophotometrically at 517 nm, different concentrations (200 to 500 μg/ml) of lemon extracts/and the NPs were separately mixed with 3 ml of 0.1 M DPPH and incubated in dark for 15 min. The absorbance was measured at 517 nm. The scavenging ability of the plant extract was calculated using this equation (9):

### UV – Visible Spectroscopy: In order to determine the formation of iron nanoparticles in the, a spectral scanning procedure was carried out using UV-V is spectrophotometer at the range of 300-700 nm

### Anticancer Activity: The anticancer of the synthesized nanoparticles and NPs on MCF-7 (human breast cancer) cell line provided by the cell Bank Unit,
Experimental Therapy Department, Iraqi Center for Cancer and Medical Genetic Research (ICCMGR). The cell was cultured in (RPMI)-1640 containing 10% fetal bovine serum and 1% penicillin-streptomycin, and incubated in CO₂ with humidity at (37 °C).

**Methyl thiazolyl tetrazolium (MTT) Solution:** Methyl thiazolyl tetrazolium (0.5g) was dissolved in 100 ml of phosphate buffer saline (PBS) (5mg/ml concentration) (Betancur-Galvis et al., 2002) (10).

**Cell culture treatment:** Different concentrations of five tested compound (Nanoparticles, Lemon, NPs +Lemon, Lemon peel, NPs + Lemon peel) were prepared (300, 250, 200, 150, 100, and 50 µg/ml) and added to the cells which seeded in 96-well transparent flat bottom plates at a density of 1×10⁴ cells/well, There were three replicates for each tested concentration, while the last column in the plate is kept as (−ve control) (cells with no treatment). The exposed transplant cells were incubated at 37°C and 5% CO₂. Cell viability was measured after 48 hr. of infection by removing the medium, stained the plates by MTT solution as described by (11). The inhibiting rate of cell growth (the percentage of cytotoxicity was calculated as (G.I) = (A-B)/Ax100, Where A is the mean optical density of untreated wells (control) and B is the optical density of treated wells (test cells) (8).

**Results and Discussion**

Figure 2 showed UV-Visible absorbance of lemon peel nano particles and lemonade nano particle, it was found that peel nano particles gave peaks at 457 and 478 nm, while lemon juice NPs gave peak at 217, and 270 nm.

**Figure 2: A: UV-Visible absorbance of peel NPs; B: UV-Visible absorbance of Limon juice NPs**

Figure 3 illustrated antioxidant activity of nano particles of peel and juice we found that the lemon peel and juice nanoparticles gave the highest scavenging activity % in all concentrations at 800,600,400, and 200µg/ml scavenging activity were 93, 78,57, and 20% for lemon peel, while for lemon juice nano particles were 64,43,38, and 19% in compare with lemon peel extract and lemon juice extract figure 3.

**Figure 3: Antioxidant activity of nanoparticles and extracts**
MCF7 cell line were exposed to the five groups of solutions were prepared with different concentration (table 1) to study their activity against MCF-7 cancer cell line, and it was found a synergism effect between the NPs and the extract while the highest inhibition percentage effect (95.16) showed by NPs + Peel at concentration of 300 µg/ml, and the lowest effect was 18.42 showed by 25 µg/ml of NPs as show in table 1.

Table 1: The growth inhibition% of MCF-7 cell line after 48 hr. of exposure to the different combination

<table>
<thead>
<tr>
<th>Conc. (µg/ml)</th>
<th>NPs</th>
<th>Lemon/Peel Extract</th>
<th>Inhibition%</th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>300</td>
<td>79.15</td>
<td></td>
</tr>
<tr>
<td>250</td>
<td>250</td>
<td>68.81</td>
<td>84.01</td>
</tr>
<tr>
<td>200</td>
<td>200</td>
<td>63.55</td>
<td>75.42</td>
</tr>
<tr>
<td>100</td>
<td>150</td>
<td>56.10</td>
<td>64.40</td>
</tr>
<tr>
<td>50</td>
<td>100</td>
<td>39.49</td>
<td>56.94</td>
</tr>
<tr>
<td>25</td>
<td>50</td>
<td>18.42</td>
<td>35.90</td>
</tr>
</tbody>
</table>

NPs: Nanoparticles

Figure 4 show the comparison in cytotoxic activity toward MCF-7 cell line between control, lemon extract, and lemon peel NPs.

![Figure 4](image1.png)

Figure 4: Cytotoxic activity of the compounds on MCF-7 cell lines, A: MCF7 control, B: MCF7 with lemon extract 20.66%, and MCF7 NPs+ lemon peel 95%

Conclusions

- Novel zirconium NPs were synthesized and characterized (lemon NPs/and lemon peel NPs).
- Free radicals (DPPH) assay was carried out successfully and it was found that lemon peel NPs shows more activity than other compounds.
- Cytotoxicity of the compounds were tested against breast cancer (MCF-7 cell line), and it was found that lemon peel NPs shows more activity than others.

Source of Funding: Self fund.

Conflict of Interest: No conflict of interest

Ethic Statement: The researchers already have ethical clearance from all required institution and laboratories.

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Effectiveness of Jacobson’s Progressive Muscle Relaxation (JPMR) on Hypertension among School going Adolescents

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Abstract

Background: Hypertension could have its origin in childhood and go undetected unless specially looked for. Though many risk factors were postulated for hypertension among adolescents, gap in knowledge is that no studies are reported on effectiveness of interventions for hypertension among adolescents.

Objectives: To determine: 1) effectiveness of JPMR on blood pressure. 2) association of blood pressure to selected variables. Basic procedure: In first phase, a cross-sectional survey was conducted among 980 adolescents following multistage stratified random sampling from classes 6th to 12th. Anthropometric measurements, HR, BP and selected blood tests were done. In second phase experimental approach with pre-test, post-test control and experimental was done with JPMR as intervention.

Main Findings: Both rural and urban adolescents were in par with regard to prevalence of hypertension. There was significant association between hypertension and family history. Prevalence of hypertension among overweight and obese adolescents was significantly higher than their counterparts. Mean post-test systolic and Diastolic BP of experimental groups in both rural and urban areas were significantly lower than their pre-test values and the post-test values of their counterparts suggesting JPMR was effective.

Conclusion: JPMR is an effective intervention for adolescent hypertension. Relaxation techniques can be made as part of curriculum in schools.

Keywords: Jacobson’s Progressive Muscle Relaxation, Heart Rate, Hypertension, Body Mass Index, Fasting Lipid Profile, School going Adolescents.

Introduction

Increased blood pressure (BP) in childhood has been considered a risk factor for hypertension in adulthood. According to non-communicable diseases (NCD) country profile in India, the proportional mortality from NCD is 60%, of which cardiovascular diseases account for 26%. The sixth target in the Global NCD action plan calls for 25% reduction in this.¹

Background of the study: Adolescent hypertension is a growing health problem. Early diagnosis is an important strategy in its control and prevention of complications. Adolescents with BP levels in higher portion of BP distribution curve tend to maintain that position over time, which is indicative of BP tracking.² Among adolescents, 85%-95% of hypertension is primary hypertension which could easily be managed by lifestyle modifications.

During a child’s hospital visit, blood pressure is not measured. Also at schools during the periodic health checkup only anthropometry is measured. Unlike in adults, normal blood pressure in children vary according to their age, gender and height.³

WHO (2007) fact sheet recommends interventions...
for early detection, prevention and management of hypertension⁴. A study of 1022 students aged 14-19 years in New Delhi, showed prevalence of hypertension was 6.4%⁵. Study in Kerala among 20263 students, incident hypertension was 11%. Systolic hypertension was 5.84% and diastolic hypertension was 6.61%. 10.65% had systolic pre-hypertension and 14.75% had diastolic pre-hypertension⁶. Cross sectional survey among 400 adolescents in Chennai revealed 21.5% was hypertensive⁷. Study conducted among 410 adolescent in Nagpur revealed 15.9% were pre hypertensive and 13.9% were hypertensive⁸. Study among 400 adolescents revealed 24.4% prevalence of high blood pressure⁹. Globalization is bringing more lifestyle modifications. Adolescents are exposed to multiple risk factors including obesity, unhealthy eating habits, academic stress etc. No studies are reported on effectiveness of relaxation for hypertension among adolescents.

**Objectives:** Aim of study was to determine effectiveness of JPMR on hypertension among adolescents. The projected outcome of study was control of hypertension among adolescents and thereby preventing the chance of stroke, cardiovascular and renal diseases in future. Objectives of the study were to determine:

1. Effectiveness of JPMR on heart rate (HR), systolic blood pressure (SBP) and diastolic blood pressure (DBP).
2. Association of blood pressure to selected variables.

**Materials and Method**

**Inclusion Criteria:** 11-17 years having pre, stage-I and stage-II hypertension.

**Exclusion Criteria:** Any medical condition not allowing practicing JPMR.

**Sample and sample size:** Alappuzha district has four educational districts, of which one was selected. After pilot study, prevalence of hypertension was 29%, based on which sample size for first phase was calculated to be 940, for a relative precision of 90% at 5% significance level.

**Sampling Technique:** Multistage stratified random sampling technique was used. There were 20 mixed rural Government Higher Secondary Schools (HSS), and 7 mixed urban Government HSS. Considering 25%, 5 rural 2 urban schools were selected. 140 students from each school, taking 20 students each from standard 6th to 12th; made the sample size to be 980. Participants were selected from the selected divisions. For the second phase, considering a reduction of 8 mmHg in systolic pressure and 10 mm Hg as combined standard deviation, 90% power and 5% significance, estimated sample size was 34; considering 10% as attrition the sample size was rounded off to 40 per group. (Sample size calculated by Sigma Plot 13, Systat Software, USA).

**Participants:** For the first phase, 980 adolescents. For the second phase, all identified participants from one rural and urban school each were assigned as control and experimental groups.

**Data collection tools:**

**Anthropometry:** Height, weight, body mass index (BMI), waist circumference (WC), hip circumference (HC) and waist hip ratio (WHR) were measured. Height was measured to nearest centimeter using tape measure and noted in meters. Weight was measured using calibrated balance scale and noted in kilograms. BMI was calculated as ratio of weight in kilogram by the square of height in meters. WC was measured using flexible tape over the abdomen, with measurements made halfway between lower border of ribs and highest point of iliac crest, while standing, at end of normal expiration. HC was measured at widest point over the buttocks when viewed from side. WHR was calculated by dividing WC by HC.

**Background data, physical activity, eating habits questionnaire:** Physical activities were assigned metabolic equivalent of task (MET) values based on compendium of physical activity (¹¹) and compendium of physical activity for youth (¹²). Data on eating habits of one week was collected using a 5 point likert scale (¹³). The reliability of physical activity questionnaire was 0.80 and that of eating habits questionnaire was 0.81.

**Biochemical profile:** Serum creatinine was
measured for all identified hypertensive cases. Lipid profile and TSH were measured for subset of sample.

Jacobson’s progressive muscle relaxation technique (JPMR): JPMR includes progressive contraction and release of entire muscle groups of body. First individual muscle group will be contracted and feel tension followed by releasing same muscles using an audio commentary, under supervision. Participants sat comfortably on chairs, closing eyes, bringing attention to their breathing.

Data collection procedure: The study was conducted after obtaining approval from Ethics Committee of Saveetha University, permission from District Director of Education (DDE) and Head Mistress of schools. Assent and informed consent were obtained from participants and their parents respectively.

**Phase-I Descriptive survey method:** Anthropometric measurements, HR, BP, background data, data on physical activity and eating habits were collected.

**Phase-II Experimental method:** Experimental approach with before and after with control design was used. Experimental group was taught and practiced JPMR for 20 min daily for 3 weeks. Post-test measurements were taken.

**Results**

Prevalence of hypertension among adolescents: Table 1 shows prevalence in rural and urban area. The obtained χ² value was not significant. Both rural and urban adolescents are in par with regard to prevalence. Distribution of age and hypertension among adolescents in rural and urban areas is shown in fig: 1. Prevalence among 14-17 years in rural and urban areas (about 35% and 36%) was higher than 11-13 years in rural and urban areas (about 22% and 20%) and was statistically significant (p<0.001). Similarly, prevalence among adolescents in class IX-XII in rural and urban areas were similar; (about 34% each) and was higher than that of adolescents in class VI-VIII in rural and urban areas (about 22% and 21% respectively) and was statistically significant (p<0.001). There was significant association between hypertension and family history (0.009) and there was no significant association between hypertension and gender, WHR, food habits, physical activity and thyroid disease.

Distribution of BMI and hypertension among adolescents in rural and urban areas is shown in fig: 2. Prevalence of hypertension among adolescents in BMI category of II (Z scores more than I; risk of overweight and obesity) in rural and urban areas (about 54% and 53% respectively) was higher than prevalence of hypertension among adolescents in the BMI category of I (Z scores less than I; normal, wasted) in rural and urban areas (about 26% and 23% respectively) and was statistically significant (p<0.001).

**Effectiveness of JPMR on HR:** Mean and standard error of HR, SBP and DBP of rural and urban adolescents are given in table 2. The mean difference of post-test HR of rural control and experimental groups was statistically significant (p=0.005). In urban areas also, mean difference of post-test HR of control and experimental groups was statistically significant (p=0.045); showing JPMR was effective in reducing HR among both rural and urban adolescents.

**Effectiveness of JPMR on blood pressure:** Mean post-test SBP of rural experimental group (118.7) was 10 mmHg lower than their mean pre-test SBP (128.4) and was statistically significant (p<0.001). The mean difference of post-test SBP of control and experimental groups was also statistically significant (p<0.001). Mean post-test SBP of urban experimental group (115.0) was 8 mmHg lower than their mean pre-test SBP (123.4) and was statistically significant (p<0.001). Mean difference of post-test SBP of control and experimental groups was also statistically significant (p<0.001). The results showed that JPMR was effective in reducing SBP among both rural and urban adolescents.

Figure 3 shows effectiveness of JPMR on DBP in rural areas. Mean post-test DBP of experimental group (73.0) was 5 mmHg lower than their mean pre-test DBP (78.0) and was statistically significant (p<0.001). Mean difference of post-test DBP of control and experimental groups was also statistically significant (p<0.001); showing JPMR was effective in reducing DBP among rural adolescents. Figure 4 shows effectiveness of JPMR on DBP in urban areas. Mean post-test DBP of experimental group (71.4) was 8 mmHg lower than their mean pre-test DBP (79.1) and it was statistically significant (p<0.001). The mean difference of post-test DBP of control and experimental groups was also statistically significant (p<0.001); showing JPMR was effective in reducing DBP among urban adolescents.
Distribution of fasting lipid profile: One third (37%) of adolescents had increased serum total cholesterol values. Obtained chi-square value was not statistically significant (p=0.774). Majority of adolescents in rural (86%) and in urban (88%) had low serum HDL values. Obtained chi-square value was not statistically significant (p=0.790). High LDL levels were seen more among urban adolescents (56%) compared to rural adolescents (40%). Obtained chi-square value was not statistically significant (p=0.436). In summary, there was no significant difference between rural and urban adolescents with regard to fasting lipid profile values.

Table 1: Prevalence of hypertension among rural and urban adolescents

<table>
<thead>
<tr>
<th>Type of Hypertension</th>
<th>Rural (N=700)</th>
<th>Urban (N=280)</th>
<th>X² (p value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHT</td>
<td>95 (47.26)</td>
<td>45 (56.25)</td>
<td>3.010 (p=0.222)</td>
</tr>
<tr>
<td>Stage-1 HTN</td>
<td>97 (48.26)</td>
<td>34 (42.5)</td>
<td></td>
</tr>
<tr>
<td>Stage-2 HTN</td>
<td>9 (4.48)</td>
<td>1 (1.25)</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Mean±SE of heart rate, systolic and diastolic blood pressure of rural and urban adolescents

<table>
<thead>
<tr>
<th>Sl</th>
<th>Parameter</th>
<th>Rural</th>
<th>Mean±SE</th>
<th>Urban</th>
<th>Mean±SE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Groups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>HR</td>
<td>Control Pre-test</td>
<td>82.2±0.9</td>
<td>83.5±1.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control Post-test</td>
<td>80.4±0.8</td>
<td>80.3±1.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exp. Pre-test</td>
<td>81.7±1.0</td>
<td>82.6±1.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exp. Post-test</td>
<td>77.1±0.7</td>
<td>76.8±0.9</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>SBP</td>
<td>Control Pre-test</td>
<td>125.3±1.1</td>
<td>122.4±1.1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control Post-test</td>
<td>124.6±0.8</td>
<td>123.3±1.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exp. Pre-test</td>
<td>128.4±1.3</td>
<td>123.5±1.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exp. Post-test</td>
<td>118.7±0.7</td>
<td>115.0±1.1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>DBP</td>
<td>Control Pre-test</td>
<td>76.9±0.8</td>
<td>77.3±1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control Post-test</td>
<td>76.9±0.6</td>
<td>77.9±1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exp. Pre-test</td>
<td>78.0±1.1</td>
<td>79.1±0.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exp. Post-test</td>
<td>73.0±0.7</td>
<td>71.4±0.8</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1: Age distribution of hypertensive adolescents in rural (R) and urban (U) areas.

N – Rural = 700; Urban = 280.
Rural - \( \chi^2 = 12.678, P < 0.001 \).
Urban - \( \chi^2 = 7.970, P < 0.001 \).

Figure 2: Distribution of BMI (I-Z scores below1; II-Z scores above1) of hypertensive adolescents

N – Rural = 700; Urban = 280.
Rural - \( \chi^2 = 25.155, P < 0.001 \).
Urban - \( \chi^2 = 16.030, P < 0.001 \).
Discussion

Present study findings showed that prevalence of hypertension among rural and urban adolescents was 28.7%, and 28.57% respectively. Prevalence of adolescent hypertension in early 2000 was about 3-6%; by 2010 studies reported about 12-16% of hypertension, it had increased further to about 25% by 2016\(^{(18,6,19,16,17)}\). Another study among 400 adolescents reported 24.4% prevalence of high blood pressure, which is slightly lower than present study findings (28.97%) \(^{(20)}\). Present study results showed significant association between hypertension and family history, age, class of study and BMI. A study conducted in Gazibad among 1340 adolescents showed significant association between hypertension and BMI, salt intake and positive family history\(^{(21)}\). A study done among 1005 adolescents reported significant association with hypertension and positive family history and BMI \(^{(20)}\). The findings showed that adolescent hypertension is a growing health problem that needs immediate measures to reduce or prevent the further increase.

Conclusion

The study findings showed JPMR was effective in reducing BP among adolescents. Though many studies reported prevalence of hypertension among adolescents, no interventions are yet reported for same. Present study finding strongly recommends need for preventive measures focused on adolescents to avoid hypertensive epidemic in them.

Acknowledgement: Authors are thankful to study participants, DDE and Head of schools for granting permission

Conflicting Interest: Authors declare no competing interests.

Contribution Details: All authors have contributed substantially towards publishing article.

References


Critical Assessment of Three Decades of Breast Cancer Research in Yemen: Systematic Review

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Abstract

Objective: The aim of this review is to critically assess three decades (1989 to 2019) of breast cancer research in Yemen and to identify the gaps in, and need for, breast cancer research in Yemen.

Methodology: A search was performed in Web of Science, EMBASE, PubMed, Google Scholar and Ovid to identify articles on breast cancer research in Yemen that were published in the last three decades. The articles were selected and reviewed by experts in this field, based on clinical relevance and future research implications.

Results: This review comprised 19,031 participants, extracted from 27 articles that were included and analyzed. Breast cancer patients in Yemen were commonly diagnosed at an early age of 50 years or younger. Overall, awareness of breast cancer among Yemeni women was very poor. Some studies reported that a low rate of only 11%-17.4% of Yemeni women practiced breast screen examination. Only 1.6% of the Yemeni women had been screened by a mammogram test. The highest performed surgery was a modified radical mastectomy (N=211). The highest cases of breast cancer were reported in Hadramout (N=956) and the most common histological subtype was invasive ductal carcinoma (N=2695).

Conclusions: Yemen is characterised by three decades of scattered, fragmented and poor quality breast cancer research. Therefore, there is a need to establish a breast cancer research center in Yemen to research all aspects of breast cancer in Yemen, and to build bridges for collaborations in breast cancer research globally.

Keywords: Breast cancer, Yemen, review, screening, diagnosis, treatment, Sana’a, Aden.

Introduction

Breast cancer is the most diagnosed cancer, with a high mortality rate, globally. In 2015 there were about 1.7 million confirmed cases of breast cancer, resulting in some 521,900 deaths, worldwide. In Yemen, breast cancer is recorded as the commonest cancer among women (30.3%) and the most common of all cancers (16.6%).
Breast cancer risk factors including age, hormone therapy, family history, extensive exposure to radiation and benign breast tumor need to all be well understood among the female population. Early detection of breast cancer will provide the patient with better diagnosis and survival. It has been shown that about 30% of all cancer cases can be avoided yearly by following prevention strategies through a healthy lifestyle and a satisfactory working environment. There is strong evidence that obesity, tobacco smoking, diet, drinking alcohol, stress, pollution, sun exposure, physical activity, and infections have an implication for the onset of breast cancer (World Cancer Research Fund, 2007).

The most available literature on different aspects of breast cancer is reported from developed and Western countries. Such research, undertaken in other countries, may not automatically apply in Yemeni settings. Few studies from Yemen have investigated the special risk factors and other aspects of breast cancer research. Therefore, there is a need to conduct a systematic review to establish the gaps and the needs for Breast cancer research in Yemen.

Methodology

Search Strategy: Articles indexed in PubMed, Ovid, EMBASE, Web of Science and Google Scholar were systematically and scientifically searched using the keywords and MeSH terms [Breast Neoplasms” OR “Breast Cancer” OR “Breast Tumor” OR “Breast Tumors” OR “Breast Carcinoma” OR “Breast Carcinomas”) and Yemen]. The references of the included articles were searched manually for further articles. Articles published from 1st January 1989 until 30th March 2019 were included.

Two authors [RAA & HA] separately screened the titles and abstracts of all studies using the inclusion and exclusion criteria. Appropriate studies were retrieved in full-text. Divergences were addressed through discussion with all authors.

Eligibility: The following study designs: case-control, cross-sectional, RCTs, non-randomized controlled trials and pre-post were included in this systematic review. Only articles written in the English language were included. Only original, primary articles were included. Review articles, editorials, comments, and letters to authors without information about study details were excluded.

Data extraction and quality assessment: A data extraction form was used to extract the required information for this systematic review. The data extraction form included: study name, first author’s name, publication year, study design, and number of participants. Two authors [RAA & HA] autonomously assessed the quality of the included studies using the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist. Studies were then classified into three categories (A, B or C) according to the percentage of criteria met: A >80%, B 50-80%, and C <50% of criteria met. Interventional studies were assessed based on their quality using the Effective Public Health Practice Project Quality Assessment Tool. Any differences in the quality assessment were resolved by discussion among all authors.

The flow of the data collection:
1. Records identified through PubMed, Ovid, EMBASE, Web of Science (N=42)
2. Records search for inclusion (N=42)
3. Excluded due to non-relevant (N=25) [Review articles=4; Lab study=13; reports=2, Not relevant=6]
4. Full text included [N=17]
5. Further reads identified through hand search in bibliography lists [N=33]
6. Excluded due to non-relevant [N= 23] [Arabic abstract only=10; Lab study=5; reports=6, thesis=2]
7. Full text included [N=10]
8. The total number included [N=27]

Result

Characteristics of research studies: In total, 27 articles were included in the final analyses for this review, comprising a total of 19,031 participants. The characteristics of the studies included are listed in Table 1. The majority of articles had less than 4 authors (N=18). The 27 articles were written by 21 different first authors and published in 17 different medical journals.

The included studies on breast cancer were all published between 1989 and 2018. Most of the studies were conducted in Sana’a (N=12), the most common study design was retrospective (N=9). None of the articles scored an A using the STORBE checklist, only 12 articles were awarded B scores (Table 1).
Table 1. The details of selected studies of breast cancer research in Yemen (N=27)

<table>
<thead>
<tr>
<th>No.</th>
<th>First author, Year, Quality#</th>
<th>Study design</th>
<th>Year</th>
<th>Number of participants</th>
<th>Governorate</th>
<th>Age (Mean±SD/Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bawazir et al. 1998 C</td>
<td>Retrospective</td>
<td>1989-1993</td>
<td>85</td>
<td>Aden</td>
<td>40-49</td>
</tr>
<tr>
<td>2</td>
<td>Al-Thobhani et al. 2001 C</td>
<td>Retrospective</td>
<td>1996-2000</td>
<td>116</td>
<td>Sana’a</td>
<td>(44±12)</td>
</tr>
<tr>
<td>4</td>
<td>Bawazir, 2002 C</td>
<td>Descriptive</td>
<td>1997</td>
<td>22</td>
<td>Aden</td>
<td>NA</td>
</tr>
<tr>
<td>5</td>
<td>Homesh et al. 2005 B</td>
<td>Randomized Controlled Trial</td>
<td>1998–2002</td>
<td>296</td>
<td>Sana’a,</td>
<td>(33±11)</td>
</tr>
<tr>
<td>6</td>
<td>Harhra, 2005 C</td>
<td>Descriptive</td>
<td>1998-2002</td>
<td>74</td>
<td>Aden</td>
<td>NA</td>
</tr>
<tr>
<td>7</td>
<td>Al-Thobhani et al. 2006 C</td>
<td>Descriptive</td>
<td>1997-2001</td>
<td>773</td>
<td>Sana’a</td>
<td>(31±12)</td>
</tr>
<tr>
<td>8</td>
<td>Barbaa et al. 2009 C</td>
<td>Capture-recapture</td>
<td>All old cases until 2008</td>
<td>134</td>
<td>Hadhramout</td>
<td>NA</td>
</tr>
<tr>
<td>9</td>
<td>Ghouth, 2009 C</td>
<td>Retrospective</td>
<td>2006</td>
<td>48</td>
<td>Hadhramout</td>
<td>(45±12)</td>
</tr>
<tr>
<td>11</td>
<td>BaSaleem et al. 2010 B</td>
<td>Secondary data</td>
<td>2002-2006</td>
<td>334</td>
<td>Aden</td>
<td>50-54</td>
</tr>
<tr>
<td>12</td>
<td>Bafakeer et al. 2010 C</td>
<td>Prospective</td>
<td>2006-2009</td>
<td>142</td>
<td>Hadhramout</td>
<td>40-49</td>
</tr>
<tr>
<td>13</td>
<td>Ahmed, 2010 B</td>
<td>Cross-sectional</td>
<td>425</td>
<td>425</td>
<td>Hadhramout</td>
<td>(21.4±1.6)</td>
</tr>
</tbody>
</table>
Breast Cancer Diagnoses: The highest number of cases of breast cancer diagnoses were reported in Hadramout (N=956) and the lowest was in Shabowah (N=3) (Table 3). For breast cancer stages, the highest was stage 2 (N=160). In terms of tumor size, patients presented with large size of tumor (Table 3). For type of surgery, the highest was modified radical mastectomy (N=211) (Table 2).
Table 2. Characteristics of breast cancer in different institutions in Yemen

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Type of surgery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modified radical mastectomy</td>
<td>97</td>
<td>114</td>
<td>-</td>
<td>211</td>
</tr>
<tr>
<td>Simple mastectomy</td>
<td>53</td>
<td>-</td>
<td>-</td>
<td>53</td>
</tr>
<tr>
<td>Lumpectomy</td>
<td>10</td>
<td>33</td>
<td>-</td>
<td>43</td>
</tr>
<tr>
<td>Radical Mastectomy</td>
<td>21</td>
<td>9</td>
<td>-</td>
<td>30</td>
</tr>
<tr>
<td>No surgery</td>
<td>13</td>
<td>-</td>
<td>-</td>
<td>13</td>
</tr>
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<tr>
<td>Governorates</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Hadramout</td>
<td>-</td>
<td>3</td>
<td>494</td>
<td>142</td>
<td>317</td>
<td>956</td>
</tr>
<tr>
<td>Sana’a</td>
<td>454</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Taiz</td>
<td>403</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Aden</td>
<td>218</td>
<td>171</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>389</td>
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<tr>
<td>Ibb</td>
<td>238</td>
<td>-</td>
<td>-</td>
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<td>-</td>
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<tr>
<td>Al-Hodidah</td>
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<td>-</td>
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<tr>
<td>Abyan</td>
<td>-</td>
<td>17</td>
<td>-</td>
<td>-</td>
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<td>17</td>
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<tr>
<td>Shabwa</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>Others</td>
<td>1068</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1068</td>
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</table>

<table>
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<tr>
<th></th>
<th></th>
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<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>18</td>
<td>20</td>
<td>22</td>
<td>60</td>
</tr>
<tr>
<td>Stage 2</td>
<td>40</td>
<td>72</td>
<td>48</td>
<td>160</td>
</tr>
<tr>
<td>Stage 3</td>
<td>54</td>
<td>84</td>
<td>17</td>
<td>155</td>
</tr>
<tr>
<td>Stage 4</td>
<td>64</td>
<td>16</td>
<td>-</td>
<td>80</td>
</tr>
</tbody>
</table>

In terms of the common breast affected with cancer, 1005 patients were affected in the left breast. In comparison, 787 patients were affected in the right breast. Only 26 patients were affected in both breasts (Table 3).

Table 3. Common Breast affected with cancer among Yemeni women

<table>
<thead>
<tr>
<th>Study</th>
<th>Left breast N (%)</th>
<th>Right breast N (%)</th>
<th>Bilateral N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bafakeer et al. (2010)</td>
<td>76 (total 142)</td>
<td>63</td>
<td>3</td>
</tr>
<tr>
<td>Alsanabani et al. (2015)</td>
<td>77 patients (48.1%)</td>
<td>81 (50.6%)</td>
<td>2 (1.3%)</td>
</tr>
<tr>
<td>El-Zaemey et al. (2012)</td>
<td>408 (43.7%)</td>
<td>393 (42.1%)</td>
<td>19 (2.0%)</td>
</tr>
<tr>
<td>Homesh et al. (2005)</td>
<td>147 (49.7%)</td>
<td>149 (50.3%)</td>
<td>NA</td>
</tr>
<tr>
<td>Al-Thobhani et al. (2006)</td>
<td>92 (59.4%)</td>
<td>63 (40.6%)</td>
<td>NA</td>
</tr>
<tr>
<td>Al-Madhaji et al. (2014)</td>
<td>205 (83.6%)</td>
<td>38 (15.5%)</td>
<td>2 (0.82%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1005</strong></td>
<td><strong>787</strong></td>
<td><strong>26</strong></td>
</tr>
</tbody>
</table>
The most common histological subtypes were invasive ductal carcinoma (N=2695), followed by invasive lobular carcinoma (N=120) (Table 4).

**Table 4. Distribution of breast cancer cases according to Histological subtypes of breast cancer in Yemen**

<table>
<thead>
<tr>
<th>Histological subtypes of breast cancer</th>
<th>Study 1</th>
<th>Study 2</th>
<th>Study 3</th>
<th>Study 4</th>
<th>Study 5</th>
<th>Study 6</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invasive ductal carcinoma</td>
<td>92</td>
<td>124</td>
<td>123</td>
<td>147</td>
<td>185</td>
<td>2024</td>
<td>2695</td>
</tr>
<tr>
<td>Invasive lobular carcinoma</td>
<td>5</td>
<td>13</td>
<td>-</td>
<td>7</td>
<td>13</td>
<td>82</td>
<td>120</td>
</tr>
<tr>
<td>Intraductal papillary carcinoma</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>Infiltrating ductal &amp; lobular carcinoma</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Ductal carcinoma in situ</td>
<td>2</td>
<td>-</td>
<td>5</td>
<td>3</td>
<td>29</td>
<td>14</td>
<td>39</td>
</tr>
<tr>
<td>Adenocarcinoma</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>11</td>
</tr>
<tr>
<td>Medullary carcinoma</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Adenoid cystic carcinoma</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Carcinoma NOS</td>
<td>60</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>62</td>
</tr>
<tr>
<td>Malignant phyllodus</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>6</td>
<td>-</td>
<td>7</td>
</tr>
<tr>
<td>Mucinous</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Unspecified</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>14</td>
<td>488</td>
<td>502</td>
</tr>
</tbody>
</table>


**Breast Awareness:** Five of the 27 studies looked at awareness of breast cancer in Yemen. The total participants were 1435 women. Two studies were conducted in Sana’a, another two studies were conducted in Hadhramout and one study took place in Aden. Overall, the awareness of breast cancer in all studies was very poor. Only 11%-17.4% of Yemeni women practiced BSE in some studies. Only 1.6% of women had been screened by a mammogram test (Table 5).

**Table 5. Characteristics and outcome of Breast awareness studies in Yemen**

<table>
<thead>
<tr>
<th>Author/s</th>
<th>No of participants</th>
<th>Study Design</th>
<th>Study location</th>
<th>Age (Mean±SD/Range)</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bawazir et al. (2018)</td>
<td>317</td>
<td>Cross-sectional</td>
<td>Hadhramout</td>
<td>31.9±10.2</td>
<td>Only 30.3% were practicing self-breast examination. Only 1.6% had been screened by a mammogram test.</td>
</tr>
<tr>
<td>Al-Sakkafe and Basaleem (2016)</td>
<td>400</td>
<td>Cross-sectional</td>
<td>Aden</td>
<td>26.5±5.6</td>
<td>89% never performed any screening.</td>
</tr>
<tr>
<td>Ahmed (2010)</td>
<td>425</td>
<td>Cross-sectional</td>
<td>Hadhramout</td>
<td>21.4±1.6</td>
<td>Only 17.4% were performing BSE.</td>
</tr>
<tr>
<td>Al-Naggar et al. (2009)</td>
<td>105</td>
<td>Cross-sectional</td>
<td>Sana’a</td>
<td>32.13±7.17</td>
<td>About 24.7% of female physician sent the patients for mammogram screening every year regardless of the patients’ history or symptoms.</td>
</tr>
<tr>
<td>Alwabr (2016)</td>
<td>103 case 103 control</td>
<td>Case-control</td>
<td>Sana’a</td>
<td>20-70</td>
<td>In the control group 83.5% of women not practiced BSE. 66% practiced in the intervention group.</td>
</tr>
</tbody>
</table>
Discussion

Breast cancer in Yemen: Breast cancer is the most common cancer and the foremost cause of cancer death among women in Yemen. Breast cancer is the most common cancer (16.6%) of all cancers and of all female cancers (30.3%) in Yemen. Local studies from the Sana’a, Aden and Hadhramaut regions of Yemen reported that breast cancer was classified as the number one cancer among Yemeni women.

In Sana’a-Yemen, Al-Thobhani et al. (2001) reported that breast cancer ranked first among Yemeni women and accounted for 8% of all cancers. Another study from the National Oncology Centre (NOC) in Sana’a reported that breast cancer was the commonest cancer among Yemeni women (21%)\(^6\). A large study, which included 2654 breast cancer patients from all governorates in Yemen reported that breast cancer represented 22% of all women’s cancer \(^7\). Yet another study from Sana’a found that breast cancer represented 26.9% of women’s cancer \(^8\).

A study reported that the incidence of breast cancer was 23.3%\(^8\). A study about breast cancer in Aden-Yemen found the breast to be the most prominent site of cancer among women in Aden \(^9\). Another population study by the Aden Cancer Registry found 334 women breast cancer patients in Aden \(^2\). A more recent study from Aden, which analyzed data from across 15-years, reported that breast cancer was the most common cancer among women with an incidence rate of 30.0% \(^10\). A study from Hadhramut-Yemen reported that breast cancer accounts for 22.4% of cancer cases in women \(^11\). Ghouth and Bafageer (2006) reported that breast cancer accounted for 14.37% of all cancer cases registered in Hadhramut, Yemen.

Breast cancer geographical distribution: In terms of breast cancer cases based on geographical location, the highest cases were reported in Hadramout (N=956), followed by Sana’a (N=454), then Taiz (403), while only three cases were reported in Shabowah. This substantial variation in the numbers of breast cancer cases reported across Yemen may be explained by where most of the research was undertaken and where the cancer registries are located. More specifically, 12 of the studies were conducted in Sana’a, 9 studies were conducted in Aden and 6 studies were conducted in Hadramout.

Breast cancer incidence: Accurate cancer incidence in Yemen is unknown due to lack of pathological and epidemiological resources, as well as the shortage and poor quality of medical records. Furthermore, political uncertainty, civil war and armed fights, have all contributed to the ambiguity of breast cancer incidence. However, studies have estimated the age-standardized rate (ASR) of breast cancer. For instance, Aden’s Cancer Registry reported the five years (2002-2006) age-standardized rate (ASR) of breast cancer as 9.6/100,000 females\(^2\). The higher rate was reported according to the International Agency for research on cancer that breast cancer incidence rates in Yemen are (20.8/100,000)\(^12\). The Globocan has estimated a higher rate of 27.4/100,000 Yemeni females\(^1\). Jordan has shown a more gradual increase in breast cancer incidence, from 32.8/100,000 to 40.1/100,000 to 61/100,000\(^13,14\). ASR rates were higher \([55.9/100,000]\) among women in Bahrain, 50.1/100,000 women in Kuwait. The lowest ASR was reported in Mongolia (8.0 cases per 100,000).

Cancer registry in Yemen: Cancer registry remains as the main challenge in Yemen, in the absence of national cancer surveillance. In Yemen there are four cancer registries, each working separately without full coordination and collaboration: the Aden Cancer Registry (ACR), the cancer registry at the National Oncology Center (NOC) (Sana’a), Hadhramout Cancer Registry (Hadhramout), and Taiz Cancer Registry (Taiz). No comprehensive national study has been conducted in Yemen that includes all of the cancer registries, teaching hospitals and other oncology centers that treat breast cancer patients. No national cancer-specific statistics are available and studies on cancer patterns are urgently needed. Furthermore, there is no accurate data-base for breast cancer incidence. Most of the studies conducted in Yemen are hospital-based or in a single cancer registry. Further challenges in Yemen are the advanced stage at presentation, the financial burden of treatment, insufficient medical staff training, and the psychological support of cancer patients. Cancer registries in Yemen often struggle with insufficient health services, transient populations, lack of finances, lack of qualified workforces, inadequate or imprecise data, and difficulty in establishing a trustworthy and reasonable cancer registry in the nation \(^5\). The average age at first birth among Yemeni women have their first baby at 20 years old, which is approximately a decade younger than women in developed countries \(^15\).

Yemen culture and breast cancer: There are special and unique reproductive factors among Yemeni women that may act as breast cancer-protective factors: age
married, parity and length of time spent breastfeeding. Yemeni women, as a socially accepted practice, tended to marry at a young age. Yemeni women had higher parity, with an average of 6 children per woman, compared to countries like Australia, the USA and the UK where the parity was approximately 2 children per woman. The average woman in Yemen breastfed her child for about 22 months. Much evidence-based research supported our argument here, that these reproductive factors among Yemeni women may have a protective effect against breast cancer. These differences in fertility may also result in differences in lifetime duration of breastfeeding which have a protective effect. It has been reported that breastfeeding 12 months reduces the risk of breast cancer by 4%. Furthermore, Ma et al. (2006) found that each birth will reduce the risk of breast cancer by 11%.

In other hands, there is evidence that cultural concerns among Yemeni women regarding breast cancer included fear and worry, shyness, seeking traditional medicine, inability to fund travel expenses for treatment abroad and lack of awareness. Other cultural norms in Yemen for not seeking the treatment earlier seem to be illiteracy, cultural shame and the male-dominant culture. For instance, a woman may hide her illness from her husband because of fearing that he may divorce her. The influence of these cultural norms are worthy of further investigation.

Age: The dominant age of Yemeni women with breast cancer is less than 50 years. This is similar to the mean age of women in Pakistan was 48.6 years. A similar finding reported that 75% of Arabic women, following a similar pattern to that reported in our systematic review, have presented with breast cancer before 50 years of age. However, only a third of women in developed countries are diagnosed before the age of 50 years. A possible explanation is a larger proportion of younger age groups in developing countries.

In developed countries, 50% of all women with newly diagnosed breast cancer are older than 63 years, while in many developing countries women with breast cancer are predominately younger than 50 years of age. This shows that breast cancer presents on average 10 years earlier among women in developing countries, including Arabic countries, compared with women in developed countries.

Lifestyle and genetic risk factors: There was only one study conducted in Yemen looking at the risk factor of breast cancer patients. Early menarche, late menopause, family history, stressful life events, and smoking were the risk factors identified. Furthermore, a reduction in breast cancer risk was found among women who breastfed their babies for two years. Many breast cancer risk factors are well-known and well-established in the existing literature such as menarche at an early age, late age at first birth, nulliparity, low parity and late menopause. Long duration of breastfeeding has been confirmed as being protective against breast cancer. Physical activity has also been shown to reduce the risk of breast cancer. However, drinking alcohol is one of the risk factors. Furthermore, there is a well-established association between high socioeconomic status women and the risk of breast cancer.

Other risk factors are dietary fat intake, hormone replacement therapy and oral contraceptives. However, the most significant risk factors for breast cancer are being a woman and growing older. Also, exposure to artificial light at night is one of the risk factors for breast cancer.

Diagnosis and pathology: The highest stage of breast cancer among Yemeni patients was stage II and the lowest was stage I. Two of the studies reported that the patients presented with a large size tumor. Similar findings reported that advanced stages are commonly seen among Gulf women.

Two studies investigated the pathology of breast cancer in Yemen. The first study was conducted in Aden, Yemen. A total number of 118 patients were investigated in this study with late stages, stage III (n=54) and stage IV (n=64), of breast cancer. The majority of the patients were in their reproductive age, from 30 to 49 years old.

The second Yemeni study included data from all fine needle breast biopsies, excisional breast biopsies, and biopsies of mastectomies. The highest case diagnoses were fibroadenoma (30.1%), followed by fibrocystic disease (27.4%), then invasive carcinoma (20.1%) and lastly breast inflammation (13.1%). Fibroadenoma had the highest incidence among younger ages group 11–20. However, carcinoma cases reported the highest incidence in the older age group 41–50 years (34.2%).

Left breast vs. right breast cancer: This review shows that the more common breast affected with cancer is the left breast, with 1005 patients affected. Comparatively, 787 patients were affected in the right breast. Only 26 patients were affected in both breasts. A
global pattern showed that breast cancer more commonly occurs in the left compared to the right breast and several publications have supported these findings. The possible explanation is not clear, however, different sizes of breasts, nurses favoring examination of the left breast, greater convenience for a woman to check her left breast compared to her right breast, brain structure and detection.

**Treatment:** This review reported that the most common type of surgery performed on breast cancer patients in Yemen was the modified radical mastectomy (N=211), financial constraints tend to result in lower use of breast conservative surgery in Yemen. Mastectomy remains an effective surgery in metastatic breast cancer. This study showed that breast surgery lowers the risk of death by 28%. Most Yemeni women are diagnosed with breast cancer at a late stage, so mastectomy is an essential surgery. As mastectomy is a scarring surgery, immediate reconstruction surgery may help Yemeni women to cope with their diseases in terms of body image and feminism. However, a few barriers to constructive surgery are of concern such as access to the health care system, cost of surgery and the most painful and important barrier is fear of further surgery.

**Quality of life studies:** Only one study investigated the quality of life among breast cancer patients in Yemen. This study was a cross-sectional study of 106 female breast cancer patients who were chosen randomly from the National Oncology Centre (NOC) Sana’a, Yemen. The study showed that educational status, BMI, income, histological grade, years after diagnosis, surgery and radiotherapy significantly impacted the quality of life of women with breast cancer.

**Histological characteristics:** This review showed that the most common type of breast cancer among Yemeni women is invasive ductal carcinoma, followed by invasive lobular carcinoma. Similarly, for Arabic women, invasive ductal carcinoma is the most frequent pattern followed by invasive lobular carcinoma. This pattern is also reported in developed countries.

**Biomarkers:** Only two studies investigated the biomarkers and hormones among breast cancer women in Yemen. A study found that there was a significant increase of the prolactin level in breast cancer patients compared to those healthy women in the control. The study suggested a relationship between prolactin levels and breast cancer among Yemeni women. The second study assessed the Her2/neu, ER, PR, and P53 among cases compared to the control group. The study found that there are high rates of positive expression of ER, PR, Her2/neu, and P53 among ductal carcinoma patients. This systematic review showed that there are high rates of positive expression of ER, PR, Her2/neu and P53 among Yemeni women. The prevalence of HER2 in Yemen was 30.6%. A higher prevalence of HER2 (40%) reported in Emirati women. Lower prevalence of HER2 reported in the US [7.1%], 5% in Europe and 13.7% in Asia.

**Addressing the delay:** A recent study using data for the period 2007-2009 from the cancer center in Aden indicated that the case fatality rate over that two years was 8.5/100 breast cancer patients with a late-stage presentation. This study suggested several factors that may have contributed to a high percentage of delayed presentation (stage III and IV): low socio-economic status, miss-diagnosed cases, the belief that it is better to ignore the symptoms, seeking traditional medicine, and insufficient facilities and specialists in Yemen.

**Interventional studies:** Two intervention studies were found related to breast cancer in Yemen. The first study was an interventional education among Yemeni female. Improvement in knowledge was reported among the group who received the intervention. That means education significantly improves women’s knowledge of breast cancer. The second study is a respective randomized controlled clinical trial to compare two method, FNAC and CNB, among Yemeni breast cancer patients. The study showed that CNB showed higher diagnostic accuracy than FNAC.

**Screening and early detection:** The results of this review showed that awareness and knowledge among Yemeni women were very poor regarding breast cancer. Only 11%-17.4% of Yemeni women practiced BSE in some studies. Only 1.6% of women performed the mammogram test, and only 24.7% of female physicians sent their patients for mammogram screening every year regardless of the patients’ history or symptoms. Similar findings from neighboring countries reported that the motives for less use of breast cancer screening services were inadequate knowledge, stigma and cultural beliefs.

Early detection is the foremost determinant factor of survival, which is reliant on awareness of and screening for breast cancer. However, breast cancer awareness is
very poor in Yemen\textsuperscript{10,46,47} and limited studies have been conducted in different parts of Yemen.

**Conclusion and Recommendations**

Yemen has been characterised by three decades of scattered, fragmented and poor quality of breast cancer research. Therefore, there is a need to establish a breast cancer research center in Yemen to cover all breast cancer research aspects in Yemen and to build bridges for collaborations globally. Poor knowledge and late presentation are the major issues. Therefore, there is an urgent need to educate the public through all available and reachable media and improve the basic oncology services for cancer patients.

**Ethical Clearance:** Taken from The Research Ethical Committee (REC) Ref. Number: HU 2019/322-Date: 24 January 2019 Al-Hikma University Sana’a, Yemen.

**Source of Funding:** Self funding

**Statement Conflict of Interest:** The authors declare that there are no conflicts of interest.

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Occupational Status and Educational Stage as a Valuable Factors Affecting Knowledge and Perception Level of Indonesian Tuberculosis Patient

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Abstract

Introduction: Indonesia has the second highest prevalence for Tuberculosis (TB) cases, with approximately two-thirds of the patients undiagnosed. Some research had investigated several aspects supporting TB new case finding a program, such as knowledge and perception while factors that affect those aspects e.g., occupational status and educational stage have not been much researched yet in Indonesia.

Objective: This study aimed to identify the level of knowledge and perception regarding tuberculosis and their correlation with occupational status and educational stage.

Method: An observational analytic study with the cross-sectional design conducted. A total of 51 pulmonary TB outpatients were collected and interviewed. A questionnaire was designed to obtain comprehensive information about the variables studied which consists of patient’s demographic status (age, gender, occupational status, and educational stage), along with patient knowledge and perception regarding tuberculosis. Parameters of patient understanding and perception classified as good or low based on average score.

Results: The result was analyzed using Coefficient Lambda revealing a significant correlation between occupational status with a level of perception (r = 0.421, p = 0.025), while no significant correlation for the level of knowledge (p = 0.000). Spearman analysis found significant correlation between last educational stage with level of education (r = 0.569, p = 0.000), while no significant correlation for level of perception (r = 0.200, p = 0.159).

Conclusion: Occupational status is an essential factor for enhancing the knowledge level of TB patient, and last educational stage is a valuable factor for intensifying level of perception of TB patient. These results will provide information for government along with healthcare workers to enhance effective health promotion program regarding knowledge and perception for tuberculosis.

Keyword: Tuberculosis or TB; Occupation Status; Level of Knowledge; Level of Perception.

Introduction

Indonesia has the second highest prevalence for Tuberculosis (TB) cases with 1,017,378 new active TB cases found in 2015¹ and approximately two-thirds of the patients undiagnosed with care status of them remained unknown². This high burden disease is the third leading contributor of all mortality and four most top cause for disability-adjusted life years (DALYs)²³. Delay in diagnosis and case detection are factors that promote this condition⁴⁵. To resolve those problems and reduce the high burden of TB, Indonesian government implemented the Directly Observed...
Therapy, Short-Course (DOTS) strategy recommended by The World Health Organization (WHO) since 1995(6), which emphasizes passive case finding(7). This program successfully applied in 100% Puskesmas as primary health care in Indonesia, but some challenges remain(6). Furthermore, the ministry of health in 2016 has targeted to eliminate TB nationwide in 2035 and its elimination in 2050. The definition of TB elimination is if only 1 per 1,000,000 population suffers from TB(1).

Effective implementation of DOTS strategies are needed to obtain the target and resolve the matters. One of the government targets is increasing tuberculosis case detection rate (CDR). The reason on why the TB CDR is still low might be due to lack of awareness aggravated by only 20% of patients received diagnostic capacity at the health center where they first sought care(2, 8). The lack of awareness delays the patients from visiting TB health center(9).

In Indonesia as well as another developing country in South East Asia, TB patients are known to avoid or seek late care, due to the misconception of famous TB etiologies such as sharing utensils, hereditary transmission and smoking(10, 11). This data supports that the lack of awareness is still a problem. Furthermore, low TB awareness level leads to lack of health-care-seeking behavior(4, 12). It will contribute to the unfortunate outcome of the DOTS program, which depends significantly on passive case finding(7). Several factors affecting community awareness and DOTS program outcome inspected by many research across different regions and populations in Indonesia. The factors that were reported to have a significant correlation with the success of DOTS program, especially in new case finding a program by increasing the community awareness, our knowledge and perception(13-15). Understanding patient knowledge and perception as precursor aspects in effective TB control is the vital step to help shed more clarity on the reason why case detection and diagnosis in DOTS may be inadequate in Indonesia. Therefore, this study aims to identify the level of knowledge and perception regarding tuberculosis and their relationship with occupational status and educational stage and to provide information for government along with health workers to enhance effective DOTS programs in Indonesia.

Method

Setting: This study organized in TB outpatients’ clinic from 1 private hospital and 2 government TB health care centers (Siti Khodijah Hospital Sidoarjo, Medaeng Community Health Center, and Taman Community Health Center) in Sidoarjo city. The TB outpatients’ clinic were selected based upon caseload and their willingness to participate in the study. They cover more than 50% TB patients for each center, represent both types of the TB care center in Indonesia, and reflect the socio-demographic characteristics of Sidoarjo TB patients.

Design: An observational analytic study with the cross-sectional design conducted. A total of 51 pulmonary TB outpatients were collected.

Study Population: The subjects were collected using total sampling. The study included all new case TB patients (pulmonary or extra-pulmonary TB) aged 15 years or older who were diagnosed with active tuberculosis on treatment, defined according to The Ministry of Health Indonesia(3) and had started the TB treatment category one according to national guidelines(3). Patients who refused to take part in the survey or having communication problem were excluded. The sample size was calculated, taking into account the prevalence of TB treatment category 1 with an alpha error of 5% and power of 80%.

Study conduct and data collection: All TB patients from September 2018 until February 2019 (6 months in line with category 1 TB treatment program)
diagnosed in the TB health care center were selected for the study. Data were collected by research assistants and nurses using an anonymous questionnaire. The research assistants were final year medical students. The nurses were staff members of the TB health care center and were responsible for actively searching for cases and controls to collect the data. An Indonesia version of the questionnaire was developed from the previously validated questionnaire\(^{18, 19}\) and pre-tested by Faculty of Medicine Universitas Muhammadiyah Surabaya, Indonesia. Adjustments were made after assembling a focus group discussion of all health worker participating in the study with expert advice from a Pulmonologist.

Data on the knowledge of the cause, prevention, and transmission of TB and the perception of TB treatment was collected. The questionnaire was divided into two main sections: (1) Knowledge; and (2) The perception of TB.

The questionnaire was designed to collect comprehensive information and filled individually, taking approximately 15 minutes to complete the questionnaire, accompanied by a research assistant personally to reduce bias. The questionnaire consisted of closed-ended questions. Items for knowledge contain a total of nine questions which include four domains: general knowledge; mode of transmission; causes; and prevention (table 1). Items for perception contain fourteen questions which consist of two domains; aversion to treatment and negative perception towards TB treatment as individual and in social life (table 1). Socio-demographic characteristics studied included gender, age, marital status, level of education, and occupational status. Data for the first time TB diagnosis were made and the duration of treatment already obtained were added to confirm inclusion criteria.

Data analysis: Descriptive analysis was used for patients’ socio-demographic information, knowledge, and perception toward TB, and it consisted of frequency counts and percentages. Quantitative data were summarized as mean ± SD or 95% Confidence Interval. Qualitative data were summarized as percentages. A Statistical Package for Social Sciences (SPSS) version 25.0 (IBM Corporation, New York, USA) was used for the data entry and the data analysis. Parameters of patient knowledge and perception were classified as good or low based on average score. Coefficient Lambda analysis was used to evaluate the effect of occupational status on knowledge and perception level. Spearman analysis was used to appraise the correlation of last educational stage on knowledge and perception level. The level of statistical significance was defined as p value.

Ethical Consideration: The questionnaire was submitted for ethical review. The study was approved by the Regional Committee for Medical Research Ethics of Sidoarjo Regency and the Medical Research Ethics Committee, Universitas Muhammadiyah Surabaya. The purpose was explained in details to each patient agreeing to participate in the study, and oral informed consent was obtained before interviews. In this study, we strictly ensure the confidentiality of the study respondents.

Results

Respondents’ Profile: The demographic and socio-economic statistical characteristics of this study are shown in Table 2. The total number of patients TB were 51 aged 21-72 years old with the characteristic of respondents based on age grouping are productive age groups (18-49 years), consists of male 29 (56.9%) and female 22 (43.1%). The average age of the respondents was 43.39 years, and most respondents were 55 years old, with a standard deviation of 13.6. Most of the respondents had been married 42 (82.4%). The result found that one-third of patients were unemployed (37.3%). The major educational stage was senior high school as many 32 (62.7%) of TB patients and the other was 9 (17.6%) junior high school, 7 (13.7%) elementary school, 2 (3.9%) diploma and degree, and 1 (2 %) no formal education.

Respondents’ knowledge and perception regarding TB (general knowledge, mode of transmission, causes, and prevention): The level of knowledge and perception regarding TB (general knowledge, mode of transmission, causes, and prevention) are shown in Table 3. Mean score was used to determine the level of knowledge. The data was categorized as good or low based on mean score. The data shows that the mean score of knowledge is 8, and the mean score of perception is 12. If the mean score of knowledge is more than 8, it is categorized as good knowledge or knowledgeable, and if the score is less than 8, it is categorized as low knowledge or lack of knowledge.

The same method was used to determine the level of perception. If the mean score of perception is more than 12, it is categorized as a good perception, and if the score is less than 12, it is categorized as low perception. This
study found that nearly two-fifths of the respondents could be concluded into lack of knowledge 19(17.6%), whereas a quarter of the respondents 10(19.6%) have a low level of perception.

Graphics-1 shows that the most incorrect answer chosen by the patient was questioned number 1, 3, and 4. Number 1 shown the agent of the disease. It can be concluded that many of the respondents did not know that the agent of the TB disease is bacteria. Number 3 and 4 shown the mode of transmission of TB. It can be assumed that the mode of transmission of TB disease still needs to be mentioned in the prevention of TB socialization.

A Spearman’s rank-order correlation was run to determine the relationship between the last educational stage on knowledge and perception level. There is a strong, positive correlation between last educational stage on level of knowledge, which was statistically significant (rs = 0.569, p = 0.000) whereas no statistically significant correlation with level of perception (rs = 0.200, p = 0.159) (Table-4).

Coefficient Lambda analysis was used to evaluate the effect of occupational status on knowledge and perception level. The lambda value to determine the correlation between occupational status on knowledge level was 0.000, suggesting that there is no association, while lambda value to determine the relationship between occupational status on perception level was 0.421 (p = 0.025) suggesting that there is a good association between two variables (Table-4).

**Table 1. Question items in Questionnaire**

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Perseption</th>
</tr>
</thead>
<tbody>
<tr>
<td>The cause of TB is bacteria</td>
<td>TB is life threatening disease for me</td>
</tr>
<tr>
<td>TB is a contagious disease</td>
<td>TB is caused by a curse</td>
</tr>
<tr>
<td>TB is an airborne disease</td>
<td>I have made sin therefore I got TB</td>
</tr>
<tr>
<td>TB patient should dispose sputum in a close container</td>
<td>TB treatment is available at Puskesmas</td>
</tr>
<tr>
<td>Closing mouth while coughing to prevent transmission</td>
<td>TB patients must be isolated from the community</td>
</tr>
<tr>
<td>TB is easily spread in a crowded house</td>
<td>TB needs serious treatment</td>
</tr>
<tr>
<td>TB should be treated for at least 6 months</td>
<td>I have to follow the treatment routinely</td>
</tr>
<tr>
<td>TB is diagnosed by sputum examination</td>
<td>I can be cured if I treated at Puskesmas</td>
</tr>
<tr>
<td></td>
<td>I am afraid if people gossiping me when I go to Puskesmas</td>
</tr>
<tr>
<td></td>
<td>I am afraid that my disease interfered my social life</td>
</tr>
<tr>
<td></td>
<td>I am afraid losing my job because of my disease</td>
</tr>
</tbody>
</table>

**Table 2. Demographic and socio economic characteristics of TB patients (n = 51)**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>N (%)</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>29(56.9)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>22(43.1)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>43(13.6)</td>
<td></td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Had been married</td>
<td>42(82.4)</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>9(17.6)</td>
<td></td>
</tr>
<tr>
<td>Occupational Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>32(62.7)</td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>19(37.3)</td>
<td></td>
</tr>
<tr>
<td>Educational Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No formal education</td>
<td>1(2)</td>
<td></td>
</tr>
<tr>
<td>Elementary School</td>
<td>7(13.7)</td>
<td></td>
</tr>
<tr>
<td>Junior High School</td>
<td>9(17.6)</td>
<td></td>
</tr>
<tr>
<td>Senior High School</td>
<td>32(62.7)</td>
<td></td>
</tr>
<tr>
<td>Diploma, Degree or above</td>
<td>2(3.9)</td>
<td></td>
</tr>
</tbody>
</table>
Table 3. Respondents’ knowledge and perception regarding TB (n = 51)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Mean Score</th>
<th>Category</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondents’ knowledge</td>
<td>8</td>
<td>Good</td>
<td>42(82.4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low</td>
<td>9(17.6)</td>
</tr>
<tr>
<td>Respondents’ perception</td>
<td>12</td>
<td>Good</td>
<td>41(80.4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low</td>
<td>10(19.6)</td>
</tr>
</tbody>
</table>

Table 4. Correlation between occupational status and educational stage on knowledge and perception level: precursor aspects in effective TB program

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Level of knowledge</th>
<th>Level of perception</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational stage</td>
<td>Spearman’s rank-order correlation $r = 0.569$, $p = 0.000$</td>
<td>$r = 0.200$, $p = 0.159$</td>
</tr>
<tr>
<td>Occupational status</td>
<td>Coefficient Lambda</td>
<td>$p = 0.000$</td>
</tr>
</tbody>
</table>

Figure 1. Incorrect answer for level of knowledge question

Discussion

The socio-demographic analysis found that men look more risk factor than women in TB infection. This result correlates with Gender differences in tuberculosis diagnosis, treatment and research outcomes in Victoria, Australia, 2002–2015 that found many TB patients in men compared to women(20), this fact might be due to women that may be reluctant to go for diagnosis because of fear of stigma in the event they are diagnosed with TB(21).

In this study, perceptions and knowledge about tuberculosis were low. Some of the main factors in TB knowledge and perception are identified. The prevalence of low TB knowledge is high in the general adult population, with a greater magnitude among men than among women. The high prevalence of low TB knowledge and perception in the general population may indicate that up-to-date information and health education about TB are inadequate and do not handle the target population correctly. This situation is also exacerbated by the fact that the majority of the population in Indonesia live in middle-low socio-economic status, with a high level of formal education or only basic education (senior high school degree), no formal employment or only private workers, with the lowest wealth index, which in turn is related to low TB knowledge.

Many studies have linked the condition regarding the level of education to knowledge and perception
of tuberculosis disease\(^{(22, 23)}\). Some studies also found an association between occupational status and TB disease\(^{(22)}\). The background behind the patient like educational level and occupational status will build an experienced life, which then accumulates into knowledge. Knowledge and its interaction with the values that develop in people’s lives will forming patterns of behavior and attitudes of society, particularly to a stigmatized disease.

However, there are also studies that reveal different things. Research in Sabah revealed there was no relationship between educational level and perception\(^{(23)}\). Other research on Kazakhstan revealed the same thing\(^{(22)}\). Conclusions were obtained in that study, was no significant relationship between occupational status and patient’s perception regarding tuberculosis. Both working and non-working patient have no pattern trends perception. This is because, in the concept of environmental health, work does not affect the formation of perceptions too much\(^{(24)}\). This result is in accordance with research conducted in Kazakhstan; namely, no relationship was found between perceptions with the work and financial condition of the respondent\(^{(22)}\).

It is proven that low community knowledge has an impact on the control of TB disease in an area. One of the causes of the lack of level of knowledge related to TB is the difference in people’s background in a specific area. These backgrounds include age, race, gender, level of education, type of work, socio-economic, and sources of information. This is in accordance with Notoatmodjo’s theory that the factors that influence a person’s level of knowledge include age, level of education, employment, and socio-economic and sources of information\(^{(24)}\).

Whereas in another country, the factors associated with knowledge regarding tuberculosis patients are the level of education, patients are feeling uncomfortable during supervision, and knowledge regarding the information of taking medication. Whereas age, sex, occupational status, and income level are not related to the variable\(^{(25)}\).

The higher association of factors from occupational status with low TB knowledge in this study might be explained by that factor included a large number of housewives, and unemployed. These groups of people are also more likely to have less education, less access to information, and have less exposure to social interactions\(^{(26)}\).

Findings regarding high misperceptions in tuberculosis are comparable with other similar studies conducted in Africa and Asia\(^{(27)}\). Understanding of tuberculosis perception is very important because it may be an indication of the late search for appropriate health and refusal to make appropriate treatment decisions and adherence to treatment. Misperceptions can also lead to stigma, which creates difficulties in involving the community in TB control programs\(^{(28)}\). Health education programs about TB need to address common misunderstandings in the community.

Poor people (low-income quintiles), or less occupational status, have a high prevalence of low comprehensive TB knowledge, and this is in line with research from India\(^{(27)}\). As evidenced by research from Manila\(^{(29)}\), people with low income have a relationship with low health-seeking behavior. The low level of knowledge among the poor in our study exacerbates the level of low health seeking behavior among poor people\(^{(30)}\). Tuberculosis burden is high among poor people with poor living conditions, malnutrition, and exposure to other infectious diseases. This lack of knowledge about tuberculosis in the community will worsen the situation because they will not know how to protect themselves from illness when to seek health care, the need for care, and the importance of adherence to treatment for TB. As a result, this, in turn, will make it difficult to have an effective TB control program. Poor people need to be addressed in health education and information about TB and addressing the problems of the poor will contribute to the effectiveness of TB control programs.

Educational level is strongly associated with a comprehensive level of tuberculosis knowledge, and uneducated people and those who only have basic education have a high chance of low comprehensive knowledge. This finding is supported by other similar studies\(^{(31)}\). In the other hand, the government should not underestimate the program for higher education or knowledge regarding TB, because patients with greater knowledge about TB were also can be delayed in seeking a diagnosis of their TB status\(^{(32)}\). The explanation might be that educated people have more access to various sources of information and easily understand more complex messages. Increasing the level of education in the community will increase general knowledge about infection control, including tuberculosis and general public health. Analysis of secondary data used in this study can be influenced by unknown boundaries related
to data collection method and primary data sampling procedures.

**Conclusion**

The level of knowledge in some important curriculum of the TB disease, such as mode of transmission, still needed to be improved by a health worker who doing health education regarding TB as health promotion to prevent the transmission of the disease. Nearly a quarter of the respondents were lack of perception, proved that the community perception level in the working area is still relatively low and need to be improved. Data shows that occupational status is an essential factor for making health promotion to enhance the level of knowledge for TB patient and last educational stage is a valuable factor for increasing the level of perception of TB patient. Health workers should give more attention regarding health promotion to patients with unemployed status and low educational stage. If the level of knowledge and level of perception of TB patient increased, DOTS program including health promotion will achieve a better outcome because of the community more aware of TB. Therefore, the problem of TB patients which known to avoid or seek late care due to a misconception can be decreased or resolved.

**Conflict of Interest:** There is no conflict of interest to declare.

**Acknowledgment:** The authors thanks Sidoarjo Regency Department of Health for the governmental support; Head and health workers of Siti Khodijah Hospital Sidoarjo, Puskesmas Taman and Puskesmas Medaeng for their willingness and helpful support collecting the data; Dean, staff and medical students as research assistant form Faculty of Medicine Universitas Muhammadiyah Surabaya for their helpful support regarding the study and manuscript. We would like to express our sincere thanks to the Indonesia Tuberculosis International Meeting (INATIME) event which facilitated us to present this research on 5-7 April 2019 at Surabaya, Indonesia.

**Funding:** None

**Data Availability:** The data set used and/or analyzed during the current study are available from corresponding author on reasonable request.

**Ethics Statement:** All procedures performed in studies involving human participants were in accordance with the ethical approval of Regional Committee for Medical Research Ethics of Sidoarjo Regency, Indonesia and the Medical Research Ethics Committee, Universitas Muhammadiyah, Surabaya, Indonesia.

**Reference**

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Family Based Rehabilitation: Pressing Priority for Rehabilitative Needs of Chronic Patients in COVID Times

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Abstract

The health care sector is currently facing twin burden, the impact of coexisting diseases as well as the pandemic of corona virus. The importance of commencing Neuro rehabilitation as early as possible is now well appreciated and accepted with adequate supporting evidence. However, it is also a fact that proper & prompt rehabilitation services are often deficient in majority of developing countries. With the ever-increasing burden of those affected with the highly infectious disease COVID-19, venturing to Physiotherapy OPD for routine rehab care is not at all safe for the already vulnerable clients.

At this point of time, family members can function as an extension of health care system by co-ordinating and contributing by participation, in the rehabilitation as directed by the therapist via telemmedicine. Remote delivery of Physiotherapy through guided family-based approach is an ideal model to support on-going Physiotherapist’s services during this period, especially in the most vulnerable clients.

Keywords: COVID 19, Family Based Rehabilitation, Tele-medicine, Neurological Disorders.

Introduction

The health care sector is currently facing twin burden the impact of coexisting diseases as well as the pandemic of corona virus. To add more gravity to the already grim situation is the fact that WHO has documented a massive burden associated with neurological disorders and has supplanted that neurological services and resources are disproportionately scarce, especially in developing & low-income countries.

The importance of commencing Neuro rehabilitation as early as possible is now well appreciated and accepted with adequate supporting evidence. However, it is also a fact that proper & prompt rehabilitation services are often deficient in majority of developing countries. Policy makers and health care providers may be under prepared to cope up with the predicted rise in the prevalence of neurological and other chronic disorders and the disability resulting from the extension of life expectancy and ageing of populations globally. The situation is further made grim by the fact that neurological dysfunction is linked to cardiopulmonary deficits due to impaired mobility and functioning, aging leading to deprived cardiopulmonary endurance and deconditioning. All these factors make early initiation of therapy and thereby movement imminent.

With the ever-increasing burden of those affected with the highly infectious disease COVID-19, how safe is it for everyone to step out? The question might be rhetoric, but the problem deserves an appropriate solution.

When faced with such a rampant contagion scenario, how wise and humane is it to expect our neurologically affected patients to get treated on an OPD basis, amidst all this? Because venturing to Physiotherapy OPD for routine rehab care is like asking the already vulnerable clients, who already are going through turmoil in their internal system, to further risk the external ailments in their stride.

With much of the country paralysed by fear and frustration, the circumstances could be potentially damaging to health as staying home with little to no social interactions not only would halt the recovery but also has proven to increase the risk of developing mental health conditions such as depression and anxiety.
“The fallout from the pandemic – job losses, prolonged stress and a deterioration of mental health – will be felt by families for years to come,” said UNICEF Chief of Early Childhood Development Dr. Pia Rebello Britto. This is not an unknown fact that number of cases are staggeringly increasing, good immunity is required to fight the pandemic. This is only possible with an obvious social distancing, in addition to which, overall fitness & nutrition also play a crucial role.

Community transmission as an impending risk, travelling up to the physiotherapist itself can summon the virus. Queuing up at hospitals or clinics may expose people to sit or stand a chance for others to get infected. Older adults are at a significantly increased risk of severe disease following infection from COVID-19.

Patients with neurological deficits as important as they need rehabilitation can’t ignore the fact that their health condition taking a toll on their immune system. Getting immunity jeopardized at this peak of hour by discontinuing rehabilitation at physiotherapy OPD/clinic & resting at home is no wise man’s decision! The possible steps to ensure safety at both ends & mitigate the virus and create a sterile environment for every patient in the OPD/clinic are economically exhausting. If we can change our shopping pattern during the pandemic alarming situation, why cannot we change our treatment patterns? This calls for the rising need for family-based rehabilitation (FBR).

**Discussion**

Family being an essential key in this integrated process necessitates more and more therapists to come up with this structured approach, so that this helps us reach to masses and downsize the suffering through neurological disorders to a great extent without imperilling our patients. Continuity being an important part of process of Neuro-rehabilitation, effective strategies can be implemented to integrate family into achieving the patient outcomes as far as possible.

At this point of time, family members can function as an extension of health care system by co-ordinating and wholeheartedly participating in the exercise regime as directed by the therapist via telemedicine. This era of time where technology meets health is a boon to most of us taking care of financial cost as it poses both a real and perceived barrier to the application and adoption of Tele rehab.

Delving on the different forms of rehabilitation family based tele-rehabilitation has the potential to prove to be the most effective for intense long-term rehabilitation of individuals with neurological ailments. This treatment model can be inexpensive but effective and can be encouraged to practice in rehabilitating various neurological disorders.

Family-based in-home treatment can effectively meet the needs of client as well as the care givers struggling with the dual challenges preventing the infection as well as providing optimum therapeutic care.

Hence in current uncertain times demanding a need for social distancing, implementation of Family Based Rehabilitation Models is very important. Remote delivery of Physiotherapy through guided family-based approach is an ideal model to support on-going Physiotherapist’s services during this period, especially the most vulnerable of the clients.

**For optimum efficiency of this regime, some pertinent questions need to be answered before implementation of a Family Based Rehabilitation:**

- Is Family Based Rehabilitation appropriate for this client?
- Does the therapist have the skills and training to provide remote physiotherapy to the patients?
- Are the techniques of Family Based Rehabilitation rooted in an evidence-based approach?
- Can available Assistive Technology be incorporated into rehab regimes to make them more efficient?
- Can some form of support in form of tele-rehabilitation be included for remote proctoring of the management?
- How the immediate and long-term goals for management be stipulated?
- Is the imparted rehabilitation model in sync with the expectations and calibre of the client and the family members?

**Conclusion**

Keeping the families safe and together, the FBR approach places emphasis on the needs of the client as well as the comfort and safety of client as well as the care givers. However, because these programs are relatively new, there is an imminent need to take on diligent and robust research to answer the some of the above-mentioned queries and thereby launch FBR for
management of subjects who require long term care. Not only would it lay down the road map for rehab care plans in case of contingencies but also serve to put forth an ideal adjunct rehab care plan for subjects with varying needs even in times of peace. With appropriate Program design, implementation FBR seems to be a promising model for the future of therapeutic care for chronic patients.

**Ethical Clearance:** Was not obtained (the manuscript is written as a brief theoretical article category for a novel concept).

**Source of Funding:** Self.

**Conflict of Interest:** Nil.

**References**


Spectral Database of Pharmaceutical Common Excipients and Paracetamol API Using ASD Field Spec 4 Spectroradiometer

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Abstract

Adulteration in pharmaceutical products is common all over the world particularly in pharmaceutical oral dosage forms like tablets, gelatin capsules. According to previous studies there were many techniques are available to recognize counterfeit medicines. Near Infrared Spectroscopic techniques is widely used in this area due to its numerous advantages. In this work, we used ASD Field Spec 4 Spectroradiometer having broad spectral range (350-2500 nanometer) and its supporting software’s to create Spectral library of pharmaceutical common drug Paracetamol and some basic excipients used in pharmaceutical industry as formulation process of tablets and capsules and finally also showed the absorption bands of Paracetamol API and Excipients.

Keywords: Active Pharmaceutical Ingredient (API), Nanometer (nm), Near Infrared Spectroscopy (NIR), Spectral Signature, ASD Field Spec4 Spectroradiometer.

Introduction

Counterfeiting of medicine is one of the worst current pharmaceutical burden. In pharmaceutical the counterfeiting of medicine can be type of overdose, under dose or wrong Active Pharmaceutical Ingredient (API) or even with toxic compound added in medicine(1). The issue of counterfeit medicine and adulteration in pharmaceutical formulation is a serious problem all over the world(2,3). According to the world health organization (WHO) approximately 10% of medicines worldwide are substandard or counterfeit, as well as up to 50% medicines purchased from the internet may be of poor quality(4). To figure out this counterfeiting problems in pharmaceutical industry we have to ensure the quality of product qualitatively and quantitatively and for that there were many techniques are available in pharmaceutical industry but we can categorized them basically in Chromatographic, Hyperspectral Imaging, and Spectroscopic technique. Chromatographic technique is widely used in pharmaceutical industry from many decades but this technique has some major disadvantages, due to this reason it shows that from past decades the pharmaceutical industry are taking interest in spectroscopic techniques. In spectroscopic techniques the number of spectroscopic are available like, Near Infrared Spectroscopic, Raman Spectroscopic, UV-VIS, FT-NIR, FT-IR, etc. In previous study, the NIR spectroscopic is widely used and showed his efficiency in pharmaceutical research. As Process Analytical Tool (PAT) NIRS is extensively used to monitor the complete development process of pharmaceutical tablet (6). NIRS is noninvasive and nondestructive feature the sample can be recollected for further analysis or can be used as approval purpose for forensic. NIRS is analytical method and used for analyzing the pharmaceutical material qualitatively and quantitatively(10). NIRS showed many advantages in this area, It is fast, noninvasive and nondestructive technique that helps to provide the physical and chemical information of analyzed samples, identification of various contents available in medicines and pharmaceutical product as well as to detect the counterfeit and substandard medicines and product, due to its massive advantages NIRS showed its acceptance in pharmaceutical domain(7). NIRS is not used only in pharmaceutical industry but also used in various remote sensing applications like Agriculture, Food, Mining, Petrochemical, etc(9) NIRS is a type of vibrational spectroscopy and its range is 700 to 2500 nanometer. The spectra of NIRS is generated due to the vibrations of –CH, -OH, -NH and –SH bonds. NIRS techniques has a limitation that is overlapping of NIR bands and NIR spectra is quite difficult to understand,
to understand this spectra and process on it, the NIRS is combined with chemo metric tools\(^{(11)}\). Chemo metric tools is combination of statistical method, Classification techniques and Regression method that helps spectra interpretation and to improve the variations between the spectra of material given by NIRS. Classification techniques are PCA, SIMCA, PLSR it useful for classification of spectra according to the material and three linear regression method are PCR, PLR, Nonlinear regression model based on ANN is used to determination of concentrations chemical compounds in pharmaceutical field using NIRS. In pharmaceutical application NIRS is mainly used for solid material preparations including tablets, gelatin capsules or powder mixtures for identification and quantification of API components and excipients \(^{(5)}\).

Pharmaceutical tablet is type of solid dosage from it is made by combination of active pharmaceutical ingredients and raw material (excipients substances). API is active ingredient, primary component in a drug producing intended effect on human body, while excipients is an inactive ingredient, secondary components helps for binding and making process of pharmaceutical tablet. Paracetamol or Acetaminophen API is widely used all over the world. It shows its effectiveness for the relief of headaches and other aches, pain and fever, cold and flu in children and adults. Paracetamol can be used with combination of other medication for the management of several pain. Paracetamol is safe if it is used by recommended doses (1000mg per single dose and up to 4000mg per day for adults), overdose of paracetamol can cause liver damage and cannot be safe for alcoholic person \(^{(12)}\). Pharmaceutical material spectral library can be useful for identification of components available on particular pharmaceutical medicine. Spectral library is a collection of spectra’s generated by standard or pure materials comes in the pharmaceutical category. Spectral library can be developed for various applications. In remote sensing domain, spectra is collected by using spectroscopic device and that can be useful for mapping of materials. The developed spectral library can be useful for various applications in remote sensing like, soil, vegetation, mineral, rocks, water, plant, microorganism identification, etc. The purpose of the present work to developed a spectral library by using a device ASDFieldSpec4 Spectroradiometer and standard or pure pharmaceutical excipients and API, that can be used for identification of API and excipients present in the pharmaceutical medicines.

**Material and Method**

**Samples:** The standard Paracetamol drug as an API and the standard Excipients (Microcrystalline Cellulose, Magnesium Stearate, Maize Starch Powder, Tale, Lactose, Sucrose, Sorbitol Powder, Mannitol, Acacia Gum, Hydroxypropyl Methylcellullos) are obtained from Department of Chemical Technology, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (MS), as a gift samples for this research work.

**NIR Spectroscopy:** The previous study has shown that NIR Spectroscopic devices is useful for pharmaceutical research and also helps to develop the spectral library of pharmaceutical materials. To develop the spectral library of Pharmaceutical API and various excipients, ASD FieldSpec4 Spectroradiometer is used that has broad spectral range in between 350-2500 nanometer and it has sampling rate 0.2 seconds per spectrum. ASD FieldSpec4 Spectroradiometer includes three sensors VNIR (350-1000nm), SWIR (1000-1800 nm) and SWIR2 (1800-2500 nm).

**NIR Measurement:** The API and Excipients was collected in air pack bag in 50 gram quantity. ASDFieldSpec4 Spectroradiometer was used for the measurement of pharmaceutical excipients and API in the Multispectral Research Lab, Department of Computer Science and IT, Dr. B.A.M. University, Aurangabad (MS), India. For avoid the disturbance of external light the sample scanning was done using reflectance mode in the completely setup dark room. As a light source Tungsten halogen light matched with Spectroradiometer was used with 45 degree incident angle. Petri dish and black paper having 10mm*90mm was used for sample holder. Standardized Spectralon panel was used to optimized device signals and calibration accuracy and sensors response. Excipients and API sample is place one by one in the petri dish and was collect it spectral signature by using spectral gun. 20 scans were taken per sample spectrum with sampling rate of 1.4 nm per spectrum at wavelength range 350-100 nm and 1.1 nm at wavelength range 1001-2500 nm. The ASDFieldSpec4 device sample scanning time per sample is 100 milliseconds.
Preprocessing of Spectra: All excipients and Paracetamol API was scanned by ASDFieldSpec4 Spectroradiometer and spectral signature of each sample was acquired through RS3 software. For every sample 20 scans was taken and convert it into the single Mean file and this is used for further processing. At beginning, Paracetamol API was taken for preprocessing and statistical analysis. 20 spectral signatures of paracetamol API was taken in the laboratory and viewed by ViewSpecPro software, the signatures are not clearly showing where absorptions and reflectance in bands. All Spectral signature files are putted into ViewSpecPro software and converted into one single file that is mean of 20 scan files and again viewed it in ViewSpecPro software. Fig.2 shows the Mean Spectra of 20 spectral signatures of paracetamol API.

In Fig.2, Splice correction and smoothing is required for the exploration of spectral bands for this 1st and 2nd derivative with 7 as derivative gap was chosen as preprocessing technique. After applied preprocessing techniques on Paracetamol Mean Spectra the Splice correction and smoothing was done, below Figure 3 and 4 shows the Spectral signature of Paracetamol API after 1st and 2nd derivative as preprocessing step.
Figure 3: 1st Derivative Spectra

Figure 4: 2nd Derivative Spectra

Figure 5: Excipients Mean Spectral data
Same process were applied for all the basic excipients. In the first stage we take all 20 scans of each sample and showed it by using ViewSpec pro spectral signature preprocessing software. Second stage, we take all 20 samples scanned Mean file and consider that mean file as a final sample, Fig. 5 showed the all 10 excipients spectral signatures.

Third stage, after observing the Mean spectra of sample we processed it to 1st and 2nd derivative as a preprocessing technique for splice correction and to clearly visualize the Absorbance and reflectance bands in it. Likewise, this same process is applied to all 10 Excipients.

Result and Discussion

In the previous work we observed that the authors used various types of Spectroscopic techniques with having limited Spectral range to show the absorption and reflectance in spectral signature for various pharmaceutical materials. Paracetamol as active component and basic excipients we observed throughout its spectral data and we found absorptions in various bands that we showed in the following Table 1.

<table>
<thead>
<tr>
<th>Table 1: Absorption Bands</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>API and Excipients</strong></td>
</tr>
<tr>
<td>Paracetamol API</td>
</tr>
<tr>
<td>Microcrystalline Cellulose (MCC)</td>
</tr>
<tr>
<td>Magnesium Stearate</td>
</tr>
<tr>
<td>Starch Maize</td>
</tr>
<tr>
<td>Talc</td>
</tr>
<tr>
<td>Lactose</td>
</tr>
<tr>
<td>Sucrose</td>
</tr>
<tr>
<td>Sorbitol</td>
</tr>
<tr>
<td>Mannitol</td>
</tr>
<tr>
<td>Acacia Gum</td>
</tr>
<tr>
<td>Hydroxypropyl Methylcellulose (HPMC)</td>
</tr>
</tbody>
</table>

In Table 1, we can see all the pharmaceutical materials that can be either active ingredients or raw material can be get in the Near Infrared Spectral range that is 750-2500 nanometer (nm). In the table we can see every material has its own spectral absorption bands. Paracetamol API has strong absorptions in the range of 1650-1700 nm and 2250-2400 nm. Likewise Table 1 showed all excipients strong absorption bands.

Conclusion

Spectral bands of various Inactive components and Paracetamol as active pharmaceutical ingredients commonly used as pain killer in pharmaceutical product is showed in this paper and also showed the Spectral library in ViewSpecPro software. In order to identification of components from pharmaceutical oral dosage forms. Paracetamol API as active component and 10 different types of basic excipients (Inactive components) commonly used in tablet and capsules formulation. Spectral data is acquired through ASDFieldSpec4 Spectroradiometer and with the help of its RS3 Spectra acquisition software. After acquisition of Spectral signature for various samples (Paracetamol API and Common Excipients) some preprocessing steps are required as smoothing and splice correction on Spectral database for visualization and exploration of reflectance as well as absorption bands, it was done with the help of ViewSpecPro software that came with Spectroradiometer as statistical and chemometric tool. As Preprocessing techniques First and Second derivative with having 7 as derivative gap is used and the output of spectral database is showed with the help of ViewSpecPro software in the form of figures for every sample.

Acknowledgement: This work is supported by Department of Science and Technology under the Funds for Infrastructure under Science and Technology
(DST-FIST) with sanction no. SR/FST/ETI-340/2013 to Department of Computer Science and Information Technology, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad, Maharashtra, India.

**Ethical Clearance:** Not required

**Source of Funding:** The authors would like to thank Department of Science and Technology for providing the financial support in the form of Inspire Fellowship and University Authorities for providing the infrastructure and necessary support for carrying out the research.

**Conflict of Interest:** Nil

**References**


Evaluation of Eustachian Tube Function on Chronic Suppurative Otitis Media

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Abstract

Introduction: Many literatures reported that poor aeration in the middle ear due to Eustachian tube dysfunction is an important factor that plays a role in causing acute and chronic otitis media.

Objective: To assess Eustachian tube function (ETF) and to confirm Eustachian tube condition during surgery on chronic suppurative otitis media (CSOM) patients.

Method: This study employed a prospective design, in which participants were examined for ETF before and after surgery. The examination used Toynbee’s procedure with impedance audiometry. The examination results were analysed using Pearson’s product-moment test with p < 0.05.

Results: The average patient’s age was 36.27 ± 5.98 years, with an age range of 12 to 67 years. Most participants had no cholesteatoma (59.89%), perforation (50.00%), and experienced conductive hearing loss (54.54%). There was no significant difference between ETF and Eustachian tube during surgery (p = 0.439).

Conclusion: This study reported that most CSOM patient had total impaired ETF with open Eustachian tube.

Keyword: Eustachian tube function, CSOM, Toynbee’s test.

Introduction

Pathogenesis of chronic suppurative otitis media (CSOM) is multifactorial with various overlapping factor. The risk of developing CSOM involves a complex interplay between host immunity and microbial pathogenicity, which in turn is affected by host and microbe genetics, as well as by environmental factors (particularly those that affect risk of exposure to bacteria) and by therapeutic interventions. Previous literatures reported that poor aeration of middle ear due to ventilatory dysfunction of Eustachian tube is a key factor in acute and chronic otitis media¹⁻³.

A normally functioning Eustachian tube is an essential physiological requirement for a healthy middle ear and normal hearing. The three physiological functions of Eustachian tube are pressure regulation (ventilation), protection and clearance (drainage). Pressure regulation can be impaired by failure of the opening mechanism (functional obstruction) and anatomical (mechanical) obstruction. Moreover, anatomical modelling suggests that Eustachian tube narrowing is unlikely to significantly impede gas exchange⁴⁻⁵.

This study aimed to assess Eustachian tube function (ETF) in patient with CSOM using impedance audiometry (Toynbee’s test) before surgery. This study evaluated the Eustachian tube condition during surgery, whether there was obstruction from pathologic tissue...
Materials and Method

Participants: Participants in this study were chronic suppurative otitis media patients. The inclusion criteria were patients diagnosed with chronic suppurative otitis media (5, 6), patients indicated for surgery, and received therapy for ≥2 weeks after surgery. Participant exclusion criteria included tympanometry type B, unreadable ETF, and uncooperative patients. Participants received an explanation regarding their rights and obligations during the research. Participants first filled out informed consent.

Design: This study used a prospective clinical design conducted for 6 months (January to July 2018). There were 22 participants in this study. The researchers conducted an ethics test at the ethics committee of Dr. Soetomo General Academic Hospital, Surabaya, Indonesia, prior to the study. Detailed history was taken and clinical examination and pure tone audiometry was performed. Audiometry pure tone examination used Interacoustics AD226 Clinical Audiometer (Interacoustics A/S, Assens, Denmark) based on standard operational procedures(7). Eustachian tube function was assessed using Toynbee’s test with impedance audiometry using Madsen Otoflex 100 (GN Otomtrics A/S, Taastrup, Denmark). Cases were categorised in normal ETF, partial impaired and total impaired ETF, depending upon tests results(8).

Toynbee’s Measurement: The impedance audiometer is programmed to artificially increase or decrease the air pressure in the middle ear and then record the change of air pressure in the middle ear each time when the patient swallows. The patient was asked to swallow repeatedly and recorded graphically by impedance audiometer. Change of pressure during swallowing was recorded as step ladder type of graph, that is, normal. If some residual pressure persists even after five swallows, the tubal function is considered to be partially impaired. If positive or negative pressure built up by the impedance audiometer cannot be neutralised at all by repeated swallowing, then the ETF is considered to be totally impaired(9).

All study subjects underwent surgery as therapy. During surgery, otologist evaluated the condition of eustachian tube and pathological tissues that affect tubal dysfunction. The condition of eustachian tube is divided into open and closed. Surgery procedures were adjusted to participant diagnosis according to CSOM management guidelines(2, 5, 10-12).

Statistical Analysis: The results of the study were presented in the form of mean±standard deviation (SD) or median (minimum - maximum) and percentage (%). The results were also displayed in the form of tables. Statistical analysis used paired t test or wilcoxon test. Static analysis used IBM SPSS Statistics software version 23.0 (IBM Corp., Armonk, NY, USA). Statistical test results were significant if p < 0.05.

Results

Characteristics of Patients: This study examined 22 participants between age group of 12 to 67 years with CSOM. Male to female ratio was 1:1. The average patient’s age was 36.27 ± 5.98 years, with a median value of 42.27 years Otorrhea was the main complaint in all cases. Most participants were Javanese (17 participants; 77.27%) and the rest were Madurese. This study found 9 participants (40.91%) with cholesteatoma and 13 participants (59.89%) without cholesteatoma. On otoscope, 11 participants (50.00%) had subtotal perforation, 5 participants (22.73%) had central perforation, 5 participants (22.73%) had attic perforation, and 1 participant (4.54%) with marginal perforation. Pure tone audiometry test showed that 12 participants (54.54%) had conductive hearing loss, 5 participants (22.73%) had mixed hearing loss and 5 participants (22.73%) had sensorineural hearing loss (Table 1). The severity of participant’s hearing loss was mostly in the moderate category by 14 participants (63.64%), while the rest was in the mild category (8 participants; 36.36%).

Eustachian Tube Function: The results of impedance audiometry showed that 7 participants (31.82%) had normal eustachian tube function, 3 participants (13.64%) had partially impaired ETF and 12 participants (54.54%) had totally impaired ETF. During surgery, there were 4 patients (19%) with blocked eustachian tube and 18 patients (81%) with open ET. There were no significant differences between ETF and Eustachian tubes during surgery in participants (p = 0.439; Table 2).

Discussion

CSOM affects 65 – 330 million people worldwide, mainly in developing countries. CSOM usually develops
in the first years of life but can persist during adulthood. Studies investigating the relationship between age and otitis media reported that otitis media has its peak incidence and prevalence in preschool years\(^1,2\). The maximum number of participants in this study (9 participants; 40.91%) were in the age group of 21–30 years, while the minimum number of participants (2 participants; 9.09%) were in the age group of 31-40. The age group of 21-30 year as second decade of life is the most active time of one’s life as more people seek medical advice for discharging ear\(^13\). This study examined 5 participants (22.73%) with age over 40, due to patient social economy status and patient knowledge about operation procedure.

Both sexes were equally affected, with 50.00% participants were male and 50.00% participants were female in this study. However, several studies reported that otitis media was more common among males than females. However, when a female patient is in a marriage age (18-20 years), awareness suddenly arouses in the patient and parents to prevent the discredit of discharging ear and hence females pay more attention to discharging ear than the male\(^2,13\).

Subtotal perforation was found in 11 participants (50.00%). Subtotal perforation occurred in pars tensa, a form of central perforation that leaves only the edge of tympanic membrane and safe type of chronic otitis media. Other perforation was central (23%), attic (23%) and marginal (14%). Marginal and attic perforation were dangerous type because it directly contacts to annulus, sulcus tympanicus and mastoid cavity\(^1,2\).

Audiometry result showed conductive hearing loss in 12 participants (54.54%). It was caused by tympanic membrane perforation dan ossicular chain destruction. Mixed and sensoryneural hearing loss were each found in 5 participants (22.73%). Cochlea function may be affected by bacterial toxins percolating through the round window and by direct invasion of pathogenic organism that result in inflammatory response\(^1,2\).

Eustachian tube serves the function of ventilation, pressure balance and clearance of secretions in middle ear. Physiologically, the neutralisation of negative middle ear pressure is brought about by intermittently opening the Eustachian tube and allowing air to pass through it such that the air pressure within the middle ear cavity is brought back more or less to the same level as that of the atmospheric air pressure. The intermittent opening of the Eustachian tube is caused by contraction of tensor palatini and partially the levator veli palatini muscles. These muscles contract during swallowing. Therefore, for assessment of Eustachian tube function, it has to be essentially ascertained whether an artificially increased or decreased middle ear pressure can be neutralised and brought back to ambient pressure by swallowing\(^3,13\).

Tests indicating patency of the Eustachian tube were Valsalva test, Pneumatic otoscopy/Siegelisation, Ear drops test, Nasopharyngoscopy, Tympanometry with Toynbee test. In this study, Eustachian tube function was examined with impedance audiometry with Toynbee test. Toynbee test is the only test which gives idea of Eustachian tube function that is opening and closing mechanism for equalisation of pressure in middle ear. Among all the above-mentioned tests, there are some cons, but only Toynbee’s test gives accurate and reliable results. Hence, Toynbee’s test is considered an ideal test to assess Eustachian tube function\(^3,14,15\).

Normal ETF was found in 31.81% participants and impaired in 68.18% participants, with total impaired in 12 participants (54.54%) and partial impaired in 3 participants (13.64%). This result was similar to a study conducted by Tadke et al. in 2017, showing that in 60 cases of Eustachian tube patency test, there were 39 participants (65%) had normal ETF and 21 (35%) had impaired function. There were differences in the subject studied, as Tadke examined patients with central tympanic perforation and dry ear\(^13\).

Study carried out by different authors showed a variation in the percentage of Eustachian tube function. Normal ETF was observed as 51% by Holmquist showed 16%, Sharp 7.5% and Dutta 26%. This difference may be caused by different method used to evaluate the Eustachian tube function and at different time of disease activity\(^13\).

Shreyas et al. in 2012 mentioned that a modern impedance audiometer offers facility to ascertain the physiological function of Eustachian tube, not only in the intact tympanic membrane but also in the presence of perforation. This audiometer is quick, non-invasive, does not require participant’s compliance, accurate and affordable and it offers the best means of assessing the Eustachian tube function. The results of the tympanometric assessment in their study were 80%\(^16\).

As per study conducted by Priya et al. in 2012, the Eustachian tube function is related to duration, type and
location of tympanic membrane perforation in chronic suppurative otitis media. Impedance audiometry is a simple, non-invasive method to evaluate the Eustachian tube function(15). As per studies conducted by Gimenez et al. in 1993, Xiao et al. in 2006 and Nishant Kumar et al. in 2012, Eustachian tube function is related to duration, type and location of tympanic perforation in chronic suppurative otitis media(14).

Common dysfunction of ET is obstruction as a result of local mucosal changes by otitis media, especially in chronic condition. Obstruction may occur due to pathologic tissue as granulation or cholesteatoma that extend toward Eustachian tube. Toxin or infection product from microbe can cause tubal dysfunction(16).

Condition of Eustachian tube during surgery were quite different from ETF result, as 18 participants (81.82%) had open ET and 4 participants (18.18%) had closed ET. During surgery, evaluation of ET was only conducted on the distal or osseous portion, therefore the researchers could not know the function of proximal or cartilagenous portion. Eustachian tube function (ETF) has been the central focus as a prognostic factor because of its presumed primary role in the pathogenesis of otitis media and in clearance of the middle ear cavity. The success of tympanoplasty depends on many factors, one of which is adequate Eustachian tube function. It is believed that tubal dysfunction is one of the most important factors for failure of tympanoplasty. Though there are many factors that influence graft uptake rate, a good preoperative tubal function is one of the prerequisite for high rate of success rates in terms of graft uptake following tympanoplasty(13,14).

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Mean±SD or n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>36.27 ± 5.98</td>
</tr>
<tr>
<td>Race</td>
<td></td>
</tr>
<tr>
<td>Javanese</td>
<td>17 (77.27)</td>
</tr>
<tr>
<td>Madurese</td>
<td>5 (22.73)</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>11 (50.00)</td>
</tr>
<tr>
<td>Female</td>
<td>11 (50.00)</td>
</tr>
<tr>
<td>Perforation</td>
<td></td>
</tr>
<tr>
<td>Central</td>
<td>11 (50.00)</td>
</tr>
<tr>
<td>Attic</td>
<td>5 (22.73)</td>
</tr>
<tr>
<td>Marginal</td>
<td>1 (4.54)</td>
</tr>
<tr>
<td>Hearing Loss</td>
<td></td>
</tr>
<tr>
<td>Conductive</td>
<td>12 (54.54)</td>
</tr>
<tr>
<td>Mixed</td>
<td>5 (22.73)</td>
</tr>
<tr>
<td>Sensorineural</td>
<td>5 (22.73)</td>
</tr>
</tbody>
</table>

SD = Standard deviation

<table>
<thead>
<tr>
<th>EFT</th>
<th>Condition Eustachian Tube</th>
<th>Open</th>
<th>Obstruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td></td>
<td>6 (27.27)</td>
<td>1 (4.54)</td>
</tr>
<tr>
<td>Partial impairment</td>
<td></td>
<td>3 (13.64)</td>
<td>0 (0.00)</td>
</tr>
<tr>
<td>Total impairment</td>
<td></td>
<td>9 (40.91)</td>
<td>3 (13.64)</td>
</tr>
</tbody>
</table>

Statistical test results indicate p = 0.439

**Conclusions**

Eustachian tube function can be evaluated on CSOM patients by Toynbee’s test with impedance audiometer. Its advantages include quick, non-invasive, does not require patients’ compliance, accurate and affordable and it offers the best means of assessing the Eustachian tube function. This study showed that most CSOM patients (54.54%) had total impaired ETF. There were 3 (13.64%) CSOM patients with partial impaired ETF and 7 (31.82%) CSOM patients with normal ETF. This result showed that CSOM can cause Eustachian tube dysfunction.

**Conflict of Interest:** The authors report no conflict of interest in this publication.

**Funding:** None

**Ethics Statement:** All procedures performed in studies involving human participants were in accordance with the ethical standards of the Ethics Committee in Dr. Soetomo General Academic Hospital, Surabaya, Indonesia.
References


Evaluated Stress and Anxiety in College Students before and After Midterm Exam

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Abstract

The purpose of this study is to assess anxiety and stress in college student before and after midterm exam. The study will be conducted on N=200 students of Galgotias University, Greater Noida, U.P., India. Scale is taken as outcome measure and students are asked to fill a form (according to DASS and PSS) after taking consent before and after midterm examination. There collected data is then to be compared to know the effect of exams on stress and anxiety level of students.

Background: The spiritual well-being of university student is an area of amplify reflection universal. The aim of this student is to check-up the expansion of stress and concern into a group of Galgotias university student. Solely as each young person, undergraduate students needfulness to cope.

Method: We are taking 200 subjects for this study. My study is based on observational study. We are using DASS and PSS scale for measuring the stress and anxiety of the students. Inclusion criteria is stress and anxiety in college student during midterm exam and exclusion criteria is neurological and psychological disorders.

Results: We are hoping for positive result. We would find that the students take exam stress and anxiety level increase.

Discussion AND Conclusion: We would conclude positive result of our study. Our study will show that during and before exam students face stress and anxiety and after exam it will decrease.

Keywords: Stress, anxiety, midterm exam, scale.

Introduction

Stress: Stress is an inescapable sensation in every phase of human life. In a medical or biological context stress is a physical, mental, or emotional factor that causes bodily or mental tension. Stresses can be external (from the environment, psychological, or social situations) or internal (illness, or from a medical procedure).

Anxiety: Depression and anxiety are the most common types of mental disorders. Many individuals with anxiety even have depression and the other way around. Anxiety and depression have been found to be more widespread among college students than the general masses.

DASS scale: The DASS is a self-administered device with well-functioning psychometric properties in community and clinical samples, and has been described to differentiate between the three states of depression, anxiety and stress.

The depression scale is mainly to assess hopelessness, dysphoria, self-deprecation, devaluation of life, lack of interest or involvement.
The anxiety scale can also measure autonomic arousal, striated muscle effects, situational anxiety and subjective experience on anxious effects.

The stress scale is affected by the measure of chronic non-specific arousal. The scale assesses difficulty relaxing, nervous arousal and being easily upset or agitated, irritability or over-reaction and impatience.³

**PSS scale:** The “PSS” suggested by Cohen et al. in 1983 measures the degree to which individual situations are evaluated as being stressful or more precisely, unpredictable, uncontrollable and intense.

Many authors (Cohen, 1978; Averill, 1973; Lazarus, 1966) only mentioned these three main categories – intensity, uncontrollability and unpredictability, are the most vulnerable components of the experience of stress, which are usually measured by objective-stress scales.⁴

Exam anxiety may be a set of responses that has excessive worry, depression, nervousness and irrelevant thinking which is experienced by many students while undertaking any exam. There are four main areas of reported stresses which can definitely lead to anxiety of exam –

(a) Issues of life style,
(b) Decrement of required information,
(c) Style of studying and
(d) Psychological factors.

Life styles issue basically include improper rest, lack of time, poor nutrition and insufficient physical activity management leading to exam anxiety as reported by many authors.⁵

Issues that contribute to their stress and anxiety include academic challenges, clinical challenges, technological advances, financial concerns, interpersonal difficulties, family problems, physical and mental health issues, inadequate support, and poor coping skills. Additional stressors include cultural adjustments, language issues, social isolation, and discrimination. Both stress and anxiety are universal among students.⁶ Anxiety and depression commonly co-occur. This overlapping can be seen at the level of anxious and depressive mood, symptoms, and disorder from samples of children through adults.

It is a fact that emotional symptoms and disorders overlap which leads to difficulties in testing causal models for either depression or anxiety.

Given the pattern of high overlapping between anxiety and depression, a researcher cannot be certain whether a assumed causal factor for specific symptoms (e.g., depression) is, in fact, contributing to those particular symptoms unless both anxiety and depression are assessed properly.

Few studies in the literature have tested causal models of anxiety or depression while measuring both anxiety and depressive symptoms to ensure that the proposed etiological factors are affectively specific as hypothesized. The primary aim of this study has been to test whether mental weakness for depression inter-acts with negative life event stop or reduce depression more specifically compared with anxiety.⁷

Numerous studies on exam stress have shown that exam periods and exam situations are stressful for students. Some of the studies showed an increase in anxiety level, depressiveness and negative emotional states.

It has been observed that there is an increase in bad mood, lack of energy, bodily discomfort, somatic strain and restlessness of students during pre-exam period and even their cortisol level and heart rate were increased after exams.⁸ The mechanisms of stress-related immune changes have not been fully uncovered. Cell-mediated immune responses as well as antibody and certain cytokines are reported as being suppressed during times of high stress.⁹ These studies indicate that academic exam stress may pose an effective model for the study of stress-related to sleeping problems with high external validity.¹⁰

Stress, at its simplest, is defined as the magnitude to which life circumstances are considered worrying. Cross-sectional study focuses on the relationship between supposed stresses. In this study, levels of perceived stress showed a significant association between the frequency of health complaints and symptoms and levels of psychological symptoms, such as depression, mood swings, and anxiety.

Emotion-focused strategies are emotionally driven, while avoidance coping strategies are those that seek distraction or removal from the stress-producing situation. In general, greater reliance on avoidance and emotion-focused coping and a lack of problem or task-focused coping has been associated with poor emotional
adjustment, psychosocial dysfunction, low self-esteem, and higher levels of anxiety, depression, apathy, and denial.11

Anxiety is associated with an increase in catecholamine’s which is responsible for an increase in magnesium urinary excretion and a decrease in its plasmatic concentrations. The noticeable increase in muscular tension linked to anxiety consumes an important amount of energy that is partially due to the ATP-ADP transformation. A high increase in urinary phosphate excretion so contributes to the magnesium reduction. Indeed, magnesium has been proposed for treatment in different anxiety disorders.12 The effectiveness of exam stress as a model of psychosocial stress has repeatedly been shown on immunological, neuroendocrine, physiological and psychological parameters. Despite these associations, exam stress has not been used to investigate predisposing factors of Somatization so far. Determined the effects of exam stress on Somatization, showing a significant positive relationship in 38 participants. Still, no quantitative description of Somatization symptoms under exam stress is available, although the somatic symptoms of acute exam anxiety have been assessed systematically. Expected to increase under exam stress and return to baseline after a period without exam. According to the stress-alexithymia hypothesis, and show a stronger association with these increases than neuroticism, state anxiety, or depression.13 According to the Anxiety Disorders Association of America (2012), anxiety disorders are the most commonly diagnosed of mental health conditions with more than 40 million Americans affected annually. College students are no exception to these trends. In a recent study conducted by the American College Health Association (2009), stress ranked as the number one health issue that impedes students’ academic performance. In addition, the latest annual survey of college counselling centre directors across the country indicated anxiety and depression as the top two presenting concerns for their student clients (Association for University and College Counselling Center Directors [AUCCCD], 2011).14 In addition to anxiety and stress, depression can also impact college life to such an extent that in-depth research is necessary in order to help future students.15

**Methodology**

The purpose of this study was to examine the impact that depression and anxiety have on academic performance among college students, during midterm exam. This study was designed to decipher whether students with anxiety and depression symptoms may prevent lower academic performance during before and after midterm exam. This is a cross-sectional study. All the students were selected from Galgotias University from various courses were considering as population of the study. The students were chosen randomly from Galgotia’s university at greater Noida. Total numbers of students are 100

**Instrument:**

- **DASS SCALE:** The DASS is a self-administered instrument with well-ordered psychometric properties in clinical and community samples, and has been shown to differentiate between the three states of depression; stress and anxiety. The Turkish version of DASS was constructed by Nuran Bayram et al.3 and used in a study of a non-clinical sample. The reliability coefficients (Cronbach’s alpha) of the Turkish version of DASS-42 in our study were found for depression, stress and anxiety to be 89.1, 82.6 and 85.9%, respectively.

- **PSS SCALE:** The Perceived stress scale (PSS) is the most widely used psychological instrument for measuring the perception of stress.

This randomized controlled study was conducted with college students. The study was conducted at Galgotia’s University. This is a mixed sample (n=100) of a population of university students made up of 53 female (53%) and 47 male (47%) for before midterm exam. This survey aimed at defining the students to evaluate stress and anxiety in college students before and after midterm exam.

**Research Design:** Data was collected using an offline questionnaire survey form. The requirements to participate include being college students from various branches and having been enrolled at the university in fall of 2020. The surveys were administered offline in conjunction with an informed consent form with survey form. Both the scales (DASS & PSS) questionnaire form distribute to college students to collect data and after filling the form collect from students. Data analysis is done on the basis of both scales.

**Result Analysis**

Demographic value analysed by Independent T test for Age.
Table No 1 demographic value of age is analysed by the T test

<table>
<thead>
<tr>
<th></th>
<th>Before Exam DASS N=100</th>
<th>After Exam DASS N=100</th>
<th>T Value</th>
<th>Level of Significance P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Age</td>
<td>23.6±3.17</td>
<td>23.6±3.17</td>
<td>0</td>
<td>0.5 Non significance</td>
</tr>
</tbody>
</table>

Table No 2. Comparative study of DASS before and after exam by one way ANOVA analysis

<table>
<thead>
<tr>
<th></th>
<th>Before Exam DASS</th>
<th>After Exam DASS</th>
<th>Level of Significance P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparative Study</td>
<td>60.81±22.98</td>
<td>1.08±1.16</td>
<td>0.001*</td>
</tr>
</tbody>
</table>

- Table No 2 the comparative study shows that there is decrease DASS average after the DASS exam before it was 60.81 and standard deviation is 22.89 and the DASS after the exam was 1.08 and standard deviation is 1.16 respectively.

Table No 3: Demographic data of age is evaluated by independent T test

<table>
<thead>
<tr>
<th></th>
<th>Before PSS N=100</th>
<th>After PSS N= 100</th>
<th>T Value</th>
<th>Level of Significance P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Age</td>
<td>23.6±3.17</td>
<td>23.6±3.17</td>
<td>0</td>
<td>0.5 non significance</td>
</tr>
</tbody>
</table>

Table No 4: Comparative study of PSS before and after by the one way ANOVA.

<table>
<thead>
<tr>
<th></th>
<th>Before PSS Average</th>
<th>After PSS Average</th>
<th>Level of Significance P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparative study</td>
<td>18.39±10.01</td>
<td>0.56±0.55</td>
<td>0.001*</td>
</tr>
</tbody>
</table>

- The table no 4 shows that the Average PSS value before was 18.39 with standard deviation 10.01 & average after PSS was 0.56 and standard deviation is 0.55, the result that there is great decrease of PSS after the exam.

Discussion

Anxiety is one if the biggest and dangerous hunter of academic performance (Mc Craty, 2007 and McCarty, et al., 2000) and various studies have clearly showed that it shows a detrimental effect. Thus it is clear that there is a possible relation between high level of anxiety and low academic performance in students. Researchers made it clear that high levels of anxiety results in the decrease of, distraction, working memory and reasoning in students (Aronen et al., 2005). Researchers have been searching for the relation between anxiety and its effect on academic performance among school students. The Students suffering from high level of anxiety have a less memory span; less concentration, and lack of confidence, and a devastating reasoning power. Generally, high level of anxiety was more closely associated with lower performance among low ability students.1 It is important to note that the population for this study is all SOAR students who were selected in the fall of 2016, not the population of all ACU students. And no data for SOAR Population is available; therefore the statistics of the population of ACU students during the Fall of 2016 semester were examined. In doing so, this may also reveal certain characteristics that are specific to the SOAR population.2 We found that our sample of students had higher mean depression, anxiety and stress scores compared with previously published normative data. Although the DASS is not diagnostic instrument, it is worth remembering that the rates of depression, anxiety and stress symptoms of moderate severity or above may require attention from health-care professionals. In our study, the distributions of students (N = 200) regarding depression, anxiety and stress symptoms of moderate severity or above were 27.1, 47.1 and 27.0%, respectively. Previous data on gender difference in depression, anxiety and stress scores from DASS were inconclusive.3

This exploratory method made it possible to show a “medium zone” which does not fall within the transactional logic of the theory of stress defined as a “discrepancy” between the primary assessment of the threat and the secondary assessment elated to the resources. Thus, how does one consider an averagely stressed individual who would have a high score of both perceived distress and perceived control according to the PSS tool.4 The anxiety of exam is the emotional outcome
that some students have to face before the exams. The fear is not irrational, but excessive fear interferes with performance. Many researchers suggest that a little worry is good for students because it keeps them task oriented; however excessive worry on the other hand can be very debilitating and interferes with the results if not managed appropriately. Psychological factors including irrational thoughts about exams and result, negative thinking, self-criticism and feeling of no control over exam situation were reported by sixty to sixty-five percent students. The results of the study show extensive course load and long duration of exams as the major contributors to exam anxiety. Based on the findings from previous studies, both anxiety and stress levels are expected to boom for nursing students when they start their first clinical training and if they do not receive any interventions. The results from this study demonstrate that the 5-week biofeedback training intervention not only monitored the nursing students’ stress levels from increasing, but also significantly reduced their levels of anxiety, a follow-up study on the impact of the biofeedback training on stress, anxiety, and academic performance of nursing students after one to two years will help nurse educators to better understand the long-term efficacy of the biofeedback intervention program. This etiological affective specificity was found regardless of whether composite depression and anxiety were used or whether the specific tripartite theory measures of anhedonic depression and anxious arousal were examined. Negative life events operated as a nonspecific risk factor for both depression and anxiety as prospective changes in stressors over time were associated with elevations in affective symptoms. The cognitive vulnerability-stress interaction was found to predict depression. Shaped that neither cognitive vulnerability-stress inter-action was left significant after controlling for the other model’s of vulnerability-stress component. In particular, total sleep time, subjective sleep quality, and daytime sleepiness have been associated with academic performance although parameters like morning-ness evening-ness and early late bedtimes have also been shown to play a role. In the present study we found that students reported to spend significantly less time in bed during the exam period, 0.5 hours less on average this reduction suggests that students alter their sleeping schedule while studying for exams. To my knowledge, this is the first study to look at the psychosocial factors that impact negatively on chiropractic students and factors that may be protective during their education. As such, it could impact on the findings finally, this survey was cross-sectional in nature. Causality between the coping strategies, resilience, and overall health dimensions cannot be assumed. A longitudinal study following the students over the length of the program may add further insight in the relationships between these factors. The present results showed that the evaluated students did not experiment a stress increase during exams but suffered a significant anxiety increase. It is interesting to observe that the psychological findings agree with urinary biomarkers studied. It is known that anxiety is related to partial magnesium decrease associated with an increase in urinary magnesium excretion. The results of this study found that the group of participants who received biofeedback training in conjunction with counselling reported significantly greater reduction in anxiety symptoms than did the group of participants who received counselling alone. One unique aspect of the study is that it was conducted within a college counselling centre and participants were recruited from the actual pool of students seeking counselling services. Given the number of students seeking mental health services for anxiety and stress-related issues, this study may provide a rational for greater implementation and all location of biofeedback training services to be provided within college counselling centres. While one of the initial goals of this survey was to narrow down possible correlates of depression, anxiety, and stress, all the potential sources of concern indicated on the survey had a significant positive correlation with levels of depression, anxiety, and stress. Of the 19 sources of concern surveyed, the 10 that caused the most concern were academic performance, pressure to succeed, post-graduation plans, financial concerns, quality of sleep, relationship with family, relationship with friends, overall health, body care, and self-esteem. When the scores for anxiety, depression, and stress were matched to living standard, the students who used to live off-campus were the most stressed, anxious, and depressed ones. In addition, to transfer students scored the highest marks in the three areas measured by the DASS, with a significant difference in anxiety levels between transfer and non-transfer students. Lastly, upperclassmen scored the highest on the depression, anxiety, and stress scales when compared with underclassmen. Conclusion

This study concluded that on the basis of comparative values DASS & PSS after and before midterm exam, it
shows the decreased level in anxiety and depression after the midterm exam so it is finally concluded that there is presence of depression and anxiety during the students before the exam and it gets decreased automatically after midterm exam.

**Funding Sources:** Self

**Conflict of Interest:** NA

**Ethical Clearance:** Institutional ethical committee

**Reference**


A Comparative Study about Knowledge, Attitude, Practice of Antibiotic Use and Perceptions of the Possible Causes of Resistance between Final Year Undergraduate Students and Postgraduate Pharmacy Students

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Abstract

Background: Antibiotic resistance is a problem leading to difficulty in treating microbial infections that may occur due to many causes. For the important pharmacist role as a reference for the information and the ability to access to medications, they are vital members in lowering the development of antibiotic resistance, and also they support the proper use and control of antibiotics misuse. Our goal is comparing the knowledge, attitude, practice of undergraduate and postgraduate pharmacy students and their perceptions about the causing factors of antibiotic resistance in Iraq.

Method: A cross sectional study was conducted involving the final year bachelor and postgraduate (master and Philosophical doctor) students from different private and public pharmacy universities in Iraq. An adjusted questionnaire was administrated to 233 students electronically and the results obtained were analyzed by using SPSS 20 for Windows Descriptive. A significant difference was found in the knowledge of antibiotic between undergraduate and postgraduate(Master and Philosophical doctor) students (Mean knowledge score 5.32 versus 5.92 respectively, p<0.001). Attitude data also showed a higher positive attitude of postgraduate students according to antibiotic use and resistance when compared to undergraduate students (Mean attitude score: 2.97 versus 2.92 respectively, p<0.05). Significant difference was observed in practices of the comparative students groups regarding to the frequency of self-medication, reason, sources of antibiotic use and in terms of disease condition where they used(p<0.05) . Continuous mutation and gene changes of micro-organism taken the higher percentages answered yes for the undergraduate students while the limited restrictions on antibiotic usage taken the higher percentages answered yes for the postgraduate students (89.1% and 98.5% respectively).

Conclusion: We can conclude from data of our study that there is a significant difference in the knowledge, attitude, practice of antibiotic use and perceptions of the possible causes of resistance between postgraduate (master and Philosophical doctor) and undergraduate (fifth year bachelor) pharmacy students when assessing the use of antibiotic and related resistance. This will help to determine the educational requirements for pharmacy students in colleges of Iraq for better understanding and dealing with the antibiotic resistance problem in the future.

Keywords: Knowledge, Attitudes, Practice, Antibiotics, Pharmacy Students.

Introduction

From the important events in the development of the medical field is the discovery of antibiotics which has a great effect on human life over the world. It helped to manage the dangerous disease or do surgeries with a high success rate for saving human life. The death due
to previous high mortality infections is now under better control(1).

High frequently used drugs often associated with irrational use are antibiotics. The most reported risk factor for the development of resistant pathogens is the over antibiotic use(2). There is a direct relation between the over usage of antibiotics and related resistance where populations who use less antibiotics develop lower amount of resistance to bacteria(3). Antimicrobials overuse can change the human’s normal flora which may lead to the multiplication of pathogenic bacteria and increase susceptibility to infections(4). However, unnecessary antibiotic prescribing remains highly common also in developed countries where higher than a 5th of all antibiotic prescriptions for patients are written for upper respiratory tract, bronchial and viral infections(5).

This antibiotic resistance is a big problem leading to difficulty in treating bacterial infections. This resistance caused by multiple reasons which include self-antimicrobial treatments without prescription, over-the-counter selling of antibiotics, low regulation of antibiotic prescriptions, expensive medical consultations, the knowledge and attitudes of patients towards antibiotic use, self-treatment, the knowledge and experiences of doctor and patient preference interaction. (5–7).

As a result multidrug-resistant (MDR) bacteria is accompanied with longer hospital stays, lower quality of life (QoL), additional fees for the healthcare department, and increased deaths(8–10). There is an increasing need to push the scientific understanding of the factors associated with antibiotics use requiring efforts for managing the use of antibiotics have been directed toward the physician, protocols, and educational programs(11).

Also, data about of health practitioners perceptions towards the use and resistance of antibiotics could be a baseline, such as, for urgent interventions including the development of national and international antibiotics policies and antimicrobial stewardship program(12). The concept of antimicrobial stewardship including any intervention that required for the optimization of antimicrobial therapies for every single patient and to prevent the overuse and misuse of these medications(13).

For the vital role of pharmacist in terms of the information and dispensing of medications, they have an essential role in the issue of antibiotic resistance, and to support the rational use and control of antibiotics. Gaps between pharmaceutical education on antibiotics and the use of them have been identified in previous studies(14–18) with one common factor was the belief that antibiotics are effective in treating the common cold and other viruses. However, most pharmacy students believed a strong knowledge of antibiotics was important for their later careers and required more education in this field(19). In this study, our goals were to assess Iraqis undergraduate and postgraduate pharmacy students’ knowledge, attitude, practice of antibiotic use, and their perceptions about the causes of antibiotic resistance.

Method

The current cross-sectional study was carried out between final year undergraduate pharmacy students and postgraduate (master and Phd) pharmacy students who were studying in different private and public pharmacy colleges in Iraq. Electronic copy of the questionnaire was used and posted in the social media for groups of the fifth stage and postgraduate pharmacy students from different Iraqi universities. This study carried out on a period of 4 months from January to April, 2020. Each student required approximately 10 minutes to fill the demographic data and research questionnaire completely.

There were five sections in the questionnaire. The first one was about the demographic characteristics of students (age, gender, place of residence, and governorate).

Section two, comprised of six questions, assessing the knowledge of participants about their use of antibiotics by asking questions regarding the effectiveness, adverse effects, resistance and economical concerns, policy issues and implication of antibiotic use. Every response was scored as: True=1 which represents the correct answer, False=0 and Don’t Know=0 which are wrong answer. The highest possible score of knowledge section was 6 and the minimum was 0. A total knowledge section score of ≥4 was taken as a good knowledge while score of <4 as a poor knowledge. The same criteria were also used for scoring the 6th section of this questionnaire in assessing the possible causes of antibiotic resistance.

The third section was about students’ attitude towards antibiotic use and resistance. It consisted from five questions which was measured on 4 point likert scale. Scores were given to strongly agree=1, agree=2, disagree=3 and strongly disagree=4. A mean score of ≥3 was taken as a positive attitude while score of <3 as a negative attitude.
The fourth section was assessing the students’ practices towards self-medication with antibiotics in 4 terms (frequency, reason, source, and the disease condition were they used). The fifth part of the questionnaire evaluated the students about possible causes of antibiotic resistance they believe. It consisted from 7 questions answered with either yes or no.

Data were statistically analyzed using SPSS 20 for Windows. Descriptive analysis was employed, and the results were expressed in frequency and percentages. Chi-squares test was used to calculate the p-value regarding dependent and independent and a value < 0.05 was considered as a significant difference between them.

**Results**

A total number of 233 pharmacy students were participated in this study with mean age (±SD) of 26.13 (±3.302) years. The number of male students was 35 (15.0%) while that of female students was 198 (85.0%). Students divided into two groups: Group (1): include 101 (43.3%) Final year undergraduate bachelor pharmacy students, Group (2): include 132 (56.7%) postgraduate (Master and Phd) pharmacy students as shown in table 1.

The majority of postgraduate students was apparent to be correctly answered all the knowledge related questions especially on question about taking antibiotics too often are less likely to work in the future (100% correct answer). On the other hand, the least percentage of correct answers for the undergraduate students answere d correctly on the same question (76.2%). The knowledge score mean was higher in postgraduate than undergraduate (5.92 versus 5.32 respectively). The responses of all knowledge questions mentioned in Table 2.

**Table 1: Demographic characteristics of students participated in the study**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>No. (%)</th>
<th>Mean (±SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>26.13 (±3.302)</td>
<td></td>
</tr>
<tr>
<td>Gender Male</td>
<td>35 (15.0%)</td>
<td></td>
</tr>
<tr>
<td>Undergraduate</td>
<td>120 (90.9%)</td>
<td></td>
</tr>
<tr>
<td>Postgraduate</td>
<td>198 (85.0%)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>198 (85.0%)</td>
<td></td>
</tr>
<tr>
<td>Undergraduate</td>
<td>78 (77.2%)</td>
<td></td>
</tr>
<tr>
<td>Postgraduate</td>
<td>120 (90.9%)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>198 (85.0%)</td>
<td></td>
</tr>
<tr>
<td>Place of residency Rural</td>
<td>30 (12.9%)</td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>203 (87.1%)</td>
<td></td>
</tr>
<tr>
<td>Stage Undergraduate</td>
<td>101 (43.3%)</td>
<td></td>
</tr>
<tr>
<td>Postgraduate</td>
<td>132 (56.7%)</td>
<td></td>
</tr>
<tr>
<td>College Private college</td>
<td>125 (53.6%)</td>
<td></td>
</tr>
<tr>
<td>Public college</td>
<td>108 (46.4%)</td>
<td></td>
</tr>
</tbody>
</table>

SD: Standard deviation

**Table 2: Knowledge questions regarding antibiotic use with students’ percentages who respond correctly (N=233)**

<table>
<thead>
<tr>
<th>Knowledge Questions**</th>
<th>Undergraduate (5th stage) pharmacy students</th>
<th>Postgraduate (Master &amp; Phd) students</th>
<th>P value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irrational use of antibiotics can lead to ineffective treatment</td>
<td>94 (93.1%)</td>
<td>130 (98.5%)</td>
<td>0.034</td>
</tr>
<tr>
<td>Irrational use of antibiotics can lead to increase adverse effects</td>
<td>87 (86.1%)</td>
<td>128 (97%)</td>
<td>0.002</td>
</tr>
<tr>
<td>Inappropriate antibiotics use may increase emergence of bacterial resistance</td>
<td>94 (93.1%)</td>
<td>131 (99.2%)</td>
<td>0.01</td>
</tr>
<tr>
<td>Irrational use of antibiotics can lead to additional medical cost on the patient</td>
<td>87 (86.1%)</td>
<td>130 (98.5%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Taking antibiotics more frequently can lead to less efficacy in the future</td>
<td>77 (76.2%)</td>
<td>132 (100%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Antibiotic resistance is a serious problem that facing patients health around the world</td>
<td>96 (95%)</td>
<td>131 (99.2%)</td>
<td>0.198</td>
</tr>
</tbody>
</table>

*P value calculated by Chi-square test.**Knowledge score mean (± SD) for undergraduate students was 5.32 (±1.095) and for postgraduate students was 5.92 (±0.318) with significant difference (P<0.001)
Data showed that the positive attitude of postgraduate students was higher than that of undergraduate students [Attitude score mean (±SD) was 2.97 (± 0.14) versus 2.92 (± 0.53) respectively] and it was statistically significant in all attitude related statements (p<0.05). The responses of undergraduate and postgraduate students towards attitude questions are summarized in Table 3.

### Table 3: Students’ attitude towards antibiotic use (N=233)

<table>
<thead>
<tr>
<th>Question</th>
<th>Positive Attitude Count (%)</th>
<th>Mean attitude score (SD)</th>
<th>P-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>I take antibiotics when having cold to prevent worsening of the illness</td>
<td>81(80.2%) 127(95.2%)</td>
<td>2.99(0.59)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>I take antibiotics when having fever to make me better more quickly</td>
<td>78(77.2%) 128(97%)</td>
<td>2.94(0.53)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Patient should stop taking antibiotics as soon as he/she feels better</td>
<td>77(76.3%) 129(97.7%)</td>
<td>3.03(0.69)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Missing one or two doses will not contribute to microbial resistance to antibiotics</td>
<td>56(55.5%) 125(94.7%)</td>
<td>2.81(0.36)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>We can commonly use antibiotics since its safe</td>
<td>81(80.2%) 127(97%)</td>
<td>2.97(0.56)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

*P value calculated by Chi-square test., **Attitude score mean(±SD) for undergraduates students was 2.92 (± 0.53), and for postgraduates students was 2.97 (± 0.14).

Self-antibiotic practices of students is illustrated in table-4. Significant difference was found between the final year bachelor pharmacy students and postgraduate pharmacy students when asked about practices in terms of frequency of self- administration, reason, sources of medication and disease for which antibiotics were taken (p<0.05).

### Table 4: Self-Antibiotics practices of students (N=233)

<table>
<thead>
<tr>
<th>Self-antibiotic use</th>
<th>Category</th>
<th>Undergraduate pharmacy (5th Stage) Students* (%)</th>
<th>Postgraduate pharmacy (Master &amp; Phd) students* (%)</th>
<th>P value**</th>
</tr>
</thead>
<tbody>
<tr>
<td>How often you take self-medication</td>
<td>Occasionally</td>
<td>46(45.5%)</td>
<td>100 (75.8%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Weekly</td>
<td>3 (3%)</td>
<td>3 (2.3%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rarely</td>
<td>49(48.5%)</td>
<td>28(21.2%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>3(3%)</td>
<td>1(0.8%)</td>
<td></td>
</tr>
<tr>
<td>Reason</td>
<td>Disease is simple</td>
<td>46 (45.5%)</td>
<td>22 (16.7%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Higher treatments’ cost in clinics</td>
<td>2 (2%)</td>
<td>3 (2.3%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Previous exposure to same health problem</td>
<td>50 (49.5%)</td>
<td>106 (80.3%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>There is no hospitals in the nearby</td>
<td>3 (3%)</td>
<td>1 (0.8%)</td>
<td></td>
</tr>
<tr>
<td>Source</td>
<td>Family, friends or neighbours</td>
<td>9 (8.9%)</td>
<td>3 (2.3%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Retail pharmacy shops</td>
<td>30 (29.7%)</td>
<td>25 (18.9%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Previous prescription</td>
<td>38 (37.6%)</td>
<td>95 (72%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>24 (23.8%)</td>
<td>9 (6.8%)</td>
<td></td>
</tr>
<tr>
<td>Disease conditions</td>
<td>Cough/cold/flu and other respiratory problems</td>
<td>77 (76.2%)</td>
<td>120 (90.9%)</td>
<td>0.013</td>
</tr>
<tr>
<td></td>
<td>Wound infection</td>
<td>7 (6.9%)</td>
<td>6 (4.5%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GIT related problems(such as diarrhea)</td>
<td>8(7.9%)</td>
<td>3 (2.3%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Eye/ear infection</td>
<td>9(8.9%)</td>
<td>3 (2.3%)</td>
<td></td>
</tr>
</tbody>
</table>

*Students answered yes,** P value calculated by Chi-square test
In table 5 the participants’ response towards the possible causes of resistance is illustrated. Significant difference was observed between the final year bachelor pharmacy students and postgraduate pharmacy students when asked about all the questions of possible cause of antibiotic resistance (p<0.05). Continuous mutation and gene changes of micro-organism taken the higher percentages answered yes for the undergraduate students while the limited restrictions on antibiotic usage taken the higher percentages answered yes for the postgraduate students (89.1% and 98.5% respectively).

**Table 5: Students perception of possible causes of antibiotic resistance**

<table>
<thead>
<tr>
<th>Following are the possible causes of resistance</th>
<th>Respondents answered Yes (%)</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration of antibiotics for non bacterial infections</td>
<td>Undergraduate (5th stage) pharmacy students 75 (74.3%)</td>
<td>Postgraduate (Master &amp; Phd) students 118 (89.4%)</td>
</tr>
<tr>
<td>Unnecessary broader spectrum antibiotics use</td>
<td>76 (75.2%)</td>
<td>120 (90.9%)</td>
</tr>
<tr>
<td>Shorter period of antibiotics administration than standard duration</td>
<td>80 (79.2%)</td>
<td>115 (87.1%)</td>
</tr>
<tr>
<td>Poor infection control measures</td>
<td>78 (77.2%)</td>
<td>124 (93.9%)</td>
</tr>
<tr>
<td>Continuous mutation and gene changes of micro organism</td>
<td>90 (89.1%)</td>
<td>128 (97 %)</td>
</tr>
<tr>
<td>Longer period of antibiotics administration than standard duration</td>
<td>63 (62.4%)</td>
<td>120 (90.9%)</td>
</tr>
<tr>
<td>Limited restrictions for antibiotic prescription and use</td>
<td>73 (72.3%)</td>
<td>130 (98.5%)</td>
</tr>
</tbody>
</table>

*p value was calculated by Chi-square test

**Discussion**

Results of our study showed that postgraduate students(master and Phd) had better knowledge about antibiotic usage in comparison to undergraduate bachelor students. Speaking on the knowledge, undergraduate bachelor students, as opposed to postgraduate students(master and Phd), answered poorly on question about taking antibiotics more frequently can lead to less efficacy in the future. This low knowledge of undergraduate students was consistent with result obtained with other study in Australia and Sri Lanka(20). So, there is a need for additional educational courses for undergraduate bachelor students for improving their understanding about the real causes of microbial resistance and improving antimicrobial therapy success(21). However, both study groups considered to have a good knowledge when compared to a study applied to non-medical students(22).

This study showed a higher positive attitude of postgraduate students when compared to undergraduate bachelor students believing that antibiotic treatment course should be standard and not stopped when patient feels better (97.7% versus 76.3% respectively), and also the antibiotics are not safe and can not be commonly used (97% versus 80.2% respectively). The biggest difference about the positive attitude between the postgraduate and undergraduate pharmacy students was in the question (Missing one or two doses will not contribute to microbial resistance to antibiotics) with percentages of 94.7% and 55.5% respectively. This gap in percentages gives an indication that postgraduate students have more awareness about antibiotic resistance in contrast to undergraduate students who may misuse antibiotic treatment.

Lower self-antibiotic medication was found among undergraduate and postgraduate pharmacy students in this study when compared to results obtained from non-medical colleges. Non-medical colleges believed that antibiotics could be prescribed for even viral infections(23). When comparing between the students groups in our study the results showed higher practice of antibiotic self-medication with postgraduate students than undergraduate students. The highest percentage was (occasional self-medication with antibiotics) for postgraduate students (75.8%) while (rare self-medication with antibiotics) for undergraduate students.
These results are consistent with previous study on Nigerian and Sudanese undergraduate students about self-medication with both antibiotics and analgesic also\(^{(24,25)}\). However, in this study, these high results were associated with more experience with the previous disease and depending on past doctor prescription for the same medical condition as illustrated in table-4.

Antibiotic were found to be used frequently among medical students all over the world which has health and economic adverse event as showed in previous studies\(^{(26–28)}\). Although this considered to be lower than nonmedical students since pharmacy and medical students received some educational courses during their study. These educational courses reflect the appropriate usage of such medications by them but still we cannot deny the high amount of antibiotic prescribing\(^{(29)}\).

In our study, when students asked about their perception for the possible causes for antibiotic resistance postgraduate students answered better on reasons related to limited restrictions for antibiotic prescribing while undergraduate students the answer was the mutation in micro-organism. Good perception with postgraduate students may be related to the experience that they had by dealing with prescriptions in pharmacies or hospitals where they work. Continuous detection of resistant microbial strain could solve and control the problem of antibiotic resistant to some extent in addition lead to lower costs and hospitalization.

Indirect factors for unnecessary antibiotic use could be due to patients demand, wrong diagnosis and communication skills\(^{(30–32)}\). Communication skills should be introduced the syllabus of medical colleges in order to teach students how to convince patients for rational antibiotic use and reflect their attitude to reduce patient expectation about antibiotic treatment\(^{(33)}\).

**Conclusion**

The results of this study showed significant difference in the knowledge, attitude, practices of antibiotic use and perceptions of the possible causes of resistance between undergraduate (fifth year bachelor) pharmacy students and postgraduate (master and PhD) when assessing the use of antibiotics and related resistance. These results can be used to determine the aspects for antimicrobial’s knowledge requirements for both undergraduate and postgraduate pharmacy students in colleges of Iraq for better understanding the proposed causes of antimicrobial drug resistance. This study can become the basis for subsequent research for the possible educational courses that can be applied to undergraduate and postgraduate students in pharmacy colleges.

**Ethical Clearance:** All the students included in this study were older than 18 years, and they reveal voluntary permission to participation. There were no personal identifiers during the administration and collection of the questionnaire to rule out any personal identification.

**Source of Funding:** Self

**Conflict of Interest:** There is no conflict of interest

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Social and Legal Aspects of Eunanasia Regulation: International Experience

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Abstract

Introduction: The basic human right is the right to life, along with the issue of the right to die. Euthanasia, as the right to die, is an urgent problem, the solution of which takes place on the border of medical science and jurisprudence.

The Aim: Analyze the international experience of social and legal regulation of euthanasia.

Materials and Method: To achieve the set goal, research method such as a comparative law method, theoretical analysis, system-analytical method and a method of conclusions systematization were applied is not prohibited, but it is not legalized in Germany, Spain, France, Albania, Israel.

Conclusions: Analyzing the current international experience of euthanasia legal regulation, it stands to mention that even with the prohibition of euthanasia, there are some gaps in the legislation, which create the possibility of passive euthanasia legal use by means of terminating life sustaining measures. It is important to enshrine the rules clearly regulating euthanasia in international law, otherwise this issue will be latent, and in the countries where there are legal gaps, excessive use of euthanasia will take place.

Keywords: Euthanasia, legal regulation, legalization of euthanasia, right to die.

Introduction

Life and death issues are the subject of scientific research by the specialists in various fields: philosophy, psychology, sociology, medicine and law. In modern states, the protection of civil rights and freedoms of a person is one of the main issues, which is given a lot of attention. Everyone has the right to life. In this context, the issue of the human right to die arises, and from the scientific research point of view, the issue of euthanasia and its legalization is a matter of debate. Thus, there are countries in the world that have legalized euthanasia at the legislative level. However, scientists have not come to a consensus concerning legalization of euthanasia and effective legal support for the exercise of the human right to euthanasia. Therefore, it is advisable to study the legal regulation of euthanasia in foreign countries and analyze the experience of countries that have legalized euthanasia at the legislative level.
Materials and Method. The article uses modern literature sources on the dynamics of the legal framework to study the international experience of socio-legal aspects of euthanasia regulation. To achieve the set goal, research method such as a comparative law method, theoretical analysis, system-analytical method and a method of conclusions systematization were applied.

Findings and discussion. The issue of euthanasia and its legal regulation is extremely topical today. Thus, I.V. Chekhovska notes that more and more attention is being paid to the role of humanism in clinical practice, which therefore increases interest in the study of euthanasia. This is explained both by the medicine development, which allows to fight for a human life for a long time, and the priority human right to life, which means freedom of choice, including the prolongation of life.

The concept of euthanasia has a pretty large number of interpretations. Thus, the pharmaceutical encyclopedia defines euthanasia as the intentional deprivation of a patient’s life in order to alleviate his suffering. In the British Encyclopedia, euthanasia is referred to as “mercy killing”, which means an act or practice of painlessly putting to death persons suffering from painful and incurable disease or incapacitating physical disorders. In the Oxford Dictionary, the concept of euthanasia means: calm and easy death; funds for it, actions for its implementation.

In the scientific literature, euthanasia is classified by various distinctive features:
- by types of services provision: active, passive;
- by the method of implementation: positive, negative;
- by the expression of the patient’s will: voluntary, compulsory;
- by the individuals receiving services: for adults, minors;
- by types of illness: for seriously ill patients in the thermal stage, mentally ill persons.

Let’s focus on the definitions of active and passive euthanasia, because this distinguishing is significant in terms of legal regulation of its implementation. Active euthanasia is the carrying out of any action or administration of drugs accelerating lethal outcome. Active medical euthanasia can take three forms and is performed:
- without the patient’s consent (for example, if the patient is in a coma), when a doctor or close family members approve of the procedure instead;
- with the help of a doctor;
- self-euthanasia, in which the patient administers a drug by himself or turns on the device, which helps him to commit suicide.

Passive euthanasia implies non-use of drugs and non-performance of medical manipulations that would sustain the life of a seriously ill patient for a certain period of time. It is difficult to agree with this point of view, because the right to refuse medical intervention, a patient’s legal right, can be exercised due to lack of consent to medical intervention, while euthanasia is a combination of one person’s individual freedom and another person’s responsibilities. Thus, the implementation of passive euthanasia requires certain activities on the part of the health worker, which determines the presence of a social component.

Euthanasia issues are regulated by the international legal enactments regulating the right to life and, accordingly, relating to euthanasia. These international documents include: the Universal Declaration of Human Rights d/d December 10, 1948, the European Convention for the Protection of Human Rights and Fundamental Freedoms d/d November 4, 1950 (as amended), some international documents of medical associations, namely: Convention of the Council of Europe, 1997, Convention for the Protection of Human Rights and Dignity of the Human Being with regard to the Application of Biology and Medicine; Convention on Human Rights and Biomedicine. However, the issue of euthanasia is not directly regulated by international law, although in 1987 the 39th World Medical Assembly in Madrid adopted the Declaration on Euthanasia.

Currently in Ukraine, euthanasia is prohibited in any form, both active and passive. It should be noted that euthanasia is not only prohibited by the current legislation of Ukraine, but its commission is considered to be a crime - premeditated murder in accordance with Part 1 of Art. 115 of the Criminal Code of Ukraine, which is punishable by imprisonment for a term of seven to fifteen years.

Assessing the current state of legalization of the institute of euthanasia in Europe, America, Asia, it is worth noting that its enshrinement in the legislation of certain countries is an exception to the general rules, not
a global trend. This thesis can be confirmed by the fact that both active and passive euthanasia is not prohibited in the Netherlands, Belgium, Switzerland, some US states and areas of Australia, Luxembourg. Passive euthanasia is not allowed (but not directly prohibited) in Germany, Spain, France, Albania, Israel, but these countries oppose the introduction of active euthanasia. In Japan, the issue of the possibility of legalizing the “right to die” is currently discussed.

In the world, the practice of euthanasia is widespread in many countries. The Netherlands is a clear example. After long hesitations and negotiations, euthanasia was legalized in this country at the legislative level in 2002. In addition, suicide assistance in the Netherlands is also not punishable by law. In this case, euthanasia requires compliance with the basic requirements: the patient must be terminally ill, suffer from excruciating pain and have no chance of recovery. This person must desire his death being in his right mind and insisting on it for a certain period of time. Currently, the acceptable age is 12 years old (with parental consent).

Switzerland is also a country where the right to die is enshrined in law. According to local legislation, assisting in the act of suicide is not prohibited, provided there are no personal sordid motives. Foreigners come to Switzerland for this purpose, as it is the only country in the world where euthanasia is allowed for residents of other countries.

Belgium is a country that, following the example of the Netherlands, adopted a law legalizing euthanasia in that country as far back as in 2002. According to the Belgian Law on Euthanasia, it can only be performed by a doctor who has been supervising a terminally ill person for a long time. Belgian citizens residing in the country can only be the patients. In 2014, the King of Belgium signed an administration bill allowing child euthanasia. In 2016, the first case of euthanasia of a minor was recorded.

In Finland and Sweden, passive euthanasia is not illegal, but the basis for its use is the free and conscious expression of the patient’s will, and at the same time, similar requests, even from close family members, are legally invalid. In 2006 in Israel, a law allowing passive euthanasia came into force, while active euthanasia is prohibited.

In 2016, Canada lifted the ban on doctor’s assisting in committing suicide for terminally ill patients. Currently, the administration bill is being formally approved. However, according to it, not all patients can get this right, but only degenerative ones, i.e. those whose tragic end is close and undeniable.

Thus, in the countries where euthanasia is prohibited, there may be gaps in the legislation allowing doctors to take action to implement euthanasia. Thus, the analysis of Ukrainian legislation in the aspect of euthanasia regulation revealed the following shortcomings. The ban on euthanasia in Ukraine is specified in Art. 52 of Basic Legislative Principles of Ukraine on Health Care, and in part 4 of Art. 43 of this document it is noted that a patient has the right to refuse medical treatment if he has full civil capacity and is aware of the significance of his actions and can control them. Part 3 of Art. 43 of the above document stipulates that if a patient refuses medical treatment, the doctor has the right to ask for written confirmation from him, and if it is impossible to obtain it - to certify the refusal in the relevant act in the presence of witnesses. This is in line with international regulations of human rights, but allows for the legal use of passive euthanasia by means of termination of life sustaining measures that is explicitly prohibited and criminally punishable in Ukraine.

It should be noted that in the scientific community there are different opinions about the legalization of euthanasia, as noted by V.V. Kozhan: those who oppose euthanasia, those who support legalization, and those who speak about the permissibility of euthanasia.

Thus, opponents of euthanasia justify its inadmissibility by the possibility of medical error regarding the incurability of the disease, misconception of the patient regarding his or her health condition, as well as making a fatal decision in an inadequate perception of the situation, the possibility of euthanasia misuse by medical staff and other people concerned.

Proponents of euthanasia consider it to be a manifestation of the highest level of humanity in relation to the person suffering pain. They firstly refer to the human right to control his or her own destiny.

Those who support euthanasia admissibility determine the list of circumstances under which euthanasia is possible. This issue was most accurately covered by H. Romanovskiy. He identifies the material and procedural criteria, which make euthanasia possible.

Therefore, we consider the opinion of V.V.
Kozhan to be right, who states that in most cases the civilized world opposes euthanasia in its active form. However, the issue of passive euthanasia admissibility is interesting. As it was mentioned before, the essence of passive euthanasia is the lack of treatment and medical care\textsuperscript{14}.

**Conclusions and Recommendations**

Given the above, we should note that there is no general consensus regarding the expediency of euthanasia legalization due to the lack of opportunity to properly determine the euthanasia legality and the possibility of euthanasia misuse by health workers. The inexpediency of euthanasia legalization is also due to the rapid development of medical technologies allowing to treat those diseases in modern realities which a few years ago were considered incurable. An analysis of the legal regulation of euthanasia in Ukraine has shown that even with the prohibition of euthanasia, there are certain legislative gaps, which create the possibility of passive euthanasia legal use by terminating life sustaining measures. Imperfect legislation raises the issue of the need for doctors to not only have high profession skills and carefully document their actions, but to be legally competent specialists. Therefore, it is important to enshrine the rules clearly regulating euthanasia in the international law. Without a clear criminal regulation of euthanasia, the issue will remain latent, and in the countries where there are legal gaps, excessive use of euthanasia will take place due to economic benefits.

**Conflict of Interest:** None

**Source of Funding:** Authors

**Ethical Clearance:** Yes

**References**


Health Monitoring Systems for Pregnant Women: Challenges and Issues

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Abstract

It is important for all pregnant women throughout their gestational period to be able to access information, services and care by having direct communication with their doctors or their healthcare provider or their relatives. With the proliferation of mobile devices and the internet it has become very easy to get access to such information in a quick and efficient manner. There are also several awareness programs which teach about the right kind of physical activity and food to be followed by such pregnant women. Having access to such information helps these women identify and prevent any pregnancy related complications or risks which could lead to issues such as still-birth, pre term labor etc. Women who do not use this information wisely are likely to be putting their lives as well as the lives of their babies at risk. The main objective of this paper is to analyse various compound reasons pregnancy related issues and the technologies available to solve such issues.

Keywords: Bioinformatics, Data Analysis, Gestational period, Healthcare, Machine Learning, Pregnant women.

Introduction

With the spurt in the number of mobile devices, the internet and other communication technologies we now have a new sector which has emerged in the area of health care called as electronic health. We are looking at a sector which has a potential to deliver good quality healthcare at very low cost combined with a wonderful customer experience[1] as well. It involves the exchange of medical information such as lab results, medical imaging, clinical information, prescriptions and dosages, past patient history to enable remote monitoring and on time determination of patient health status/critical diseases. With this technology we can potentially have access to automated and effective healthcare from anywhere[3] on the globe with the least use of resources[2] and power even in the most remote of locations where it is difficult to get in person medical consultation or support. With computers becoming smaller, networks becoming faster, mobile devices becoming smarter, reliable and secure, cost of making such devices decreasing, we are now provided with a variety of options to monitor our health remotely and effectively. But all this technology does not help unless we have a proper network of the healthcare professionals such as doctors, hospitals, nurses etc who can be connected with the patients thus enabling effective interaction between them and also increase the awareness of health issues/risks which was not possible before. There can be many types of networks that we build in our lives which help in this case. Some of the different networks that include the professional network of colleagues and customers, social networks which includes our friends, acquaintances and family networks that include our close relatives and family members. The electronic health sector enables connecting these networks to the network of healthcare professionals to enable faster, effective health care which can improve the areas of personal health, child health, geriatric health etc. These networks can increase the awareness of patients on the potential health issues/risks and remediation. This was not previously possible unless there was a face to face interaction between the patient and healthcare professionals[5].

Today a very small percentage of pregnant mothers know about the development status of their baby[6]. They are not aware of the stages of pregnancy and the parameters that need to be measured or tracked during these various stages. They are also not aware of what are the right foods and the wrong foods to eat during their
pregnancy. The electronic health sector will allow these mothers to have access to such data about the various stages of pregnancy and also allow them to connect to this network of healthcare professionals to get their doubts clarified and any emergencies taken care of. This capability is enabled by the use of Smartphone and internet which enables this information to be available at the right place at the right time at the right stage of development. Having such a connected network also enables the Hospitals/nursing homes to monitor and attend to any urgent needs of such pregnant women which can reduce the delay in taking certain decisions which can otherwise endanger the life of the mother and the baby as well. This will improve the mother mortality rate and also improve the fetal mortality rate while improving the general health/survival of the women.

**Literature Review:** Vyacheslav Shulgin[7] The problem of premature or preterm birth is a major cause of baby’s long term morbidity and also a primary cause of neonatal fatalities as well. The current devices and method used for monitoring and predicting preterm births are very inaccurate, invasive, expensive and can only be used in hospitals/clinical laboratories. One of the newer method which have been discovered to improve on this is to analyze the Electrohysterography signals (EHG) which is measured from the abdominal region of pregnant women. These signals are said to be very effective in predicting preterm births. The most important part of the signals collected is the Conduction Velocity (CV) which occurs during uterine contraction. The paper discusses an algorithm which can be used to estimate the CV based on the space-time processing of abdominal signals. This algorithm has been formulated on the basis of actual EHG recordings to estimate the CV.

Yunus Santur[8], People today use the internet for almost everything in their life such as collecting information, socializing with people, being in touch with family and friends and to handle any official business as well. In addition to connecting offline to such professional, personal and social networks a lot more people are now connected to virtual social networks. Facebook is the world’s largest social network and has so many people who are on their network and who have formed virtual networks with other people/companies on the same network. There are millions of such social networks available on various topics which can be professional, personal, social. Imagine if we could set up such a social network which would connect pregnant women with other pregnant women or women who have been through pregnancy. This network can be used to share useful information about the various stages of a babies development, what to eat and not to eat, what are the risks to be monitored, where to get the right information/help, when to take regular scans, when to give vaccinations to the baby, what is the weight/height at various stages of the baby etc. This would really help spread the awareness of pregnancy related risk and the steps to be taken to ensure the wellbeing of both the mother and the baby.

Lingyun Wu[9] Ultrasound (US) images are very important to monitor the growth of the baby during the gestational period of a pregnant woman. It helps determine the size/weight/heart rate etc of the baby based on which we can determine whether the baby is healthy or not. It can also help identify abnormalities such as missing organs, double organs, deformities etc very early so that the necessary decisions can be taken on whether to abort the baby or to continue with the pregnancy. In order to make such critical decisions the quality of the ultrasound images must be very good. But the process of getting good quality images is very manual and labor intensive and all of this can only happen in a hospital/clinical environment. In order to improve the image quality, reduce the measurement error, improve the slice choice and the accuracy of measurement, a new method was proposed to assess the ultrasound Image quality. This is accomplished by using the concept of Artificial Neural Networks. There are 2 custom deep learning models that were developed denoted as L-CNN and C-CNN. The former aims to seek out the ROI (Region Of Interest) which is then used by the latter to evaluate the quality of the images and assess the details of the required parts of the body that need to be measured. In order to improve the performance of the models, we need to complement the neural network with local features derived from the original data. More the number of input sources the better is the quality of the image. This method has also been evaluated by a group of medical doctors and has found to be on par with the results from actual doctors.

Nandakishor D Valakunde[10], India has more number of stillbirths and a higher maternal mortality rate compared to other developing countries of the world. It has been determined that a pregnant woman should make at least four visits to their doctor or their healthcare provider in order to ensure a safe pregnancy for both the mother and the baby. The Smart ASHA Pregnancy Monitoring System [SAPMS] is one such system which
was created to reduce the incidents of maternal mortality by enabling healthcare providers to reach out to the pregnant women in the most remote/underprivileged parts of the world which is made possible by the many types of mobile devices (smartphones) and the internet. This system can provide efficient and effective healthcare to the pregnant women.

Raghav Hari Krishna V S\(^{[11]}\) The most prevalent reason for perinatal morbidity is preterm birth. In order to be able to correctly predict preterm we need to collect a lot of information such as the mother’s height, weight, gravida or number of pregnancies and para. There is a model which has been developed which can predict the risk of preterm. The authors were able to achieve 89.99% accurate results which is very promising. The model developed can then be used to predict/identify the women.

**Challenges:**

- To facilitate a communication network between the healthcare providers and the patients.
- To facilitate in forming a communication network between the pregnant ladies and allows them to exchange their experiences and ideas.
- To facilitate in increasing the awareness around healthy food/healthy habits to pregnant women.
- To facilitate monitoring using the pregnant woman’s health status using a wearable smart watch sensor connected to a mobile application.
- To facilitate monitoring the fetal movements using a sensor belt which can count the number of kicks.
- To facilitate delivering medical services to clinics in remote areas which are not accessible for in person consultation/support.

**Health Care Monitoring Systems For Pregnant Women:**

**Health Care provider unit:** This unit consists of a mobile application and also a web application using which doctors/nurses/healthcare providers can interact with their patients and diagnose any issues remotely. The healthcare providers can also use this network for creating awareness and to schedule any follow ups required. This unit creates a private social network which can be used to only connect the doctor/healthcare provider directly to the pregnant woman. This network can also be used to connect this unit to other pregnant women so that they can interact with and understand from each other. Doctors/healthcare providers can also post messages, images, videos etc which can then be used to create awareness with pregnant women using mobile application/SMS. In order to prevent incorrect diagnosis or unwanted images from being stored, there should exist a capability to be able to delete any incorrect images/files etc. This system will also provide full access to the pregnant woman’s profile, history of treatments etc to enable giving the right support. The unit can also measure information about the physical activity of the mother and child using a wrist band and also include the physical activity of the baby by measuring the number of kicks of the baby using a body touch sensor.\(^{[12]}\)

**Wearable Technology and Smartphones to Monitor Hypertension during Pregnancy:** The authors talk about being able to use wearable devices\(^{[19]}\) such as smart watches, wrist bands etc to measure, monitor and control hypertension during pregnancy which often leads to complications such as preeclampsia which can cause complications such as pre-tirm, still birth, miscarriage etc. By using this technology we can ensure that patients are engaging in healthy activities in turn reducing the costs associated with fetal and maternal health problems.

In addition to using wearables, we can also use smartphones\(^{[20]}\) to do the similar kind of monitoring. Today smartphones have become very versatile and have several sensors such as heart rate sensor, blood pressure sensor, fingerprint sensor etc which can be used to measure the required parameters of the pregnant woman. The data collected from the smartphones can also be used to perform analysis of the health status and share the same with the healthcare provider remotely.

**Measuring Uterine Contractions using On Body Sensors:** This paper proposes a cost effective system to monitor the risks of premature labor in pregnant women\(^{[21]}\). As per their research premature birth is the most important reason for deaths of children before the age of 5 or even if they survive they will have issues such as hearing disability or loss of vision or mental instability. Their system works by measuring uterine contractions using a non-invasive body sensor which is then connected to a smartphone which will send an intimation/alert to a doctor/family member in case of emergency so that they can take care of the same.

**Fetal Remote Monitoring System:** This paper proposes a method to remotely monitor the status of
pregnant women using several sensors which can be used to measure the below parameters.

- Heart Rate
- Abdominal Breathing
- Blood Pressure
- Fetal Movement Data
- Mother Movement Data
- Temperate of Mother

The parameters above can be measured by using non-invasive body based sensors\textsuperscript{[22]}. The data from these sensors are collected, analysed and compared with previously collected data to determine the status of the mother/fetus. Based on the status the doctor/healthcare professional can take the required action.

**Cloud Based HealthCare System:** This paper proposes a cloud based infrastructure to collect and store electronic health records of patients which can then be used to perform analysis using machine learning to determine the status of the patient being monitored\textsuperscript{[23]}. The data in the cloud can be collected either in real time from sensors worn by the patient or can also be collected from the health records of the patient shared by the hospital or by data collected in the past for the same patient. The information collected from the sensors are raw data which must then be processed to derive the right kind of information.

**Intelligent Assistant for Pregnancy:** This system enables remote monitoring\textsuperscript{[12]} of pregnancy related risks which is essential for women who are unable to get access to proper healthcare during their pregnancy which can result in complications such as preterm/stillbirth. The intent of this system is to monitor the health status of the pregnant woman using a network of on body non-invasive sensors connected to the internet. The data collected from these sensors is placed into a central repository. This information can then be compared to the previous information collected for the same patient and also information collected from other patients to determine whether the health status of the pregnant woman is fine or not. By using the internet this system helps connect the pregnant women to their doctor/healthcare provider or family members to provide assistance during various stages of pregnancy. This network enables us to get real time suggestions from the doctor/healthcare provider. This system incorporates a lot of personalized information which is useful for the pregnant women such as the stages of delivery, due date, personalized diet recommendations etc. it can also track the weekly progress and any abnormalities in the pregnancy.

The system works by having doctors/hospitals/patients register themselves to a network. The pregnant women have sensors/smartphones to measure critical parameters such as temperate, heartrate, blood pressure etc. The information collected is then stored in a cloud over the network. This information can then be analyzed using machine learning algorithms to determine the health status of the pregnant woman. This information can then be shared with the doctor/healthcare professionals or family members to identify any complications or risks based on which some urgent action needs to be taken. The information collected during registration of the patient would include the previous health details, previous scan results, any medications currently being consumed, any known family history, any known allergies etc. This information is very important to determine the health status and also for a doctor to understand the reasons behind a particular health status and to prescribe the right medicine for the same. This system will also be able to communicate the information collected regularly over the gestational period to their doctor, healthcare provider or family member either through mobile app based notifications or using SMS (Short Messaging Service). It can also send reminders of health checks/scans etc.

**Conclusion**

It is important for all pregnant women throughout their gestational period to be able to access information, services and care by having direct communication with their doctors or their healthcare provider or their relatives. With the proliferation of mobile devices and the internet it has become very easy to get access to such information in a quick and efficient manner. This paper provides a summary of all such systems which exist to help provide such information to a pregnant woman in the most simple, cost effective manner.

**Conflict of Interest:** Nil
Ethical Clearance:

- This manuscript in part or in full has not been submitted or published anywhere.
- This manuscript does not contain previously published content.

Source of Funding: Self

References


a High Risk of Premature Labour Using Sensor Networks”.


Comparative Study between Alvarado Scoring System and Ohmann Score as a Diagnostic Tool for Acute Appendicitis at Two Teaching Centers Study in Baghdad City

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Abstract

Background: Acute Appendicitis first characterized as a surgical entity in 1886 by pathologist Reginald Fitz, appendicitis is now the most common abdominal emergency and appendectomy is the non-elective surgery most frequently performed by general surgeons. More than 250,000 cases are diagnosed and intervened annually in the United States. It occurs less frequently in men than in women, with a lifetime risk of 8.6% and 6.7% respectively. Acute appendicitis occurs infrequently in very young children as well as in older adults. Having its peak incidence in patients between the end of the second decade and the third decade of life. Showing an inverse relationship between incidence and mortality, its prevalence was less than 1% in the general population and increases to 4-8% in older adults.

Aim of the Study: To assess Alvarado scoring system as a diagnostic tool for acute appendicitis

Method: A prospective cross-sectional study carried at Al-Yarmouk Teaching hospital and Baghdad Teaching hospital in the period from the first of Jan 2020 to end of July 2020, in which 190 patients from both genders were enrolled, and their ages ranged from 12-68 years.

Conclusion: Alvarado score was better than Ohmann score in diagnosis of the patients with acute.

Keyword: Acute appendicitis, Alvarado score, Ohman score.

Introduction

Acute appendicitis were first characterized as a surgical entity in 1886 by pathologist Reginald Fitz(1), appendicitis is now the most common abdominal emergency and appendectomy is the non-elective surgery most frequently performed by general surgeons(2).

Annually more than 250,000 cases are diagnosed and intervened in the United States(3). It occurs less frequently in men (8.6%) than in women (6.7%), with a lifetime risk of presenting it(4).

Acute appendicitis occurs infrequently in very young children as well as in older adults, having its peak incidence in patients between the end of the second decade and the third decade of life. Showing an inverse relationship between incidence and mortality, since the latter is less than 1% in the general population and increases to 4-8% in older adults(5).

Anatomical Considerations:

Embryology: The vermi form appendix is derived
from the midgut along with the small intestine, the cecum, the ascending colon, and the right half of the transverse colon; all these structures in turn supplied by the superior mesenteric artery.

It is visible in the eighth week of gestation and the first accumulations of lymphatic tissue develop during the fourteenth and fifteenth weeks of gestation (6).

Anatomy: The appendix in the adult is blind tubular in shape, approximately 9 cm in length, varying from short forms of 5 cm up to long forms of 35 cm. The appendix has a small mesentery that contains the appendicular artery in its free edge, in this mesentery the typical arches of intestinal irrigation do not appear, so the appendicular artery is terminal, this fact may overlap the clinical environment, since being part From a terminal irrigation, the appendicular artery in cases of appendicitis is unable to supply the tissue needs, generating ischemic damage. The base of the appendix also receives blood supply from the anterior and posterior colic arteries, hence the importance of proper ligation of the appendix stump, in order to avoid bleeding from these vessels (7). The appendicular artery is usually described as a branch of the ileocolic artery.

Clinical Diagnosis: Despite the multiple diagnostic method currently available, the clinical history focused on the evolution of pain and associated symptoms as well as the findings obtained during the physical examination are still the cornerstones of the diagnosis of appendicitis.

Historically, pain is described as acute onset and initially localized at the epigastric or periumbilical level, later with the passage of time the pain migrates to the right iliac fossa where it increases in intensity, however this only occurs in 50-60% of patients (8).

It is important to take into account anatomical considerations and their variants since they largely influence the presentation of pain, for example with an appendix in a retrocecal location, the pain can start in the right iliac fossa or in the right flank, in the same way an appendix length beyond the midline can cause pain in the left lower quadrant (9).

Anorexia and nausea frequently accompany abdominal pain, vomiting may occur but rarely occurs before the onset of pain.

During the evaluation of the patient, emphasis should be placed on the location of the pain and the classic signs. Taking into account that the positivity or negativity of these depends largely on the variants in the location of the appendix as well as the time that has elapsed since the onset of pain (9).

Temperature is a poor predictor of appendicitis, however the presence of marked fever and tachycardia warn of the possibility of perforation and formation of an intra-abdominal abscess (1). At this point, it is important to discuss the use of analgesia in patients who are under observation for abdominal pain, especially in those who still do not have a definitive diagnosis and in whom the need for surgery has not yet been ruled out. Classically it has been described that the use of analgesics can attenuate or even abolish the signs suggestive of acute appendicitis, so they should not be administered to these patients. However current evidence does not support this judgment (11). It should be taken into account that there are drugs with pure analgesic properties (opioids), as well as others that additionally have anti-inflammatory mechanisms of action (such as the case of non-steroidal anti-inflammatory drugs), a case-control study carried out by Frei and colleagues showed that opioids are not associated with treatment delay, on the other hand anti-inflammatory drugs did show an association with treatment delay (12).

Radiologic: Plain abdominal radiography should not be used routinely, but it can be useful in cases of atypical symptoms and diagnostic doubt, it can show a fecolith, a localized ileus, loss of the fatty pattern of the peritoneum or unsuspected pneumonia. Pneumoperitoneum only occurs in 1-2% of appendicitis cases (9).

Ultrasound (US) and abdominal tomography (CT) have been compared in recent years in order to refine the diagnosis of acute appendicitis (13). CT has shown a sensitivity and specificity of 94% and 95% in children, respectively, and 94% and 94% in adults. In the same study, US showed a sensitivity and specificity of 88% and 94% in children respectively, and of 83% and 93% in adults (14).

Another disadvantage of US is its known dependence on the knowledge, skill, and patience of the sonographer who performs and interprets it (15).

Some authors have promoted the protocol use of CT in patients who meet the criteria for suspicion of acute appendicitis since their admission, as they have shown a reduction in hospitalization costs and better results in these patients (13).
Since CT use has become more popular in the United States, rates of negative appendectomies have decreased. However, no improvement has been shown in patients with classic appendicitis symptoms.\(^{(16,17)}\)

Carrying out a CT scan unnecessarily delays the diagnosis and treatment, which is why it is concluded that it is preferable to carry out the study in cases where there is diagnostic doubt.\(^{(18)}\)

**Laboratory:** Most patients have a blood count prior to surgery as part of the basic studies; leukocytosis between 12,000 and 18,000 mm\(^3\) is very frequently observed.\(^{(34)}\) The leukocyte count can be useful in the diagnosis and in the exclusion of appendicitis, but it has no value in the differentiation between complicated and uncomplicated appendicitis.\(^{(35)}\)

Urinalysis is usually requested to exclude the possibility of urinary tract infection when it is suspected, and pyuria and/or hematuria without bacteriuria may be found in one third of patients with appendicitis due to the proximity of the ureter and the bladder.\(^{(36)}\)

**Differential Diagnosis:** The differential diagnosis of acute appendicitis could involve any entity that causes abdominal pain, however there are some pathologies that are more commonly confused.

**Aim of the study:** To Compare between Alvarado scoring system and Ohman score as a diagnostic tool for acute appendicitis.

### Patients and Method

A prospective cross-sectional study carried at Al-Yarmouk Teaching hospital and Baghdad Teaching hospital at the period from the first of Jan 2020 to end of July 2020, in which 190 patients from both genders were enrolled, and their ages ranged from 12-68 years.

**Statistical Analysis:** SPSS version 26 (Statistical Package for the Social Sciences) used for entry and analysis of data. Results existing in the form of tables and graphs. Chi square test used to assess association between descriptive data and Fisher exact test used if the chi square test is not applicable. P value <0.05 will be considered significant.

**Results**

The current study was included 190 patients with suspected appendicitis, with in a mean age (27.4±0.8) year and the main age group was in group between (10-19) years old, female (57.6%) was more than male (42.4%), and the female mean age was (25.4±7.2) years which is younger than male mean age (27.5±3.1) years.

Table 1 revealed that time needed from the beginning of the clinical presentation until the time of operation was mainly in group of time < 24 hours, then patient’s in-group between 24-48 hours, and patients needed more than 2 days (>48 hours) with the majorities of female group (79.5%).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td><strong>Duration (hours)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;24</td>
<td>52</td>
<td>69.3</td>
<td>23</td>
</tr>
<tr>
<td>24-48</td>
<td>22</td>
<td>52.4</td>
<td>20</td>
</tr>
<tr>
<td>&gt;48</td>
<td>15</td>
<td>20.5</td>
<td>58</td>
</tr>
<tr>
<td>Total</td>
<td>89</td>
<td>46.8</td>
<td>101</td>
</tr>
</tbody>
</table>

As for the validity test of the AS to diagnosis of the acute appendicitis we found that from those in group I (Alvarado score ≥ 7) 114/120 patients were truly positive diagnosed with the disease while 6/120 were false positive. For group II (Alvarado score < 7) we found that 12/40 were diagnosed as false negative and 28/40 patients were diagnosed as true negative.
Regarding to the validity test of the Ohmann score to diagnosis of the acute appendicitis we found that from those in group I (≥ 12) about 143/148 patients were truly positive diagnosed with the disease while 5/148 were false positive (patients don’t have the appendicitis but we diagnosed it as app). As for group II (score <12) we found that 60/82 were diagnosed as false negative and 22/82 patients were diagnosed as true negative. (Table 3).

### Table 2: Validity test of Alvarado group

<table>
<thead>
<tr>
<th>AS group</th>
<th>No.</th>
<th>Confirmed Appendicitis</th>
<th>Not Appendicitis</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I (Alvarado score ≥ 7)</td>
<td>135</td>
<td>(True positive) 122</td>
<td>(False positive) 13</td>
<td>0.001 Hs</td>
</tr>
<tr>
<td>Group II (Alvarado score &lt;7)</td>
<td>55</td>
<td>(False negative) 17</td>
<td>(True negative) 38</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>190</td>
<td>139</td>
<td>51</td>
<td></td>
</tr>
</tbody>
</table>

Hs: Highly significant difference

Table 4 show the accuracy of the test to detect the acute appendicitis: for the Ohman score we found that the sensitivity was (68%), specificity was (64%) accuracy (67%), positive predictive value (89%), negative predictive value (32%). While for AS the sensitivity was (88%), specificity was (75%) accuracy (84%), positive predictive value (90%), negative predictive value (60%).

### Table 3: Validity test of Ohmann group

<table>
<thead>
<tr>
<th>Ohmann group</th>
<th>No.</th>
<th>Confirmed Appendicitis</th>
<th>Not Appendicitis</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I (≥ 12)</td>
<td>117</td>
<td>(True positive) 105</td>
<td>(False positive) 13</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Group II (score &lt;12)</td>
<td>73</td>
<td>(False negative) 50</td>
<td>(True negative) 23</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>160</td>
<td>155</td>
<td>35</td>
<td></td>
</tr>
</tbody>
</table>

### Table 4: Accuracy of the test

<table>
<thead>
<tr>
<th></th>
<th>Ohmann score</th>
<th>AS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity</td>
<td>68</td>
<td>88</td>
</tr>
<tr>
<td>Specificity</td>
<td>64</td>
<td>75</td>
</tr>
<tr>
<td>Accuracy</td>
<td>67</td>
<td>84</td>
</tr>
<tr>
<td>PPV</td>
<td>89</td>
<td>90</td>
</tr>
<tr>
<td>NPV</td>
<td>32</td>
<td>69</td>
</tr>
</tbody>
</table>

### Discussion

The current study shows that incidence of acute appendicitis was more common in youthful group with more prominent in female than male. which is in contract with greatest of the outcomes of regular world’s studies, and recognized that it happened mostly in young population. Which is same that stated by American studies approved by Abdeldaim Y et al, (19). A number of scoring systems that have been developed for the perseverance of rising the validity of both the sensitivity and specificity of the diagnosis of acute appendicitis had been frequently tested. Scoring systems signify low-cost, non-invasive and easy to use diagnostic benefit(20). As for Ohmann scoring system, the study done by Koppad SN et al, specified that Sensitivity of 96%, specificity 66.7%, positive predictive value 82.8% and negative predictive value of 90.9%. (21) Moreover, in a study carried by Memon ZAetal, found that sensitivity (92.3%) and specificity (80.6%), positive predictive value was (92.3%) and negative predictive values (83.3%). (22)

in the present study we found that the validity test at Alvarado score cutoff value of (7) was as follow: sensitivity (88%), specificity (75%), accuracy (84%), positive predictive value (90%), negative predictive value (69%). Xingye W et al, found that Alvarado score established the highest sensitivity (92.7%) percentage. (23) In Agbo S et al, study in the same cut-off of the Alvarado scores found that validity test was butter than that in our study. (24)

Memon et al, study found that the sensitivity of this scoring system (Alvarado) has a sensitivity of 93.5%, specificity of 80.6 %, PPV of 92.3 %, NPV of 83.3%, and accuracy of 89.8%. (22) While in Tekeli MT et al, study...
the sensitivity was (75.2%), specificity was (76.1%) PPV (90.2%), NPV (50.9%) and accuracy of the test to diagnose the disease was (75.4%).(25)

Conclusion
Alvarado score was better than Ohmann score in diagnosis of the patients with acute.

Conflicts of Interest: No

Source of Funding: Self

Ethical Clearance: Was taken from the scientific committee of the Iraqi Ministry of health

References


Assessment of Anxiety Level and Practice Modifications among Dentist During Novel Corona Outbreak (COVID-19) in Tamilnadu

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¹PG Student, ²Associate Professor and Head in Charge, ³Reader, ⁴Senior Lecturer, Department of Oral Medicine and Radiology, SRM Dental College, Chennai

Abstract

Background: Pandemic and panic are two sides of the same coin. The sudden outbreak of corona virus COVID-19, has influenced the routine practices of dentist. Dentists were categorized as high risk profession during this pandemic, which created anxiety and stress regarding their personal and financial issues. Such a survey would help us to understand the impact of psychological burden among the dentist during the pandemic.

Method: A set of 28 close ended, validated questionnaire was circulated among 250 dentist in Tamilnadu to assess the level of anxiety and practice modification adopted in dental clinics during this sudden outbreak by the dental professionals.

Results: There were significant differences in anxiety scores and practice management questionnaire scores between clinicians with varying years of clinical experience (P=0.0001).

Conclusion: Anxiety and stress has been the main psychological burden among dentist during this covid-19 outbreak.

Keywords: Anxiety, Fear, Novel Corona Virus 2019, PANDEMIC, SARS-COV 2.

Introduction

The spread of coronavirus (COVID-19) has posed significant challenges for the dentists worldwide. The New York Times reminded the world that dentistry is a high risk profession for COVID-19(2). This pandemic had led to panic among the people and these continuous lockdown and quarantine has brought a major impact on individual’s life which has led to fear, anxiety and depression among them. This quarantine has produced many stressful life events: the loss of freedom and social connectivity, and the inability to work has harmed the mental health(3). Mental health is an important part of overall health and well being. Mental health issues that coincide with pandemic are rarely studied.

The COVID-19 outbreak has negatively impacted the activity of dentists(4). Many dental professionals have suspended their practice as they work in close proximity with patients, frequent exposure to saliva, blood, other body fluids and handling sharp instruments(11). Moreover, oral mucosa has been recognized as high risk factor for transmission, which has made dentists to limit their dental activities and treat only urgent and emergency procedures to minimize the spread(6). Droplet spread via aerosol production in dental clinic is an important concern as scaling back droplet production to zero is impossible while performing emergency and urgent procedures.

Additionally, Dental assistant must be educated...
about the routes of spread and newer protocols of disinfection. Dentist are worried about the risks of contracting the infection during dental procedures. Thus dentists are attributed to psychological distress such as the fear of getting infected with COVID-19 and have anxiety while treating patients.

Considering the current rapid spread of infection, the American Dental Association (ADA) highlighted key precautions to be taken by dentists in addition to the standard universal precautions, since transmission of airborne droplet is one among the most routes of spread.

Till date no universal protocol is available for dental care provision or suspected COVID-19 cases. Use of personal protective equipments such as masks, protective goggles, gowns, gloves, head caps, face shields, shoe covers are strongly recommended for all health care personnel. Rubber dam isolation, high volume suction, HEPA filters, UVC light chamber are other additional equipments used currently to avoid cross infection. Yet, dentists are disinclined and anxious while treating patients during COVID.

This study was done to assess anxiety amongst dentists during this current pandemic. Also the additional practice modifications made by them in their clinics to avoid cross infection.

**Aim:** The aim of the study was to assess the anxiety level among dentist and also the practice modifications in their dental clinics during novel COVID-19 outbreak in Tamil Nadu.

**Objectives:**
1. To assess the level of anxiety among dentist who practice during corona outbreak.
2. To assess the practice modification adopted by dentist during the pandemic outbreak.
3. To compare the level of anxiety and practice modification with various years of clinical experience among dentist.

**Materials and Method**

The prepared questions were subjected to content validation by the experts, comprising of an oral medicine and radiologist, a public health dentist and a general dentist. The questionnaire was made in English language. The questionnaire included the questions to assess the level of anxiety.

A. Are you afraid of getting infected from your patients?
B. Are you afraid of losing your patients?
C. Do you feel nervous when talking to patients in close vicinity?
D. Do you have the fear of carrying the virus to your family?
E. Do you want to close your practice until the COVID-19 Cases starts declining?

The second set of questionnaire regarding the practice management adopted by dentist in clinics were regarding the CDC guidelines for cross infection control, recording patients temperature, about PPE Kits, Rubber dam isolation, pre procedural mouthwash with 1% H2O2 or 0.2% povidine iodine, fumigation etc.

All the practicing dentists including undergraduates (CRRI) and postgraduate students in Tamil Nadu were included in the study. The dental undergraduate students who had not entered their clinical postings and the dentists who were not willing to participate in the study were excluded. The questionnaire was given to 280 dentists and 250 responses were recorded over a duration of 30 days. The responses that were incomplete or had 2 options chosen for the same question which could lead to bias in the results were not considered during validation.

Responses were obtained and tabulated in Microsoft excel sheet, for statistical analysis.

**Statistical Analysis:** Data was analyzed using STATA version 16.1 (STATA corp., College station, Texas) statistical software. Reliability of the questionnaire was assessed using Intra-class correlation coefficient (Cohen’s Kappa). Data was examined using Shapiro-Wilk test to determine whether the distribution was normal and was found that the data was not normally distributed. Kruskal Wallis test was used to test the null hypothesis which showed that there was no difference in anxiety scores and practice modification between the three groups of clinicians categorized based on years of clinical experience. The non-parametric Mann Whitney
U test was used to perform the pairwise comparisons with a significance level of P<0.05.

Results

Reliability: The intra-examiner reliability for responses of clinicians as assessed by Cohen’s Kappa shows substantial agreement with an ICC of 0.84 for anxiety score and an ICC of 0.78 for practice management.

Anxiety Score: The median anxiety score for the clinicians with less than 5 years of clinical experience the score was 7 (IQR=4-8), for the clinicians with 5-10 years of clinical experience the score was 6 (IQR=4-8) and for the clinicians with more than 10 years of clinical experience the score was 5 (IQR=4-5). The maximum anxiety score for the clinicians with less than 5 years of clinical experience and 5-10 years of clinical experience was 9. Whereas the maximum anxiety score was 5 for the clinicians with more than 10 years of clinical experience. Kruskal Wallis test showed that there was significant difference in anxiety scores between the clinicians with varying years of clinical experience (P=0.0001). The results of Mann Whitney U test shows that the clinicians with more than 10 years of clinical experience had lesser anxiety scores when compared with the clinicians with 5-10 years of clinical experience (P<0.0001) and also with the clinicians less than 5 years of clinical experience (P<0.0001). The probability for the clinicians with 5-10 years of clinical experience to have greater anxiety scores than clinicians with more than 10 years of clinical experience was 79.6%.

Practice Management: The median practice management questionnaire score for the clinicians with years of clinical experience less than 5 years was 14 (IQR=13-15), for the clinicians with 5-10 years of clinical experience was 14 (IQR=12-16) and for the clinicians with more than 10 years of clinical experience was 16 (IQR=16-17). The maximum practice management questionnaire scores for the clinicians with less than 5 years of clinical experience was 16. The maximum practice management questionnaire score for the clinicians with 5-10 years of clinical experience and for the clinicians with more than 10 years of clinical experience was 19. Kruskal Wallis test showed that there was significant difference in practice management questionnaire scores between clinicians with varying years of clinical experience.
years of clinical experiences ($P=0.0001$). The results of Mann Whitney U test showed that the clinicians with more than 10 years of clinical experience had greater practice management questionnaire scores when compared with the clinicians with 5-10 years of clinical experience ($P<0.0001$) and also with the clinicians less than 5 years of clinical experience ($P<0.0001$). The probability for the clinicians with more than 10 years of clinical experience to have greater practice management questionnaire scores than the clinicians with 5-10 years of clinical experience was 94.2%. The probability for the clinicians with more than 10 years of clinical experience to have greater practice management questionnaire scores than the clinicians with less than 5 years of clinical experience was 86.9%.

![Figure 2: Box and whisker plot describes the practice modifications adopted in clinics with various years of clinical experience.](image)

**Discussion**

Covid has created panic amongst the people. The most common emotion faced by everyone is fear and anxiety. Fear and anxiety are not novel to the COVID-19 pandemic; it had been well described in other infectious diseases and epidemics such as HIV or SARS\(^\text{14}\). Dentists also at a higher risk for getting psychological distress. As dentists are at high risk of acquiring infection, effective prevention control by additional practice protocol is necessary for both dentists and dental assistants.

Coronavirus is an enveloped virus with a positive sense (single stranded) RNA virus. It is approximately 26–32 kb in size. This viruses often leads to the upper respiratory tract infection, frequently resulting in common cold symptoms. Three specific strains of these viruses that are of zoonotic origin, including severe acute respiratory syndrome coronavirus (SARS-CoV), Middle East respiratory syndrome coronavirus (MERS-CoV), and 2019 novel coronavirus (2019-nCoV), had caused lethal infections in humans\(^\text{8}\).

**The route of transmission of covid-19 are:**

1. Direct transmission through inhalation of droplets generated through coughing or sneezing and via mucous membrane such as conjunctival, nasal or oral mucosa to infectious droplets.
2. Indirect transmission via contaminated surfaces

Dentists as front line workers, have a significant role in disrupting the transmission chain by performing only emergency cases with extra protective measures.
The unexpected pandemic had led to development of fear and anxiety amongst the dentists with different years of experience. In the study, there were two sets of questionnaire, the first set of questions were about the anxiety level amongst the dentists while practicing during COVID-19 pandemic. The second set of questions were about the practice modification adopted in dental clinics to limit the spread of cross infection.

Health care workers who came in contact with infected patients developed anxiety, exhaustion, detachment from others and poor concentration and work performance during SARS epidemic. Consolo et al. reported that in Italy 85% of the dentists were worried about acquiring the infection during dental procedures (4).

Shacham et al. identified psychological distress among dentists and found that the fear of getting infected with COVID-19 from a patient provides high psychological tension (7).

This study shows that there was significant difference in anxiety score amongst the dentists with various years of clinical experiences. The Dentist with clinical experience less than 5 years found to have higher anxiety level than those with experience more than 5 years and above.

Dentist had the fear of losing their patients and anxiety of carrying infection to their families, getting quarantined which may affect their economical and financial status leading to financial burden. They were also anxious about the cost of the treatment if they were infected (10). Dentist should be aware of 2019-nCov and they ought to practice in effective way by undertaking only emergency procedures with proper Personal protective equipments (PPE).

The list of emergency and urgency procedures are given in table below.

<table>
<thead>
<tr>
<th>Table 1: List of Emergency and Urgency procedures to be carried in dental clinics during COVID-19.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Emergency Procedures</strong></td>
</tr>
<tr>
<td>2. Severe uncontrolled dental pain, not responding to routine measures.</td>
</tr>
<tr>
<td>3. Uncontrolled bleeding of dental origin.</td>
</tr>
<tr>
<td>4. Trauma involving the face or facial bones.</td>
</tr>
<tr>
<td><strong>Urgency Procedures</strong></td>
</tr>
<tr>
<td><strong>For Adults:</strong></td>
</tr>
<tr>
<td>1. Dental pain of pulpal origin not controlled by Advice, Analgesics, Antibiotics (AAA) .</td>
</tr>
<tr>
<td>2. Acute dental abscess of pulpal/periodontal/endo-perio origin/Vertical split of tooth .</td>
</tr>
<tr>
<td>4. Pericoronitis.</td>
</tr>
<tr>
<td>5. Long-standing cysts and tumours of the jaw with abrupt changes.</td>
</tr>
<tr>
<td>7. Orthodontic wire or appliances, piercing or impinging on the oral mucosa.</td>
</tr>
<tr>
<td><strong>For Children &amp; Adolescents:</strong></td>
</tr>
<tr>
<td>Acute pulpitis</td>
</tr>
<tr>
<td>Dental abscess</td>
</tr>
<tr>
<td>Dentoalveolar abscess.</td>
</tr>
</tbody>
</table>

Several Organizations such as DCI, IDA along with Gov of India have come up with an unified guidelines regarding the modifications to be done in dental set up an while practising in clinic during pandemic to minimize the risk of cross infection (12).

As thoughts regarding the psychological impact among dentist is very limited, this study throws light into the much neglected aspect of anxiety level among dental practitioners during pandemic in Tamilnadu. The limitations of our study was smaller sample size, because of short duration. One inherent weakness was that this study was restricted to dentist within Tamilnadu. Thus, this study projected that dentist are in state of anxiety and fear while practicing during pandemic.

**Conclusion**

SARS-COV 2 outbreak, major public health concern
has caused major psychological distress among dentist which has compromised their professional and personal life\(^{(15)}\). Dentist should be encouraged in following alternative treatment modifications like tele dentistry.

**Ethical Clearance:** Ethical Clearance was obtained from the Institutional Review Board of SRM DENTAL COLLEGE, Ramapuram.

**Conflicts of Interest:** Nil

**Source of Funding:** Self

**References**


Progression and Free Progression Survival Indices in Patients with Multiple Myeloma

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¹Research Scholar, Departments of Chemistry, College of Medicine, Al-Nahrain University, Iraq, ²Research Scholar, Departments of Chemistry, College of Medicine, Al-Nahrain University.

Abstract
The main feature in multiple myeloma is osteolysis and, hence, bone turnover markers have got the at most care in different studies on this disease. The present paper would stress on the calculation of free progression survival indices using some of these markers.

Sixty-five MM (males=41, females=24) patients distributed to different hematolgycenters in Iraq were enrolled in this study. Their age range was 39-81 years, they were distributed all on three stages of the disease according to the international staging system (ISS) : Group A – Stage I (n=21 patients, age mean 57.14±12.25 years), Group B – Stage II (n=22 patients, age mean of 56.45±11.33 years), and Group C-Stage III (n=22 patients, age mean 60.59±11.55 years). Blood samples were taken from each patient just prior to starting the chemotherapy for the measurement of blood hemoglobin (Hb), serum Creatinine, Calcium, β2 Microglobulin, Osteocalcin (OC), total and Beta C-terminal telopeptide (CTX, BCTX), Parathyroid hormone (PTH), Syndecan-1 (CD138), and both kappa & lambda free light chain (FLCκ, FLCλ).

There was no significant association between age, sex, body weight and residency with disease staging or progression. From the bone markers studied only CTX and BCTX were significantly associated with the disease progression and showing varying free progression patient survival times with CTX and BCTX at different concentrations.

The comparison between the results of the newly diagnosed and long-standing patients revealed that only total FLC, FLCκ, FLCλ and CD138 were significantly higher in the long-standing patients. Their sensitivity and specificity values were varying among these markers.

Keywords: Progression, survival indices, multiple myeloma.

Introduction
The annual incidence of multiple myeloma (MM) in the UK was reported to be 5/100 000, constituting about 10% of hematological malignancies and affecting middle sixties mostly with variation among different races and sex⁽¹⁾.

It was reported that neither changes in monoclonal protein levels nor X-rays can be exact indices of the activity in bone turnover and thus, the need for biochemical markers for bone activity in MM is essential⁽²⁾.

Staging of MM, principally, depends on serum levels of β₂-microglobulin and albumin (International staging system, ISS). The heterogenicity and variability of MM course led to the inclusion of other prognostic factors as C-reactive protein, lactate dehydrogenase, LDH, and cytogenetics by Fluorescence in situ hybridization, FISH⁽³-⁴⁾.

Improvement in the survival of MM patients, in the last decade, including those with high risk has been
Elevated C-reactive protein is considered a determinant predictor of lower survival rates in patients with several cancers including MM\(^6\).

Classification of myeloma risk using the international staging system (ISS) and host factors such as age, performance status, and comorbidities are considered important for determining prognosis and choosing treatment options \(^7\). However, many parameters were suggested for these purposes, some concern demographic characteristics as age, residence, gender, race, or obesity \(^8\)-\(^10\), others are related to diagnostic results as radiology or laboratory findings as Hb, plasma cells, renal insufficiency, hypercalcemia, \(\beta\)-microglobulin, free light chain, Parathyroid hormone, PTH, or immunofixation tests \(^11\)-\(^17\).

Bone markers have also, been found to be related to MM staging in variable degrees as total and Beta C-Terminal telopeptide (CTX, BCTX), osteocalcin (OC), Syndecane-1 (CD138).\(^{18}\), with a statistically significant positive correlation between bone lesions degree and \(\beta\)-CTX levels\(^{19}\).

Disease progression and free progression survival rates are two important tasks for treatment of patients with MM\(^20\). The present study elucidates and evaluates these two points for different biomarkers in a sample patient with MM.

**Materials and Method**

Hospital-Based cross-sectional research was conducted over eleven months from May 2018 to June 2019. A total 65 Multiple Myeloma (MM) patients (with age range of 39-81 years) were involved in the study who were subjected to physical examination and diagnosed by hematologists with Multiple myeloma from both genders (based on the Diagnostic criteria of the International Myeloma Working Group - IMWG). They were distributed to different Departments of hematology from Al-Imamain Al-Kadhimain Medical City, Al-Yarmuk Hospital, Baghdad Medical City teaching laboratories, Mirjan teaching Hospital in Hilla, and center of hematology and oncology in Basra.

A group (12) of newly diagnosed patients emerged. The 65 patients were grouped into 3 stages according to the international staging system (ISS): Group A – **Stage I** (21 patients, age mean 57.14±12.25 years), Group B – **Stage II** (22 patients, age mean of 56.45±11.33 years), and Group C-**Stage III** (22 patients, age mean 60.59±11.55 years).

Full data were obtained from each patient using a preformed questionnaire. Initial laboratory results were recorded from tests performed for the patients. Serum urea, creatinine, and calcium were determined by spectrophotometric method. Moreover, a complete blood count and ESR, serum Immuno-fixation Electrophoresis, Imaging bone surveys, bone marrow aspirate, and bone marrow biopsy results were registered for each patient. Patients excluded from the study were those who had Liver disease, active infections (human immune-deficiency virus, HIV, Hepatitis B, or C), and pregnant or breast-feeding women. For each patient the following laboratory tests were done: Serum albumin, and protein electrophoresis, Free light chains test Kappa (FLC-k) & Lambda (FLC-l), \(\beta\)-microglobulin (\(\beta\2-MG\)), Osteocalcin (OC), C-terminal telopeptide (CTX), Beta C-terminal telopeptide (\(\beta\)CTX), Parathyroid hormone (PTH) and Syndecan-1(CD138). All tests were done by ELISA technique.

**Results**

None of the included demographic characteristics like age, gender, BMI, as well as residency showed any significant association with any of the three stages of the disease, (as shown in table 1).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Stage I (n=21)</th>
<th>Stage II (n=22)</th>
<th>Stage III (n=22)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (Years)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean±SD</td>
<td>57.14±12.25</td>
<td>56.45±11.33</td>
<td>60.59±11.55</td>
<td>0.461</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>14(66.67%)</td>
<td>12(54.55%)</td>
<td>15(68.18%)</td>
<td>0.593</td>
</tr>
<tr>
<td>Female</td>
<td>7(33.33%)</td>
<td>10(45.45%)</td>
<td>7(31.82%)</td>
<td></td>
</tr>
<tr>
<td><strong>BMI (kg/m²)</strong></td>
<td>22.83±3.88</td>
<td>21.36±3.29</td>
<td>22.73±4.05</td>
<td>0.359</td>
</tr>
<tr>
<td>Variables</td>
<td>Stage I (n=21)</td>
<td>Stage II (n=22)</td>
<td>Stage III (n=22)</td>
<td>P-value</td>
</tr>
<tr>
<td>----------------</td>
<td>---------------</td>
<td>----------------</td>
<td>-----------------</td>
<td>---------</td>
</tr>
<tr>
<td>Residence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>9(42.86%)</td>
<td>8(36.64%)</td>
<td>14(63.64%)</td>
<td>0.168</td>
</tr>
<tr>
<td>Rural</td>
<td>12(57.14%)</td>
<td>14(63.64%)</td>
<td>8(36.36%)</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underweight</td>
<td>4(19.05%)</td>
<td>4(18.18%)</td>
<td>5(22.73%)</td>
<td></td>
</tr>
<tr>
<td>Normal weight</td>
<td>12(57.14%)</td>
<td>15(68.18%)</td>
<td>8(36.36%)</td>
<td>0.589</td>
</tr>
<tr>
<td>Overweight</td>
<td>4(19.05%)</td>
<td>2(9.09%)</td>
<td>8(36.36%)</td>
<td></td>
</tr>
<tr>
<td>Obese</td>
<td>1(4.76%)</td>
<td>1(4.55%)</td>
<td>1(4.55%)</td>
<td></td>
</tr>
<tr>
<td>Duration (Months)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean±SD</td>
<td>6.19±2.96</td>
<td>15.73±10.45</td>
<td>35.04±31.78</td>
<td>0.00</td>
</tr>
</tbody>
</table>

a, b and c different small letters indicate significant differences.

For the bone markers the Univariate Cox progression analysis showed that only CTX and βCTX had a significant association with disease progression with P-values of 0.023 & 0.044 respectively (table 2).

Kaplan-Meier survival curve was constructed to find out the prognostic value of CTX and βCTX in free-progression survival (FPS). Mean FPS for patients with CTX ≤ 25 ng/ml was 52.86 months (95%CI= 36.93-68.78), while that for CTX > 25 ng/ml it was 25.46 months (95%CI= 19.0-31.91), p-value (Log-Rank) = 0.015 (Figure 1-A).

Likewise, mean FPS for patients with βCTX ≤ 6800 ng/ml was 52.51 months (95%CI= 35.97-69.06), while that for βCTX >6800 ng/ml= 32.26 months (95%CI= 18.48-46.03) p-value (Log-Rank) = 0.014 (Figure 1-B).

**Table 2: Univariate Cox Regression Analysis of bone turnover markers as Risk for MM progression**

<table>
<thead>
<tr>
<th>Variable</th>
<th>p-value</th>
<th>HR</th>
<th>95%CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLCλ (ng/ml) ≤30, &gt;30</td>
<td>0.267</td>
<td>0.43</td>
<td>0.1-1.91</td>
</tr>
<tr>
<td>FLCκ (ng/ml) ≤30, &gt;30</td>
<td>0.816</td>
<td>1.14</td>
<td>0.37-3.5</td>
</tr>
<tr>
<td>Total FLC (ng/ml) ≤60, &gt;60</td>
<td>0.154</td>
<td>1.60</td>
<td>0.37-6.82</td>
</tr>
<tr>
<td>κ/λ ratio ≤2.5, &gt;2.5</td>
<td>0.154</td>
<td>2.62</td>
<td>6.7-9.86</td>
</tr>
<tr>
<td>PTH (pg/ml) ≤150, &gt;150</td>
<td>0.851</td>
<td>1.1</td>
<td>0.37-3.25</td>
</tr>
<tr>
<td>Osteocalcin (mg/dl) ≤10, &gt;10</td>
<td>0.338</td>
<td>0.36</td>
<td>0.04-2.9</td>
</tr>
<tr>
<td>CTX (ng/ml) ≤25, &gt;25</td>
<td>0.023</td>
<td>4.65</td>
<td>1.23-17.62</td>
</tr>
<tr>
<td>βCTX (ng/ml) ≤6800, &gt;6800</td>
<td>0.044</td>
<td>3.61</td>
<td>1.03-12.57</td>
</tr>
<tr>
<td>CD138 (ng/ml) ≤400, &gt;400</td>
<td>0.179</td>
<td>2.53</td>
<td>0.65-9.81</td>
</tr>
</tbody>
</table>
The patients of the study were divided into two groups regardless of staging: newly diagnosed (12 cases) and longstanding (43 cases). The bone turnover markers which show significant differences between newly diagnosed and longstanding patients are (shown in table -3).

### Table 3: Bone markers in Newly Diagnosed & Longstanding MM Patients

<table>
<thead>
<tr>
<th>Variables</th>
<th>Newly diagnosed (n=12)</th>
<th>Longstanding (n=53)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLCκ (ng/ml)</td>
<td>8.81±7.91</td>
<td>32.65±25.76</td>
<td>0.002</td>
</tr>
<tr>
<td>FLCλ (ng/ml)</td>
<td>9.88±6.57</td>
<td>35.03±32.74</td>
<td>0.011</td>
</tr>
<tr>
<td>PTH (pg/ml)</td>
<td>174.5±15.0</td>
<td>150.36±29.94</td>
<td>0.009</td>
</tr>
<tr>
<td>κ/λ ratio</td>
<td>3.98±9.53</td>
<td>2.11±1.7</td>
<td>0.175</td>
</tr>
<tr>
<td>Total FLC (ng/ml)</td>
<td>18.69±5.35</td>
<td>67.68±26.46</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Osteocalcin (ng/ml)</td>
<td>10.39±9.2</td>
<td>9.56±5.13</td>
<td>0.668</td>
</tr>
<tr>
<td>CTX (ng/ml)</td>
<td>22.6±4.63</td>
<td>24.42±8.04</td>
<td>0.454</td>
</tr>
<tr>
<td>βCTX (ng/ml)</td>
<td>6380±1388</td>
<td>6926.2±2413</td>
<td>0.454</td>
</tr>
<tr>
<td>CD138 (ng/ml)</td>
<td>262.58±90.76</td>
<td>428.17±190.85</td>
<td>0.005</td>
</tr>
</tbody>
</table>

The Receiver operating characteristic (ROC) curve was used to evaluate the diagnostic value for the detection of new MM cases. Figure s 3 & 4 show the results of ROC curve in the evaluation of FLCκ, FLCλ, total FLC and CD 138.

The CD138 showed significant increase in the longstanding patients compared with the newly diagnosed patients, The AUC was 0.742, 95%CI= 0.49-0.951, p=<0.001. The sensitivity and specificity of the test at CD38 cut off= 345.35 ng/ml were 0.922 and 0.73 respectively.

### Discussion

About 80% of newly diagnosed MM patients were reported to have bone disease (osteoporosis osteolysis or compression fractures) with spine being the more frequent site affected\(^{(21)}\). The present results show the significant association of CTX and βCTX with disease progression. Recent study has attributed osteoporosis of MM to imbalance of osteoclast and osteoblasts which results in increased production of βCTX and show very high concentration in the third stage of MM\(^{(22)}\).

They were claimed to be useful in assisting clinicians to evaluate a patient’s risk of developing complications during healing following surgical intervention\(^{(23)}\), moreover it was reported to show significant change in MM before progressive disease were recognized \(^{(24)}\). Another report on the clinical importance of urine N-terminal telopeptide (NTx) and serum C-terminal telopeptide (CTX) showed that these markers, with osteocalcin and bone alkaline phosphatase, were very important in the prognosis of MM\(^{(25)}\).

In addition of being a marker for clonal evolution of the neoplastic cells it also indicates a loss of control on heavy and light chains synthesis\(^{(28)}\). However, recent report recommended the use of serum FLC ratio with caution and abnormal serum FLC ratio should be limited to those who have high Light chain only\(^{(29)}\).

Syndecan (CD138) is among the markers which showed a significant difference between the newly diagnosed and long-standing MM patients with acceptable sensitivity and specificity (fig 1).
Syndecan is a member of a family of integral membrane heparin sulfate proteoglycans. It is detected solely on cells of the B lymphocyte lineage\(^{30}\).

The results of a recent study show that squamous cell (and urothelial) carcinomas are prone to express Syndecan-1, often at high levels. The CD138 expression analysis is currently used in routine diagnostic pathology to distinguish and quantitate plasma cells, for example, in the bone marrow and in endometrial biopsies where the presence of plasma cells indicates chronic endometritis\(^{29}\). The surface expression of CD138 was reported to dynamically regulates a switch between growth and dissemination for myeloma, in response to nutrient conditions\(^{30}\).

**Conclusions**

All the studied markers could be used collectively to give better detection, prognosis and discrimination between newly diagnosed and long-standing patients, but, however the total FLC remains the best.

**Ethical Clearance:** Taken from Al-Nahrain University ethical committee.

**Source of Funding:** Self

**Conflict of Interest:** Nil

**References**

17. Lin Q, Zhao J, Song Y & Liu D. Recent updates on CAR T clinical trials for multiple myeloma,


Rate of Hypokalemia and Risk Factors in Patients on Peritoneal Dialysis Under PD First Policy

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Abstract

Background: Hypokalemia is common among peritoneal dialysis (PD) patients. The incidence rate of hypokalemia and risk factors were investigated.

Material and Method: A retrospective cohort, enrolled 1,044 incident PD patients under the Universal Health Coverage (UHC) Scheme of a regional hospital between January 2012 and December 2018. Hypokalemia was defined as having serum potassium less than 3.5mEq/L. The rate of hypokalemia in episodes per one year at risk was determined. Risk factors of hypokalemia were reported as an incidence rate ratio using Poisson regression.

Results: The incidence rate of hypokalemia was 2.21(95% confidence interval, 2.14-2.27) episodes per one year at risk. Risk factors of hypokalemia were; older than 60 years, female, diabetes, bodyweight less than 45 kg, serum albumin less than 3.5 g/dL, serum phosphate less than 2.5 mg/dL, and total lymphocyte count less than 1,500 cells/mm^3.

Conclusions: Hypokalemia was frequently occurred in PD patients. Elderly PD patients, female, diabetes, malnutrition, low serum albumin, and low serum phosphate had higher risks to develop hypokalemia.

Keywords: Electrolyte, potassium, hypokalemia, dialysis, peritoneal dialysis, CAPD PD First, Thailand.

Introduction

The prevalence of hypokalemia in peritoneal dialysis (PD) patients are previously reported between 10 to 36% (1-6). Hypokalemia at baseline and time-average of serum potassium less than 3.5 mEq/L demonstrated its association with an elevated risk of mortality, particularly from cardiovascular and infectious-related causes (5-9). Previous studies showed that malnutrition is an important factor correlated with low serum potassium levels in PD (5,10,11). Daily potassium loss in dialysate, potassium loss from diarrhea, intracellular potassium shift stimulated by increases in blood levels of insulin release due to continuous glucose absorption from peritoneum infused with glucose-based peritoneal fluid, and usage of furosemide diuretic especially in patients with high residual renal function may additionally contribute to the development of hypokalemia in patients on PD (6,12-15).

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There is a wide range in the prevalence of hypokalemia from previous studies. It may depend on the different populations studied, time of serum potassium measurement, and management of hypokalemia. PD First policy in Thailand was implemented in 2008 to provide dialysis for Thai patients with end-stage renal disease (ESRD) under the universal health coverage (UHC) scheme. According to this policy, there is a dramatic increase in the number of patients on PD. Our previous study showed that most of these patients had low educational levels and low socioeconomic status. The rate of PD patients with preexisting diabetes was higher than those in other Asia-Pacific countries (16). The occurrence of hypokalemia in these patients may differ from others as they may have preexisting malnutrition, comorbid conditions, and inability to intake enough dietary potassium which, in consequence, may lead to a high chance for hypokalemia. To our knowledge, the magnitude of the incidence of hypokalemia in the PD cohort has not been investigated. The objectives of this study were to analyze the incidence rates of hyperkalemia and to identify risk factors associated with hypokalemia in PD patients under the UHC Thai PD First policy.

Materials and Method

Study population: PD patients, older than 15 years of age, under UHC scheme in Chaiyaphum Hospital between January 2012 and December 2018 were recruited into the cohort. There were initially 1,215 PD patients, 171 cases were excluded from being younger 15 years of age and incomplete electrolyte results. The final number of patients enrolled in the study was 1,044 cases.

Data collection and variables: The clinical and laboratory variables for analysis were gender, age at starting PD, diabetic status before initiating dialysis, date at start PD, date at the drop out from PD, bodyweight at the start of PD (BW), blood urea nitrogen (BUN), serum creatinine (SCr), serum albumin, serum phosphate, serum potassium and total lymphocyte count (TLC). Interested factors were gender, age at start PD, and diabetic status before initiating PD for investigating their association with serum potassium since they were factors related with patient survival in our previous study (16).

Definition and timing of hypokalemia, rates of hypokalemia per one year at risk, and defined risk factors from variables: Serum potassium level less than 3.5 mEq/L (<3.5 mEq/L) was defined as hypokalemia (15). It was measured at every two-month visit. Patients who had serum potassium measured and the level was <3.5 mEq/L more than one time in 2 months, they were counted as having one hypokalemia episode to avoid the high occurrence of hypokalemia from too often potassium measured. We did not use the time-averaged serum potassium in the entire cohort because it might be higher than 3.5 mEq/L from the calculation. For example, the time-averaged serum potassium was 3.8 mEq/L in a patient who had six values of serum potassium levels as 4, 3, 4, 3, 6, 5, and 3 mEq/L. However, this patient had 2 episodes of hypokalemia based on the number of events that occurred. The rate of hypokalemia that occurred in episodes per one year at risk was determined by dividing the number of episodes of developing hypokalemia with the cumulative time on the treatment of PD patients. The time on therapy for each patient was calculated from the first date of continuously starting PD to the date of drop out or the last day of December 2018.

Gender, age at start PD, body weight, diabetic status, serum albumin, serum phosphate, and TLC were categorized into groups to identify the risk of developing hypokalemia. They were classified as the followings; male vs female, age younger and equal to 60 years vs older than 60 years, BW less than 45 kilograms (kg) vs equal to or higher than 45 kg, yes vs no diabetic status, serum albumin less than 3.5 g/day vs equal to or higher than 3.5 g/dL, serum phosphate less than 2.5 mg/day vs equal to or higher than 2.5 mg/dL, serum phosphate less than 2.5 mg/day vs equal to or higher than 2.5 mg/dL, TLC less than 1,500 cells/mm3 vs equal to or higher than 1,500 cells/mm3, BUN, SCr, serum albumin, serum phosphate, and TLC were calculated at baseline which were the results recorded in the first three months of initiating PD and the averaged levels of those variables at the entire cohort to compare the results with each categorical risk factors.

Statistical analyses: The data were analyzed using the Stata software version 14.2 (serial number 501406216647, StataCorp, College Station, TX, USA. Categorical variables were demonstrated as frequency and percentage. Continuous variables were presented as mean and standard deviation. The rates of hypokalemia episodes per one year at risk were calculated for the median with 95% confidence interval (CI) which were analyzed based on the normal approximation to the binomial distribution. Risk factors of the rate of hypokalemia were shown as an incidence rate ratio (IRR) using Poisson regression analysis. A p-value of less than 0.05 was defined as statistical significance.
Results

Demographic and baseline clinical parameter of patients of 1,044 PD patients, proportion of male to female gender were 486 (46.74%) to 556 (53.26%) respectively. The proportion of diabetes before starting PD was 51.95%.

The mean (SD) of BW, BUN, SCr, serum albumin, serum phosphate and TLC in cells/mm³ at baseline were 58.04 (10.31) kg, 58.10 (17.69) mg/dL, 14.23 (6.70) mg/dL, 3.31 (0.63) g/dL, 4.96 (2.07) mg/dL and 1,606.52 (719) cells/mm³ respectively. The mean (SD) time of the treatment was 21.59 (18.49) months. The demographic and baseline of clinical parameters of patients were presented in Table 1.

Table 1 Demographic and baseline clinical characteristics of patient population

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Number of male (%)</td>
<td>488 (46.74)</td>
</tr>
<tr>
<td>Number of female (%)</td>
<td>556 (53.26)</td>
</tr>
<tr>
<td>Age at start PD (years)</td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>56.18 (12.87)</td>
</tr>
<tr>
<td>Body weight (kilogram)</td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>58.04 (10.31)</td>
</tr>
<tr>
<td>Diabetic status before initiate dialysis</td>
<td></td>
</tr>
<tr>
<td>Number (%)</td>
<td>542 (51.92)</td>
</tr>
<tr>
<td>Blood urea nitrogen (mg/dL)</td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>58.10 (17.69)</td>
</tr>
<tr>
<td>Serum creatinine (mg/dL)</td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>14.23 (6.70)</td>
</tr>
<tr>
<td>Serum albumin (g/dL)</td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>3.31 (0.63)</td>
</tr>
<tr>
<td>Serum phosphate (mg/dL)</td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>4.96 (2.07)</td>
</tr>
</tbody>
</table>

Rate of hypokalemia per one year at risk and risk factors: Table 2 shows the rates of hypokalemia episodes per one year at risk. There were 4,143 (36.7%) episodes of hypokalemia occurred in 11,291 events of follow up time every two months during 1,881.77 years of cumulative time on therapy. The incidence rate of hypokalemia was 2.21 (95% CI, 2.14-2.27) episodes per one year at risk. Patients who were older than 60 years of aged at the start of PD, female gender, BW less than 45 kg, having diabetes before PD, serum albumin less than 3.5 g/dL, and serum phosphate less than 2.5 mg/dL had significantly higher rates of hypokalemia per one year at risk than the other groups.

Risk factors of hypokalemia among PD patients were; older than 60 years of aged at starting the start of PD, female gender, BW less than 45 kg, having diabetes before PD, serum albumin less than 3.5 g/dL, serum phosphate less than 2.5 mg/dL, and TLC less than 1,500 cells/mm³ (Figure 1).

Levels of nutritional parameters and risk factors: The averaged levels of BUN, SCr, serum albumin, serum phosphate, and TLC of the entire cohort were shown in Table 3. Patients who were older than 60 years old, female gender, BW less than 45 kg, and having diabetes before PD, had lower levels of BUN, SCr, and serum phosphate than the other group. In addition, these patients except those with had BW less than 45 kg had lower levels of serum albumin than the others.
<table>
<thead>
<tr>
<th>Factor</th>
<th>Number of patients</th>
<th>Number of events</th>
<th>Person-time (year)</th>
<th>Rate per 1-year at risk</th>
<th>95%CI</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>556</td>
<td>2,551</td>
<td>1,035.62</td>
<td>2.46</td>
<td>2.37 to 2.56</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Male</td>
<td>488</td>
<td>1,592</td>
<td>846.20</td>
<td>1.88</td>
<td>1.79 to 1.98</td>
<td></td>
</tr>
<tr>
<td>Body weight (kg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;45</td>
<td>68</td>
<td>314</td>
<td>114.99</td>
<td>2.73</td>
<td>2.44 to 3.05</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>≥45</td>
<td>976</td>
<td>3829</td>
<td>1,766.83</td>
<td>2.17</td>
<td>2.10 to 2.24</td>
<td></td>
</tr>
<tr>
<td>Diabetic status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>542</td>
<td>2,238</td>
<td>896.33</td>
<td>2.50</td>
<td>2.39 to 2.60</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>No</td>
<td>502</td>
<td>1,905</td>
<td>985.49</td>
<td>1.93</td>
<td>1.85 to 2.02</td>
<td></td>
</tr>
<tr>
<td>Serum albumin (g/dL)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;3.5</td>
<td>594</td>
<td>2,427</td>
<td>984.59</td>
<td>2.46</td>
<td>2.37 to 2.57</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>≥3.5</td>
<td>450</td>
<td>1,716</td>
<td>897.22</td>
<td>1.91</td>
<td>1.82 to 2.01</td>
<td></td>
</tr>
<tr>
<td>Serum phosphate (mg/dL)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;2.5</td>
<td>82</td>
<td>437</td>
<td>156.59</td>
<td>2.79</td>
<td>2.54 to 3.07</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>≥2.5</td>
<td>962</td>
<td>3,706</td>
<td>1,725.23</td>
<td>2.15</td>
<td>2.08 to 2.22</td>
<td></td>
</tr>
<tr>
<td>TLC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;1,500</td>
<td>518</td>
<td>2,115</td>
<td>978.74</td>
<td>2.16</td>
<td>2.07 to 2.26</td>
<td>0.216</td>
</tr>
<tr>
<td>≥1,500</td>
<td>526</td>
<td>2,028</td>
<td>903.08</td>
<td>2.25</td>
<td>2.15 to 2.35</td>
<td></td>
</tr>
</tbody>
</table>

Abbreviation: TLC; total lymphocyte count (cells/mm³)

Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>IRR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age &gt; 60 year</td>
<td>1.21 (1.13 to 1.28)</td>
</tr>
<tr>
<td>Female</td>
<td>1.24 (1.17 to 1.33)</td>
</tr>
<tr>
<td>Body weight &lt;45 kg</td>
<td>1.17 (1.04 to 1.32)</td>
</tr>
<tr>
<td>Diabetic status before initiate dialysis</td>
<td>1.19 (1.12 to 1.27)</td>
</tr>
<tr>
<td>Serum albumin at baseline &lt; 3.5 g/dL</td>
<td>1.22 (1.14 to 1.30)</td>
</tr>
<tr>
<td>Serum phosphate at baseline &lt; 2.5 mg/dL</td>
<td>1.15 (1.04 to 1.28)</td>
</tr>
<tr>
<td>Total lymphocyte count &lt; 1,500 cells/mm³</td>
<td>1.07 (1.01 to 1.14)</td>
</tr>
</tbody>
</table>

Abbreviations: IRR, Incidence rate ratio; CI, Confidence interval

Figure 1: Incidence rate ratio of risk factors for developing hypokalemia in multivariate analysis
Table 3: Blood urea nitrogen, creatinine, albumin, phosphate and total lymphocyte count levels classified in age at start PD, gender, body weight and diabetic status

<table>
<thead>
<tr>
<th>Factor</th>
<th>BUN (mg/dL) Mean (SD)</th>
<th>Creatinine (mg/dL) Mean (SD)</th>
<th>Albumin (g/dL) Mean (SD)</th>
<th>Phosphate (mg/dL) Mean (SD)</th>
<th>TLC* Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at start PD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age &gt; 60 years</td>
<td>68.48 (43.37)</td>
<td>9.00 (2.91)</td>
<td>3.22 (0.66)</td>
<td>4.53 (1.85)</td>
<td>1,576.69 (711.87)</td>
</tr>
<tr>
<td>Age ≤ 60 years</td>
<td>73.80 (50.82)</td>
<td>11.26 (3.66)</td>
<td>3.37 (0.61)</td>
<td>5.26 (2.16)</td>
<td>1,626.68 (723.65)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>64.77 (40.70)</td>
<td>9.28 (2.85)</td>
<td>3.29 (0.62)</td>
<td>4.61 (1.86)</td>
<td>1,681.81 (768.93)</td>
</tr>
<tr>
<td>Male</td>
<td>79.50 (54.15)</td>
<td>11.57 (3.88)</td>
<td>3.33 (0.65)</td>
<td>5.37 (2.22)</td>
<td>1,520.75 (647.71)</td>
</tr>
<tr>
<td>Body weight (kg)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 45 kg</td>
<td>71.25 (45.64)</td>
<td>9.12 (3.14)</td>
<td>3.38 (0.70)</td>
<td>4.59 (2.09)</td>
<td>1,668.23 (1,132.70)</td>
</tr>
<tr>
<td>≥ 45 kg</td>
<td>71.68 (48.19)</td>
<td>10.44 (3.57)</td>
<td>3.31 (0.63)</td>
<td>4.99 (2.07)</td>
<td>1,602.22 (681.59)</td>
</tr>
<tr>
<td>Diabetic status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>61.08 (41.65)</td>
<td>9.08 (2.81)</td>
<td>3.22 (0.59)</td>
<td>4.73 (1.96)</td>
<td>1,670.04 (725.84)</td>
</tr>
<tr>
<td>No</td>
<td>83.07 (51.70)</td>
<td>11.72 (3.76)</td>
<td>3.41 (0.67)</td>
<td>5.22 (2.15)</td>
<td>1,537.95 (705.86)</td>
</tr>
</tbody>
</table>

*Cells/mm³

Discussion

This is the first study that demonstrated the incidence rates of hypokalemia occurred per one year at risk of PD patients under the UHC First PD policy in PD patient cohort. In previous studies, the time-averaged serum potassium, instead of the average potassium, was used to calculate for hypokalemia due to serum potassium changes followed the time on PD[9, 17]. Using the time-averaged serum potassium might observed fewer occurrence of hypokalemia than the actual events. In clinical practice, potassium supplement is prescribed to correct hypokalemia and serum potassium may turn to normal or higher in the next measurement. Using the time-averaged serum potassium levels may not reveal hypokalemia in this situation. This is the reason why we reported the incidence of hypokalemia by calculating the rate of events occurred per one year at risk, not using the time-averaged serum potassium, in this PD cohort. We counted the episode of hypokalemia occurred at every two months visit according to the process of follow up time in our PD clinic. We found that nearly 90% of PD patients had at least one episode of hypokalemia during their PD treatment courses. The incidence rate of hypokalemia (<3.5 mEq/L) was 2.21 episodes per one year at risk.

The results in our study demonstrated 88.7% of the patients had at least one episode of hypokalemia. It confirmed previous studies that hypokalemia is common in PD patients[1, 5, 10]. The rate of hypokalemia at 2.21 episodes per one year at risk meant one patient could have hypokalemia nearly every six months of the follow-up visits. There are reasons to explain the development of hypokalemia in our study. First, our patients had averaged serum albumin levels less than 3.5 g/dL in the entire cohort. It indicated that our patients would have similar risk of developing hypokalemia with previous studies, observing the association between serum potassium and poor nutritional status[11, 18]. Second, there was a high proportion of patients with preexisting diabetes (51.9%) when compared with those in others (less than 50%)[1, 7-10, 17]. It demonstrated that patients with preexisting diabetes had significant higher rate of hypokalemia per one year at risk than those without (2.50 vs 1.93 episodes per one year at risk, respectively). Hypokalemia was more likely to occurred in patients with preexisting diabetes-related, who were not only had poor nutritional status but also had chronic inflammation from coexisting comorbidities[5]. The levels of BUN, SCr, serum albumin, and serum phosphate were lower preexisting diabetes patients when compared with those without diabetes. Furthermore, the number of TLC which represented the immunological process, was higher among patients with preexisting diabetes. These results are supported by our observations. Third, our patients had the lower baseline serum albumin and serum phosphate levels than those in previous studies[7, 9, 10].
The risk factors of a high incidence of hypokalemia in our study were elderly at the start, female gender, underweight, had preexisting diabetes, low serum albumin at baseline, low serum phosphate at baseline, as well as low TLC. The rates of hypokalemia occurred in patients with these risk factors except for TLC. TLC less than 1,500 cells/mm³ were significantly higher than those patients without these risk factors. Patients with these risk factors might have preexisting malnutrition before initiation of PD which persisted and increased severity after performing PD. The evidence showed the persistence and increased severity of poor nutritional status was the lower levels of BUN, SCr, serum albumin, and serum phosphate during the entire cohort among elderly, female gender or underweight. The presence of persisted and increased severity of malnutrition could be the reasons to explain the high incidence of hypokalemia in these patients.

Hypokalemia is related to poor nutritional status, of which our study was indirectly implied that malnutrition was a major problem among UHC-PD patients. It may be related to poverty, low education level, and low socioeconomic status. Other possible causes of malnutrition among PD patients were related to the dialysis process such as protein loss in PD solution, abdominal fullness from PD fluid infused in the abdominal cavity, peritonitis, or volume overload. Hypokalemia per se may be one factor that aggravates the persistence of poor nutritional status after PD from bowel ileus. Besides, hypokalemia was shown as being an independent risk factor of peritonitis in patients on PD. Therefore, we propose the potassium supplementation should be prescribed for a long duration especially in patients with persisted malnutrition.

The limitation of this study is that it was conducted in a single center. The data of PD prescription, dialysis adequacy, residual renal function, and the use of diuretics, angiotensin-converting enzyme inhibitor, and angiotensin II receptor blockers were not included in our analysis. We suggest that potassium levels should be closely monitored closely among patients with malnutrition. The causes of malnutrition in each patient should be addressed and corrected to reduce the incidence of hypokalemia.

**Conclusion**

Hypokalemia is associated with poor nutritional status. Patients aged older than 60 years at the start PD, female gender, BW less than 45 kg, had preexisting diabetes, preexisting poor nutritional status have high risks of developing hypokalemia.

**Ethical Clearance:** Institutional Ethical Review Committee for Research in Human Subjects of Khon Kaen University for obtaining approval of Chaiyaphum Hospital

**Source of Funding:** None

**Conflict of Interest:** None

**References**


The Relationship of Adding Allicin Powder to Diet on Concentration of Glutathione Enzyme and Histological of Thymus Gland of Broiler

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Abstract

This study was conducted at the field of poultry - Abu Gharib/department of Animal Production/college of agricultural engineering Sciences - university of Baghdad, during the period from 12/10/2019 to 24/11/2019 duration (42 days), to demonstrate the effect of adding different levels of Allicin to broiler diet on Glutathione level in blood and histological of thymus gland, total of 225 Ross 308 chicks was used. Birds were randomly distributed into five treatment groups which were : First treatment T1: without additives to diet (control), other treatments T2, T3, T4, T5 was added Allicin at a rate of (800,600,400,200 mg/Kg diet) respectively, and Allicin was added from first day until the end of the experiment for all addition treatments, results of this experiment showed: High significant (P<0.01) in all additive treatments compared to control for glutathione enzyme in plasma at 21, 42 days for broiler age. With respect to the histological examination of thymus gland showed that adrenocortical hyper function and degeneration and depletion in lymphoid tissue in T2, T3 and T5 treatments compared to control treatment, while cortex and Pulp with a lymphatic interstitial in the stage of degeneration for T4 and control treatments.

Keyword: Allicin, glutathione, thymus gland, broiler.

Introduction

Herbs were used as natural and safe food supplements in poultry diets as a tool to increase animal production efficiency in general and improve the health and production of poultry in particular (1), a biological characteristics were attributed to Allindailylsulphide and Allicin, Allicin is naturally produced from the breakdown of garlic tissue with the presence of alliinase (2),which is belongs to the Alliaceae famili(3), Allicin has anti-bacterial, anti-fungal, and anti-inflammatory properties.(4),(5,6) Explain the primary mechanics of Allicin’s anti-oxidant and anti-stress activity by trapping free radicals when the Allicin decays, it forms 2-Propene sulfuric acid and this compound is the one that binds to free radical. It interprets it as an antioxidant and anti-stress, and reduces oxidative stress(7,8). Thus, it has a stimulating effect of immunity (9), Alliin is the main source of Allicin, a non-protein amino acid, and s + allylcysteinesulfoxides are hydrolyzed by enzymes alliinase Upon the interaction of Alliin, it leads to the production of Dehydroalanine, the allylsulfenic acid, and two of these acids are self-condensing to produce one molecule of Allicin(10). It is worth noting that the alternative pathway to the formation of Allicin is from glutathione after obtaining the allele group and then it enters a chain of reactions (11), glutathione is one of the most important antioxidants in the body due to its presence inside the cell and the body can manufacture it from amino acids(12), and glutathione scavenging free radicals(13), it also has a role in the metabolism process and the regulation of cellular activities and regulate the immune response(14,15), it also has a metabolic function that includes cysteine storage(16). The immunity of the body has been connected to activities associated to the lymphomyeloid organs and their cells, the lymphatic system is compounded by a network of diffuse defense, birds have discrete lymphoid tissues and absence of lymph nodes(17), and thymus gland is ranked as one of the primary lymphoid organs, it’s the first organ which formed and grows instantly after birth in response to postnatal antigen stimulation and the demand for great number of mature T cells(18), in other hand thymus may
function as a secondary lymphoid organ because it is capable of playing a direct role in the immune reactions, and the appearance of plasma cells in chicken thymus at different ages provides further support to this idea. This is a vital role in vaccination of chicken (19). It is considered as the initial site for development of T cell immunological function as well as it generates, differentiates, and matures T and B lymphocytes respectively (20, 21). So the aim of this study came to know the effect of using different levels of garlic-Allicin on the concentration of glutathione enzyme and histological sections of the thymus gland in broilers.

Materials and Method

Birds and Dietary treatment: Allicin was added from the first day until the end of the experiment for all addition treatments, all treatments gave ad libitum diet and water in all the experiment period and diet contents chosen as a (22) which contain protein 23% in initiator diet and 21.5% in growth diet and 22% in final diet, while metabolism energy was 3000.5, 3103.7 and 3204.6 Kcal/kg diet for each diet.

Soybean cake used an Argentine source of crude protein content by 48% and 2440 Kcal/Kg metabolism energy, protein meal user product from Netherlands origin Brocon(contain 40% crude protein 0.2107 kcal/kg protein metabolism energy, 0.5% crude fat 2.20% crude fiber 5%, calcium 4.68%, phosphorus 3.85% lysine 4.12%, methionine 4.12%, methionine plus cysteine 0.42%, tryptophan 0.38%, threonine 1.70%, it contains a mixture of vitamins and minerals needed believes rare birds of these elements.

Allicin Chemical Analysis: Chemical analysis (infrared spectroscopy of Allicin) was carried out for the purpose of accurate diagnosis of Allicin and knowledge of its effective groups when using Fourier-transform infrared spectroscopy (FTIR) to measure infrared radiation within the range (4000 – 6000 cm⁻¹) using K Br tablet for the solid material in the Ibn Sina Laboratory/College of Girls Education/University of Baghdad (23), the results of this analysis showed that Allicin powder was pure.

GSH Standards Solution (0.001M): Stock standards solution (0.001M) was prepared by dissolving (0.0156) g of GSH in a final volume of 50 ml of (0.02 M) EDTA solution. Dilution were made in EDTA Solution to (5, 10, 15, 20,30,40,50 µM/mL). (This working standard solution should be prepared daily).

Procedure: Serum Glutathione was determined by using a modified procedure using Ellman’s reagent (DTNB), which is summarized as follows: Duplicate of each standard and sample test tube were prepared solution were mixed tubes were mixed in a vortex mixer, the spectrophotometer was adjusted with reagent blank to read zero absorbance (A) at 412 nm and the absorbance of standard and sample are read within 3 minutes of the addition of DTNB reagent. The concentration of serum glutathione was obtained from the calibration curve in µM/mL (24, 25).

Histological traits: Random samples of broiler meat were slaughtered at the end of the experiment at the age of 42 weeks and 6 samples of thymus gland were preserved for each treatment in formalin solution 10% concentration until the tissue sections were performed, as part of the gland was cut and made covered by a thin layer of wax after this was applied with formalin for 24 hours, after which the passage was passed in different concentrations of alcohol 60, 70, 80 and 90% % For a quarter of an hour in each concentration after which it is placed in the wax mold at a temperature of 50 ° C for 24 hours, then the mold is placed in freezing for 24 hours after it is placed in the Microtom device as this device cuts the mold into slices and then fix the slices on glass slides and is placed In an oven at 20 ° C for one hour after which we wash it with distilled water after the slices are stained with hemotoxin and eosin tincture (haemaloxylin and eosin) Then the slice is passed in different concentrations of Xylol 70, 80 and 90%. After this process, the lid is placed over the slice and the slice is placed in the oven for one hour to be dried after so the slides are examined microscopically to see the effect (26).

Results and Discussion

Table (1) showed a High significant (P<0.01) in all additive treatments compared to control for glutathione in plasma at 21, 42 days of broiler age. The reason for the increase in the concentration of glutathione in the addition of Allicin may be due to the role of Allicin as an antioxidant by trapping free radicals when the Allicin decomposes as it forms acid 2-propenesulfinic it is this compound that binds to free radicals and reduces oxidative stress (9). It is worth noting that the alternative pathway to the formation of Allicin is from glutathione after obtaining the allele group and then it enters a chain of reactions (11). So, through these points, the results of
this research indicated the role of Allicin in preventing reactive oxygen types by regulating the removal of enzymes and toxins because the reactive oxygen type (ROS) is extremely harmful to the cell by oxidizing fats and proteins, and since the glutathione is low in cells.

Table 1. Effect of adding Allicin on Glutathione enzyme at 21 & 42 days of age (Mean±Standard error)

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Glutathione at 21 days of age</th>
<th>Glutathione at 42 days of age</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>22.05±0.25d</td>
<td>23.62±0.04d</td>
</tr>
<tr>
<td>T2</td>
<td>25.65±0.25c</td>
<td>25.78±0.15b</td>
</tr>
<tr>
<td>T3</td>
<td>27.95±0.45b</td>
<td>26.49±0.04a</td>
</tr>
<tr>
<td>T3</td>
<td>30.85±0.65a</td>
<td>25.56±0.05b</td>
</tr>
<tr>
<td>T5</td>
<td>29.50±0.20a</td>
<td>24.69±0.02c</td>
</tr>
<tr>
<td>Significant</td>
<td>**</td>
<td>**</td>
</tr>
</tbody>
</table>

Means having with the different letters in same column differed significantly** (P<0.01)

It is the most important part that provides protection against ROS by forming glutathione(27,28). This result is consistent with his finding(29) activity of glutathione because Allicin could enhance antioxidants and thus detoxify the liver cells in Rat.

The histological examination of thymus gland showed that adrenocortical hyper function and degeneration and depletion in lymphoid tissue in T2, T3 and T5 treatments compared to control treatment, while cortex and Pulp with a lymphatic interstitial in the stage of degeneration for T4 and control treatments. Showed in figure (1, 2, 3, 4 and 5).

Figure 1. Histological section of the thymus gland (control group) shows: cortex (C), pulp (M). Tincture of Yamatoxin and Eosin. X40
Figure 2. Histological section of the thymus gland (group II) shows: Adrenocortical hyper function (C), while the pulp region (M) Degeneration and depletion in lymphoid tissue (D) is a dye of amatoxylin and eosin. X40

Figure 3. Histological section of the thymus gland (group III) shows: Adrenocortical hyper function (C), while the pulp region (M) Degeneration and depletion in lymphoid tissue (D) is a dye of amatoxylin and eosin. X40
Figure 4. Thyroid tissue enlarged cross section (group IV). Figure A shows the natural appearance of lymphocyte groups in the cortex (yellow arrow). Figure (B) shows the normal appearance of lymphocytes in the phase of degeneration (black arrows). Tincture of Yamatoxin and Eosin. X400

Figure 5. A tissue enlarged section of the thymus gland (group V). Figure A shows lymphocyte degeneration of the cortex (yellow arrow) with tissue depletion (D). (B) Stages of Degeneration and depletion in lymphoid cells (black arrows). Tincture of Yamatoxin and Eosin. X400
Additionally, with regard to the tissue sections of the thymus gland, these results may be attributed to the use of Allicin at concentrations that may be high because degeneration and depletion in lymphoid tissue it occurs when there is an actual chemical change in the lymphoid tissue itself. And also Enlargement of the cortex and pulp (Pumpkin). Gland disorders are conditions that interfere with the normal functioning of the gland\(^{30,31}\).

**Conclusion**

The present study concluded that the use of Allicin at these mentioned levels has led to an increase in the concentration of glutathione enzyme Which in turn is considered a powerful antioxidant to protect the cell from damage that might be caused by free radicals additionally, Allicin levels may have led to Degeneration and depletion in lymphoid tissue and Enlargement of the cortex and pulp (Pumpkin) Thus, allicin levels can be reduced to maintain thymus tissue.

**Conflict of Interest:** None

**Funding:** Self

**Ethical Clearance:** Not required

**References**

30. Cooper, M.D., Raymond, M.D., Peterson, D.A., Mary Ann South, M.D. and Robert, A.G. The function of the thymus system and the bursa system in the chicken. From the pediatric research laboratories of the variety club heart hospital, University of Minnesota: 1965. 11-14.
Evaluation of Load Deflection, Surface Roughness and Frictional Forces of Aesthetic Niti Arch Wires

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Abstract

Objective: The purpose of this in vitro study is that NiTi esthetic arch wires are preferred to match esthetic braces; but the presence of coating layer is greatly affect friction during sliding mechanics.

The aims of this study were to evaluate the load deflection and the influence of surface roughness with the coating material types on the frictional force of coated nickel titanium wires.

Method: The sample of this study consisted of 90 segments of uncoated and coated Nickle titanium arch wires for three tests (friction test, roughness test and loading force test) 45 segment for each test involving two wire dimensions (0.016 × 0.022 and 0.019 × 0.025 inches). The static frictional force was measured through pulling the wires through a set of ceramic brackets by the universal testing machine while, the surface topography of wires were assessed by using Atomic force microscope (AFM) and load deflection test also measured. The data were analyzed using one-way analysis of variance (ANOVA) and Tukey’s post hoc significance difference tests. Differences were considered significant at P<0.05.

Results: The frictional forces of gold wires is lesser than both control(uncoated) niti wire and epoxy coated wire for both wire dimention (0.016×0.022 and 0.019×0.025) inch. Surface roughness of coated arch wires is higher than control wires for both wire dimentions. Load deflection force of control wire is a higher than coated wires for (0.016×0.022) inches wire dimension.

Conclusion: The gold plated wires had lower frictional force than both (control and epoxy coated wires). Surface roughness of coated arch wires was higher than control(uncoated)arch wire. Load deflection force of coated wires was lesser than control wires.

Keywords: Coated arch wires, Load deflection force, Friction, Surface roughness.

Introduction

The demand for the aesthetic modalities is growing among patients seeking orthodontic treatment, the development of the orthodontic arch wires with optimum aesthetic appearance and clinical performance has become an essential and important factor of the treatment nowadays(1).

The presence of coating layer was usually influence the mechanical and frictional properties of arch wires(2,3). Therefore; the manufacturers always try to coat the wires with a material that offer a perfect aesthetic and frictional properties(4). Friction is defined as the resistance to movements of two or more contacting objects, or the force of resistance to movements(5,6). The frictional forces in clinical orthodontics were considered as a primary concern, since it resists normal tooth movements(7). During sliding movements of the teeth, the wire edges contact the bracket slot angles and a frictional force will develop, this will compete with
normal tooth movements and decrease the magnitude of applied orthodontic forces\(^8\). Some researchers have investigated that frictional forces of aesthetic orthodontic wires focused on the link with the surface roughness of coating layer of coated arch wires\(^9\).

Friction is a multifactorial subject that is affected by several physical and biological factors such as arch wire dimension, form, and materials type. A small arch wire size produces less friction than larger arch wire because of the larger elasticity and the increased free space that is present between arch wire and bracket slot, and that friction is increased with rectangular wire than with round wires\(^{11,12}\).

**Materials and Method**

**Samples:** Ninety segments of uncoated and coated nickel titanium wires.

The uncoated wires form IOS/USA company. And coated nickel titanium wires include both gold plated wires from orthotechnology/Florida/USA and epoxy coated wires from USOP/USA companies.

With two wire dimension 0.016\(\times\)0.022 inches and 0.019\(\times\)0.025 inches.

Five samples for each wire size.

A group of 30 maxillary right premolar ceramic brackets (Hubit) with a 0.022” slot were selected for the test. Ligature elastics were supplied from IOS Company seventy custom-made acrylic blocks cut by CNC laser machine for accurate dimensions of the block with dimensions of 40 mm \(\times\) 15 mm \(\times\) 9 mm where used and the guiding positioner frame for more accuracy on the positioning of the brackets (Figure 1).

**Devices:** Atomic force microscope (AFM) was used for measurement of surface topography of wires coating layer. Computerized Intron Tenuis Olsen testing machine with a load cell 10 Newton (N) was used for measurement of static frictional resistance forces.

**Procedures:**

Frictional resistance/coated arch wires were prepared by, cutting the wires from the straight posterior ends to a length of 50 mm using a ruler and wire cutter. Every three brackets were fixed to the acrylic blocks with the use of bracket holder and cyanoacrylate adhesive in a straight alignment with inter-bracket distance of 8 mm with the aid of a custom-made plastic template and a straight stainless-steel wire segment of 0.0215 \(\times\) 0.025 inch to properly reproduce the same angles and locations of brackets (Figure 2).

Figure 1: Acrylic block and the acrylic bracket positioner guide.

Figure 2: The setting of brackets

Every wire segment was ligated to the set of brackets and ligation was done with the use of an artery...
forceps. Hand gloves and tweezer were used to avoid contamination of wire surfaces. By the universal testing machine, a tensile test was used, the acrylic blocks with the adhered brackets and ligated wire was griped firmly by the lower jaw of the testing machine and the end of the wire was attached to the clamp of upper movable part (Figure 3).

Figure 3: Wire-brackets block system fixed to machine.

The specification of this test was done according to many studies\textsuperscript{(17,18)} and as follows:

- The crosshead rate of the machine was set at 5 mm/min.
- The wire was pulled through a distance of 5 mm.
- For every group of wires five bracket-block combination were used and every block was used one times to exclude any expected wearing of brackets and the wires were used only once.
- All measurements were performed under dry conditions at room temperature.

A load extension curve was displayed in the attached computer with the required static frictional forces measured in Newton unit.

AFM for analysis/Preparation of the Slides, needs to use small slides instead of regular ones. The slides were cut into small sections about (1 cm × 1 cm) after being measured with the Vernier.

Fixing the Samples After mixing epoxy steel adhesive, each wire segment was then affixed on the new slide with a very small amount of the adhesive. Subsequently, about 2.5 mm was cut from each end as it was not needed and its surface might be affected during handling\textsuperscript{(15)} (Figure 4A).

Then, the samples were held in petri dishes in a specific way -using a tape- that they would not move in any direction assuring their surfaces would not be affected during carriage, samples were then rinsed with distilled water, allowed to dry in air and kept in closed petri dishes. (Figure 4 B).

Figure 4: (A) Fixing the Samples on slides and (B) Preparation of the Samples held in petri dishes.
Throughout all the experiment, the wire segments were handled carefully to prevent any scratch to their surfaces.

Tapping mode was used to analyze the surface topography of the test wires under ambient conditions\(^\text{(16)}\). For each specimen, three areas on the archwire had been scanned with a scanning area of 25 µm × 25 µm: one in the center of the wire, one 2 mm left, and one 2 mm right to obtain more ideal results. However, for labial coated wires, wires were scanned three times on each of the surfaces (lingual uncoated, labial coated, and lateral surfaces). However, it became clear that the lateral surfaces represented an inconsistent mix of coated and uncoated surfaces and therefore was excluded from analysis.\(^\text{(19)}\)

The mean value on each specimen was used. Two numerical values were determined in each scan: Ra (roughness average) and Ry (maximum peak-to-valley roughness height), to elucidate its surface roughness\(^\text{(13)}\).

Each specimen was fixed to a piezo scanner with three translatory degrees of freedom. Subsequently, the 3D view of archwire was shown on the monitor of the attached computer representing the surface of the specimen. Using proprietary software supplied with the AFM, the images were processed\(^\text{(20)}\).

**Load deflection test:** A computerized Instron H50KT Tinius Olsen testing machine (England) with a 10 N load cell was used for the experiments in the ministry of science and technology where it was properly maintained and calibrated prior to testing. The machine consists of upper and lower jaws; the fulcrum was attached to the lower jaw while the intender was screwed to the upper movable part of the machine the lower jaw is considered as the base for the custom made block with dimensions of 40 mm × 15 mm × 9 mm which have two fixed fulcrums (0.1 mm thickness) on which the wire is placed (Figure 5).

Every wire segment was fixed onto the fulcrum with the help of the marked points. Then by a computer-controlled stepper motor loading was achieved through movement of a metal loading device (intender) adapted on the machine downward to the center of the wire and fulcrum to start bending test till a permanent deflection of a minimum of 2 mm was reached the resultant curve represented the force loading curve\(^\text{(9)}\).

**Results**

Table 1 revealed the mean values of static frictional forces for both sizes 0.016”×0.022” and 0.019”×0.025” arch wires.

ANOVA test for both wire dimensions showed a statically significant result on 0.016”×0.022” size and highly significant difference on 0.019”×0.025” sizes.
For (0.016′×0.022′) friction was higher for the control, epoxy coated wires in a descending order Table 2.

However, for (0.019′×0.025′) the epoxy wire showed significantly larger friction than the uncoated wires, then control and gold wires in descending order.

Turkey’s test performed for comparison between each two types of arch wires.

Table 1: Descriptive statistics and ANOVA tests for the static friction of 0.016′×0.022′ and 0.019′×0.025′ arch wires.

<table>
<thead>
<tr>
<th>Wires</th>
<th>0.016′×0.022′</th>
<th></th>
<th>0.019′×0.025′</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Descriptive statistics</td>
<td>Comparison</td>
<td>Descriptive statistics</td>
<td>Comparison</td>
</tr>
<tr>
<td></td>
<td>N  Mean   SD  Min  Max  f-test  p-value</td>
<td>Mean   SD  Min  Max  f-test  p-value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control (uncoated)</td>
<td>5  4.0280 .2851 3.80 4.50 8.409 .005</td>
<td>5.6580 .29175 3.53 6.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orthotechnology (gold plated)</td>
<td>5  3.2560 .7826 2.76 3.70 4.1780 .50504</td>
<td>3.40 4.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>USOP (Epoxy coated)</td>
<td>5  4.0360 48449 3.25 4.40 5.6580 .29175 3.53 6.13</td>
<td></td>
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</tbody>
</table>

Table 2 revealed the mean values of (Ra) for both arch wires dimensions. The (Ra) value for both wire dimension for all wires was higher than the control wires. However, for gold wires on both wire dimensions the coated surface was higher on average roughness than epoxy wires and lastly the control wires in descending order.

Tukey test was performed for comparison, for 0.016′×0.022′ there was no significant differences between all types of wires while, for 0.019′×0.025′ they showed highly significant difference between all types of wires at P<0.01.

Table 2: Descriptive statistics and ANOVA tests, average roughness (Ra) for 0.016”×0.022” and 0.019”×0.025” arch wires.(Ra In ηm)

<table>
<thead>
<tr>
<th>Wires</th>
<th>0.016’×0.022′</th>
<th></th>
<th>0.019’×0.025′</th>
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<tbody>
<tr>
<td></td>
<td>Descriptive statistics</td>
<td>Comparison</td>
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</tr>
<tr>
<td></td>
<td>N  Mean   SD  Min  Max  f-test  p-value</td>
<td>Mean   SD  Min  Max  f-test  p-value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control (uncoated)</td>
<td>5  29.9567 26.15428 10.24 59.63 4.347 .069</td>
<td>11.6047 3.25341 8.95 15.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orthotechnology (gold plated)</td>
<td>5  67.6647 4.1303 59.63 74.23 2.901 .003</td>
<td>71.5530 3.28951 68.90 75.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>USOP (Epoxy coated)</td>
<td>5  34.4833 11.77853 20.90 41.90 4.347 .069</td>
<td>35.0980 2.57439 32.50 37.65</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3 showed the mean, standard deviation and ANOVA test results for the load force of 0.016×0.022 and 0.019×0.025 inch arch wires.

For 0.016×0.022 wires the highest loading value represented by epoxy coated wire then control then gold then control wire in descending order.

For 0.019×0.025 inch wires, the highest loading values represented by gold wire then control then epoxy coated wire in descending order.

ANOVA test showed a highly significant difference on both wire dimensions.
Tukey’s test between three wires showed: For (0.016×0.022) wires, there was significant different between control and gold wires at P<0.05 and there was highly significant difference between control wires and epoxy coated wire at p<0.01.

Table 3: Descriptive statistics and ANOVA tests, loading force for 0.016”x0.022” and 0.019”x0.025” arch wires.(in N)

<table>
<thead>
<tr>
<th>Wires</th>
<th>0.016’’×0.022’’</th>
<th>0.019’’×0.025’’</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Descriptive</td>
<td>Comparison</td>
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</tr>
<tr>
<td></td>
<td>N  Mean  SD</td>
<td>Min  Max</td>
</tr>
<tr>
<td>Orthotechnology (gold plated)</td>
<td>5  2.8567 .40673</td>
<td>2.43  3.24</td>
</tr>
<tr>
<td>USOP (Epoxy coated)</td>
<td>5  2.4267 .13868</td>
<td>2.31  2.58</td>
</tr>
</tbody>
</table>

Discussion

The present study showed that the static friction was generally greater on the 0.019’’×0.025’’ dimension rather than 0.016’’×0.022’’ dimension to the same type of wires and this indicate that static frictional forces were increased with larger wire dimension of all coated and uncoated arch wires, this agreed with many studies(19).

The maximum static frictional forces of the coated wires were lesser to or higher than those of the uncoated wires (control), and there was a variation in the degree of change related to multiple factors such as arch wire dimension, type and thickness of coating, hardness, surface roughness, and modulus of elasticity as it is reported by many studies(3,18).

These results come in agreement with some studies who concluded that friction of the coated wires is affected by the total cross section and inner core dimension and not by surface roughness and suggest that the high elastic modulus of wires may increase the wire binding at the edges of the bracket(18).

There was a significant difference between all types of the tested archwires and the surface roughness of the coated wires in the present study was higher in compared with their uncoated conventional control nickel titanium counterpart, which is consistent with the previous studies(18,19,22).

On the other hand, the ion implanted wires had highest average roughness than control and less frictional force than control wires,

According to current investigation the results revealed no correlation between surface roughness and friction illustrates this lack of relationship between surface roughness and friction with a wide scatter of data and no discernible pattern, and friction of the coated wires was influenced by the total cross-sectional and inner core dimensions, inner core nano hardness, inner core elastic modulus, and elastic modulus, but not by surface roughness. As revealed by many studies(18, 19).

Concerning the load deflection behavior, most of aesthetic coated archwires for both wire dimensions 0.016×0.022 and 0.019×0.025 inch delivered statistically significant lower loading forces than uncoated wires of some dimensions for both wire dimension and these result came on agreement with most previous studies(13,14,4).

On the other hand among the ion implanted wires, the gold wire showed about the same loading force level to the control wire while in (0.016×0.022)wire the epoxy coated wires showed loading force lower than control wire and this and this may be due to manufacturing process and our in investigation was disagreed with Katic V et al.(21).

Conclusion

- Ion implanted arch wires (gold) plated had lower frictional forces than both coated and control (uncoated) arch wires.
Surface roughness of coated arch wires was higher than non-coated wires.

It appeared that frictional forces does not correlated with the surface roughness.

**Declarations:** Conflict of Interest the authors declare that there are no potential conflicts of interest related to the study.

**Source of Funding:** Nil

**Ethical Clearance:** This research has exemption as it a routine treatment (no new materials were used).

**References**


Nurse’s Clinical Skill Utilisation: 
An Opinion from Public Health Institutions

Santosh Mahindrakar¹, Mansingh Jat², Besty Ann Varghese³

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³Nursing Officer, All India Institute of Medical Sciences, New Delhi

Abstract

Background: Nurses are the backbone of health care systems worldwide. In India the assessment of existing knowledge of nursing workforce and the utilization of skills is not evaluated and properly used to ensure good quality in health care.

Method: Using the Delphi technique a survey was developed and sent to nurses. Self-rating method (on a likert scale) were used in order to operationalize the personal skills.

Results: Almost half (48%) of the participants have a Bachelor degree. Out of this 27.2% qualified for a higher education (e.g. Master in related subject). Most nurses (56% in sample were females) are permanent employed working as staff nurse or nursing officers in the public sector. Among the participants 20% have sufficient teaching experience between 1 to 3 years. Self-rating of skills was high in almost all topics.

Conclusion: Having attained higher education most of the participants remain working as staff nurses. The good self-rating of participants underlines their ability to take over much higher positions and responsibilities. Moreover, teaching experience is hardly acknowledged by institutions since teaching staff is usually recruited from outside. The study suggests that a majority of the population has an interest to work in rural area. Better work conditions are needed in order to gain workforce in this areas.

Skills should effectively utilized in areas of administration, management, research and education, with a proper distribution to rural and urban areas in order to ensure a good health care system in India.

Keywords: Utilization of nursing skills, nursing skills, public health nurses, India.

Introduction

Admittedly, human resources for health, which are involved in the production, protection and improvement of population health, still remains as an underdeveloped zone without receiving much attention for metamorphism.¹ This situation pertains since decades in India, irrespective of the various measures employed by the World Health Organization (WHO) for the same. Unfortunately, India still lacks adequate health workforce. Nurses, being the backbone of health sector, play a pivotal role in placing the population into the trajectory of a healthy nation. However as stated by Rao et al ² nurses are not given appropriate power to implement various health measures, as observed in other developed countries. As per WHO, there is a wide disparity in the distribution of human resources, and there are major concerns based on their number, deployment, inadequacy of training as well as improper expertise mix.³ Mentioned disparities are usually observed along with poor human resource management, absence of appropriate career ladder, inadequate work conditions, and without much room for professional development. Hence, it is the need of the hour to obtain adequate, latest and trustworthy data of this major workforce to obtain an evidence base, without which adequate planning would be inappropriate. It involves a delve into the matter, to analyze whether the right people are placed at right quantity in the right position, and without this

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information, a proper decision making in the health care development, would be an impossibility. It was found that many studies are not undertaken in this area and among this health care population.

Thus, a study was undertaken among the nurses working in public health institutions with the objective to assess the existing knowledge and skill utilization of nursing workforce in the public health sector.

**Methodology**

Survey method was adopted to achieve the defined objective. A tool was formed using the Delphi technique. A set of expertise was identified and the tool was sent to them for validation and the same was adopted. Google form inbuilt consent form was sent to a list of friends and later they sent to their known. A snow-ball technique was used to select the convenient samples. Reminders were sent to the first set of known participants and then requested to spread a word among their friend group. There were 409 responses in total during the period of 30 days.

**Result**

Around half (48%) of the participants had Bachelors degree as a basic education, few of them had additional qualification like Bachelors in other subject, certificate courses related to skill, post graduate diploma in hospital management/administration and masters in other health subjects like Public Health, Human Resource management. The clinical nurses were pursuing additional and higher education to update their skills and knowledge but these are skills are not yet recognized. There is a further need to evaluate to the lack their skill recognition.

More than ¼ of the participant’s designation was clinical nurse/nursing officer, 56% were female, and 79.2% were permanent workers in the public health institutions.

Most of the participants want to work in the native places when they are provided with good working conditions. There were many studies reporting non-availability of the specialist at rural public health institutions. Nurses who are experienced in the tertiary care hospitals with hand on skills are not allowed to go back and work in their native places. Around half of the participants had more than five years and ¼ of the participants had more than a decade of clinical experience.

**Table 1: Baseline information of the participants**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Midwifery and Nursing</td>
<td>101</td>
<td>24.8</td>
</tr>
<tr>
<td>BSc</td>
<td>196</td>
<td>48.0</td>
</tr>
<tr>
<td>MSc</td>
<td>103</td>
<td>25.2</td>
</tr>
<tr>
<td>PhD</td>
<td>8</td>
<td>2.0</td>
</tr>
<tr>
<td>Additional qualification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>325</td>
<td>79.6</td>
</tr>
<tr>
<td>Bachelor of Arts</td>
<td>11</td>
<td>2.7</td>
</tr>
<tr>
<td>Certificate</td>
<td>15</td>
<td>3.7</td>
</tr>
<tr>
<td>Diploma</td>
<td>28</td>
<td>6.8</td>
</tr>
<tr>
<td>Masters</td>
<td>27</td>
<td>6.6</td>
</tr>
<tr>
<td>Multiple</td>
<td>2</td>
<td>0.5</td>
</tr>
<tr>
<td>Designation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical Nurse</td>
<td>311</td>
<td>76.2</td>
</tr>
<tr>
<td>Nurse educator</td>
<td>54</td>
<td>13.2</td>
</tr>
<tr>
<td>Research</td>
<td>20</td>
<td>4.9</td>
</tr>
<tr>
<td>Supervisor</td>
<td>8</td>
<td>2.0</td>
</tr>
<tr>
<td>Community Health Officer (CHO)</td>
<td>5</td>
<td>1.2</td>
</tr>
<tr>
<td>Public Health Nurse (PHN)</td>
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<td>1.2</td>
</tr>
<tr>
<td>Unemployed</td>
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<td>1.2</td>
</tr>
<tr>
<td>Type of contract</td>
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</tr>
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</tr>
<tr>
<td>Permanent</td>
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<td>79.2</td>
</tr>
<tr>
<td>Years of clinical experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up to 5 yrs</td>
<td>208</td>
<td>51.0</td>
</tr>
<tr>
<td>5-10</td>
<td>96</td>
<td>23.5</td>
</tr>
<tr>
<td>10-15</td>
<td>62</td>
<td>15.2</td>
</tr>
<tr>
<td>15-20</td>
<td>17</td>
<td>4.2</td>
</tr>
<tr>
<td>20 +</td>
<td>25</td>
<td>6.1</td>
</tr>
<tr>
<td>Teaching experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>212</td>
<td>52</td>
</tr>
<tr>
<td>0-5</td>
<td>154</td>
<td>37.7</td>
</tr>
<tr>
<td>5-10</td>
<td>22</td>
<td>5.4</td>
</tr>
<tr>
<td>10 +</td>
<td>20</td>
<td>4.9</td>
</tr>
<tr>
<td>Utilization of knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>31</td>
<td>7.6</td>
</tr>
<tr>
<td>2.0</td>
<td>36</td>
<td>8.8</td>
</tr>
<tr>
<td>3.0</td>
<td>81</td>
<td>19.9</td>
</tr>
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<td>Frequency</td>
<td>Percentage</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------</td>
<td>------------</td>
</tr>
<tr>
<td>4.0</td>
<td>118</td>
<td>28.9</td>
</tr>
<tr>
<td>5.0</td>
<td>115</td>
<td>28.2</td>
</tr>
<tr>
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<td>27</td>
<td>6.6</td>
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</tbody>
</table>

**Utilization of Skill**

<table>
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<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
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<td>6.1</td>
</tr>
<tr>
<td>2.0</td>
<td>33</td>
<td>8.1</td>
</tr>
<tr>
<td>3.0</td>
<td>84</td>
<td>20.6</td>
</tr>
<tr>
<td>4.0</td>
<td>113</td>
<td>27.7</td>
</tr>
<tr>
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<td>125</td>
<td>30.6</td>
</tr>
<tr>
<td>Missing</td>
<td>28</td>
<td>6.0</td>
</tr>
</tbody>
</table>

**Rural area work**

<table>
<thead>
<tr>
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<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
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<td>10.5</td>
</tr>
<tr>
<td>Yes</td>
<td>310</td>
<td>76.0</td>
</tr>
<tr>
<td>May be</td>
<td>55</td>
<td>13.5</td>
</tr>
</tbody>
</table>

### Table 2: Cross table between the qualification and clinical nurses

<table>
<thead>
<tr>
<th></th>
<th>Clinical</th>
<th>Non-clinical</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percentage</td>
<td>Frequency</td>
</tr>
<tr>
<td>GNM</td>
<td>85</td>
<td>25.8%</td>
<td>15</td>
</tr>
<tr>
<td>BSc N</td>
<td>176</td>
<td>53.5%</td>
<td>18</td>
</tr>
<tr>
<td>MSc N</td>
<td>67</td>
<td>20.4%</td>
<td>34</td>
</tr>
<tr>
<td>PhD</td>
<td>1</td>
<td>.3%</td>
<td>7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>329</td>
<td>100%</td>
<td>74</td>
</tr>
</tbody>
</table>

### Table 3: Comparison of clinical and non-clinical nurses with their clinical and teaching experiences

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical experience</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical</td>
<td>329</td>
<td>7.998</td>
<td>6.5274</td>
<td>.3599</td>
<td>.001</td>
</tr>
<tr>
<td>Non Clinical</td>
<td>74</td>
<td>5.014</td>
<td>6.7634</td>
<td>.7862</td>
<td></td>
</tr>
<tr>
<td>Teaching experience</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical</td>
<td>329</td>
<td>1.2678</td>
<td>2.79670</td>
<td>.15419</td>
<td>.000</td>
</tr>
<tr>
<td>Non Clinical</td>
<td>74</td>
<td>5.7677</td>
<td>6.74320</td>
<td>.78388</td>
<td></td>
</tr>
</tbody>
</table>

Mean clinical experience among the clinical nurses is higher than non-clinical and mean teaching experiences among the non-clinical higher than clinical nurses and statistically significant. It is a point to note that among the clinical nurses, 20.4% of them completed and have teaching experiences of 1.3±2.8 years and clinical experiences of 8±6.5 years. Most of these tertiary hospitals are attached with nursing institutions are doing direct recruitment of the teaching staff rather than promoting these skilled nurses with adequate qualification within an institution.

### Discussion

**Nurses and their demographic profile:** In the study, it was found that the larger population had Bachelor’s Degree (48%) and it almost constituted half of the population. The remaining half was almost equally composed of Diploma holders and postgraduates. However, this is in contrast to the Delhi Nursing Council (DNC) Statistics of 2015, where the largest group was that of Diploma holders (55.1%), followed by that of B.Sc Nurses (39.4%) and the least (5.5%) was that of...
auxiliary nurses. Unfortunately, they did not have an account of the nurses who have attained any other higher degrees.

A characteristic, which was revealed from the study, was that the larger proportions of nurses (55.9%) were females. Only 42.4% were males, and 1.7% of the population, did not mention their gender. These findings are similar to a study conducted by Gupta et al., 2003, to assess the health workforce, in which it was proved that about 62% of health sector was occupied by women and it was attributed that this skew was due to the female dominance in nursing. It was also commented in the study that nursing, in spite of being a highly complex skilled profession, has not received a market value in accordance to the level of skills involved in it, courtesy, perception of it as “women’s work”.

Nurses’ interest to work in rural or urban areas

The study reveals that a majority of the population has an interest to work in rural areas. However, as per the WHO report on human workforce by Anand and Fan, only 39.6% of nurses work in rural sector and among them, only 9.9% of them had a medical qualification. The rest 67.1 % had qualification less than secondary schooling, 9.3% had technical or non-technical diploma, 23.7% had basic or post graduate degree. Also, 73 districts had no nurses with a medical qualification. According to the study, about 85.5% of the nurses are working in public sector. But, this is in contrast to the study done by Karan et al. where about three- fourth of the nurses were employed in private sector. An appropriate and equal distribution of nurses in rural and urban areas, and in public and private sector is a mandate to ensure universal access to healthcare.

Utilization of nursing competencies-skill and knowledge: According to the study, when the participant nurses were asked to rate the utilization of their knowledge on a 5- point scale, the highest proportion of them rated it at 4 and 5, accounting to about 28.9% and 28.2%, respectively. At the same time, 19.9 % of them rated it at 3, 8.8% at 2 and 7.6% at 1. On the other hand, when the utilization of skills were assessed, largest group of them, that is 30.6% and 27.7% of them felt that it was at 5 and 4, on the rating scale, respectively. However, 34.8% of them felt that their skills were under- utilized, irrespective of the high level of training and expertise they have attained. About 6-7% of participants missed to give this information. Though there are few studies on assessing the competencies of nurses, this was a pioneer study in the perception of the extension to which nursing competencies are exploited.

Implications: It is evident from the study that, our nation has a handful of qualified experienced efficient nurses, but unfortunately, their knowledge and skills are not employed, as how it should be ideally done. The resources, that a developing nation like India possess, is ample enough to uplift the existing skewed health care system to a better and balanced one, where “Health For All” can be assured. However, a comprehensive and practical system should be introduced for the same to deploy qualified nurses in the right areas. Implementation of dual system of nursing will be a great step towards proper utilization of clinical knowledge and skills for the betterment of the patients, nursing students and nurses. The administrative and decision-making skills of post- graduate nurses should be exploited right from their productive young age, rather than waiting for a minimum of two decades for them to get promoted to the post of nurse manager. If promotion system is re-structured based on knowledge, skills, qualification, experience and the interest to keep oneself updated with the recent evidence-based practices, that will be a great impetus to the nursing practice, administration, education and the profession itself.

Some of the recommendations for further studies are: Comparative study on the skills of nurses as perceived by self and rated by an observer and analytical study to find the hindering factors in proper utilization of nursing skills.

Conclusion

Nurses, the mainstay of health sector face many challenges today, which demand an interrogation and analysis into the situation. We have an ample supply of qualified nurses, but their skills and abilities remain obscure, as they lack adequate and fair opportunities. If these skills are effectively utilized in areas of health practices, administration, management, and research with a proper distribution to rural and urban areas, then health care services quality improve with better outcome. It is recommended that, in institutions where nursing colleges are also a part of it, they should recruit the nursing faculty within the clinical pool of nurses; at least a higher percent of the seats if reserved for them, would be beneficial for both the employee and the employer. This would not only motivate the former,
but also, would aid in reducing the cost burden for the latter in appointing and training an external candidate.

If all these pitfalls of nursing workforce are not addressed in the right manner, at the right time, our well-qualified nurses will go in search of greener pastures to foreign nations, where they can grow multi-dimensionally, thereby, resulting in a crisis in our nation’s healthcare sector, with acute shortage of efficient nurses, in the near future itself.

**Ethical Approval:** We did not take ethical approval from any ethical committee but we followed the ICMR guidelines in all the steps verified by experts.

**Source of Funding:** It’s self funded. We authors did not receive any funding from any organization for this study.

**Conflict of Interest:** Nil

**References**


Assessment of Potential Factors that Effect Women Response to Labor Pain at Al-Elwyia Maternity Teaching Hospital

Sarab Nasr Fadhil¹, Rabea Mohsen Ali¹, Aqdas Dawood Salman¹

¹Maternal and Neonate Nursing Department, College of Nursing, University of Baghdad, Iraq

Abstract

This study aims to assess the potential factors that effect on women response to labor pain. A descriptive design was conducted on non-probability (Purposive Sample) of (60) pregnant women admitted to Al-Elwyia Maternity Teaching Hospital suffering from labor pain. The data were analyses used descriptive & inferential statistical. The study results show a highly significant differences concerning factors aggravate labor pain regarding positive and negatives items generally, and there source factors have highly assessed completely as very enough which accounted (94%), and service provider factors also extremely assessed good. The study concluded that there are many factors effect on women’s coping with labor pain. The study recommended developing educational program for pregnant women teach them about all changes during period of pregnancy and labor, and initiation of childbirth classes in primary health care centers.

Keywords: Assessment, factors, labor Pain.

Introduction

Labor pain is a part of a normal process in spite of the fact that it predictable during labor process, it is considered as the most unwanted part of the labor trial during childbirth.(1) There are many factors that influence labor pain, include socio-demographic factors (such as age, education), physiological factors, parity, rupture of membranes, fetal factors, maternal position, psychological factors, non-preparation toward labor, expectations of labor, nursing support, family support, and cultural factors.(2)

Methodology

Descriptive designs was conducted on non-probability (purposive sample) of (60) pregnant women that admitted to Al-Elwyia Maternity Teaching Hospital suffering from labor pain for the period of (4th July 2018 through 24th October 2018). Data were collected through used a questionnaire format, which consist of four parts.

Results

Table (1): Distribution of the socio-demographic data

<table>
<thead>
<tr>
<th>Variables</th>
<th>Groups</th>
<th>(n=60)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age Groups (Per Years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 20</td>
<td>30</td>
<td>50%</td>
</tr>
<tr>
<td>20-24</td>
<td>21</td>
<td>35%</td>
</tr>
<tr>
<td>25-29</td>
<td>6</td>
<td>10%</td>
</tr>
<tr>
<td>30-34</td>
<td>3</td>
<td>5%</td>
</tr>
<tr>
<td>Educational level of wife</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>2</td>
<td>3.3%</td>
</tr>
<tr>
<td>Read &amp; write</td>
<td>5</td>
<td>8.3%</td>
</tr>
<tr>
<td>Primary school</td>
<td>20</td>
<td>33.3%</td>
</tr>
<tr>
<td>Intermittent school</td>
<td>16</td>
<td>26.7%</td>
</tr>
<tr>
<td>Preparatory school</td>
<td>7</td>
<td>11.7%</td>
</tr>
<tr>
<td>Bachelor</td>
<td>9</td>
<td>15%</td>
</tr>
<tr>
<td>Higher studies</td>
<td>1</td>
<td>1.7%</td>
</tr>
<tr>
<td>Occupation status of wife</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housewife</td>
<td>56</td>
<td>93.3%</td>
</tr>
<tr>
<td>Employee</td>
<td>1</td>
<td>1.7%</td>
</tr>
<tr>
<td>Free job</td>
<td>3</td>
<td>5%</td>
</tr>
</tbody>
</table>

*% = Percentage

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Instructor, Dr. Nursing College, University of Baghdad, Iraq
e-mail: sarab@conursing.uobaghdad.edu.iq
Table (1) shows that the highest percentages (50%) which are (< 20) years old. (33.3%) which are primary, schools' graduates, (93.3%) were housewives.

**Table (2): Summary Statistics for Factors that Aggravate Labor Pain**

<table>
<thead>
<tr>
<th>Factors</th>
<th>MS</th>
<th>SD</th>
<th>P-value</th>
<th>Ass</th>
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</thead>
<tbody>
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<td><strong>Psychological Factors</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>1.650</td>
<td>.48099</td>
<td>0.040</td>
<td>NS</td>
</tr>
<tr>
<td>Fear of Birth Process</td>
<td>1.833</td>
<td>.37582</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td>Sense of loss of Control</td>
<td>1.450</td>
<td>.50169</td>
<td>0.640</td>
<td>NS</td>
</tr>
<tr>
<td>Stress</td>
<td>1.400</td>
<td>.49403</td>
<td>0.210</td>
<td>NS</td>
</tr>
<tr>
<td><strong>Physiological Factors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cervical dilation</td>
<td>1.9833</td>
<td>.12910</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td>Decent of presenting part</td>
<td>2.000</td>
<td>.00000</td>
<td>0.00000</td>
<td>HS</td>
</tr>
<tr>
<td>Frequency, Intensity, duration of Uterine Contraction</td>
<td>1.9667</td>
<td>.18102</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td>Position, presentation of Fetus</td>
<td>2.000</td>
<td>.00000</td>
<td>0.00000</td>
<td>HS</td>
</tr>
<tr>
<td>Stretching the perineum area, pressure on the Bladder</td>
<td>2.0000</td>
<td>.00000</td>
<td>0.00000</td>
<td>HS</td>
</tr>
<tr>
<td><strong>Cultural and religious beliefs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family Support</td>
<td>1.9000</td>
<td>.30253</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td>Family Problems</td>
<td>1.1167</td>
<td>.32373</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td>Lack of Medical Support</td>
<td>1.2833</td>
<td>.45442</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td>Mental Preparation</td>
<td>1.7667</td>
<td>.42652</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td>Non-Preparation toward Labor</td>
<td>1.5667</td>
<td>.49972</td>
<td>0.470</td>
<td>NS</td>
</tr>
<tr>
<td>Use Medication to Augmented Labor</td>
<td>1.9333</td>
<td>.25155</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td>Cry</td>
<td>1.7500</td>
<td>.43667</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td>Pray or call God</td>
<td>1.7333</td>
<td>.44595</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td>Scream</td>
<td>1.8667</td>
<td>1.28177</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td><strong>Other Factors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urination</td>
<td>1.3667</td>
<td>.48596</td>
<td>0.080</td>
<td>NS</td>
</tr>
<tr>
<td>Eating</td>
<td>1.0167</td>
<td>.12910</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td>Change Position (Sitting, Standing, rolling in bed, Lying Down, Walking)</td>
<td>1.7500</td>
<td>.43667</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td>Lack of sleep/Tiredness</td>
<td>1.9333</td>
<td>.25155</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td>Massage</td>
<td>1.3000</td>
<td>.46212</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td>Heat Pack/Pad</td>
<td>1.0833</td>
<td>.27872</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td><strong>Environment Factors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bright Lights</td>
<td>1.0667</td>
<td>.25155</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td>Noise</td>
<td>1.2000</td>
<td>.40338</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td>Temperature (Cold)</td>
<td>1.2167</td>
<td>.41545</td>
<td>0.000</td>
<td>HS</td>
</tr>
<tr>
<td>Temperature (Hot)</td>
<td>1.0333</td>
<td>.18102</td>
<td>0.000</td>
<td>HS</td>
</tr>
</tbody>
</table>

*HS : Highly Sig. at P<0.01; S: Sig. at P<0.05; NS: Non Sig. at P>0.05, MS: Mean Score, SD: standard deviation, Asse. Assessment.

Table (2): The results show the factors that aggravate labor pain, assigned that the observed responses regarding positive and negatives items are high significant generally, while left over items named (anxiety, sense of loss of control, and stress) in psychological factors and item named (non-preparation toward labor) in cultural and religious beliefs and item named (urination) have no significant differences are obtained at P>0.05.
**Figure (1): Summary Statistics for Resource Factors influencing laboring women perception on quality of intrapartum care**

*Figure (1)* show that resource factors influencing laboring women perception on quality of intrapartum care’s items concerning study group assigned that observed response has highly assessed completely as very enough which accounted (94%) that named “The number of service providers, and availability of drugs, delivery beds, equipment and supplies”, while, some women reported (3%) for both somewhat enough, and not enough for the same items.

**Table (3): Service provider factors influencing the laboring women perception on quality of intrapartum care**

<table>
<thead>
<tr>
<th>Service provider factors influencing the laboring women perception on quality of intrapartum care</th>
<th>Good</th>
<th>Moderate</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation for admission</td>
<td>42</td>
<td>70%</td>
<td>16</td>
</tr>
<tr>
<td>Efficiency of the admission procedure</td>
<td>44</td>
<td>73.3%</td>
<td>10</td>
</tr>
<tr>
<td>Attention of admitting</td>
<td>43</td>
<td>71.7%</td>
<td>12</td>
</tr>
<tr>
<td>Staff to individual needs</td>
<td>37</td>
<td>61.7%</td>
<td>19</td>
</tr>
<tr>
<td>Provision of information by nurses</td>
<td>33</td>
<td>55.0%</td>
<td>22</td>
</tr>
<tr>
<td>Concern and caring by the nurses</td>
<td>32</td>
<td>53.3%</td>
<td>22</td>
</tr>
<tr>
<td>How well the nurses listened</td>
<td>29</td>
<td>48.3%</td>
<td>24</td>
</tr>
<tr>
<td>Nurses attention to mothers’ condition</td>
<td>32</td>
<td>53.3%</td>
<td>22</td>
</tr>
<tr>
<td>Availability of nurses when needed</td>
<td>31</td>
<td>51.7%</td>
<td>24</td>
</tr>
<tr>
<td>Nurses response to mothers, calls</td>
<td>31</td>
<td>51.7%</td>
<td>24</td>
</tr>
<tr>
<td>Skills and competence of the nurses</td>
<td>44</td>
<td>73.3%</td>
<td>14</td>
</tr>
</tbody>
</table>

Freq.=Frequency

*Table (3): The results show that all quality of intrapartum care observed responses has highly and extremely assessed good.*

**Discussion**

*Regarding socio-demographic data: Table (1):* Several demographic characteristics of women may have effect on women’s perception to labor pain. Therefore,
the demographic characteristics and their relations to labor pain have been studied, as the current study has reported a highest percentage (50%) were at age group (< 20) years old(3). This finding is in consistent with study which indicated that labor pain was found to be more severe in younger age as compared to those above 20. The highest percentages (33.3%) are primary schools graduates. These finding is in consistent with study show that women with low educational level will have minimum level of performance to cope with pain during childbirth process(4). The height percentage of occupational status is “Housewives”, and they are accounted (93.3%). This finding is in constant with the study that found that majority of women (sixty percent in study group, and sixty four percent in control group) were not working. They explain that the occupation factor is one factor that can influence women to experience labor pain.

**Factors that Aggravate Labor Pain: Table (2):**

This study is in agreement with a descriptive study made at Iraq governorate, (2007) for (100) pregnant women at three hospitals in Baghdad city which “The main results of the study reported a high mean of scores in women’s fear on herself concerning labor (such as dystocia, demise during labor, uncontrolled uterine contractions, protracted labor, fear of being left alone, an episiotomy, and exposure to infection) and fear on their newborn from delivery of unhealthy or abnormal newborn delivery, shoulder dystocia, asphyxia, and exposure to cold and infection), so that a current study recommended program to teach the pregnant women about psychological & physiological changes during the pregnancy period and childbirth process(6). In addition to that, this study is in agreement with Australian and Swedish study that results suggest that psychological factors are significant factors concerning to birth consequence, due to have a passive effect on women’s emotional health through pregnancy and increased the negative birth experience, so that must be clarify by health providers during the antenatal period to assist women in childbirth preparation(7). Also, this study is agreement with study made in, (2004) which indicates that (7%) of the sample had a passive birth experience that concern to many factors such as (Induction, Augmentation of labor, transfer of infant to neonatal care, unwanted pregnancy, loss of control, and take of obstetric analgesia). Furthermore, studies in Hong Kong, (2017) and study in Jordan (2005) present that labor pain is apprehension to have both psychological & physiological origin, that contractions of uterus and dilation of cervix which are consider a physiological source(9&10). On top of that the women’s perception toward labor pain can be effect by religious and cultural beliefs, in some culture, the women are shout and cry uncontrollable, while in other cultures they not explicit much distress the women’s perception toward labor pain can be effect by religious and cultural beliefs, In some culture, the women are shout and cry uncontrollable, while in other cultures they not explicit much distress. Cultural factors can play important role in cope of women with pain during labor(11). Finally, a significant positive relationship was found between labor stress & pain and from environmental factors in primiparas and in multipara’s women in study made in 2009.(12)

Resource Factors influencing laboring women perception on quality of intrapartum care: Figure (1) show that resource factors named “the number of service providers, and availability of drugs, delivery beds, equipment and supplies” have highly assessed completely as very enough which accounted (94%) which mean that women agreed that these resources are available in maternity wards, and not effect on their perception of labor pain while just (3%) of sample said unavailability of supplies and equipment. This result is agreement with result of study that has shown that some women experiences good health services during pregnancy, labor, and postpartum period. However, the lack of space, medical supplies, goods, human resources, and the passive behavior of health care providers is what most women face challenges while using services (13).

**Service provider factors influencing the laboring women perception on quality of intrapartum care: Table (3):** The results show that all quality of intrapartum care observed responses has highly and extremely assessed good, this mean that the women copy positively with labor pain. This results agreement with study revealed that midwives’ attitude and practice arise affirmative effect on women during labor, which gave a positive impression on the pregnant women’s perception. Also, supportive relationship and high-quality care will empower the women in labor, thus assist the women to copy with her labor pain.(14)

**Recommendation:** The study recommended developing educational program for pregnant women teach them about all changes during period of pregnancy and labor, and initiation of childbirth classes in primary health care centers.
Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Is obtained from the (ALElwyia maternity Teaching Hospital), and all pregnant women participants in the research - have been approved before the questionnaire is started.

References
8. Ulla Waldenström, Ingegerd Hildingsson, Christine Rubertsson RN, RM, MA, Ingela Rådestad; A Negative Birth Experience: Prevalence and Risk Factors in a National Sample; 19 March 2004,
Role of Intestinal Microbiota and its Virulence Factors in Pathogenesis of Inflammatory Bowel Disease

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Abstract

Inflammatory bowel disease (IBD) is a chronic relapsing unexplained etiological condition and microbiota have been suggested to influence its etiology and pathogenesis. Ulcerative colitis (UC) and Crohn’s disease (CD) are the two main categories of this disease. The present study examined the fifty fecal samples obtained from IBD patients and control. The bacterial isolates were identified by culture, microscope examination, biochemical test, and Vitek 2 compact system. Results showed that IBD patients had different percentages of Proteobacteria (54.5%), Actinobacteria (1.6%), and Firmicutes (43.8%) when identified. They encompassed 17 genera that involve 121 bacterial isolates. The corresponding percentages in control were 49%, 0% and 51%, respectively, with four genera and 68 bacterial isolates. The bacterial isolates of IBD patients and control are assessed for some virulence factors, which included biofilm formation and production of phospholipase and hemolysin, as well as antibiotic susceptibility. In IBD patients, evaluation of biofilm formation revealed that 20.6% of isolates were high-producing, 69.4% was moderate producing and 10% non-biofilm producing. The corresponding percentages in control were 1%, 62% and 37%, respectively. The bacterial isolates showed different abilities in producing phospholipase. In samples of patients, 20.5% of isolates showed large activity, 44% moderate activity and 35.5% negative activity. For control samples, most of the isolates were non-producer of phospholipase (66%), while large and moderate enzyme activity accounted for 4.5% and 29.5%, respectively. The hemolysin enzyme activity was determined as 35% of isolates with high activity, 40% with moderate activity and 25% without activity. These percentages in control isolates were 25%, 35% and 40%, respectively. Imipenem was the most effective antibiotic against gram-positive and gram-negative bacteria of the patient isolates with the resistance of 27% and 24%, respectively, while the less effective antibiotics was cefixime with resistance of 95% and 88%, respectively. In the control isolates, the imipenem was also the most effective against bacteria with a resistance of 15%. The less effective antibiotics for gram-positive isolates was erythromycin with resistance of 43% and for gram-negative isolates, it was tetracycline (45%).

Keywords: Inflammatory bowel disease; Ulcerative colitis; Crohn’s disease; Microbiota; Virulence factors, Dysbiosis.

Introduction

Inflammatory bowel disease (IBD) is a chronic relapsing unexplained etiological condition. Ulcerative colitis (UC) and Crohn’s disease (CD) are the two main categories of inflammatory bowel disease, these groups of chronic idiopathic inflammatory diseases affecting the digestive system. The etiology of both subtypes is incompletely understood but it is suggested to involve complex interactions between genetic, environmental, immunological, and gut microbiomical factors. Their interactions orchestrate a cascade of inflammatory responses in the intestinal mucosa.

In humans more than 100 trillion microorganisms colonize the gastrointestinal tract creating mutual relations with the host which are collectively referred to as
the gut microbiota\textsuperscript{4,5}. Such indigenous microorganisms co-evolved in a symbiotic relationship with the host. Beyond their metabolic advantages, symbiotic bacteria provided the host with several activities that encourage immune homeostasis, immune responses, and pathogen colonization inhibition. The capacity of symbiotic bacteria to prevent pathogen colonization is mediated through many mechanisms involving direct killing, competition for limited nutrients, and enhanced immune responses \textsuperscript{5}.

Metagenomic data suggest that the most predominant phyla in healthy individuals are in gram-negative Bacteroidetes (17–60\%) and gram-positive firmicutes (35–80\%)\textsuperscript{6,7}. The intestinal microenvironment comprising gut microbiota and its metabolites, which is easily altered by nutrition, medications, stress, bacterial or viral pathogens infection\textsuperscript{8,9}.

Host immunity should adapt to change according to the gut environment, along with dysbiosis and infection with pathogenic bacteria. The imbalance between protective and harmful bacteria known as dysbiosis, resulting in loss of intestinal homeostasis, is described in numerous intestinal diseases including irritable intestinal syndrome (IBS) and inflammatory intestinal disease (IBD) \textsuperscript{10,11}. Zuo and Ng, (2018) have been documented that the inflammatory environment in IBD supports the growth of adherent invasive bacterial strains such as Fusobacteria and Enterobacteriaceae. As well, an increased number of adherents invasive E. coli has been found in both UC and CD\textsuperscript{13,14}. Recently, the microbiota uses as a biomarker to screen the progression of IBD and the specific strains require stimulating or treating IBD need further investigation\textsuperscript{15}.

**Material and Method**

**Patients and Control:** During January–June 2019, a case-control study was conducted on 50 IBD patients and 50 healthy control subjects after receiving the approval of the Ethics Committee at the Iraqi Ministry of Health and Environment. The patients attended the outpatient gastrointestinal clinics at Al-Kindy Teaching Hospital, Baghdad Teaching Hospital and Gastroenterology and Hepatology Teaching Hospital in Baghdad for diagnosis and treatment. The diagnosis is made by consultants at the clinics. It is based on standard clinical, radiological, endoscopic and histopathological criteria\textsuperscript{16}. Patients with other associated autoimmune diseases are excluded. The control sample included blood donors who are healthy and their serum profile for anti-pathogen antibodies is negative (Central Blood Bank, Baghdad).

**Stool sample collection:** The sample is collected by using a sterile stool cap that contains (10 ml) of Carry-Blair transport media. Then the sample incubates in BHIB for 24 hr. at 37°C after that, a loop full of bacterial culture from incubating tubes are streaked separately into the Blood agar, Nutrient agar, MRS agar, MacConkey agar, Yersinia agar, Mannitol salt agar, Ss agar, Chocolate agar, Campylobacter agar, Eosin methylene blue agar and incubating for 24 hrs at 37°C in aerobic and anaerobic conditions.

**Identification of Bacterial isolates:** Bacteria are isolated as single colonies on different selective media including Blood agar, Man-Rogosa- Sharpe agar (MRS), MacConkey agar, Mannitol salt agar, Ss agar, Eosin methylene blue agar, chocolate agar, Yersinia Selective Agar and Campylobacter Base agar that incubate at 37°C for 24 hrs. The primary identification of the bacterial isolates is based on a macroscopical examination that depends on colonial morphology characteristics and microscopical examination via using Grams stain technique, catalase and oxidase test. Confirmation diagnosis of bacterial isolates are using Vitek2 System\textsuperscript{17,18}.

**Detection of virulence Factors:**

**Biofilm formation:**

- **Congo red method:** A single isolate colony is aerobically incubated on congo red agar for (24-48) hrs. at 37 °C. The high positive result show as the development of black colonies with a dry crystalline and the low positive result show as black colonies without a crystalline dry color, while negative results show as red colonies \textsuperscript{19}.

- **Microtiter Plate Method:** In the brain heart infusion broth bacterial isolates are inoculated with 1% glucose. Broths are incubating at 37 C for 24 hrs. A (180) μl, brain heart infusion broth, is applied to sterile 96- well polystyrene microtiter plates and loaded with 20 μl of bacteria isolates. Following incubation time, all wells are washed 3 times with 0.2 ml of phosphate buffer saline (PBS) to remove unattached bacteria while remaining biofilms are fixing with 0.1% of crystal violet for 15 minutes after that, the excess stain is wash with PBS. The
Crystal violet attaches to the biofilm has been fixed with 0.2 ml ethanol- acetone mixture (80:20 w/v). The results reading by ELISA reader at a wavelength of 680 nm\(^{(20)}\).

**Detection of Phospholipase Production:** About 5 \(\mu\)l of bacterial inoculum equal to \((1.5 \times 10^8\) CFU/ml) is inoculated onto the surface of Egg-Yolk agar. Plates incubate at 37°C for 24 hrs., colonial diameter and precipitation zone diameter are calculated \((21)\). The result of phospholipase activity is calculated by using this formula: \(\text{Pz value} = \frac{\text{Colony diameter}}{\text{Colony diameter} + \text{Zone of precipitation}}\). When Pz =1 means the strain is negative, while a value of Pz <0.64- 0.99 = moderate activity and <0.63 = large activity\(^{(22)}\).

**Detection of Hemolysin Activity:** Hemolysin activity is assessed on the blood agar plate. Bacterial isolates 10\(\mu\)l, equal to \((1.5 \times 10^8\) CFU/ml) is deposited onto the medium. The plates are then incubated at 37°C for 24 hrs, the ratio of the colony’s diameter to that of the translucent hemolysis zone (in mm) is used as the hemolytic index (Hz value). The results of hemolytic activity (Hz) were calculated by using this formula: Hz value = \(\frac{\text{Colony diameter}}{\text{Colony diameter} + \text{Zone of precipitation}}\). The Hz index: Hz < 0.69; large hemolysin activity, Hz = 0.70- 0.79; moderate and the negative activity Hz =1\(^{(21)}\).

**Antibiotic Sensitivity Test:** All isolates are tested for antimicrobial susceptibility following the CLSI (2016) criteria by using the agar diffusion method as follows: few colonies (2-4) from overnight cultivation are transferred to 2 ml of normal saline to prepare the bacterial suspension adjusted to 0.5 McFarland turbidity equivalent to \((1.5 \times 10^8\) CFU/ml). A sterile cotton swab is used to inoculate the bacterial suspension in Muller Hinton agar plates. Different antimicrobial discs with six discs were used {azithromycin (AZM), tetracycline (TE), ciprofloxacin (CIP), cefixime (CFM), imipenem (IPM) and erythromycin (E)} place on the surface of the medium and the plates are incubating at 37°C for 24 hrs. Measure the diameter of each antibiotic disc’s inhibition zone and interpret the results by referring to the CLSI recommendation.

**Statistical Analysis:** Data were statistically analyzed using the package IBM SPSS Statistics 25.0 (Armonk, NY: IBM Corp.). Pearson’s Chi-squared, Fisher’s exact tests and analysis of variance (ANOVA) were used to compare categorical variables and derive significant.

**Results and Discussion**

**Identification of Bacteria:** Fifty fecal samples of IBD (UC and CD) patients have been collected and 121 bacterial isolates are isolated on different selective laboratory media. The three most abundant bacterial phyla across all samples are Proteobacteria (54.5%), Actinobacteria (1.6%) and Firmicutes (43.8%). Whereas, at the genus/species level, the seventeen genera of the bacterial isolate from IBD disease, the bacterial name and number are distributed in table 1.

On the other hand, also fifty samples of stool from apparently healthy people have been collected and 68 bacterial isolates are isolated on different selective laboratory media. The three most abundant bacterial phyla across all samples are Proteobacteria (54.5%), Actinobacteria (1.6%) and Firmicutes (43.8%). Whereas, at the genus/species level, the seventeen genera of the bacterial isolate from IBD disease, the bacterial name and number are distributed in table 1.

**Table 1: Numbers and Percentage of Bacterial Isolates in IBD Patients and healthy control**

<table>
<thead>
<tr>
<th>Bacterial Isolates</th>
<th>IBD isolates No.</th>
<th>Percentage (%)</th>
<th>Control isolates No.</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aeromonas salmonicid</td>
<td>1</td>
<td>0.8</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Burkholderia cepacia</td>
<td>2</td>
<td>1.6</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Citrobacter spp.</td>
<td>11</td>
<td>9</td>
<td>2</td>
<td>2.94</td>
</tr>
<tr>
<td>E. coli</td>
<td>28</td>
<td>23.1</td>
<td>31</td>
<td>45.6</td>
</tr>
<tr>
<td>Enterobacter aerogenes</td>
<td>2</td>
<td>1.6</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Enterobacter cloacae</td>
<td>1</td>
<td>0.8</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Enterococcus faecium</td>
<td>4</td>
<td>3.3</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Klebsiella pneumonia</td>
<td>6</td>
<td>4.9</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Kocuriakristinae</td>
<td>1</td>
<td>0.8</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
### Table 2: Bacterial Variation between UC and CD patients

<table>
<thead>
<tr>
<th>Bacterial Species</th>
<th>UC</th>
<th>CD</th>
<th>Total</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aeromonas salmonicid</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0.488</td>
</tr>
<tr>
<td>Burkholderiacepacia</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1.000</td>
</tr>
<tr>
<td>Citrobacter spp.</td>
<td>5</td>
<td>6</td>
<td>11</td>
<td>0.759</td>
</tr>
<tr>
<td>E. coli</td>
<td>15</td>
<td>13</td>
<td>28</td>
<td>0.832</td>
</tr>
<tr>
<td>Enterobacter aerogenes</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>0.496</td>
</tr>
<tr>
<td>Enterobacter cloacae</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1.000</td>
</tr>
<tr>
<td>Enterococcus faecium</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>1.000</td>
</tr>
<tr>
<td>Klebsiella pneumonia</td>
<td>3</td>
<td>3</td>
<td>6</td>
<td>1.000</td>
</tr>
<tr>
<td>Kocuriakristinae</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0.488</td>
</tr>
<tr>
<td>Lactobacillus acidophilus</td>
<td>10</td>
<td>10</td>
<td>20</td>
<td>1.000</td>
</tr>
<tr>
<td>Lactobacillus plantarum</td>
<td>6</td>
<td>6</td>
<td>12</td>
<td>1.000</td>
</tr>
<tr>
<td>Leuconstocmesenteroides</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0.488</td>
</tr>
<tr>
<td>Micrococcus leteus</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0.488</td>
</tr>
<tr>
<td>Proteus spp.</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>1.000</td>
</tr>
<tr>
<td>Pseudomonas putida</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0.488</td>
</tr>
<tr>
<td>Salmonella enterica</td>
<td>3</td>
<td>3</td>
<td>6</td>
<td>1.000</td>
</tr>
<tr>
<td>Serratia spp.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>0.613</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>8</td>
<td>6</td>
<td>14</td>
<td>0.778</td>
</tr>
<tr>
<td>Staphylococcus cohii</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0.488</td>
</tr>
<tr>
<td>Streptococcus iniae</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0.488</td>
</tr>
</tbody>
</table>

The microbial variation between Ulcerative colitis and Crohn’s Disease: The gut microbial composition variation reveals no significant difference in all bacterial species between UC and CD patients such as summarized in table 2.

Several studies document intestinal microbiota of healthy individuals is known to provide the host with multiple health benefits such as diet metabolism and contributing to the immune system by protection against...
the pathogen. The intestinal microbiota coevolves with humans and the maintenance of human health by including several symbiotic relationships between the host and the microbiota. An undesirable alteration function and composition of a microbial community called “dysbiosis”, that changes the relationship between host–microbiota and the host immune system that demonstrate in the chronic inflammation with IBD patients\(^{(10,24,25)}\). The populations of microbiota imbalance or alteration induce pathogenicity mainly by restricting compounds of beneficial bacteria or by increasing proinflammatory species\(^{(26)}\).

A more recent study for microbiome differences among IBD reports the no significant difference link between the distribution of type lesions and bacterial community in IBD patient, although may little diversity in some species according to disease activity\(^{(27)}\).

**Microbial Variation between IBD Patient (UC and CD) and Control:** The microbial isolates alteration between IBD patients and control shown in figures 1. The result showed a clear and significant separation between patients and control, which were the large range of microbial species diversity and altered composition in patients compared to control that have a small microbial species.

![Figure 1: The different bacterial isolates between UC, CD and controls.](image-url)
These results may fit with other studies that suggest the microbiological profiles are a significant difference between IBD and healthy control[28]. Another study documents the important role of a significantly increasing Proteobacteria, Actinobacteria phylum and decreasing of Firmicutes, Bacteroides and Clostridiaceae phyla in the etiopathogenesis of IBD when compared with control[29]. Inflame samples have several taxa belong to the Proteobacteria phyla show lower transcriptional activity although being present in larger numbers compared to non-inflamed samples[30]. The increase in Staphylococcus, Enterococcus, Bifidobacterium, Lactobacillus, Klebsiella Pseudomonas, and Proteus genera, are common bacterial features associate with IBD[31]. Reducing of Firmicutes levels identified among UC and CD patients when compared to healthy individuals[32]. In UC and CD patients increasing of Enterococcus genus when compared with healthy people. These changes in the wall of the intestinal may be resulting inan inflammatory process ongoing, which make it easier for bacteria growing and access nutrients[33].

**Virulence Factors:**

**Biofilm Formation:** Congo red method (CRA) and microtiter plate method is used for the detection of biofilm formation. A total of 121 clinical isolates from IBD and 68 isolates from controls are undergone to a method of biofilm detection. The results showed in table 3.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Biofilm formation</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High-producer</td>
<td>Moderate-producer</td>
</tr>
<tr>
<td>IBD patients (N= 121)</td>
<td>20 (16.6%)</td>
<td>86 (71.1%)</td>
</tr>
<tr>
<td></td>
<td>vs. 25 (21%)</td>
<td>vs. 84 (69%)</td>
</tr>
<tr>
<td>Controls (N= 68)</td>
<td>0</td>
<td>39 (57.3%)</td>
</tr>
<tr>
<td></td>
<td>vs. 1 (1%)</td>
<td>vs. 42 (62%)</td>
</tr>
</tbody>
</table>

For several recalcitrant infections, biofilm-forming by bacteria is responsible for a highly difficult to eliminate.

They exhibit antibiotic resistance by various method such as restrict antibiotic penetration into biofilms, resistance gene expression and decrease growth rate[34]. Incomplete infection clearance caused by the production of biofilm can result in a chronic infection that led to serious outcomes. For that reason, biofilm detection in such cases is essential to allow choosing a better antimicrobial treatment[35].

The bacteria or substance aggregation are the most important virulent factor that increases in these diseases due to the ability for changes of the intestinal wall. The higher bacterial concentration then relates to more extensive intestinal inflammation and thus to worse disease progression[33]. The increase bacterial number is detected relate to IBD patient’s mucosa compared to irritable bowel syndrome patients and healthy control, this might be associate with failure of maintenance of mucosal barrier integrity that resulting in a reduce ability for infection clearance[36].

The results of the CRA method show (16.6% vs. 21) high producer organisms, (71.1% vs. 69%) moderate producer and (12.3% vs. 10%) non-producer bacteria when compared with the microtiter plate method in IBD patient these differences may be an associate with CRA a good method for identifying strong biofilm producers, but it is difficult to distinguish between moderate, weak and non-producer’s biofilm according to the variability of the results identify by different observers[20].

Manandhar et al., (2018) documented the decreased accuracy of the CRA method in biofilm production, despite being simpler and faster, the CRA approach cannot be relied on for accurate detection of biofilm producers in the routine diagnostic laboratory. The microtiter plate method was the best method among other detection method for detection of biofilm formation by pathogens extracted from our samples because of a strong specificity performance and fewer subjectivity
errors; it can be routinely used for biofilm detection in the microbiology laboratory (35).

**Production of Phospholipase Enzyme**

Results showed difference ability of 121 IBD isolates and 69 of control isolates to produce phospholipase enzyme showed in the table 4.

The phospholipase enzyme digests the phospholipid host cell membrane and causes lysis of the cell and surface feature changes that improve adherence, which can be used as one of the parameters to distinguish virulent invasive strains from non-invasive strains and thus result in infection, by reducing a hydrophobic barrier and enable the commensal bacteria to invasion and inducing inflammation (22,38).

This result is related to the positive result of another study that demonstrates the phospholipase enzyme activity increase of fecal intestinal microbiota in the inflammatory stage in UC patients and has a role in the pathogenesis of the disease (38).

**Hemolysin Production:** The enzyme hemolysin is produced by different clinical isolates from patients infected with IBD out of 121 total isolates and 69 of control isolates as in table 4.

**Table 4: The hemolysin and Phospholipase activities results of IBD patients and control**

<table>
<thead>
<tr>
<th>Groups</th>
<th>Number of isolates (%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Large activity</td>
<td>Moderate activity</td>
</tr>
<tr>
<td>Hemolysin</td>
<td>IBD patients (N=121)</td>
<td>42(35%)</td>
</tr>
<tr>
<td></td>
<td>Controls (N=68)</td>
<td>17(25%)</td>
</tr>
<tr>
<td>Phospholipase</td>
<td>IBD patients (N=121)</td>
<td>25(20.5%)</td>
</tr>
<tr>
<td></td>
<td>Controls (N=68)</td>
<td>3(4.5%)</td>
</tr>
</tbody>
</table>

Hemolysin enzyme provided a significant role in the pathogenesis of organisms to induced diseases. They aid in the host cell membrane lysis, escape the immune system and the nutrients released for the microbe’s survival and development of disease (39).

**Antimicrobial Susceptibility Assay:** The results of the antibiotic sensitivity test show relied on measuring the diameter of inhibition zone and comparing it with CLSI (2016) (Clinical & Laboratory Standards Institute) the gram-negative bacteria of patients (K.pneumoniae, Enterobacter spp., S. enterica, E. coli, Proteus spp., P. putida, Burkholderiacepacia, Serratia spp., A. salmonicid and Citrobacter spp.) display a different response for five antibiotics in figure 2. Out of 66 gram-negative isolates, the antibiotic imipenem was the most effective antibiotic against gram-negative bacterin thesensitive proportion (76%) while the resistance of this antibiotic (24%), The proportion of resistance to azithromycin (85%), tetracycline (61%) and ciprofloxacin (71%) while the lower effective are in cefixime that (88%) of the resistance proportion.

On the other hand, the out of 68-gram negative and gram positive isolates from control (E. coli, Citrobacter freundii, S. aureus and Lactobacillus spp.) display a different response for five antibiotics in figure 2, where the antibiotic imipenem is the most effective antibiotic against the resistance proportion (27%) and the sensitive proportion (73%), whereas the proportion of resistance to azithromycin is (80%), erythromycin (91%) and ciprofloxacin (73%) while the lower effective are in cefixime that (95%) of the resistance proportion.
Resistance to antibiotics are commonly understood to be associate with genetic modifications or achieve without any genetic modification, called non-inherited resistance phenotypic is correlate with certain conditions, such as biofilm formation, a stationary phase of growth\(^{40}\). Bacteria in biofilms form exhibit higher antibiotic tolerance than planktonic form, so MIC value for bacterial biofilms can be up to 1000–1500 times higher than those with planktonic bacteria\(^{20}\).

In this study we found a significant difference between IBD patient and control among antibiotics sensitivity, in my opinion maybe this a reflection of the association disease, alteration in microbiota interaction, diet, immunosuppresses drugs (infliximab) and other antibiotics that may give resistance to some drugs, biofilm and other virulence factors.

**Conclusion**

In the present study, we can conclude that microbiota alteration in IBD patients (both CD and UC) and healthy volunteers have an imbalance in microbial communities that have different phylum and species levels relative to healthy volunteers and in different activity in their virulence factors.

**Acknowledgment:** The authors would like to thank Mustansiriyah University, Iraq (www.uomustansiriyah.edu.iq) for its support of the current work.

**Source of Funding:** Self fund.

**Conflict of Interest:** No conflict of interest

**Ethic Statement:** The researchers already have ethical clearance from all required institution and laboratories.

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**References**


Pattern of Suicidal Deaths in Belagavi: Retrospective Study

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Abstract

A retrospective study was undertaken over a period of 3 years to find out pattern of suicidal deaths in Belagavi. Autopsied at BIMS Hospital, a referral District hospital catering to the needs of public within a radius of 150 km. Out of 2200 autopsies conducted, 670 were suicidal deaths.

The commonest age group of victims were 21-40 yrs. Males predominated females in the ratio of 3:1. Maximum number of victims belonged to rural area. Majority of the victims were married. Common mode of suicide was poisoning. Maximum victims were brought dead. Maximum numbers of victims were farmers. Depression was the commonest cause for suicide.

Keywords: Suicidal deaths, rural area, poisoning, depression.

Introduction

Suicide is defined as an act in which a person intentionally causes his/her own death. Attempt to die by suicide is defined as a nonfatal and self injurious behaviour with an intent to die.

The word “suicide” was first used by the English author, Sir Thomas Browne in 1642 in his treatise “Religio Medici”. The word originated from SUI (of oneself) and CAEDES (murder).

According to the data from the World Health Organization, every year, more than 800,000 people die from suicide worldwide. Most concerning observation seen in the last two decades is the increasing rate of adolescent and youth suicide attempts and deaths in many regions of the world, including India¹. Eighty five percent of suicides in the world occur in low and middle income countries. India being one among them suffers considerably from this burden.

Common causes for suicides include problems in interpersonal relationships, family conflicts, domestic violence, academic failure, unemployment, bankruptcy in business, loneliness, medical ailments, poverty and other stressful life events.

The objective of this study is to know the pattern of suicidal deaths in relation to age, sex, marital status, occupation, survival period, mode used for suicide and causes for suicide.

Materials and Method

All suicidal deaths autopsied at BIMS Hospital, Belagavi from January 2017 to December 2019 form the material for the study. During this period out of 2200 cases, 670 were suicidal deaths.

Data was obtained from hospital case records and police inquest reports. A proforma was evolved to get uniform information from all the above mentioned sources.

Observation and Results

The total number of autopsies conducted during this period is 2200 out of which 670(30.45%) were due to suicidal deaths.
The commonest age group of victims were 21-40 yrs (53%). Male predominated females in the ratio 3:1. Maximum number of victims belonged to rural area (66%).

Poisoning was the most common mode used for suicide (49%). Depression was the commonest cause for suicide (26%).

Maximum number of victims were brought dead (49%). Suicides were more commonly seen in the month of March and April.

Majority of victims were married (69%). Maximum number of victims were Hindus (92%).

Maximum number of victims were farmers (27%)
Occupation | Male | Female | Total | Percentage  
--- | --- | --- | --- | ---  
Housewife | 105 | 105 | 105 | 15.67%  
Business | 55 | 55 | 55 | 8.20%  
Daily Wage Labourers | 110 | 111 | 111 | 16.56%  
Doctor | 1 | 1 | 1 | 0.40%  
Unemployed | 91 | 13 | 104 | 15.52%  
Total | 508 | 162 | 670 |  

Table 5. Causes for committing suicide.

| Causes | Male | Female | Total | Percentage  
--- | --- | --- | --- | ---  
Alcohol Addiction | 112 | 0 | 112 | 16.72%  
Business Loss | 10 | 0 | 10 | 1.49%  
Physical Health Issues | 16 | 24 | 40 | 5.97%  
Crop Failure | 66 | 0 | 66 | 9.85%  
Depression | 108 | 65 | 173 | 25.82%  
Domestic Violence | 1 | 22 | 23 | 3.43%  
Exam Failure | 23 | 19 | 42 | 6.27%  
Financial Loss | 62 | 0 | 62 | 9.25%  
Impulsive Behaviour | 2 | 7 | 9 | 1.34%  
Mental Illness | 9 | 3 | 12 | 1.79%  
Not Known | 99 | 22 | 121 | 18.06%  
Grand Total | 508 | 162 | 670 |  

Table 6. Year and month wise distribution of suicide deaths

| Year | 2017 | 2018 | 2019 | Total  
--- | --- | --- | --- | ---  
January | 26 | 18 | 19 | 63  
February | 13 | 19 | 15 | 47  
March | 18 | 33 | 14 | 65  
April | 21 | 24 | 28 | 73  
May | 17 | 28 | 22 | 67  
June | 18 | 21 | 19 | 58  
July | 14 | 9 | 25 | 48  
August | 15 | 16 | 12 | 43  
September | 17 | 18 | 20 | 55  
October | 17 | 22 | 15 | 54  
November | 21 | 21 | 18 | 60  
December | 10 | 17 | 10 | 37  
| 207 | 246 | 217 | 670  

Discussion

Today’s world has become a roller coaster ride of unwanted competition and undue stress among people of all generations. We see an unhealthy social structure growing in our society where people become judgemental of other people. Stress is seen at all the generations, from
a child to an elderly person. Children face competitive and comparison stress sometimes from parents, teachers or their friends. Some children go through traumatic experiences of sexual/physical abuse. As they reach their teenage the stress of being the best in their curricular/ sports activities increases. The elders are not far behind in facing stress. They face stress in their job, in fulfilling family requirements, financial burden, etc. The senior citizens too face age related health problems, loneliness, lack of finance, etc. And when they find no ear to listen to their pain they chose to surrender their life.

Death by suicide is an extremely complex issue that causes pain to the victim and the ones they leave behind. The suicide rate in India is 16.5 per 100,000 people, the highest in South East Asia. Suicide is the second leading cause of death among the age group 15-29 years, claiming 200000 lives in 2016 worldwide.\(^2\)

The Global Burden of Disease Study 1990 – 2016 – NCBI, India’s contribution to global suicide deaths increased from 25.3% in 1990 to 36.6% in 2016 among women, and from 18.7% to 24.3% among men.\(^3\)

According to present study, male predominated females in the ratio 3:1, which is contrast to the study conducted by Joseph et al 2003, in which the commonest method of suicide was poisoning followed by hanging which is consistent with our study.\(^4\)

As per Aaron et al 2004, the commonest method of suicide was hanging which is contrast to present study. In our study the commonest is poisoning.\(^5\)

As per Khan et al 2005, the commonest age group was 15-35 years which is almost consistent with our study where the age group is 21-40 yrs. Rural and married people are more affected in our study which is contrast to their study where unmarried and urban people were more affected.\(^6\)

As per Abraham et al study 2005, the commonest method of suicide was hanging followed by poisoning which is contrast to our study where the commonest method was poisoning followed by hanging.\(^7\)

As per Gajalakshmi et al 2007, male to female ratio is 1:1 but in our study the ratio is 3:1 which is contrast, and the commonest method was poisoning followed by hanging which is consistent with our study.\(^8\)

As per study conducted by Chavan et al 2008, commonest method was hanging followed by poisoning, male female ratio is 1:1, maximum victim belonged to urban area which is in contrast to our study.\(^9\)

As per study conducted by Ashok Kumar Shetty, the commonest age group was 21 – 30 years, males predominated females in the ratio 2:1, poisoning was the commonest mode used for suicide, majority of victims were married, maximum victims belonged to rural area which is consistent with the present study.\(^10\)

**Prevention:** Prevention requires a comprehensive approach that occurs at all levels of society—individual, family and community level.

A comprehensive national plan needs to be developed focusing the overall requirements of an individual physically and mentally. The national plan should include Economic plans to strengthen household financial security and include mental health coverage in health insurance. Early identification and treatment of mental health disorders like depression. Creating of employment opportunities for the youth and training them with the necessary soft skills. Reducing easy availability and access to pesticides, strict rules to be made for purchase of alcohol and life threatening medicines. Making availability of mental health care at the primary level by appointing medical practitioners/faith healers specially for counselling and treatment even at the rural areas.

**Ethical Clearance:** Taken from Institutional Ethics committee, BIMS Belagavi.

**Source of Funding:** Self

**Conflict of Interest:** Nil

**References**


The Effectiveness of Crocodile Oil Extract Ointment on the Treatment of Burns in Mice (*Mus musculus*)

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**Abstract**

The purpose of this study was to determine the effectiveness of the crocodile oil extract ointment in the treatment of burns in mice (*Mus musculus*). The research found that the ointment of crocodile oil extract has an effect in the healing of burns in mice (*Mus musculus*), with the best concentration of 30% of the crocodile oil extract ointment dose. Moreover, the ointment met the standard on the basis of organoleptic and homogeneity tests. The ointment of crocodile oil extract with concentrations of 30% and 50% has the healing activity degree II-A burns in mice (*Mus musculus*). The best percentage of reductions in average burns in mice was the ointment with a concentration of 30%. Further study needs to be done in the healing of wound in human skin.

**Keywords:** Burn, crocodile oil extract, effectiveness, ointment.

**Introduction**

Burns is one of the most common injuries in accidents and continues to be a global public health problem.¹ Burn injuries can lead to complications such as long-term disability, prolonged hospitalization, loss of body limbs and even death.² Wound repair is a process that follows skin injury, which is initiated by an inflammatory reaction and the cells below the dermis begin to increase the production of collagen. The epithelial tissue is then regenerated.³ Although many advances have been made in our understanding and in the care of burn injuries, modern medicine still has a challenge to heal burn injuries.¹

Traditional medicine has existed since human civilization and has been growing for thousands of years with the combination of new technology in the search for good drugs.⁴,⁵ This is important for public health, based on the experience and knowledge that has been collected to date. Humans have used medicines for alleviating and treating diseases with natural products such as plants, animals, microorganisms and marine organisms.⁶,⁷

Traditional medicine is one of the nation’s cultural heritages, which is very valuable for the preservation of traditional medicine for public health. The development of the use of natural ingredients as a traditional medicine is now more desirable, as it is relatively easy to obtain. This is generally derived from a wide variety of plants, animals and minerals. Natural materials such as plants, animals and mixtures of these materials may be used as traditional medicines. They contain a variety of compounds that can affect the living cells of the organ. Wound injury healing process is effectively promoted through the use of traditional remedies, mainly based on plant and animal sources.¹ In addition; natural ingredients have minimal side effects. One of the natural ingredients used as a traditional medicine other than plants is derived from animals such as the use of crocodile oil for treatment.

Siamese crocodile (*Crocodylus siamensis*) is one of the freshwater crocodile species that was originally distributed throughout Southeast Asia.⁸ Crocodile oil has been shown to be very effective in the treatment of diseases, ranging from skin conditions to cancer, and has been used by traditional practitioners for centuries.⁹ In Africa, crocodile oil is used to treat skin rashes and
promote wound healing.\(^9\) Crocodile oil has been used by local communities in Papua to treat various diseases, both as an internal medicine and as an external medicine, namely treatment of skin diseases such as skin burns or for other reasons.

Burns have recently increased to be a major cause of morbidity and mortality in low-and middle-income countries. Burns accounts for 1% of the global disease burden\(^{10}\), causes more than 7.1 million injuries and more than 265,000 deaths worldwide each year.\(^{11}\) The latest data on burns in Indonesia was obtained from the Ministry of Health (published in 2019), which showed that the proportion of burns in Indonesia was 1.3. In addition, the proportion of burn injuries in Papua Province was 2.1, which is higher than in the national.\(^{12}\)

Antibiotics and anti-septics are widely used in the treatment of burns, but besides having advantages, they also have disadvantages. Some types of bacteria found in burns are resistant to some antibiotics.\(^{13,14}\) In addition, anti-septic may also cause irritation to sensitive victims, discoloration of the skin, and may cause skin scarring.\(^{15}\) On the basis of these reasons, it is necessary to find other alternatives for the treatment of burns, one of which is by using natural compounds derived from plants and animals.\(^{16}\) Traditional medicine, derived from animals used by humans to treat burns, is crocodile oil. Crocodile oil contents such as fat, vitamin E, vitamin A, linoleic acid, sapogen and antiseptic terpine are useful for the treatment and softening of the skin. It is effective in treating conditions such as eczema, psoriasis and chapped lips. Crocodile oil contains fatty acids such as 3, 6 and 9 omega. These three ingredients are effective against inflammation, helping to reduce the appearance of redness, especially in skin conditions that are sensitive and easily reddened. Oleic acid is another ingredient in crocodile oil. This content is very important to help regenerate cells in the treatment of wounds and irritations. According to Khaitami, crocodile oil can significantly accelerate the healing of wounds and irritations and reduce the appearance of scars.\(^{17}\) In some components, crocodile oil is similar to coconut oil in terms of skin protection. However, crocodile oil contains fatty acids with a higher level of truncation than coconut oil, i.e. omega 3, 6 and 9. This substance is very important to maintain a healthy skin layer. Crocodile oil has moisturizing properties like other oils. The function is to protect the skin biologically from dryness. The use of crocodile oil to treat burns by the public is still very traditional. Moreover, it has not yet been formulated in any form of any kind. The authors are therefore interested in developing the extract of crocodile oil into a pharmaceutical preparation to increase its use. One drug preparation that is easy to use is the ointment. Ointment was chosen because it is the most appropriate pharmaceutical preparation for medicinal purposes for the skin due to prolonged contact between the drug and the skin. Ointment is a semi-solid preparation in the form of a soft mass which is easily applied and used as an external medicine. The ingredients of the medicine must be dissolved and dispersed in an appropriate ointment base. The use of natural medicines by the community is still limited, both in terms of dose determination and how to concoct. In this study, the authors provide information on concentrations that have an effect on easier-to-use skin and drug dosage forms, namely by formulating ointment preparations.

**Material and Method**

This study is an experimental laboratory with a completely randomized design (CRD) analysis conducted at the Laboratory of Bio-Pharmacy, Hasanuddin University, Makassar, in April 2019. The study has been approved by the Ethic Committee of the Hasanuddin University, Makassar, Indonesia, with document no. UH20010056. The work was conducted in vivo on 25 burn-induced mice which were divided into 5 treatment groups namely Group 1 (positive control) using Bioplacenton, Group 2 (negative control) using Vaseline album, Group 3, Group 4, and Group 5 using crocodile oil extract with a concentration of 15%, 30% and 50%, respectively. Organoleptic and homogeneity tests were performed for the quality of the ointment. Examination of the effectiveness of the ointments as a medicine for the healing of burns was done in mice (*Mus musculus*).

**Animals:** Healthy 25 male albino Wistar rats (*Mus musculus*) about the age of 4-5 weeks, and body weight range (26.6 ± 6.4) grams were obtained from the Laboratory Animal in Maros Regency, South Sulawesi, Indonesia. The animals were housed in stainless steel cages with the area of (30 cm x 50 cm x 15 cm), and were kept under standard conditions 12 hours light, 12 hours dark at 22±2°C and 50-60% relative humidity. The animals were given standard food about 300 grams per day and water. Mice are laboratory animals commonly used as a research model before being treated in humans.
Crocodile Oil Extraction: Siamese crocodile (Crocodylus siamensis) oil was derived from crocodiles in the Mamberamo River, Mamberamo District, Papua Province, Indonesia. It was taken directly by crocodile hunters from the river. Oil was extracted using non-chemical method that are stream rendering. First, the crocodile meat was cut into small pieces, about 3-6 cm in diameter, then ground. It was then flowing at a temperature of 90 °C for about 45 minutes. The cooked fat was wrapped in cloth and pressed onto the machine. The crude oil was divided into liquid fractions and the oil was centrifuged.

Making Ointments: The following is the formulation of a crocodile oil ointment extract with different concentrations for the treatment groups: 1) Ointment of crocodile oil extract with a concentration of 15%, R/Ointment base 12.75 grams, Crocodile oil extract 2.25 grams, Adesplanae 15 gram; 2) Crocodile oil ointment extract with a concentration of 30%, R/Ointment base 10.5 grams, Crocodile oil extract 4.5 grams, Adesplanae 15 grams; 3) Crocodile oil extract ointment with a concentration of 50%, R/Ointment base 7.5 grams, 7.5 grams crocodile oil extract, Adesplanae 15 grams. How to make it: For each group, weigh all the ingredients needed. Cetyl alcohol and liquid paraffin are melted down, using a porcelain cup on a water bath at a temperature of around 700°C-750°C, while stirring continuously using a stirring rod until an ointment mass is obtained. The extract of crocodile oil was put into mortar, and then added the ointment base little by little while being crushed until homogeneous. The ointment is placed in a container and stored tightly in a place protected from light.

Organoleptic Test: Observations made in this test are the shape, odor and color of the preparation. The quality parameters of a good ointment are a semi-solid form, the ointment smells typical of the extract used and is colored like an extract. How to make it: For each group, weigh all the ingredients needed. Cetyl alcohol and liquid paraffin are melted down, using a porcelain cup on a water bath at a temperature of around 700°C-750°C, while stirring continuously using a stirring rod until an ointment mass is obtained. The extract of crocodile oil was put into mortar, and then added the ointment base little by little while being crushed until homogeneous. The ointment is placed in a container and stored tightly in a place protected from light.

Homogeneity Test: Homogeneity test of preparations was carried out by observing the results of applying ointment on a glass plate. Homogeneous ointment is characterized by the absence of lumps in the basting result, a flat structure and has a uniform color from the starting point of the basting to the finishing point. The ointment tested was taken from three places namely the top, middle and bottom of the ointment container.

Test the Effectiveness of Crocodile Oil Extract Ointment on Mice (Mus musculus): Testing the healing effect of burns is done using animal experiments of mice (Mus musculus). Mice were grouped into five groups, namely the positive control group (Bioplacenton ®), the negative control group (Vaseline base), the concentration of crocodile oil ointment extract 15 per cent, 30 per cent and 50 per cent. The mice were shaved on the back, then the skin was induced by a heat induction tool. The extent of the injury is measured after each group is treated with an ointment. Observation was carried out until signs of healing of wounds appeared. Wound healing is marked by the beginning of the edge of the wound that is bright red and bleeds easily, then changes from bright red to dark red for several days. Next, the cells begin to fill the wound area with new collagen to form a scab; this tissue grows from the edge of the wound to the wound bed, and then the wound contracts. Wound contractions are the result of myofibroblast action. Myofibroblast crosses the wound and pulls the edge of the wound to close the wound. Increased blood flow to damaged areas, early cell cleansing from foreign cell development is part of the healing process. The diameter of the wound is calculated according to the formula as shown in equation 1.

\[
dx = \frac{dx(1)+dx(2)+dx(3)+dx(4)}{4}
\]

Where:
dx is the diameter of the burn of day x (mm)
dx(1), dx(2), dx(3), and dx(4) are burn diameters measured from 4 different angels.

In addition, the percentage of wound healing can be calculated using the formula in equation 2:

\[
Px = \left(\frac{d1^2-dx^2}{d1^2}\right) \times 100\%
\]

Where:
Px : Percentage of treatment on day x (percent)
d1 : The diameter of the wound on the first day
dx : The diameter of the wound on day x

Statistical Analyses: The results are expressed as mean ± standard deviation of the mean. A one-way ANOVA with LSD post hoc tests were used for multiple comparisons. A p < 0.05 was considered statistically significant.
Findings:

Organoleptic test: The test was performed to determine the shape, color and smell. The results show the four types of ointment (Table 1). The ointments have a semi-solid shape, white gray to light brown color, and the ointment smells typical of Vaselin used. They all indicate that the ointments are good.

<table>
<thead>
<tr>
<th>No</th>
<th>Type of the Ointment</th>
<th>Shape</th>
<th>Color</th>
<th>Smell</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ointment base</td>
<td>Semi-solid</td>
<td>White gray</td>
<td>Typical ointment smell (Vaselin)</td>
</tr>
<tr>
<td>2</td>
<td>Ointment of crocodile oil extract (15%)</td>
<td>Semi-solid</td>
<td>White gray</td>
<td>Typical ointment smell (Vaselin)</td>
</tr>
<tr>
<td>3</td>
<td>Ointment of crocodile oil extract (30%)</td>
<td>Semi-solid</td>
<td>White brown</td>
<td>Typical ointment smell (Vaselin)</td>
</tr>
<tr>
<td>4</td>
<td>Ointment of crocodile oil extract (50%)</td>
<td>Semi-solid</td>
<td>Light brown</td>
<td>Typical ointment smell (Vaselin)</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2019

Homogeneity Test: The test was done by taking the ointment from the top, the middle, and the bottom. The ointment is then applied to a piece of glass object. The results of the test can be found in Table 2. It has been shown that all experimental groups are homogeneous.

<table>
<thead>
<tr>
<th>No</th>
<th>Type of the Ointment</th>
<th>Homogeneity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ointment base</td>
<td>Homogeneous</td>
</tr>
<tr>
<td>2</td>
<td>Ointment of crocodile oil extract (15%)</td>
<td>Homogeneous</td>
</tr>
<tr>
<td>3</td>
<td>Ointment of crocodile oil extract (30%)</td>
<td>Homogeneous</td>
</tr>
<tr>
<td>4</td>
<td>Ointment of crocodile oil extract (50%)</td>
<td>Homogeneous</td>
</tr>
</tbody>
</table>

Characteristics of mice based on age, and body weight: The experimental animals used in this study were mice (Mus musculus). They were divided into five treatment groups. Each group consisted of five species. Group 1 was a negative control group (Vaselin/placebo), group 2 was a positive control group (Bioplacenton), group 3 was a 15% concentration of crocodile oil extract, group 4 was a 30% concentration of crocodile oil extract and group 4 was a 50% concentration of crocodile oil extract. Characteristics of mice based on age and body weight in each treatment group as shown in Table 3. It can be seen that the mice are 4-5 weeks old and have a body weight of about (26.6 ± 6.4) grams.

<table>
<thead>
<tr>
<th>No</th>
<th>Group</th>
<th>Body weight (grams)</th>
<th>Age (weeks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Negative control (-)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>22.6</td>
<td>4-5</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>30.1</td>
<td>4-5</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>32.6</td>
<td>4-5</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>28.7</td>
<td>4-5</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>39.1</td>
<td>4-5</td>
</tr>
<tr>
<td>2</td>
<td>Positive control (+)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>20.8</td>
<td>4-5</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>21.4</td>
<td>4-5</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>24.2</td>
<td>4-5</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>22.4</td>
<td>4-5</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>23.5</td>
<td>4-5</td>
</tr>
</tbody>
</table>
Examination of Healing Burns of Crocodile Oil Extract Ointment on Mice.

The measurement of reduction diameter of burn in mice: The results of measurements of the 14-day reduction in the diameter of burns in mice can be seen in Table 4. It was shown that: for the positive group, the reduction in burn diameter was approximately (8.83±1.518) mm; for the negative group, the reduction in burn diameter was approximately (11.99 ± 2.754) mm; for the formula 15 percent group, the reduction in burn diameter was approximately (10.07 ± 1.813) mm; for the formula 30 percent group, the reduction in burn diameter was approximately (12.61 ± 2.228) mm; and for the formula 50 percent group, the reduction in burn diameter was approximately (12.95 ± 2.571) mm.

Statistical test results using ANOVA for the reduction in burn diameter in mice were obtained by p-value = 0.009 (p<0.05), which means that there was a significant difference in the reduction in burn diameter in the five treatment groups. In addition, the analysis continued with further tests using the LSD (Least Significant Difference) Pos Hoc test and found that the formula 30% and the formula 50% were the best ones to reduce burns in mice in diameter.
The Post-Hoc test: This test was performed to determine the significant difference between the groups in the average reduction of the wound diameter. The result has been shown in Table 5. The table shows that:

1) There was a significant difference in mean wound diameter reduction between the positive (+) control group and the negative (-) control group (d=3.163, p=0.015); 2) There was a significant difference in mean wound diameter reduction between the positive (+) control group and the 30% crocodile oil group (d=3.785, p=0.007); 3) There was a significant difference in mean wound diameter reduction between the positive (+) control group and the 50% crocodile oil group (d=4.122, p=0.002); 4) There was a significant difference between the 15% concentration of the crocodile oil group and the 30% concentration of the crocodile oil group (d=2.539, p=0.005) in the mean reduction of the wound diameter; 5) There was a significant difference between the 15% concentration of the crocodile oil group and the 50% concentration of the crocodile oil group (d=2.876, p=0.026) in the mean reduction of the wound diameter; and 6) Although there is a difference in the mean reduction of the wound diameter between the positive (+) control group and the formula 15 per cent; the negative (-) control group and the formula 15%; the negative (-) control group and the formula 30%; the negative (-) control group and the formula 50%; and the difference between the formula 30% and the formula 50%; however, the difference was not statistically significant.

Table 5. The Post-Hoc test results (LSD) of the diameter reduction of burns in mice.

<table>
<thead>
<tr>
<th>N=31 Average difference (P-value)</th>
<th>Control (+)</th>
<th>Control (-)</th>
<th>Formula 15%</th>
<th>Formula 30%</th>
<th>Formula 50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control (+)</td>
<td>-</td>
<td>3.163 (0.015)*</td>
<td>1.245 (0.297)ns</td>
<td>3.785 (0.007)*</td>
<td>4.122 (0.002)*</td>
</tr>
<tr>
<td>Control (-)</td>
<td>3.163 (0.015)*</td>
<td>-</td>
<td>1.918 (0.127)ns</td>
<td>0.621 (0.643)ns</td>
<td>0.958 (0.445)ns</td>
</tr>
<tr>
<td>Formula 15%</td>
<td>1.245 (0.297)ns</td>
<td>1.918 (0.127)ns</td>
<td>-</td>
<td>2.539 (0.05)*</td>
<td>2.876 (0.026)*</td>
</tr>
<tr>
<td>Formula 30%</td>
<td>3.785 (0.007)*</td>
<td>0.621 (0.643)ns</td>
<td>2.539 (0.05)*</td>
<td>-</td>
<td>0.337 (0.801)ns</td>
</tr>
<tr>
<td>Formula 50%</td>
<td>4.122 (0.002)*</td>
<td>0.958 (0.445)ns</td>
<td>2.876 (0.026)*</td>
<td>0.337 (0.801)ns</td>
<td>-</td>
</tr>
</tbody>
</table>

*Significant; ns=not significant

Percent reduction of average burn diameter in mice:

Table 6. The percentage reduction in the average diameter of burn in mice.

<table>
<thead>
<tr>
<th>No</th>
<th>Group</th>
<th>Average Diameter of Initial Burn (mm) (Pre)</th>
<th>Average Diameter of Final Burn (mm) (Post)</th>
<th>Percentage of Reduction in Average Diameter of Burns (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Control (+)</td>
<td>18.98 ± 0.558</td>
<td>10.14 ± 1.695</td>
<td>46.52</td>
</tr>
<tr>
<td></td>
<td>Control (-)</td>
<td>18.38 ± 1.897</td>
<td>6.38 ± 3.249</td>
<td>65.23</td>
</tr>
<tr>
<td>2</td>
<td>Ointment of crocodile oil extract (15%)</td>
<td>18.15 ± 0.950</td>
<td>8.07 ± 1.863</td>
<td>55.48</td>
</tr>
<tr>
<td>3</td>
<td>Ointment of crocodile oil extract (30%)</td>
<td>19.10 ± 1.178</td>
<td>6.48 ± 1.612</td>
<td>66.02</td>
</tr>
<tr>
<td>4</td>
<td>Ointment of crocodile oil extract (50%)</td>
<td>19.99 ± 0.527</td>
<td>7.03 ± 2.554</td>
<td>64.78</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2019

The percentage reduction of average burn in mice after treatment until day 14 can be seen in Table 6. It was shown that: for the positive group, the percentage reduction of the average burn diameter was approximately 46.52%; for the negative group, the percentage reduction of the average burn diameter was approximately 65.23%; for the formula 15% group, the percentage reduction of the average burn diameter was approximately 55.48%; for the formula 30% group, the percentage reduction of the average burn diameter was approximately 66.02%; and for the formula 50% group, the percentage reduction of the average burn diameter was approximately 64.78%. The formula 30% is best suited to the reduction of average mice burn diameter (66.02%).
Discussion

Crocodile oil has been used by the public to cure various skin conditions, while others are used as cosmetics to smooth the skin. Crocodile oil is the same as human skin oil. They differ only in terms of the percentage of available material. Because of its composition, which is identical to human skin oil, crocodile oil is rarely allergic when applied to human skin. This will also be a very suitable and safe product to use.\(^{21}\) Crocodile oil and items containing crocodile oil which are currently on the market are used for the following purposes:\(^{21}\) 1) Therapy for dermatitis, 2) Treatment of bruises, pimples, rash bumps, bed sores, hemorrhoids and anal fissures, 3) Reduces discomfort and inflammation in arthritis, 4) Treatment for loss of color and pigmentation of brown spots such as skin, spots and darkening of menopause, 5) Treatment of dry, scaly, itchy and flaky skin (such as aging), rash, athlete’s foot, athlete’s scratching, and scalp irritation.

There have been many positive claims in the use of products containing crocodile oil. Those include fading streaks, pimples, zit signs, dark lines, wrinkles and lines of laughter. This involves the absence of irregular dark shades, blurred shadows, sunspots and other color shifts. This helps prevent discoloration from developing, making the skin smoother, lighter and more appealing. It also manages rash and dryness.\(^{21}\)

Burns are the most common incidents encountered by the community, particularly in households. This is indeed very critical that medication supplies rapidly resolve the healing of burns and avoid things from getting worse. The most severe burns are second-grade burns.

Pharmaceutical preparations were made in the form of ointments using the base of Vaseline album in this study. The aim of the preparation in the form of an ointment is to prolong the time of contact with the surface of the burn skin on the mice. In this type, the active ingredient in the extract of crocodile oil is capable of providing optimum stimulation for the healing process of burns on the surface of the mice’s skin. The longer the drug is in contact with the surface of the skin, the higher the strength of the drug absorbed by the surface of the skin for the healing process.

The formulation of the ointment consists of 3 types of concentrations in order to see its efficacy in the process of treating the burns in mice. In addition, the organometric and homogeneity tests have been performed as a quality control test for the products involved in the healing process of mice burns. The color of the crocodile oil extract ointment is the same as the color of the crocodile oil extract, which is white to light brown chocolate. Observation of ointment preparations reveals that the ointment has a distinct odor of ointment from extracts of crocodile oil. Supply of ointment extracts of crocodile oil at all concentrations has a strong homogeneity, because there are no lumps that minimize its homogeneity.

The findings of the study showed that the ointment extract of crocodile oil has efficacy in the healing of mice burns. That can be seen from the calculation of average burn diameter in mice from the first day of treatment to the 14th day with a substantial decrease in average burn diameter (ANOVA test, \(p<0.05\)). Based on the LSD Pos Hoc test, it was found that the 30% concentration of crocodile oil extract ointment had a higher percentage reduction in the average burn diameter of the mice (66.02%).

Conclusion

In conclusion, the ointment of crocodile oil extract has an effect of the healing of burns in mice (\(\textit{Mus musculus}\)). In addition, the safest treatment for treating burns in mice is the ointment composed of 30% of the crocodile oil extract. Further research needs to be done on the magnitude of potential healing burns in human skin.

Conflict of Interest: Nil

Source of Funding: Cenderawasih University

Ethical Clearance: The Ethic Committee of the Hasanuddin University, Makassar, Indonesia, with document no. UH20010056.

References


2. Upadhyay NK, Kumar R, Mandal SK, Meena RN, Siddiqui MS, Sawhney RC, Gupta A. Safety and healing efficacy of Sea buckthorn (\(\text{Hippophae rhamnoides}\) L.) seed oil on burn wounds in rats.


Death by Stimulation of the Left Vagus Nerve in a Case of Neck Grasping in a Healthy Young Man

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Abstract

Fatal neck pressure due to manual strangulation is a relatively common event. Sudden deaths that occur in the first seconds of pressure are attributed to effects of the nerve. According to leading authors, the process occurs through a reflex arc where the afferent (sensory) nerve impulses emerge in the carotid complex of the nerve endings, but not in the vagus trunk itself.

On the contrary, we describe one such fatality. The body of a man in his early twenties came to attention in our Institute. According to testimonies and investigations, the victim had a domestic fight with his brother. After a verbal altercation, the victim was grabbed by the neck and immediately fell dead. During the external examination, only two small finger-nail superficial abrasions were found in the left cervical region. No other signs of violence were detected. The dissection of the neck only revealed a perineural hematoma in the left vagus trunk in the cervical tract. The cause of death was attributed to neurally mediated cardiac arrest induced by direct left vagus nerve compression.

Keywords: Vagus nerve direct stimulation; Sudden death; Fatal pressure of the neck; Forensic diagnosis.

Introduction

Fatal pressure on the neck provides one of the most complex and controversial areas of “asphyxial” deaths, as the mechanism is often uncertain. To understand the mechanisms resulting in death caused by pressure on the neck, several anatomical and physiological factors must be considered such as airway occlusion, occlusion of the neck veins, compression of the carotid arteries and nerve effects.¹

The last few mentioned are considered to be the ones with the most controversial medical-legal aspects.

In fact, the absence of certain diagnostic method for deaths carried out exclusively by the effects on the nerve represent a diagnosis excluding any clear signs that may indicate other causes of death. There is further controversy in the medical field as to which real pathways and reflex arcs are capable of this type of rapid death.

The physiological role of nerve transmission carried out by the vagus nerve is well known. While at the clinical level, its direct stimulation is recognized to produce powerful effects both on humans and guinea pigs that are useful in therapies including bradycardic, arrhythmic and even cardiac arrest.²,³ Many authors believe that in cases of fatality for short and even slight neck pressure, “nervous effects” are fundamentally determinant by a reflex arc in which the afferent sensory part is conveyed by the carotid complex, but not by the vagal trunk itself, excluding the possibility of an activation in response to direct mechanical stimuli in its cervical tract.¹

We report, however, a case of fatal pressure of the neck in which we believe that the mechanism which determined death was precisely that of direct stimulation of the vagal trunk.

Case History: A young man in his early twenties died at home. According to witnesses and police reports,
the victim was involved in a domestic dispute with his brother who, after a verbal dispute, grabbed him around the neck with his right hand.

Immediately following this, the victim collapsed to the ground lifeless.

No immediate attempts for resuscitation were made, and upon arriving at the scene, the victim was pronounced dead.

**Autopsy Findings:** During the external inspection of the corpse, two small finger-nail abrasions were found in the skin of the left cervical region (fig. 1).

Upon dissecting the neck planes, a hemorrhagic infiltration was detected surrounding and infiltrating the left vagus nerve in its tract below the common carotid bifurcation, in correspondence to the skin abrasions (fig. 2).

Autopsies for the thoracic, abdominal, skull and brain structures all appeared normal.

The histological examination did not reveal anything significant, and the toxicology report was negative.

**Discussion**

While it is reported that a mild or ‘playful’ pressure applied to the neck may have induced an ‘instantaneous death’ related to a hypokinetic arrhythmia and cardiac arrest due to ‘vagal inhibition’, which is a well-known mechanism involving stimulation of the carotid sinuses, the same cannot be said about the direct stimulation of the vagus nerve itself.

Sudden death due to direct vagus nerve stimulation during fatal neck compression is a very rare occurrence, and only few cases have been reported in literature.5,6,7

We believe that the physiopathological theory behind those deaths is the direct mechanical activation of a parasympathetic efferent pathway of the carotid sinus reflex arc, via the vagus nerve and the parasympathetic ganglia, to the heart, but without the activation of the stretch receptor of the carotid sinus and the stimulation of the vagal nuclei in the medulla.

For these reasons, as the carotid sinus massage (CSM) or pressure, following the same efferent limb, may lead to a cardio-inhibitory response, defined as 3 seconds or longer of ventricular standstill or asystole, the same would happen if the vagus is directly and mechanically activated.

Although the possibility of this kind of activation is uncertain, two considerations must be taken:

1. a condition of carotid sinus hypersensitivity (CSH) is well known clinically and leads to the cardio-inhibitory response to the CSM. It is known to be asymptomatically quite common in the population and should not be omitted in such an abnormal event.9

2. cases of severe bradycardia or asystole due to direct stimulation of the vagus nerve or its branches have been directly observed during neck surgery and reported.10,11

In order to solve this case and reach our conclusions, we carefully performed a post-mortem examination, finding only two small finger-nail abrasions on the neck of the victim in the absence of any additional external signs of violence. In addition, during the internal exam, the only significant sign observed was the perineural hematoma of the left vagus trunk, indicating there was a significant compression of the nerve.
This illustrates the importance of an accurate post-mortem examination in forensic pathology. To avoid the risk of misdiagnosing the cause of death, all of the wounds, even the ones that seem most irrelevant, must be evaluated accordingly to their severity and location.

Based on the results and evidence from the post-mortem examination, we believe that the victim’s sudden death was indeed due to an Instantaneous Neurogenic Cardiac Arrest (INCA) induced by direct vagus nerve compression.

Fatal vagal inhibition following a direct vagus nerve injury is considered a very rare occurrence, especially those with left vagus compression considering the anatomical and physiopathological reasons.

The efferent cholinergic fibers represent the parasympathetic innervations of the heart that slows the heart rate. The right vagus branch innervates the sinoatrial node, the normal pacemaker of the heart. The left vagus only innervates atrial muscle fibers and its stimulation has generally limited effects which are predominantly directed at the atrial muscle only slowing down the electric conduction to the AV node.12

We believe that the left inhibitory parasympathetic activation related death is derived from cholinergic overstimulation resulting in a severe atrioventricular block and cardiac arrest.

**Conclusion**

Deaths for direct manual vagus stimulation are such rare events. The mechanisms involved are uncertain as uncertain is the real possibility of that happening.

We described a case in which we retain this event as the explanation. We propose a physiopatological theroy involving the activation of the only efferent pathway of the carotid sinus reflex and that must consider a condition of increased sensibility to direct stimulation.

Also, for the relative fewer effect on the heart of left vagusin comparison to the contralateral, our case seems such a rarer occurrence, linked to a severe AV block due to decreased electrical conduction in atrial muscle cells.

The importance of a careful necroscopic examination, well evaluating also the apparently irrelevant factors, must be clear in similar cases.

**Declarations of Interest:** The Authors declare that there is no conflict of interest.

**Ethical Clearance:** The following study didn’t need an ethical clearance from any committee.

**References**


The Association of Gene Expression and Single Nucleotide Polymorphism (rs 6152 SNP) in Androgen Receptor Gene with Recurrent Spontaneous Abortion (RSA) in Iraqi Women

Shireen Hamid Farhan¹, Ismail A. Abdul-Hassan²

¹Scholar Researcher, Department of Pathological Analysis, Applied Science, University of Fallujah, Iraq, ²Scholar Researcher, Institute of Genetic engineering and Biotechnology for postgraduate studies, University of Baghdad, Iraq

Abstract

The proposal target was determining the gene expression and single nucleotide polymorphism of Androgen receptor gene (rs6152 G>T) in blood sample of recurrent spontaneous abortion (RSA) Iraqi females. Fifty females (n=50) with RSA consulted Al-Elwiya teaching hospital from February to June 2019 and apparently healthy fertile control (n=50) were enrolled. DNA and RNA were extracted from leucocytes to detriment the SNP and gene expression which were carried out by (RT-q PCR). The results showed non-significant difference (p>0.05) in the mean of threshold cycle(ΔCt) of androgen receptor gene between female with RSA and control. Assessing the 2^ΔΔCt in female with RSA, non-significant decreased expression of folding in androgen receptor m RNA compared with control. The genotypes and allele frequencies in the two groups showed significant decrease in the heterozygous (GA) and mutant (AA) genotype frequencies in female with RSA, the frequency of wild (GG) genotype is increased in female with RSA. In conclusion, expression of androgen receptor gene didn’t affect in female with RSA, the mutant genotype may play as protective SNP against RSA.

Keywords: Androgen receptor gene, gene expression, single nucleotide polymorphism and recurrent spontaneous abortion.

Introduction

Losing more than three or more repeated pregnancies before 20 weeks referred to as Recurrent spontaneous abortion (RSA), its multifactorial disorder including uterine anomaly, chromosomal abnormalities, endocrine and immune dysfunction, life style and maternal infections¹. Androgens are sex steroid hormones found in male and female and play a role in the physiological function of many organs such as hypothalamus adrenal gland, thyroid gland, pituitary gland mammary gland, heart, liver, kidney, ovaries, uterus epididymis prostate and seminal vesicles, also androgens regulate the growth and secondary sex characteristics². In females the normal ovary secretes three major steroid androgens: androstenedione, testosterone and dehydroepiandrosterone by the stroma (interstitial tissue) and by the theca interna cells³ androgens production is very important for decidualization, a process that controls embryo implantation and placentation⁴.

Recent researches which are interest in females’ health suggest that the testosterone hormone ((one form of androgens)) plays role in many medical conditions such as recurrent miscarriage, polycystic ovary syndrome, androgenic alopecia, hirsutism, acne and many various conditions⁵.

Androgens mediate their actions via the androgen receptor AR a ligand–dependent nuclear transcriptional factor⁶. AR belongs to the steroid hormone nuclear receptor family, its expressed in different tissues and plays a biological action in bone, muscle, prostate, adipose tissue, cardiovascular, immune, neural and reproductive system⁷. AR activated by testosterone or dihydrotestosterone and the activated AR is transferred into the nucleus where it regulates the transcription of genes⁸.

Uncontrolled AR signalling through activation of AR via phosphorylation of the AR which is called ligand–
independent activation involves in the development of tumours in prostate, bladder, liver, kidney and lung (9).

Subjects, Material and Method

This study included fifty females (n=50) who had idiopathic RSA (mean age 35.06 ±0.9) and consulted Al Elwiya teaching hospital, Baghdad, Iraq between January 2019 and April 2019 and fifty normal fertile females(n=50) with at least 2 live births and without history of abortion. Patients with anatomical, infection, endocrine metabolic disorder and autoimmune diseases were excluded from the study. Ethical approval for the study was obtained from Al Elwiya teaching hospital.

DNA extraction and genotypes analysis: The DNA was extracted from blood by using kit (Quick-gDNA ™ Blood MiniPrep, Zymo research/USA), Nanodrop was used to estimate the purity and the concentration for DNA samples. Genotyping analysis was performed using Real Time PCR by predesigned TaqMan fluorescent oligonucleotide probes and primers ordered from integrated DNA technologies/USA for examined SNP rs6152 in exon 1 of androgen gene were stored lyophilized at -20°C. Taq man SNP genotyping assay using real time thermocycler according to the protocol recommended by the manufacturer as showed in table (1) and (2).

Table (1) The component reaction.

<table>
<thead>
<tr>
<th>Component</th>
<th>20 μl (Final volume)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2X TaqMan ®Master</td>
<td>10 μl</td>
</tr>
<tr>
<td>20X Assay Working</td>
<td>1 μl</td>
</tr>
<tr>
<td>Nuclease –free</td>
<td>-</td>
</tr>
<tr>
<td>DNA sample volume</td>
<td>9 μl</td>
</tr>
</tbody>
</table>

Table (2) The thermocycler program

<table>
<thead>
<tr>
<th>Steps</th>
<th>Temperature</th>
<th>Duration</th>
<th>Cycles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enzyme activation</td>
<td>95°C</td>
<td>10 Minutes</td>
<td>Hold</td>
</tr>
<tr>
<td>Denaturation</td>
<td>95°C</td>
<td>15 Seconds</td>
<td>40</td>
</tr>
<tr>
<td>Annealing extension</td>
<td>60°C</td>
<td>1 Minute</td>
<td></td>
</tr>
</tbody>
</table>

RNA extraction and gene expression: The expression of androgen receptor gene was determined by the reverse transcription quantitative polymerase chain reaction (RTqPCR) method after isolation of total RNA. A ready-to-use reagent (TRIzolTM LS Reagent; Thermo Fisher Scientific; USA) was used to isolate total RNA. The isolated RNA was reversely transcribed to cDNA using prime Script™ RT reagent Kit. The reverse transcription quantitative polymerase chain reaction (RT-qPCR) was carried out using the KAPA SYBER FAST qPCR Master Mix Kit (Universal, Germany) and cDNA as a template. Forward and reverse oligonucleotide primers of androgen receptor gene were designed and showed in table (3). The forward and reverse primers of the housekeeping gene GAPDH (reference gene: glyceraldehyde-3-phosphate dehydrogenase) were also given.

Table (3) The primers of gene expression.

<table>
<thead>
<tr>
<th>Primer</th>
<th>Sequence</th>
<th>Tm (°C)</th>
<th>GC (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward of androgen receptor gene</td>
<td>TCACATCGTGTTCAATGCTCA</td>
<td>54.3</td>
<td>42.9</td>
</tr>
<tr>
<td>Reverse of androgen receptor gene</td>
<td>TGAGAGCACTGGATGCTGTT</td>
<td>56.5</td>
<td>50</td>
</tr>
<tr>
<td>Forward of GAPDH (reference gene)</td>
<td>AGGTCTACCCCTGAGCTGAA</td>
<td>52.1</td>
<td>45</td>
</tr>
<tr>
<td>Reverse of GAPDH (reference gene)</td>
<td>CTGCTTCACCACCTTCTTGAT</td>
<td>55.6</td>
<td>47.6</td>
</tr>
</tbody>
</table>
The reaction mix was adjusted to a final volume of 20 µl as suggested by the manufacturer, and included: 10µl KAPA SYBR FASR_ qPCR Master Mix (2X), for 2-Step RT-qPCR, 0.4µl of each primer (0.2 μM), 3 µl cDNA, and nuclease-free water. The mix was transferred to a real time thermocycler (Sacace Real-time PCR System, Italy), which was programmed for the following optimized cycles: initial denaturation for 5 min at 95 °C (one cycle), 40 cycles of denaturation (20 sec. at 95 °C), annealing (20 sec. at 56 °C) and extension (20 sec. at 72 °C), and finally one cycle of melt curve (15 sec. at 90 °C). The expression was given as 2^ΔΔCt, which represents the relative fold change. Therefore, the results were expressed as a fold change in the expression level of a target gene that was normalized to endogenous control (housekeeping gene) and relative to a calibrator, which is the target gene in control subjects.

**Statistical Analysis:** The Statistical Analysis System- SAS (2012) program was used to detect the effect of difference factors in study parameters. Least significant difference –LSD test (Analysis of Variation-ANOVA) was used to significant compare between means. Chi-square test was used to significant compare between percentage (0.05 and 0.01 probability). Estimate of Odd ratio and CI IN this study (10).

**Results**

**Genotype and allele frequency of androgen receptor gene:** The rs6152 SNP that examined in this study because there was an association with RSA in a different population (Mexicans, Greek and Iranian) and the interest to further examination of this SNP on Iraqi population.

The rs6152 is a silent SNP located in exon 1 on chromosome X, it’s a single nucleotide variant (G>A) in the androgen receptor gene that does not produce new amino acid at the position 211 of the protein, it has shown that although it’s a silent SNP it has a functional effect by modifying the co translational folding and the tridimensional structure of protein (11). The distribution of genotype alleles frequency presented in table (4-2).

### Table (4) the genotype and allele frequencies of rs6152 SNP in exon 1 of androgen receptor gene

<table>
<thead>
<tr>
<th>Group</th>
<th>Control</th>
<th>Female with RSA</th>
<th>χ²</th>
<th>OR</th>
<th>CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>Percentage</td>
<td>No.</td>
<td>Percentage</td>
<td></td>
</tr>
<tr>
<td>GG</td>
<td>21</td>
<td>42%</td>
<td>32</td>
<td>64%</td>
<td>8.52 **</td>
</tr>
<tr>
<td>GA</td>
<td>10</td>
<td>20%</td>
<td>6</td>
<td>12%</td>
<td>4.38 *</td>
</tr>
<tr>
<td>AA</td>
<td>19</td>
<td>38%</td>
<td>12</td>
<td>24%</td>
<td>5.02*</td>
</tr>
<tr>
<td>Allele frequency</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>0.52</td>
<td>0.70</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>A</td>
<td>0.48</td>
<td>0.30</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

*(P<0.05), ** (P<0.01).

The frequency of wild GG genotype was significantly (p<0.01) higher in female with RSA than in apparently healthy subjects (64% versus 42%, respectively, χ²= 8.52, OR= 1.27, p<0.01). In contrast, the frequency of heterozygous GA genotype was significantly (p<0.05) lower in female with RSA when in comparison with apparently healthy subjects (20% versus 20%, respectively, χ²=4.38, OR=0.658, p<0.05). The AA genotype was significantly lower in female with RSA when in comparison with apparently healthy subjects (24% versus 38%, respectively, χ²=4.5.02, OR=0.783, p<0.05).
The Gene expression of Androgen receptor gene: The values of Ct, ∆Ct and 2^−∆Ct of androgen receptor gene for apparently healthy female and female with RSA are shown in table (5).

The means of Ct value of androgen receptor gene show non-significant difference apparently healthy female and female with RSA, they were 33.16±0.12 and 33.49±0.12 for apparently healthy female and female with RSA, respectively.

Table (5) Comparison between the study groups in Ct, ∆Ct and 2^−∆Ct of androgen receptor gene (Means±SD).

<table>
<thead>
<tr>
<th>Group</th>
<th>Ct Means of androgen receptor gene</th>
<th>∆Ct</th>
<th>2^−∆Ct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>33.16±0.12</td>
<td>12.77</td>
<td>1.43</td>
</tr>
<tr>
<td>Aborted female</td>
<td>33.49±0.12</td>
<td>12.96</td>
<td>1.25</td>
</tr>
<tr>
<td>LSD</td>
<td>0.337NS</td>
<td>0.556NS</td>
<td>1.261NS</td>
</tr>
<tr>
<td>P-value</td>
<td>0.055</td>
<td>0.749</td>
<td>0.378</td>
</tr>
</tbody>
</table>

NS= non- significant, SD= standard deviation
The results related with the folding of androgen receptor gene expression depending on 2^ΔCt and 2^ΔΔCt method are presented in table (6). As shown in table (6) there was none significant decrease in the gene expression of androgen receptor gene depending on the 2^ΔCt method, it was 0.87 in females with RSA while it was 1 in control. Also the findings confirmed by calculating the fold depending on 2^ΔΔCt method.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>2^ΔCt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups</td>
<td>Control</td>
</tr>
<tr>
<td>2^ΔCt Target</td>
<td>1.43</td>
</tr>
<tr>
<td>Experiment/control</td>
<td>1.43/1.43</td>
</tr>
<tr>
<td>Fold of gene expression</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameters</th>
<th>2^ΔΔCt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups</td>
<td>Control</td>
</tr>
<tr>
<td>ΔCt Calibrator</td>
<td>11.7</td>
</tr>
<tr>
<td>ΔΔCt</td>
<td>1.07</td>
</tr>
<tr>
<td>2^ΔΔCt</td>
<td>0.47</td>
</tr>
<tr>
<td>Experiment/control</td>
<td>0.47/0.47</td>
</tr>
<tr>
<td>Fold of gene expression</td>
<td>1</td>
</tr>
</tbody>
</table>

Discussion

The development of RSA cases may be controlled by diverse hereditary pathways, it was reported that RSA is associated with different genes products that involve in biological pathways (12). Many studies were investigating whether the polymorphism of different genes could contribute to RSA progression (13). Androgen receptor gene polymorphism is a good candidate gene because it acts in many tissues. The results of the study showed that the wild type GG genotype is related with the risk of RSA while the heterozygous GA and mutant genotype AA are considering as protective factors. This result disagrees with results of the same SNP on Mexican population which proposed that the heterozygous GA and mutant homozygous were more frequent in patients (14). In Iranian and Greek populations, the heterozygous GA is association with the risk factor of RSA and the present of A allele is related with abortion (13,15). In study on Saudi’s women the finding confirmed that there were no association between the SNP and the occurrence of RSA (16).

The down regulation of AR during decidualization may be beneficial to the proliferation and differentiation of stromal cells and embryo implantation (21).

Conflict of Interest: None

Funding: Self

Ethical Clearance: Not required

References


Estimation of Stature from Nasal Dimensions

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Abstract

The objective of this study was to estimate stature from nasal measurements in South Indian population. The study was done using standard measuring apparatus measuring tape and vernier calipers including both males and females.

Regression formula and correlation was derived between nasal dimensions and stature. In this study, regression formula is derived with three variables generalized for both males and females, \( S=118.005+6.804NL+4.003NW+0.254NH \ -9.70100 \). Linear Regression equation for males and females have been derived separately with each of the nasal parameters. In conclusion nasal measurements can be an effective tool in estimating stature.

Keywords: Stature estimation, nasal height, nasal length, nasal width.

Introduction

Estimation of stature is a vital tool in forensic examination especially in unknown, highly decomposed, fragmentary and mutilated human remains. Identification of human skeleton remains is an important aspect of forensic examination. Stature is one of the reliable parameters in medico-legal examination. The human body dimensions are affected by geographical, racial, gender, and age factors. Physical measurements can be worked out and used in differentiation of racial phenotypes[1]. Stature reconstruction is important as it provides forensic anthropological estimate of the height of a person in the living state; playing a vital role in the identification of individuals[2]. Stature is the height of the person in erect posture and this can determine the physical identity of a person. It happens many a times when highly decomposed or mutilated bodies or sometimes only facial remains of skull are brought for medico-legal examination stature examination is important including age, sex and race[3]. There is a definite biological relationship of stature with the all body parts[4]. Many studies have been conducted on the estimation of stature from various body parts like hands, trunk, intact vertebral column, upper and lower limbs, individual long and short bones, foot and footprints[5]. Usually, long bones measurements are used to estimate stature[6]. This forensic assessment of stature helps identify individuals. Thereby helping medico-legal and forensic investigations.

Materials and Method

It is a cross sectional study consisting of South Indian population. Subjects irrespective of sex, with age of 18 years, those who have given their consent were included in this study and those who have not given consent, those below 18 years of age were excluded from this study. Source of data is predominantly from the residents of Chennai. They are measured for stature using stadiometer/measuring tape (Person should stand erect with head in the Frankfurt plane. Heels are together, with weight distributed equally on both feet; Shoulders and the upper extremities are kept relaxed), and for nasal dimensions (using Vernier calipers): nasal height—distance between the nasion of the nose posteriorly and the subnasale, below the nasal septum; nasal width—
distance between the external surface of one ala to the other at right angle to the other at right angle to the nasal height; nasal length – distance from the nasion to the pronasale (tip of the nose). All the dimensions are recorded to the nearest centimeter using standardized measuring equipment and sliding calipers. Since stature is variable among population, age and sex, regression formula have been derived for the population. The data will be tabulated, analyzed and subjected to statistical calculation using SPSS software. It is then used to derive a relation between nasal dimensions and height.

**Implications:** The expected results from this study is knowledge of relation between stature and nasal dimensions and its importance in medico-legal and forensic examinations.

**Result**

**Estimation of stature using nasal measurements:**

Table No: 1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Number</td>
<td>34</td>
<td>41</td>
</tr>
<tr>
<td>Mean of Stature</td>
<td>171.05</td>
<td>154.64</td>
</tr>
<tr>
<td>S.D of Stature</td>
<td>7.56</td>
<td>4.89</td>
</tr>
<tr>
<td>Mean of Nasal Length</td>
<td>4.34</td>
<td>4.23</td>
</tr>
<tr>
<td>S.D of Nasal Length</td>
<td>0.40</td>
<td>0.30</td>
</tr>
<tr>
<td>Mean of Nasal Width</td>
<td>3.47</td>
<td>3.34</td>
</tr>
<tr>
<td>S.D of Nasal Width</td>
<td>0.51</td>
<td>0.47</td>
</tr>
<tr>
<td>Mean of Nasal Height</td>
<td>5.44</td>
<td>5.29</td>
</tr>
<tr>
<td>S.D of Nasal Height</td>
<td>0.41</td>
<td>0.51</td>
</tr>
</tbody>
</table>

Table No: 2: Correlation of stature with nasal dimensions

<table>
<thead>
<tr>
<th>Correlation</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nasal Length</td>
<td>0.351</td>
</tr>
<tr>
<td>Nasal Width</td>
<td>0.335</td>
</tr>
<tr>
<td>Nasal Height</td>
<td>0.271</td>
</tr>
</tbody>
</table>

Table No: 3

Linear Regression equation for Male

\[
S = 132.071 + 8.983NL + 6.762\text{SEE}
\]

\[
S = 150.157 + 6.020NW + 7.026\text{SEE}
\]

\[
S = 131.486 + 7.273NH + 7.074\text{SEE}
\]

Linear Regression equation for Female

\[
S = 139.184 + 3.655NL + 4.822\text{SEE}
\]

\[
S = 142.356 + 3.684NW + 4.624\text{SEE}
\]

\[
S = 148.544 + 1.153NH + 4.912\text{SEE}
\]

**Correlations**

<table>
<thead>
<tr>
<th>Stature</th>
<th>NL</th>
<th>NW</th>
<th>NH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stature</td>
<td>1</td>
<td>.351**</td>
<td>.335**</td>
</tr>
<tr>
<td>NL</td>
<td>1</td>
<td>.592**</td>
<td>.584**</td>
</tr>
<tr>
<td>NW</td>
<td>1</td>
<td>.652**</td>
<td></td>
</tr>
<tr>
<td>NH</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.05 level (2-tailed), **Correlation is significant at the 0.01 level (2-tailed).

**Regression equation**

\[
S = 118.005 + 6.804NL + 4.003NW + 0.254NH + 9.70100\text{SEE}
\]

**Discussion**

Estimation of stature is important in forensic examination especially in unknown, highly decomposed, fragmentary and mutilated human remains. The commonly used parameters are hands, trunk, limbs, bones, footprints and intact vertebral column. Since all these parts of the body and bones are not always available for forensic examination, it becomes necessary to make use of other parts of the body like face and head region. Other parameters for stature estimation are cephalo-facial region, foot measurements, hand measurements, etc. For investigation and identification of an individual, age, sex, stature, etc., are estimated from the other reliable parameters. In identification of human remains, forensic anthropologists help to interpret evidence pertaining to manner or cause of death. Stature estimation can be possible with the help of these parameters when only the skull or remains of the skull are available for medico-legal examination.
Objective of this study is to estimate the stature of an individual with the help of nasal measurements—nasal height, nasal breadth and nasal length. Study design is cross-sectional. It is done among the adults in South Indian population, with informed consent given. Inclusion criteria is the adult population with consent given. Exclusion criteria includes population under the age of 18 years and those who have not given consent.

The study was conducted among 75 adults, out of which 34 were males (45.33%) and 41 were females (54.67%). Stature and nasal measurements were taken using standard measuring tape and vernier calipers respectively. Tabulated values are the mean and standard deviation values of nasal height, nasal length and nasal width derived from the entire sample space and also according to the sex distribution. Correlation and regression formula have been derived from the collected data which helps us to estimate stature from the nasal dimensions.

Stature can be estimated either by multiplying the parameter with the derived multiplication factor or can be measured by employing regression equation. The regression analysis is considered to be the best for stature estimation. In this study, regression formula is derived with three variables generalized for both males and females, \( S = 118.005 + 6.804NL + 4.003NW + 0.254NH - 9.70100 \). Linear Regression equation for males and females have been derived separately with each of the nasal parameters.

In this study only nasal dimensions are used as a parameter to estimate stature. Most of the researchers (Lukpata PU, Agnihotri AK, Wankhede KP, Patil KR, Kharyal A, etc) have used nasal height in conjunction with other cephalo facial parameters and it gives a positive correlation; the values being higher in males as compared to females.

**Conclusion**

Evidence from the present study appears to support the fact that nasal measurements can be effective tool in assessing forensic stature of subjects for any purpose. The correlation of the parameters with the stature will vary according to the geographical areas. It can be concluded that the calculation regression formula shows good reliability and applicability of estimation of stature.

**Ethical Clearance:** Obtained from institutional ethical committee

**Source of Funding:** Self funding

**Conflict of Interest:** Nil

**References**

1. Chongtham Rajlakshmi Department of Anatomy, Regional Institute of Medical Sciences, Imphal, Manipur India https://www.jmedsoc.org/article.asp?issn=0972-4958;year=2012;volume=26;issue=3;spage=156;epage=158;aulast=Rajlakshmi
Stringent Road Safety Laws; Need of the Hour to Stop the Homicides on Indian Roads: A Regulatory Perspective

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Abstract

Indian roads are deemed to be the most dangerous, considering the number of annual fatalities, which touched 151,113 in the year 2019, the highest in the world. Causes ranging from poorly designed roads, tardy enforcement of traffic rules, delay in giving medical assistance, ill equipped hospitals, refusal of treatment by hospitals, all contribute to this unenviable predicament. A lax regulatory environment with minor penalties, has accentuated the crisis. Having held the pivotal position amongst 199 countries, there is a dire need for concrete action by Government. While 2,211,439 road accidents in the US in the year 2016 took away 37,461 lives,a relatively lower number of 480,652 accidents snuffed out 150,785 lives in India. Creating comparable safety levels could take decades for a developing country. But with the country’s share constituting about 11% of road accident casualties worldwide and the estimated social cost hovering around $58 billion, the problem begs for an immediate fix. Tightening regulations would be a practical solution for both short and long-term gains. Enough deterrents need to be put in rules governing road safety; the Motor Vehicles Act to ensure defensive driving. This paper examines how certain loopholes need to be plugged in the new Motor Vehicles Act 2019 to achieve the higher goal of road safety.

Keywords: Road accidents, traffic regulations, MV Act amendment 2019.

Introduction

With India occupying the pivotal position amongst 199 countries for having the highest number of road accidents per annum, there is little doubt that the bull must be taken by the horns. While 2,211,439 accidents in the US in the year 2016 resulted in 37,461 deaths, in India just 480,652 incidents took away 150,785 lives(1). Despite the number of accidents being one fifth, the death toll was four times higher in India. Hence, the immediate concern is to reduce fatalities. Reaching comparable safety standards of US would take decades, because improvements are required simultaneously in many areas including road infrastructure, surveillance, behaviour of road users, medical facilities, as well as safety regulations. However, with a massive annual social cost estimated at $58 billion by UNESCAP(2) there is a crying need for immediate action. The one way to have both short and long-term gains is to have a stringent regulatory environment. One of the early researchers in the domain of road safety created the Haddon Matrix(3), wherein there is interaction of human, machine (motor vehicle) and environmental factors in traffic accidents. While infrastructural environment consists of highways, bridges etc, the regulatory environment comprises the legal ecosystem having norms for manufacture, sale, registration and use of motor vehicles on public roads, including fuel/emission norms. It also consists of traffic rules on use of roads, licensing of drivers, issue of vehicle permits, motor vehicle taxes/insurance, certification of road worthiness of vehicles, scrapping of old/damaged vehicles etc. The Motor vehicles Act governs the use of motorized vehicles on public roads and one of its objectsis to regulate conduct of road users, to make highways accident free.
**Background of the study:** The large-scale homicides happening on Indian roads pricks the conscience of all road users. It is high time that a concrete solution has been found to bring it under control. The dismal five-year accident record below speaks volumes about the gravity of the situation.

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of road accidents</th>
<th>No. of deaths</th>
<th>No. of injuries</th>
<th>No. of non-injury cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>501,423</td>
<td>146,133</td>
<td>500,279</td>
<td>57,395</td>
</tr>
<tr>
<td>2016</td>
<td>480,652</td>
<td>150,785</td>
<td>494,624</td>
<td>36,091</td>
</tr>
<tr>
<td>2017</td>
<td>464,910</td>
<td>147,913</td>
<td>470,975</td>
<td>34,743</td>
</tr>
<tr>
<td>2018</td>
<td>467,044</td>
<td>151,417</td>
<td>469,418</td>
<td>34,087</td>
</tr>
<tr>
<td>2019</td>
<td>449,002</td>
<td>151,113</td>
<td>451,361</td>
<td>27,339</td>
</tr>
</tbody>
</table>

**Socio-economic cost of road accidents in India:** Although UNESCAP had estimated annual loss of $58 billion as the socio-economic cost of road accidents in the year 2018, calculations done independently by Indian Institute of Technology, New Delhi and Delhi Integrated Multi-Modal Transit System (DIMTS) Ltd indicates a figure of INR 8.53 Lakh crores (as in Table 2) according to the Ministry of Road Transport and highways (morth).

<table>
<thead>
<tr>
<th>Head</th>
<th>MORTH data for 2018 (persons)</th>
<th>Cost impact (Rs. in Crores)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatalities</td>
<td>151,417</td>
<td>137,016</td>
</tr>
<tr>
<td>Grievous injuries</td>
<td>178,641</td>
<td>5,649</td>
</tr>
<tr>
<td>Minor injuries</td>
<td>290,777</td>
<td>1,096</td>
</tr>
<tr>
<td>Property damage cost</td>
<td>Rs. 2,088 Crores</td>
<td>Administrative cost Rs. 1,264 Crores</td>
</tr>
</tbody>
</table>

**Major share of socio-economic cost:**

**Death:** Medical cost (Rs.88,000), Lost output (Rs.74 Lakh) Pain/Suffering (Rs.14.8 Lakh) & Other costs (Rs.70,000).

**Research Question:** Can stringent regulations bring down road accident casualties in India?

**Literature Review:** Road accidents have been a research topic from different standpoints like road safety, vehicle design, human error, external terrain, regulatory as well as road user behaviour. Another research strand has papers estimating probability of occurrence of road accidents and quantification of potential losses following accidents, done from an actuarial perspective for the purpose of insurance pricing. Shortlisting the ones on road accidents studied from a regulatory perspective, the earliest one was about the effect of legislation on road accidents(6). Subsequently a matrix was designed, showing the interaction of human, machine and environment on road accidents(5). A later study established that non-installation of legally mandated safety devices in motor vehicles increased highway fatalities to the tune of 20%(7). A study on the causes leading to motor accidents in India was also made(8). Research was also carried out on how mandatory regulation for installation of daytime running lights could save lives of motorcyclists in New Zealand(9). The effect of traffic safety regulation on accidents in Sweden was also studied (10). A study was also made on the regulations adopted by different states in US to control road accidents(11). There was also a study on Risk homeostasis and the purpose of safety regulation(12). The intention of pedestrians to violate traffic laws was also studied (13). A further study of the cost benefit analysis of imposing safety measures was made (14). Road safety was also studied from a policy making perspective(15). The impact of vehicle impoundment regulations on road accidents in Israel was then studied (16). Similar studies on impact of safety regulations on motorist’s behaviour was also studied in China(17).

<table>
<thead>
<tr>
<th>Table 2: Socio-economic cost(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
</tr>
<tr>
<td>---------------------------</td>
</tr>
<tr>
<td>Fatalities</td>
</tr>
<tr>
<td>Grievous injuries</td>
</tr>
<tr>
<td>Minor injuries</td>
</tr>
<tr>
<td>Property damage cost</td>
</tr>
</tbody>
</table>
**Methodology**

This paper contains a critical study of Government’s regulatory amendments in road safety laws; the Motor vehicles Act 2019, the shortcomings and the gaps to be addressed. This is a qualitative study.

**Discussion and Results**

**Amendments made by Government in Motor Vehicles Act for improving road safety:** Based on recommendations of the ten member Sundar committee, the Government has made major changes in Motor Vehicles Act 1988, replacing it with the Act of 2019 giving more teeth to road safety provisions. The new Act primarily focusses on making traffic rules stricter, by having a steep hike in penalties ranging from doubling to a twenty-fold increase for road traffic offences to serve as a deterrent for motorists. The Table-3 shown below indicates the major changes in Motor vehicles Act 2019, in comparison with the erstwhile Act of 1988 and the new provisions included.

**Table 3**(18): Major amendments in Motor Vehicles Act 2019

<table>
<thead>
<tr>
<th>Section</th>
<th>Type of offence</th>
<th>Old Penalty (MV Act 1988)</th>
<th>New Penalty (MV Act 2019)</th>
</tr>
</thead>
<tbody>
<tr>
<td>177</td>
<td>General</td>
<td>Rs. 100</td>
<td>Rs. 500</td>
</tr>
<tr>
<td>New 177A</td>
<td>Rules of road regulation violation</td>
<td>Rs. 100</td>
<td>Rs. 500</td>
</tr>
<tr>
<td>178</td>
<td>Ticketless travel</td>
<td>Rs. 200</td>
<td>Rs. 500</td>
</tr>
<tr>
<td>179</td>
<td>Disobedience of authorities’ orders</td>
<td>Rs. 500</td>
<td>Rs. 2,000</td>
</tr>
<tr>
<td>180</td>
<td>Unauthorized use of vehicles without license</td>
<td>Rs. 1,000</td>
<td>Rs. 5,000</td>
</tr>
<tr>
<td>181</td>
<td>Driving without license</td>
<td>Rs. 500</td>
<td>Rs. 5,000</td>
</tr>
<tr>
<td>182</td>
<td>Driving despite disqualification</td>
<td>Rs. 500</td>
<td>Rs. 10,000</td>
</tr>
<tr>
<td>182 B</td>
<td>Oversize vehicles</td>
<td>New</td>
<td>Rs. 5,000</td>
</tr>
<tr>
<td>183</td>
<td>Over speeding</td>
<td>Rs. 400</td>
<td>Rs. 1,000 for LMV Rs. 2,000 for Medium passenger vehicle</td>
</tr>
<tr>
<td>184</td>
<td>Dangerous driving penalty</td>
<td>Rs. 1,000</td>
<td>Up to Rs. 5,000</td>
</tr>
<tr>
<td>185</td>
<td>Drunken driving</td>
<td>Rs. 2,000</td>
<td>Rs. 10,000</td>
</tr>
<tr>
<td>189</td>
<td>Speeding/Racing</td>
<td>Rs. 500</td>
<td>Rs. 5,000</td>
</tr>
<tr>
<td>192 A</td>
<td>Vehicle without permit</td>
<td>Up to Rs. 5,000</td>
<td>Up to Rs. 10,000</td>
</tr>
<tr>
<td>193</td>
<td>Aggregators (violations of licensing conditions)</td>
<td>New</td>
<td>Rs. 10,000</td>
</tr>
<tr>
<td>194</td>
<td>Overloading</td>
<td>Rs. 2,000 and Rs. 1,000 per extra tonne</td>
<td>Rs. 20,000 and Rs. 2,000 per extra tonne</td>
</tr>
<tr>
<td>194 A</td>
<td>Overloading of passengers</td>
<td>New</td>
<td>Rs. 1,000 per extra passenger</td>
</tr>
<tr>
<td>194 B</td>
<td>Seat belt</td>
<td>Rs. 100</td>
<td>Rs. 1,000</td>
</tr>
<tr>
<td>194 C</td>
<td>Overloading of two wheelers</td>
<td>Rs. 100</td>
<td>Rs. 2,000 Disqualification for 3 months of the licence</td>
</tr>
<tr>
<td>194 D</td>
<td>Helmets</td>
<td>Rs. 100</td>
<td>Rs. 1,000 Disqualification for 3 months of the licence</td>
</tr>
<tr>
<td>194 E</td>
<td>Not providing way for emergency vehicles</td>
<td>New</td>
<td>Rs. 10,000</td>
</tr>
<tr>
<td>196</td>
<td>Driving without Insurance</td>
<td>Rs. 1,000</td>
<td>Rs. 2,000</td>
</tr>
<tr>
<td>199</td>
<td>Offences by Juveniles</td>
<td>New</td>
<td>Guardian/Owner shall be deemed to be guilty. Rs. 25,000 with 3 yrs imprisonment.</td>
</tr>
</tbody>
</table>
New Penal provisions in the amended Motor Vehicles Act 2019:

a) Oversize vehicles (Sec182B): Some unscrupulous vehicle owners carry out minor alterations on their vehicles after its registration. This marginally increased size and posed a hazard by obstructing view particularly when light weight cargo like hay was being carried. Creation of a new provision would sort out the issue henceforth.

b) Aggregators (violation of licensing conditions) Sec.193: Technology has brought in car rental companies Zoomcar, Revv and aggregators like Ola, Uber etc. Whether renting out a car or aggregator including a new entrant into their fleet, there is onus on them to ensure validity of all vehicle documents. Hence this new provision is created.

c) Overloading of passengers (Sec194A): In rural areas, we see the ubiquitous six-seater Mahindra Jeep carrying as many as 25 passengers, clinging onto body frame from all three sides. It often resulted in instability of the vehicle, causing more accidents. The RTO officials would turn a blind eye in the absence of penal provisions. The issue is addresses by the new provision.

d) Obstructing emergency vehicles (Sec194 E): Often ambulances carrying critical patients or organs for transplant are unable to reach their destination at the expected time due to insensitive motorists not allowing them to pass. The RTO was unable to impose fines without adequate provisions. This new section addresses the issue.

e) Juvenile offences (Sec 199): Sadly, in the erstwhile Act, whenever juveniles without eligibility to drive got involved in accidents, the RTA could frame charges on the driver only for non-possession of a valid driving license. There was no way that their parents or guardians could be booked. The tweaked provisions fix accountability even on guardians/vehicle owners who have let a minor drive the vehicle, making them liable for payment of steep fines as well as imprisonment.

f) Power to impound documents (Sec 206): This is also a new provision aimed at empowering the RTA. Besides imposing fines for violations, they are empowere d to confiscate driving licenses/Registration books or suspend validity of these documents.

g) Offences committed by enforcing authority (Sec 210B): Interestingly, the amended Motor vehicles Act has this new provision to impose fines on RTA officials for failure to implement motor vehicle rules or penalize anyone breaking traffic laws. Itdeters corrupt officials from turning a blind eye towards offenders for some consideration.

Other benevolent provisions in the Act: Besides enhancing penalties for traffic offences, the amended Act has created provisions which are protective than punitive, like creation of a Motor Accident fund (with contribution from Insurers/Government) under Sec 164B. This fund would be utilized to meet emergency treatment cost at hospitals for road accident victims during ‘Golden hour’ (the first one hour of accident occurrence as defined u/s 162). It would save lives because in the past, hospitals were reluctant to treat victims who were unaccompanied by bystanders or unable to pay. Likewise, the fund would also be utilized to compensate victims of ‘hit & run’ cases where accident vehicles are not traceable. The amounts for such victims have also been enhanced from INR 25000 to INR 2 Lacs and from INR 12500 to INR 50K respectively for accident death and grievous injury (u/s 161). In the past, good Samaritans who rushed accident victims to hospitals were often harassed and even accused of being the culprit. They have been given protection in the amended bill. The new Act provides for community service, more stringent rules for delay in driving license renewal, provision for recall of unsafe/unfit motor vehicles and subsequent replacement of the same to buyer. To avoid protracted litigation, claimants could directly negotiate with Insurers through Motor Accidents Claims tribunals (Sec 149). In instances where victims are unwilling to take up case for driver’s negligence before a court, they could opt for direct settlement with Insurers (Sec 164). Reinstatement of

<table>
<thead>
<tr>
<th>Section</th>
<th>Type of offence</th>
<th>Old Penalty (MV Act 1988)</th>
<th>New Penalty (MV Act 2019)</th>
</tr>
</thead>
<tbody>
<tr>
<td>206</td>
<td>Power of Offices to impound documents</td>
<td>New</td>
<td>Suspension of driving licenses u/s 183, 184, 185, 189, 190, 194C, 194D, 194E</td>
</tr>
<tr>
<td>210 B</td>
<td>Offences committed by enforcing authorities</td>
<td>New</td>
<td>Twice the penalty under the relevant section</td>
</tr>
</tbody>
</table>
the 6 months’ time limit for filing compensation cases in road accidents would help insurers get rid of many spurious claims which were getting into their books in the past.

**Will the amended motor vehicles Act amendment enhance road safety?:** The Government’s amendment of the erstwhile Motor Vehicles Act 1988 generally focuses on hiking penalties across the board. Although it was effective from 1st Sept 2019, the impact of amended regulation is yet to be known, particularly because of the nationwide lockdown imposed and consequent restrictions on vehicle movement from the month of March 2020. Nevertheless, will hiking fines across the board for all traffic offences control motor accidents? It would only help partially only because the propensity to cause fatalities is different for each of the offences. Hence logically, the penalty should be commensurate with the potential for an offence to cause fatalities. The Table-4 gives a clear picture, comparing the cause-wise road accident deaths for the year 2019 with respect to the previous year. Hence specific provisions need to be reviewed in the light of certain offences causing a relatively higher number of fatalities on Indian roads. Table-4 shown below indicates the cause-wise number of road accident deaths in the year 2019 compared to the previous year. It becomes obvious from the table-4 that those infringements causing higher number of casualties need to have more stringent penalties.

**Table-4(1): Cause-wise comparison of road accident deaths for last two years:**

<table>
<thead>
<tr>
<th>Offence</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speeding</td>
<td>97,588</td>
<td>101,723</td>
</tr>
<tr>
<td>Not wearing of helmet</td>
<td>43,614</td>
<td>44,666</td>
</tr>
<tr>
<td>Driving without licence</td>
<td>37,585</td>
<td>44,358</td>
</tr>
<tr>
<td>Hit &amp; run</td>
<td>28,619</td>
<td>29,354</td>
</tr>
<tr>
<td>Not wearing of seatbelt</td>
<td>24,435</td>
<td>20,885</td>
</tr>
<tr>
<td>Driving on wrong lane/breaking lane disciple</td>
<td>8,764</td>
<td>9,201</td>
</tr>
<tr>
<td>Use of mobile phones</td>
<td>3,707</td>
<td>4,945</td>
</tr>
<tr>
<td>Potholes</td>
<td>2,015</td>
<td>2,140</td>
</tr>
<tr>
<td>Jumping traffic light</td>
<td>1,545</td>
<td>1,797</td>
</tr>
<tr>
<td>Driving under influence of alcohol/drugs</td>
<td>1,188</td>
<td>5,325</td>
</tr>
</tbody>
</table>

**Offences which deserve more stringent penalties than those stipulated in the act:**

a) **Over-speeding:** Although penalty for over-speeding has been hiked from INR400 to INR1000 for cars and to INR2000 for larger vehicles, under amended Motor vehicles Act 2019, it is only logical to increase it further against the backdrop of a staggering 101,723 number of deaths in the year 2019 resulting from over-speeding. Suspension of driving license and impoundment of vehicles for repeat offenders can be contemplated. However, proper implementation of the rule would entail fixing of warning boards showing speed limits and installation of speed guns at all potential areas.

b) **Non-use of helmets/seatbelts:** The amended Act provides for a ten-fold hike from INR100 to INR1000 for both the offences, but the total number of deaths on these counts last year were a staggering 65,551 numbers. There is also temporary suspension of driving license apart from fines for non-use of helmets. In view of the high number of deaths due to non-use of seatbelts, the same additional penalty can be made applicable. Though the Act is mum regarding helmet quality, motorists using non-ISI helmets need to be penalized as it serves only ornamental purpose, often breaking with even mild impact.

c) **Driving without valid driving license:** With 44358 number of deaths caused by drivers not possessing a valid driving license, the offence warrants more stringent penalty than just fines. As vehicle impoundment regulations have positively impacted road safety in countries like Israel and China as seen above, similar penalty should be applicable for this kind of offence.

d) **Hit and run cases:** When a vehicle speeds away without stopping after knocking down someone, apart from enduring pain, disability, and huge treatment costs, they have no possibility of getting any compensation as the accident vehicle is non-traceable. Drivers may do it deliberately to escape from potential liability when their vehicles are either uninsured or have some shortcoming in documents like fitness certificate/driving license/permit etc. The abominable practice needs to be stopped as it defeats the very purpose of sec 163 A/165 of the benevolent legislation like Motor vehicles Act. With 29354 cases in the year 2019, fines for such an offence needs to be hiked multi-fold.

d) **Drunken driving:** In the year 2019, there has been
5325 number of road accident deaths resulting from drunken driving. Although penalties for such offences have been hiked, non-monetary penalties like suspension/revocation of driving license of offenders need to be introduced to ensure that callous, irresponsible behaviour does not take away innocent lives. Vehicle impounding needs to be contemplated for repeat offenders.

c) **Mobile-phone use while driving:** Use of mobile phones while driving had caused death of 4945 people in the year 2019, marginally lower than those resulting from drunken driving. Though it has been brought under the category of dangerous driving under the amended Motor vehicles Act with a hefty fine of INR 5000, more stringent action like suspension of driving license is needed.

d) **Offensive driving:** It is unfortunate that more than 10,000 deaths on Indian roads have happened in the year 2019 due to extremely offensive, callous and aggressive driving, disregarding human life. As many as 9201 fatalities resulted from driving on wrong side whereas jumping red signal or lanes have caused 1797 deaths. Although the offences are chargeable under dangerous driving, such recklessness needs to be dealt more stringently by way of suspension/revocation of driving license.

**Conclusions**

The alarming number of road accident casualties are a major concern for a country like India. Giving more teeth to traffic laws was conceived as one step towards raising safety standards and accordingly the Motor vehicles Act 1988 got amended in the year 2019 based on Sundar committee recommendations. The impact of amended Motor vehicles Act which became effective from 1st Sept 2019 cannot be analysed correctly at this stage because of the nationwide lockdown imposed from March 2020 and the consequent traffic restrictions declared by individual states. However, across the board hike in penalties for all road traffic offences may not be the panacea for reining in the indisciplined and reckless drivers on Indian roads. Fines/penalties for offences must be commensurate with propensity to cause fatalities on public roads. Hence the penalty provisions in the amended motor vehicles Act 2019 warrants a relook to ensure that serious life-threatening offences are dealt with an iron hand.

**Ethical Clearance:** The study involves a critical analysis of the amended Motor Vehicles Act 2019, highlighting the gaps and shortcomings. It was done using data from secondary sources, without having any experiment or data from primary sources. Neither human nor animal subjects are involved in the study. Hence it complies with the ethical standards set by COPE.

**Source of Funding:** As the study did not involve data collection or experimentation, no funding was required.

**Conflict of Interest:** There is no conflict of interest.

**References**

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2. ET. India loses $58 billion annually due to road accidents: UN study. The Economic Times. 2016.


Study in Correlation between Senile Cataract and Serum 25-Hydroxyl Vitamin D Insufficiency

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Abstract

Background: Study in correlation between Senile cataract and Serum 25-Hydroxyl Vitamin D Insufficiency. Mean Value of vitamin -D less than 10ng/ml seen in group-1 which show severe deficiency. Mean Level of vitamin-D in group-2 15-24 ng/ml which show mild to moderate deficiency. There was a statistically significant difference in both groups. (p value<0.03)

Method: 25 OH D level were examined in 300 patients who had cataract and 280 normal patients of both sex were examined using the technology name as chemiluminescent micro particle immunoassay (CMIA).

Conclusion: In normal patients have below the reference levels while a severe insufficiency of 25-OH D levels in cataract patients. These shows the role of 25-OH D deficiency in senilecataract patients.

Keywords: Senile cataract, 25 hydroxyl Vitamin D, Chemiluminescent micro particle immunoassay (CMIA).

Introduction

India is a developing countries, Eye problems specially refractive problems is a leading cause in worldwide.[¹] Visual deterioration is commonest risk factors for day to day life time functions and work and those are at very high risk of socially isolated.[²,³] In general if we see, females are more prone to develop cataract than men.[⁴] In age related disease, visual deterioration is a major non modifiable risk factors.[⁵] Factors which are modifiable risk factors are smokers[⁶,⁷] chronic liquor use[⁸] fatness[⁹], malnutrition and chemicals[¹⁰] which increase redness and oxidative stress. Vitamin D have a anti inflammatory properties[¹¹], which has a protective role against cataract formation[¹²]. This study includes correlation between 25-OH D and cataract development[¹³] help us early identification of any risk factor which help us to delay the onset of cataract.

Material and Method

The place of study was managed in the Ophthalmology Department of Dhiraj Hospital, Sumandeep Vidyapeeth, MI & RC, Piparia, Vadodara from August 2019 to January 2020 of 580 cataract patients who were undergone for cataract surgery. Inclusion criteria were patients with age more than 50 years and senile cataract that includes cortical cataract, nuclear and sub capsular cataract. Exclusion criteria were: Patient on any systemic medication like Aspirin or any blood thinner, any anti-inflammatory or steroid use of medication, any recent ocular surgery, if on any anti diabetic medication. Informed consent was obtained from both groups. The control group was taken from the routine out patient clinic who have no cataract. Grading of lens was done byLens opacity classification system (LOCS) that includes both nuclear and cortical cataract[¹⁴]. In total, the case group included 300 patients who having senile cataract and the control group included 280 normal individual. From both the groups, 3 ml blood sample was collected in a plain vacutainer. After
centrifugation of whole blood after clot formation for 5 minutes at 3000 rpm all serum sample was assessed and stored freezing for 2 months at –80 degree. A technology which was used to estimate the 25- OH vitamin D level is chemiluminescent micro particle immunoassay (CMIA). Serum Sample and pretreatment reagent both are mixed. To create a reaction mixture, pretreated sample was mixed with diluents and para magnetic anti vitamin D coated micro particles. Mixing of all trigger solutions there action developed was chemiluminescent reaction that was measured as Relative Light Units (RLUs). The level of 25-OH D in every groups was stratified by 3 breakpointsless than 30 ng/ml(vitamin D insufficiency), less than 20 ng/ml(vitamin D deficiency), and less than 10 ng/ml(vitamin D severe deficiency)[15].

Statistical Analysis: Quantitative data were expressed in terms of means with or without standard deviation, median, and range. Qualitative data were expressed in number. The chi-squared test used for comparison between two groups.

Result and Discussion

In the group-1 that include patients having senile cataract, 300 patients were included, from that 100 patients had a cortical cataract, and 80 patients had a posterior subcapsular cataracts, 120 patients had a nuclear cataract while the group-2 that include normal individual had 280 patients. There is no statistical difference in term of age and sex in both groups. The 25-OH D mean level was low in group 1 which was less than 10 ng/ml, where in group-2 had a mild-to moderate deficiency in range between 15-24 ng/ml. High statistically significant difference was noticed between both groups.(p value-<0.03) The nuclear cataract shows lowest level of 25-OH D and the posterior sub capsular type cataract has the highest value. The study shows undesirable correlation that with increasing age and serum 25-OH D level change.

Age Distribution:

Undesirable relationship with 25 OH D deficiency seen in macular degeneration[16] diabetic related ocular problems[17] uveitis and keratoconjunctivitis sicca. Result of this study shows serum 25-OH D level low in both groups. In group 1 level of 25-OH D much lower than stated levels of severe deficiency. In the group 2, 25-OH D level was lower which show mild to moderates vitamin D deficiency compared to standard values and also lower than the levels in other studies which were conducted in different regions like in Asia and USA.[18]. To obtained normal values of vitamin-D level people have to work in day time so have more sunlight exposure which help them to have normal range of 25-OH D level.[20]. Another possibility is different lifestyle with different dietary supplements. In a Korean study[21] if we compare level of vitamin D in cataract patients in both sex group was 16 and 14 ng/ml in men and women respectively. This things indicates
that vitamin D value vary from different people, state, region and country according to exposure of sunlight\(^\text{[22]}\). Vitamin D levels has no correlation with age. Although, studies done in Korea and Thailand showed the result that as young people has more work in indoor activities so less sun exposure so less vitamin D level as compare with old age people\(^\text{[23,24]}\), Role of Vitamin D that reduces inflammatory mediators and shows anti-oxidative properties \(^\text{[29–31]}\) that protect against cataract development. It was advised that increased vitamin D supplements may prevent cataractogenesis \(^\text{[21]}\).

**Conclusion and Acknowledgement**

We conclude that in both the group serum 25-OH D level were low than standard Level. In all type of cataract particularly. Nuclear cataract has lowest 25-OH D levels. These results see the role of deficiency of 25-OHD in senile cataract patient.

**Ethical Clearance:** Taken from HRRP committee

**Source of Funding:** Nil

**Conflict of Interest:** Nil

**References**


Mitigating the Impact of COVID-19 Through Technological Interventions is India Legally Equipped: Aarogya App Case Study

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Abstract

Tremendous utilisation of technology during lockdown and quarantine for COVID-19 pandemic has been observed. The health care agencies are making best possible efforts to fight the pandemic. The phone applications for tracing proximity to people to identify infection hotspots and possible transmission is also gaining popularity. Various countries have launched apps which can be installed in smartphone for contact tracing. Indian government has also launched Aarogya Setu app. The launch of this app fueled alot of discussion as compliance with patient privacy and human rightsissues. This app constantly monitors GPS location of an individual which is considered as an invasion of privacy by legal experts. Although Aarogya Setu app has many in built privacy features to protect sensitive data. In 2017 Supreme Court held privacy to be constitutionally protected right under Article 21 of the Indian Constitution. The same was followed by introduction of Personal Data Protection Bill in Parliament in year 2018 and again in 2019. However, it still remains in the form of bill only. Further, in Puttaswamy Judgement Supreme Court allowed states to collect data for certain legitimate purpose where there is state or public interest. COVID-19 has definitely accelerated the need to have stronger data protection legislation in India to protect patient privacy. Stronger data protection law will only add to the legitimate, efficient and careful processing of important data which is required to fight against the pandemic.

Keywords: COVID-19, Aarogya Setu app, Data Protection, Digitalisation, Contact tracing.

Introduction

COVID-19 originated from China in December 2019 which later became global pandemic. During COVID-19 pandemic technologies are playing crucial role in fulfilling day to day needs in time of lockdown and quarantine. Trends of online shopping, robot deliveries, digital and contactless payments, work from home, distance learning, telehealth, online entertainment and drones for sanitization are gaining popularity during pandemic. Apart from these, digital contact tracing is also being used to tackle COVID-19 pandemic. These smart phone applications (apps) are being considered for tracing proximity of people to determine possible sources of transmission1. Such technical solution requires patient privacy protection otherwise benefits can be undermined due to low adoption. Various countries launch apps for contact tracing as manual contact tracing may require a lot of time and resources2. For instance, Australian Government launch COVIDSafe and Indian Government launch Aarogya Setu app. The launch of these apps has fueled a lot of discussion on complying with privacy and human rights frameworks, including whether this information can, in fact, ever be anonymized3. Fully effective anonymisation is not possible when collecting data as gross as regular interaction with others in addition to age, gender and pincode demographics, as has been

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demonstrated by previous attempts to de-anonymise data. If these data are unintentionally or purposely linked with other datasets part of cloud computing, anonymity is virtually impossible to guarantee. Civil society in the United Kingdom called for clear and comprehensive primary legislation to regulate data processing in symptom tracking and digital contact tracing applications, including with a strict purpose, access and time limitations. Such regulation may improve trust.

**Indian initiative in digital tracking: Aarogya app:** As the COVID-19 pandemic gripped the country, a national-wide lockdown was enforced in March, 2020. The health workers along with other government services embarked upon a process of controlling the spread of novel corona virus in the nation. Other than the efforts to ramp up the hospitals to curb the pandemic, the digital efforts by the Government of India included introduction of the Aarogya setu application to control the spread of the virus by digitally tracking COVID-19 patients or people at-risk of getting the disease. The Prime Minister of India, in its address to nation urged the countrymen to download the application as it would help the Government identify the potential risks and provide immediate help.

The app aims at providing users information as to whether they are prone to a COVID-19 infection by analysing their proximity to COVID-19 positive persons. The app requires the user to submit the user’s geodata. It also uses bluetooth to connect to other registered users and from the network thus formed, analyse whether the user has come in contact with anyone who has been tested positive. The app, as per its terms of service is intended to “notify, trace, and suitably support” a registered user regarding COVID-19 infection.

**Working model of Aarogya setu application:** The application uses the location and Bluetooth information of the phone in order to analyse if an individual has been in close proximity to a person who had been infected by the virus by comparing with the database already prepared by the Government. The application calculates the risk of infection based on how recent it was, the proximity and recommends measures. The registration of the application is voluntary. The user needs to provide name, gender, age, profession and information about foreign travel in the past 30 days in addition to the mobile number. A unique device identity number (hereinafter referred DID) is allotted to the mobile number provided at the time of registration. It is this DID that is used for future interactions with other devices. The whole information including personal information and details of interaction with other devices is encrypted and stored on Aarogya Setu servers.

**Privacy concerns:** The application constantly monitors the GPS location of an individual which is considered as an invasion of privacy by legal experts. Many other countries have also utilized contract tracing applications to keep a track on virus spread. Though the objective of all these apps is similar they somewhat differ in the process. For instance, the Trace Together application used by Singapore does not collect GPS information and the data can only be used by health ministry officials. Similarly, U.K. has the data centrally stored with National Health Service (NHS) servers. The data stored on servers can be utilised by the health workers as well as law enforcement agencies in U.K. to identify the hot spots based on GPS data. Thus, practically the government can obtain the information on individuals who are sick and obtain their location as well. India does not have stringent data privacy laws as such which makes the medical data vulnerable because of the lack of regulation process of the data.

**Privacy features:** The medical data is considered as personal sensitive data. The Aarogya setu application has many in built privacy features to protect the sensitive data. The personal information is anonymized by assigning a DID to the mobile number and using the same for future reference. The whole information is encrypted and stored. The location information and contact tracing information is stored locally on the mobile devices and uploaded on the server only of individual test positive. This information is permanently deleted from the device at every 30 days cycle if the individual does not test positive. The information which might have been uploaded to the server will be deleted at every 45 days cycle. If someone test positive the contact tracing info is deleted from the server after 60 days.

The government has taken a significant step in utilizing technology to check the spread of novel coronavirus. Human contact tracing is a long and cumbersome process. In such a scenario, the application will definitely provide useful information to the agencies. The application has largely addressed the privacy issues by encrypting the stored data on the servers. With a total of 13.11 crore people enrolled (as on 19th June 2020), the application would provide useful data to the
health workers. The host of facilities on the application like self-assessment test and helpline number will also provide easy help to patients to identify if they are at risk and obtain immediate medical help when required.

**International Data Protection Regime:**
International Position in European Union (E.U.), privacy is considered as a Fundamental Right. The recently enacted General Data Protection Regime (GDPR) recognises the importance of Data privacy as a human right and thus provides a comprehensive law on data protection and privacy which its member states are bound to incorporate in their respective states. There is no law in E.U. which gives unbridled power to the member states for surveillance and data retention. In U.S.A., data privacy is not considered as a fundamental right. It is considered more of a consumer right and thus there is no comprehensive law on data protection; it is scattered in different laws. The surveillance practices of U.S.A. have been found covert and arbitrary. However, with the passing of new surveillance laws, these surveillance activities have been made legal. In Australia, the legislature and the Government has been the most active in passing legislations to deal with the legal issues arising from technological advancements. In U.K., the Data Protection Act, 2018 caters to the challenges of I.T. technological advancements. The recent law on surveillance Investigatory Powers Act, 2016 explicitly provides for tools that facilitate electronic surveillance for combating terrorism and anti-national activities. In China, the Government has laid down rules through law on protecting data privacy. However, the surveillance activities undertaken by the Chinese Government are so covert that the Law seems to be inadequate in protecting the data privacy of individuals.

**Data Protection in India:** In 2017, a nine-judge bench of the Supreme Court unanimously held privacy to be a constitutionally protected right under Article 21 of the Indian Constitution. The court also laid down certain benchmarks which every governmental action had to suffice in case any infringement of privacy is sought for. Following this, a Committee was constituted under the chairmanship of Justice B.N. Srikrishna for laying down the framework of data protection legislation in India. The committee recommended identifiability of the data being processed to have a significant bearing on the definition of personal data and suggested bringing besides identifiable data, de-identified data and up to certain extent anonymised data as well under the purview of the legislation. The committee further categorizing health data under the category of sensitive personal data, acknowledged that the same is more prone to infringing privacy of the data principal. The same was followed by introduction of a Personal Data Protection Bill in Parliament in the year 2018 and again in 2019. The preamble to the bill states that “the right to privacy is a fundamental right and it is necessary to protect personal data as an essential facet of informational privacy.” However, the same is still in the stage of a bill and therefore, India as of now does not have a dedicated legislation on data protection and data privacy which makes its position very vulnerable. Certain provisions of IT Act, 2000 along with the Rules framed by the Government of India is the only legal protection for ensuring data privacy and against arbitrary surveillance by Government agencies; which are inadequate in the present day dependence of individuals on cloud enabled applications and insufficient to provide a strong legal platform for India’s ambitious ‘Digital India’ and ‘Make in India’ projects.

Aarogya Setu and Contact Tracing - The lawful justification: In 1998, the Supreme Court held that right to privacy is not absolute and can be curtailed on the ground of protection of health of other individuals. The same was reiterated by the Supreme Court in CPIO v. Subhash Chandra Agarwal (2019) wherein it was held that the personal information including medical records, treatment etc. is entitled to protection from unwarranted invasion of privacy of that individual however, conditional access may be guaranteed wherein larger state interest is justified by the government.

The Balance Test: The recent judicial pronouncements though allowing states to collect data for certain legitimate purposes have imposed strict checks to ensure careful and legitimate handling of the data. The Supreme Court in the Puttaswamy judgment held that in all the cases even where defense of state interest is taken to justify infringement of privacy,
a three-fold requirement has to be justified by the government. Primarily, there must be a law justifying the infringement, secondly there must be a legitimate state aim ensuring that the same fulfills the mandate of reasonableness under Article 14 of the Constitution and third, the means chosen to achieve the end should be proportionate. Justice DY Chandrachud quoting Christina P. Mondis who stated that “information collection can be swiftest theft of all” concluded that a delicate balance has to be drawn in the legitimate interests of the state and the individual interests of protecting one’s privacy. The Kerala High Court in April 2020 while deciding on a case concerning a contract signed by the Kerala government with Sprinklr Inc., to analyze the data of COVID 19 susceptible individuals, affixed responsibility on the state to ensure anonymisation of all the sensitive data and held that “controlling COVID-19 pandemic cannot lead to a data epidemic”. The right of a state on account of public interest to collect the data cannot be an opportunity for absolute violation of right to privacy of individuals.

Future Perspective: The need for Data Protection Legislation: COVID-19 has definitely accelerated the need to have a stronger data protection legislation in India. As of now, the privacy law in India is governed by multiple judicial pronouncements and legislations. This adds to the uncertainty in the legal sphere and consequently leads to a common man facing formidable hurdles while determining his rights and duties. To ensure a proper balance between the confidentiality of data and processing of personal data if mandated by the social circumstances, it has to be assured that none is favored at the very outset. This can only be ensured when a stronger data protection regime is in the place. Collection of data in a sensitive situation like this has definitely accentuated the spread of information and knowledge to control the novel coronavirus, however, it has to be ensured that no situation like present should be used as an opportunity for abhor infringement of a right which has been accorded the status of a natural and inalienable right. Stronger data protection law will only add to the legitimate, efficient and careful processing of important data which is required to fight against the pandemic.

Conflict of Interest: There is no conflict of interest

Funding: Self

Ethical Clearance: The study was approved by the Institutional Ethics Committee of Dasmesh Institute of Research and Dental Sciences, Faridkot

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The Role of Sharing Peer Group Intervention on Nutritional Anemia Prevention to Children at Bayang Public Elementary School in Makassar City

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Abstract

The prevalence of nutritional anemia is one of elementary school-aged children’s nutritional problems and brings an impact on students’ learning achievements. This study aimed to analyze the role of sharing peer group intervention on nutritional anemia prevention to elementary school-aged children. The research design used was quasi-experiment with control group design. Population and samples of students from IV and V classes were 54 and the students were chosen through purposive sampling method. Data were analyzed with paired test. Results showed that there were increment scores in cognitive aspect after sharing peer group method was applied as research intervention (M=24.07; SD=11.851). The value was greater than cognitive scores increment after counseling method applied as research intervention (M=14.81; SD=8.931) with p value=0.002 less than significance value (p<0.05). It shows that there is increase of average increment to respondent’s cognitive scores. Average increment affective scores of respondents after sharing peer group (M=25.55; SD=15.275) was conducted is greater than counseling method (M=15.92; SD=14.212) with p value=0.020 less than significance value (p<0.05). It means that there is increase of average increment to respondent’s affective scores. Average increment psychomotor scores of respondents after sharing peer group (M=22.22; SD=11.208) was conducted is greater than counseling method (M=15.18; SD=11.559) with p value=0.027 less than significance value (p<0.05). It means that there is increase of average increment to respondent’s psychomotor scores. It is expected to school practitioners to continue the counseling and sharing peer group to students in order to maintain healthy food consumption pattern with sustainable and proper way so that students can avoid nutritional anemia cases.

Keywords: Nutritional Behavior, Sharing Peer Group, Nutritional Anemia.

Introduction

Nutritional anemia is generally found in nutrition vulnerable groups in elementary school-aged children(1).

The World Health Organization (WHO) reports that the number of cases of nutritional anemia in the age group of elementary school-aged children in the Asian continent is 58.4%. This value is higher than the number of cases of anemia in the school age group in the African continent, which is 49.8%(2). Based on the results of the Basic Health Research or Riset Kesehatan Dasar (Riskesdas) in 2013, it showed that iron nutritional anemia in children aged 5-12 years was 29% and in Makassar City in particular it was 37.6%(3). A study of students in grades 4-6 of elementary schools in Taiwan regarding the selection of healthy and unhealthy snacks found that around 31.8% of students rarely bought unhealthy snacks. The number of children who were obtained in this research as many as 78% of students(4). Students who suffer nutritional
anemia can cause low concentration which has an impact on decreasing learning achievement. This condition is allowed to be left to children which will have an impact on productivity levels and suffer degenerative diseases in the future\(^5\). Eating and buying snacks that are low in mineral nutrients, especially iron, have a negative impact on children’s health\(^6\).

Nutritional anemia has an impact on decreasing the quality of human resources, especially in elementary school-aged children. The case we found in the literature review is related to the unfulfilled iron intake that can cause problems in the growth process of both body cells including the growth and development of brain cells. There is a decrease in hemoglobin levels in the blood so that it can cause symptoms of weakness, fatigue, tired and sluggish, which in turn can cause a decrease in learning achievement for school children and a decrease in work productivity. In addition, the effect that can be caused for someone who is deficient in iron will reduce the immune system or the body’s immune system which results in susceptibility to the infection\(^7\).

Healthy snacking behavior can be used to educate children in choosing snacks according to 4 healthy 5 perfect meal combination campaigned by Indonesia health practitioners (4 sehat 5 sempurna). On average, each student buys between 2 and 3 types of snacks each time they buy meal or snack\(^8\). Snacks for children are very easy to obtain at relatively cheap prices, low in nutritional intake and for school children and are very dangerous for health. The purpose of this study was to analyze the effect of peer group sharing intervention on the prevention of nutritional anemia in children of the Bayang Public Elementary School in Makassar City, South Sulawesi.

**Research Methodology**

Quasi experiment research approach is used in this study. We conducted pretest and post-test to elaborate before and after intervention with control group design. The treatment group was given nutritional and health education as research intervention for three months through peer group sharing by giving nutrition posters and leaflets to elementary school children with nutritional anemia. In comparison, the control was not given intervention but we elaborated the research by providing only in the form of health counseling. The research stages included: preparation and processing of research permits; distribution of correspondence; initial data collection (hemoglobin measurement and health parameter screening); implementation of interventions; and monitoring and evaluation. This research was conducted at the Bayang Public Elementary School in Makassar City which had the same characteristics and had never been screened for nutritional anemia before. The population and samples were students suffered from nutritional anemia at Bayang Public Elementary School in Makassar City. The samples were chosen through a purposive sampling method. Samples were selected among the population according to the certain limitation set by the researcher based on the samples criteria. The research instrument was elementary school children who were selected as the research samples. The students as samples then would be checked for screening and hemoglobin (Hb) levels by experts (health practitioners). Then we proceeded with questions and answers about diet and food consumption using the previously prepared interview guidelines (food frequency questionnaire). Hb level examination used the “Cyanmethemoglobin” method as recommended by the World Health Organization and the International Committee for Standardization in Hematology as well as a 24-hour food recall and analyzed using the Indonesian version of the 2007 Nutrisurvey software. Intervention media are nutrition posters and leaflets using peer group sharing.

**Results**

We collect data of respondents from certain characteristics which were class, intervention group, sharing peer group, and penyuluhan to the respondents themselves. The frequency of characteristics-based respondents can be seen in Table 1 to the total amount and percentage.

**Table 1. Distribution of Characteristics-based Respondents**

<table>
<thead>
<tr>
<th>Respondent’s Characteristics</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>26</td>
<td>48.2</td>
</tr>
<tr>
<td>V</td>
<td>28</td>
<td>51.8</td>
</tr>
<tr>
<td>Total</td>
<td>54</td>
<td>100.0</td>
</tr>
<tr>
<td>Intervention Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sharing Peer Group</td>
<td>27</td>
<td>50.0</td>
</tr>
<tr>
<td>Counseling</td>
<td>27</td>
<td>50.0</td>
</tr>
<tr>
<td>Total</td>
<td>54</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Table 1 shows that the distribution of respondents based on class level. Of the 54 respondents, the most respondents were identified from class V. There were 28 students (51.8%) from total samples. The remaining 26 students (48.2%) as respondents were identified from class IV. In addition, based on the intervention group, from 54 respondents there were 27 students (50%) in each of the peer group sharing intervention and counseling intervention groups.

Table 2. Distribution of Students’ Cognitive, Affective, and Psychomotor Scores Based on Sharing Peer Group Intervention

<table>
<thead>
<tr>
<th>Descriptive Statistics</th>
<th>Cognitive Score</th>
<th>Affective Score</th>
<th>Psychomotor Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Post-test</td>
<td>Pretest</td>
</tr>
<tr>
<td>n</td>
<td>27</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>Mean</td>
<td>40.00</td>
<td>64.07</td>
<td>39.63</td>
</tr>
<tr>
<td>p-Value</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Table 2 shows that students’ cognitive aspect score about anemia increased after the implementation of health interventions with the peer group sharing method. The average post-test under cognitive score (M=64.07; SD=7.473) was greater than the average pretest cognitive score (M=40.00; SD=12.710) with the obtained p value=0.000, smaller than the significant value (p<0.05). The average post-test affective score (M=65.19; SD=8.490) is greater than the average pretest affective score (M=39.63; SD=11.260) with the obtained p value=0.000, smaller than the value of significant value (p<0.05). The average post-test psychomotor score (M=62.59; SD=6.559) greater than the average pretest psychomotor score (M=40.37; SD=8.540) with the obtained p value=0.000, smaller than the significant value (p<0.05). It means that there were significant differences in the average score of cognitive, affective, and psychomotor.

Table 3. Distribution of Students’ Cognitive, Affective, and Psychomotor Scores Based on Counseling Intervention

<table>
<thead>
<tr>
<th>Descriptive Statistics</th>
<th>Cognitive Score</th>
<th>Affective Score</th>
<th>Psychomotor Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Post-test</td>
<td>Pretest</td>
</tr>
<tr>
<td>n</td>
<td>27</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>Mean</td>
<td>43.70</td>
<td>58.52</td>
<td>44.44</td>
</tr>
<tr>
<td>p-Value</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Table 3 shows that students’ cognitive aspect score about anemia increased after the implementation of health interventions with the counseling method. The average post-test under cognitive score (M=58.52; SD=7.698) was greater than the average pretest cognitive score (M=43.70; SD=8.389) with the obtained p value=0.000, smaller than the significant value (p<0.05). The average post-test psychomotor score (M=58.15; SD=7.863) greater than the average pretest psychomotor score (M=42.96; SD=10.309) with the obtained p value=0.000, smaller than the significant value (p<0.05). It means that there were significant differences in the average score of cognitive, affective, and psychomotor.
Table 4. Achievement Comparison on Students’ Cognitive, Affective, and Psychomotor Scores Between Sharing Peer Group and Counseling Intervention

<table>
<thead>
<tr>
<th>Descriptive Statistics</th>
<th>Cognitive Score Increment</th>
<th>Affective Score Increment</th>
<th>Psychomotor Score Increment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sharing Peer Group</td>
<td>Counseling</td>
<td>Sharing Peer Group</td>
</tr>
<tr>
<td>n</td>
<td>27</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>Mean</td>
<td>24.07</td>
<td>14.81</td>
<td>25.55</td>
</tr>
<tr>
<td>SD</td>
<td>11.851</td>
<td>8.931</td>
<td>15.275</td>
</tr>
<tr>
<td>p-Value</td>
<td>0.002</td>
<td>0.020</td>
<td>0.027</td>
</tr>
</tbody>
</table>

Table 4 shows the results of achievement comparison of students’ cognitive, affective, and psychomotor scores on each aspect. There were difference results between sharing peer group and counseling as intervention in this study. The results show that there were increment scores in cognitive aspect after sharing peer group method was applied as research intervention (M=24.07; SD=11.851). The value was greater than cognitive scores increment after counseling method applied as research intervention (M=14.81; SD=8.931) with p value=0.002 less than significance value (p<0.05). It shows that there is increase of average increment to respondent’s cognitive scores. Average increment affective scores of respondents after sharing peer group (M=25.55; SD=15.275) was conducted is greater than counseling method (M=15.92; SD=14.212) with p value=0.020 less than significance value (p<0.05). It means that there is increase of average increment to respondent’s affective scores. Average increment psychomotor scores of respondents after sharing peer group (M=22.22; SD=11.208) was conducted is greater than counseling method (M=15.18; SD=11.559) with p value=0.027 less than significance value (p<0.05). These results show that there were significant differences of using sharing peer group and counseling as nutritional anemia prevention; which became research intervention.

Discussion

Nutritional anemia suffered by elementary school-aged children is influenced by diet, nutritional intake, and infectious diseases. Nutritional anemia are mostly experienced by students (9). In addition, the eating behavior of elementary school children on average is not more than three times a day. In our study, the eating behavior that is categorized as “eating” is not only in the context of consuming staple foods but snacking are also categorized as eating (10). The cases of nutritional problems were very much influenced by the knowledge (cognitive), attitudes (affective), and behavior (psychomotor) about healthy lifestyle and nutrition intake understood and applied by children daily. It will cause an inner response in the form of action through prevention of nutritional anemia. Students are positive because they get information about nutritional anemia from the teacher who currently teaches the class. Of students being observed as the respondents, there are also students who do not know the impact and dangers of nutritional anemia as they have not been taught properly about it. According to Duque (2014), anemia can be caused by a lack of iron nutrients intake in food, either due to inappropriate food consumption patterns, inadequate quality and quantity of food, or due to an increase in iron needs (11).

The main problem with iron nutrients utilization by the body is the low absorption in the intestines. The absorption of iron nutrients is influenced by two factors, namely the absorption of heme and nonheme iron. These processes indicate the presence of two different types of iron in food. Sources of heme in human food are meat, fish and poultry, while nonheme sources of food to consume are cereals, nuts, vegetables and fruit. The type of tea that is often consumed by respondents is tea in glass (instant tea with additive flavour). This kind of snack or specifically drink is currently very popular with children and the community. Instant tea is very affordable and fash-ordered because it is easily sold at a relatively cheap price with cold condition. Other types of foods that inhibit iron absorption are very rarely consumed because the respondent’s favorite type of food is milk (12). Less than a third of children have a good knowledge of substitute foods, which is especially important for people with limited purchasing power. Replacing certain types of food with other foods that are inexpensive but still have an equivalent
Nutritional content will be able to overcome some of the completeness of nutrient intake\(^{(13)}\).

The results obtained showed the comparison of the average increase in the score of knowledge (cognitive), attitudes (affective), and behavior (psychomotor) of students as respondents about healthy lifestyle and nutritional anemia after the implementation of health interventions with peer group sharing and counseling method. The average increase in students’ knowledge (cognitive scores) after the implementation of health interventions with sharing peer group method was greater than the average increase of counseling group method. Not only cognitive aspect, the average increase in affective and psychomotor at pretest (before intervention) and post-test (after intervention) scores due to sharing peer group method is better than only counseling method. Based on these findings, it can be concluded that the health intervention using the peer group sharing method is better in increasing the score of cognitive, affective, and psychomotor aspects of elementary school-aged children as respondents of this study about nutritional anemia than the only counseling method. These results generally illustrate that children’s knowledge, attitudes, and actions about food are still not stable and require more complete information. This needs to be balanced with the correct understanding, that nutritional anemia is indeed very dangerous cases for health and nutrition as well as productivity levels\(^{(14)}\).

Nearly all the children stated that they should have breakfast before going to school; half said that they should eat every day. These statements can describe their daily practice and biologically reflect the increased nutritional requirements at this age. Some of the knowledge, attitudes and actions of school students are already good, but they still need to be improved properly.

The results of the study were supported by Astina’s research (2016) at Public Elementary School Pasanggrahan 1, Purwakarta Regency. The results show that the attitudes of elementary school children mostly supported as much as 60% with good nutritional anemia prevention measures as many as 24 elementary school children (45%)\(^{(15)}\). The attitude in choosing snacks for children with nutritional anemia is not only formed from the knowledge they have, but is also influenced by the culture and educational institutions where the children go to school\(^{(16)}\). The peer group sharing approach given to students with nutritional anemia material can change most aspects of knowledge and attitudes of students in a positive direction. However, this approach is not sufficient to change student actions, possibly because the consumption pattern of students is still very dependent on the actions of the teachers, while the intervention is not aimed at teachers but at students. However, we did not elaborate longitudinal research approach so that the short intervention time has not been able to change the nutritional behavior as expected. Overall, learning and counseling for elementary school children about nutritional anemia has great potential to change children’s diet plan. Not much different from nutritional knowledge on cognitive aspect, most students agreed not to eat much or snacking food too often\(^{(17)}\). To determine the change in knowledge, attitudes, and actions of students after the intervention, bivariate analysis under statistics measurements was carried out. In general, in the second measurement, the mean score of children’s knowledge, attitudes, and actions regarding nutritional anemia had increased after the peer group sharing method was applied.

**Conclusion**

There is an effect of peer group sharing method and counseling method on the nutritional behavior of nutritional anemia students. Health and educational practitioner parties in the scope of the school can work together in providing education to students on how to prevent and overcome cases of nutritional anemia in order to improve the quality of health and student learning achievement. The research address to perform further research on various state.

**Ethical Clearance:** Ethical approval has been obtained from Ethical Commission of Health Research, Faculty of Public Health.

**Source of Funding:** This research was supported by the Directorate of Research and Community Service, the Directorate General of Research and Development Strengthening Indonesia.

**Conflict of Interest:** The author(s) declare that they have no conflict of interest

**References**


The Relationship between the Implementation of Nutrition Conscious Families (KADARZI) and the Toddler Nutrition Status: A Cross Sectional Study

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Abstract

Resolving nutritional problems can be done from the time of pregnancy until the child is 5-year-old. The purpose of this study was to determine the relationship between the application of nutrition awareness family program or Keluarga Sadar Gizi (KADARZI) at the household level with the toddler nutrition status. This study was an observational analytic study, with a cross sectional study research design. The sample consisted of 42 toddlers in Libukang Mandiri Village. Data collection was done by weigh and height measurement and nutrition level behavior questionnaire. The results of the research shows that the KADARZI component has a significant relationship. It was the consumption of various foods (p value = 0.006), weighing regularly (p value = 0.017). Meanwhile, the nutrition level component has no significant relationship, which was iodized salt consumption (p value = 0.681), exclusive breast milk (p value = 0.066), and vitamin A nutrition supplement (p value = 0.632). Furthermore, there is a significant relationship of KADARZI on a composite basis with toddler nutrition status (p value = 0.044). The better the application of KADARZI at the household level, the better the nutrition status of toddlers. It is expected that the mother and all family members should behave well in maintaining nutrition level so that the family members always live healthy and have proper nutritional intake.

Keywords: KADARZI; Nutrition Status; Toddler.

Introduction

The nutritional state is the level of activity in the process of utilizing nutrients for body maintenance, growth, and development as a result of the food and beverages consumption at mealtime(1). Malnutrition can occur from several consequences, namely imbalance intake of nutrients, digestive disease factors, absorption and infectious diseases(2). Malnutrition in childhood is a global health problem. Data from the World Health Organization (WHO) shows that malnutrition is the cause of under-five mortality, such as in sub-Saharan Africa 28% and Latin America 7%(3).

Based on the national basic health research or Riset Kesehatan Dasar (RISKESDAS) in 2018, the prevalence of under-five children with malnutrition decreased from 14.43% in 2016 to 14.00% in 2017 (4). One of the steps in tackling the high rate of malnutrition in Indonesia, the government has implemented the nutrition awareness family program Keluarga Sadar Gizi (KADARZI). KADARZI is a family with all the members maintaining balanced nutritional behavior and they are able to recognize health and nutrition problems; and able to take steps to overcome nutritional problems encountered by each family member.
The incidence of malnutrition among toddlers and school-age children in Indonesia shows that nutritional behavior at the family level is still not good, so the problem of malnutrition must continue to get attention because the impact it causes can be long-term problems in households of society\(^5\). In accordance with research conducted by Wijayanti, et al. (2017) on the behavior of a nutritionally conscious family in toddlers in Tulungagung, the result states that children with malnutrition have a negative impact on physical and mental growth, which in turn will hinder learning achievement\(^6\). Another result is a decrease in immune system which causes the loss of a healthy life span for children under five, and a more serious impact is the incidence of disability, high morbidity and accelerated death\(^7\). The purpose of this study was to analyze the relationship between KADARZI behavior at the household level and the nutritional status of children under five.

### Method Research

This type of research is observational study with a cross-sectional method. The dependent variable of this research is toddler nutrition status, while the independent variable is KADARZI behavior. This research was conducted from April to July 2019. The unit of analysis for this study was households with mothers of families as the research respondents. The sampling technique was total sampling and the minimum number of analysis units obtained was 42 samples of toddlers who meet the inclusion criteria, among others they were: 1) toddlers aged 12-59 months who live in the village of Libukang Mandiri Village, Luwu Timur Regency; 2) registered on the data of healthy family card or Kartu Menuju Sehat (KMS) and/or one way health public service or Pos Pelayanan Terpadu (POSYANDU); and 3) not having moderate pain during pre-study or data collection study process. The research questionnaire used is a structured questionnaire or list of questions to collect KADARZI behavior data and anthropometry for assessing the nutritional status of toddlers. The analysis used the chi square test with a confidence level of 95%.

### Results

#### Table 1. Distribution of KADARZI Behavior and Toddler Nutrition Status in Libukang Mandiri Village, Luwu Timur Regency

<table>
<thead>
<tr>
<th>KADARZI Behavior</th>
<th>n</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Food Intake Variation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proper</td>
<td>29</td>
<td>69</td>
</tr>
<tr>
<td>Improper</td>
<td>13</td>
<td>31</td>
</tr>
<tr>
<td><strong>Weigh Measurement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular</td>
<td>35</td>
<td>83.3</td>
</tr>
<tr>
<td>Irregular</td>
<td>7</td>
<td>16.7</td>
</tr>
<tr>
<td><strong>Iodized Salt Consumption</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>36</td>
<td>85.7</td>
</tr>
<tr>
<td>No</td>
<td>6</td>
<td>14.3</td>
</tr>
<tr>
<td><strong>Exclusive Breastfeeding</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>28</td>
<td>66.7</td>
</tr>
<tr>
<td>No</td>
<td>14</td>
<td>33.3</td>
</tr>
<tr>
<td><strong>Vitamin A Nutrition Supplement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>40</td>
<td>95.2</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>4.8</td>
</tr>
<tr>
<td><strong>KADARZI Behavior Implementation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implement KADARZI</td>
<td>19</td>
<td>45.2</td>
</tr>
<tr>
<td>Do Not Implement KADARZI</td>
<td>23</td>
<td>54.5</td>
</tr>
<tr>
<td><strong>Toddler Nutrition Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malnutrition</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Less Nutrition</td>
<td>8</td>
<td>19.0</td>
</tr>
<tr>
<td>Good Nutrition</td>
<td>34</td>
<td>81.0</td>
</tr>
<tr>
<td>Over Nutrition</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

In Table 1, it can be seen that the KADARZI component achieving the most coverage is the vitamin A nutrition supplement intake as much as 95.2% while the KADARZI component achieving the lowest coverage is exclusive breastfeeding as much as 66.7% based on the children who are given exclusive breastfeeding.
Table 2. The Relationship between KADARZI Behavior with Toddler Nutrition Status in Libukang Mandiri Village, Luwu Timur Regency

<table>
<thead>
<tr>
<th>KADARZI Behavior</th>
<th>Toddler Nutrition Status</th>
<th></th>
<th></th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Less Nutrition</td>
<td>Good Nutrition</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Food Intake Variation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proper</td>
<td>2</td>
<td>4.8</td>
<td>27</td>
<td>64.3</td>
</tr>
<tr>
<td>Improper</td>
<td>6</td>
<td>14.2</td>
<td>7</td>
<td>16.7</td>
</tr>
<tr>
<td>Weigh Measurement</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular</td>
<td>4</td>
<td>9.5</td>
<td>31</td>
<td>73.8</td>
</tr>
<tr>
<td>Irregular</td>
<td>4</td>
<td>9.5</td>
<td>3</td>
<td>7.2</td>
</tr>
<tr>
<td>Iodized Salt Consumption</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>7</td>
<td>16.7</td>
<td>29</td>
<td>69.0</td>
</tr>
<tr>
<td>No</td>
<td>1</td>
<td>2.4</td>
<td>5</td>
<td>11.9</td>
</tr>
<tr>
<td>Exclusive Breastfeeding</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3</td>
<td>7.2</td>
<td>25</td>
<td>59.5</td>
</tr>
<tr>
<td>No</td>
<td>4</td>
<td>11.9</td>
<td>9</td>
<td>21.4</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>8</td>
<td>19.0</td>
<td>32</td>
<td>76.2</td>
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<tr>
<td>No</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>4.8</td>
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<tr>
<td>KADARZI Behavior Implementation</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implement KADARZI</td>
<td>1</td>
<td>2.3</td>
<td>18</td>
<td>42.9</td>
</tr>
<tr>
<td>Do Not Implement KADARZI</td>
<td>7</td>
<td>16.7</td>
<td>16</td>
<td>38.1</td>
</tr>
</tbody>
</table>

Table 2 is summarized the results of statistical analysis with a confidence level of 95% and a significance level of $\alpha = 0.05$. Table 2 shows the results of this research in p value. It shows that the KADARZI component has a significant relationship. It was the consumption of various foods ($p$ value = 0.006), weighing regularly ($p$ value = 0.017). Meanwhile, the nutrition level component has no significant relationship, which was iodized salt consumption ($p$ value = 0.681), exclusive breast milk ($p$ value = 0.066), and vitamin A nutrition supplement ($p$ value = 0.652). Furthermore, there is a significant relationship of KADARZI on a composite basis with toddler nutrition status ($p$ value = 0.044). It can be said that KADARZI implementation behavior as a whole has a significant relationship with the nutritional status of toddlers.

**Discussion**

Fulfillment of toddler nutrition intake depends closely on the behavior patterns of parents. Food consumption patterns can be influenced by the level of awareness of family nutrition. By KADARZI, family is able to recognize, prevent, and overcome nutritional problems for each member\(^{(1)}\). One alternative to tackling the high rate of malnutrition in Indonesia is the establishment of KADARZI program held by the government. KADARZI is a family with all the members maintaining balanced nutritional behavior and they are able to recognize health and nutrition problems; and able to take steps to overcome nutritional problems encountered by each family member. The targets of KADARZI program are families with toddlers, families with pregnant women, and mother and/or housewives. One of the indicators of KADARZI is eating a certain and balanced variety of foods. Toddlers are said to eat a variety of foods if the toddler consumes food sources that contain carbohydrates, animal protein, vegetables, and fruit. Toddlers who consume various kinds are still very low because they have not reached the 80% target set by the Ministry of Health\(^{(4)}\). The results of the research conducted in Libukang Mandiri Village showed that the coverage of consumption of a variety of foods in children under five only reached 69.0, it was still lower than the target by the Ministry of Health which is 80%. Based on the results of interviews with mothers of children under five, the consumption of various foods is still low, not reaching 80% of the target of the Ministry of Health. This is due to various factors such as the absence of an available market in the area and also inadequate access to transportation because the
from the mothers. This is due to the lack of breastmilk. Only 66.7% of babies getting exclusive breastfeeding in Libukang Mandiri Village, exclusive breastfeeding is still low. There are problems of only breastfeeding until the age of 6 months. Babies need nutritious food cooked and the food temperature is not too hot. Iodized salt should preferably be in a closed container and use iodized salt when cooking when the food is prepared. The iodine concentration in salt is maintained. Iodized salt is not resistant to hot temperatures and the use of an open container will cause the iodine in the salt to evaporate easily which causes the iodine concentration in salt to become smaller. Two brands or types of salt used by households that do not contain iodine after the iodine test is carried out. The iodine in salt test has been done by dripping method. If the salt has been dripped, there will be no color change in the salt. However, from the results of the analysis, there was no significant relationship between the use of iodized salt and the toddler nutrition status under five with a value of $p = 0.681$. This can be derived from the intake of sufficient protein, carbohydrate, and fat to meet the growth and development needs of children so that the use of iodized salt does not have a significant relationship to the nutritional status of children under five. Although there were (11.9%) children who did not consume iodized salt but they had a good nutritional status. The use of iodized salt is also accompanied by proper storage method so that the iodine concentration in salt is maintained. Iodized salt is not resistant to hot temperatures and the use of an open container will cause the salt to evaporate easily which causes the iodine concentration in salt to become smaller. Storage of iodized salt should preferably be in a closed container and use iodized salt when cooking when the food is cooked and the food temperature is not too hot.

In this study, it is known that there is a significant relationship between KADARZI behavior in the households and the nutritional status of toddlers. Better nutritional status of children under five was found more in families implementing KADARZI than in families who are not implementing KADARZI. This shows that the better the KADARZI family behaves, the better the nutritional status of the toddlers who live in it. KADARZI behavior is very important in realizing good nutritional status for toddlers so that toddler nutrition status is closely related to nutritionally conscious families; the family who are implementing KARDASI. This is in line with research conducted by Hartono, et al. (2017). The result found the relationship between nutrition-conscious family behavior (KADARZI) and clean and healthy living behavior in household arrangements with the nutritional status of toddlers aged 24-59 months. Research conducted by Wijayanti, et al. (2017) on the relationship found that a significant relationship between KADARZI behavior in the household level with the toddler nutrition status under five (p value = 0.04). It is recommended that health workers increase the socialization of KADARZI contention in family structures. It is also expected that health practitioners and families tag along to increase cross-program and cross-sector cooperation to achieve levels of content at the household level due to KADARZI implementation.

Conclusions and Suggestions

In this study, it can be concluded that there is a significant relationship between KADARZI behavior at the household level with the toddler nutrition status under five (p value = 0.04). It is recommended that health workers increase the socialization of KADARZI contention in family structures. It is also expected that health practitioners and families tag along to increase cross-program and cross-sector cooperation to achieve levels of content at the household level due to KADARZI implementation.
Ethical Clearance: The results of this study found that eating culture in the local area can affect eating patterns due to geographic conditions, thus impacting on food and energy use so that it affects changes in nutrition status.

Acknowledgement: We would like to thank the people and government of Luwu Timur Regency for their permission and big support to develop this research in the respective area.

Research Funding: Funds used during this research came from private funds.

Conflict of Interest: The author(s) declare that they have no conflict of interest.

References
Issues Arising from the Creation of Special Economic Zone in Southern Thailand: A Scoping Step of Rapid Health Impact Assessment

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Abstract

Background: Special Economic Zone (SEZ) policy of Thai government aimed to promote the economy in bordered provinces. Its establishment may cause concerns and impacts on communities. This article explores those issues arising from SEZ establishment in Southern Thailand.

Method: The scoping step of rapid health impact assessment process was applied using documentary research combined with qualitative descriptive approaches, including focus group discussions, interviews, and brainstorming. Data were collected from seventy participants, comprising government officials, local government officials, community leaders, public health volunteers, members of local organizations, and local residents. Content analysis was used to analyze the data.

Conclusion: The most important issues were found in four aspects—economic, social, environmental, and health. The economic aspect involved higher income and more employment opportunities, while for the environmental aspect, the issues were related to waste management and water pollution. The social issues comprised the build-up of traffic and the influx of migrant workers. The health issues were emerging/re-emerging infectious diseases, particularly from migrant workers and the insufficiency of health services. As a result, a rapid health impact assessment should be carried out based on these issues. It should be taken into consideration by local officials responsible for developing and regulating the SEZ.

Keywords: Scoping, rapid health impact assessment, special economic zone.

Introduction

Special economic zones (SEZ) is an economic development policy adopted in many countries¹. Its advantages are mainly economic, such as increasing foreign direct investment and export value. Furthermore, SEZs help generate employment and increase income for the local community²,³. However, SEZs also have negative impacts, such as the losses of agricultural or forest land and living space, causing residents to become landless, jobless, or income loss⁴–⁶. Other problems concern pollution from industrialization² and infectious diseases from immigrants⁷,⁸.

Health impact assessment (HIA) is a procedural tool for assessing health impacts, widely used in many countries, including Thailand⁹. Rapid HIA is a type of HIA that requires fewer resources and time, or there is little time available for decision making¹⁰,¹¹. HIA consists of six main steps: screening, scoping, assessing, reviewing, reporting, and monitoring and evaluation¹². In the scoping step, the key issues/topics relating to health concerns are identified by questioning the community residents or stakeholders about policies, projects, or activities¹³. The results from this step provide the
boundaries for the HIA, including 1) key topics/issues to consider, 2) populations and stakeholders affected, 3) geographical area covered, 4) timescale, and 5) tools or method for acquiring data\(^{(13)}\).

In Thailand, SEZs is a government policy, which aims to promote trade and investment, improve quality of life, and develop outlying provinces. Its implementation consists of creating industrial estates, facilities, and transportation networks, and logistical systems. These activities impact the health of local community residents. Thus, HIAs are indispensable for rapidly assessing health impacts by focusing on community concerns. The objective of this study was to conduct the scoping step for a rapid HIA to explore and identify community concerns or issues arising from the creation of the SEZ by using Songkhla SEZ in Southern Thailand as a case study.

**Study Area:** Songkhla SEZ was established since it is a highly developed area bordering Malaysia. Its area covers four sub-districts of Sadao district in Songkhla province, i.e., Sadao, Padang Besar, Samnak Kham, and Sumnak Taeo. The important goal of Songkhla SEZ can be summarized as ‘export processing industries and multimodal transport’\(^{(14)}\).

**Materials and Method**

This action research was conducted between January and July 2018. Documentary research and qualitative approaches were used for data collection, including focus-group discussions, face-to-face interviews and brainstorming techniques. Content analysis was implemented for all data.

**Documentary research:** Twenty-one documentaries related to SEZ impacts were reviewed. These impacts were collected using data extraction sheet and can be grouped in four aspects-economic, social, environmental, and health.

**Focus-group discussions:** Four focus group discussions were conducted in the four sub-districts. The participants comprised twelve community leaders, sixteen community residents, fourteen public health volunteers, two civil society officers, and six local government staff. They were asked with open-ended questions, i.e., ‘What do you expect from Songkhla SEZ?’ ‘What benefits will you or your community gain from Songkhla SEZ?’, and ‘What are the main economic/social/environmental/health problems in your community?’ Data was analyzed.

**Face-to-face interviews:** Face-to-face interviews were performed with six informants comprising three government officers, one academic, one local government staff, and one member of a non-government organization. The key informants were interviewed to gather information about the situation and impacts that may result from the SEZ using the same open-ended questions used for the focus-group discussions. Data were analyzed.

**Brainstorming Techniques:** A brainstorming session was conducted with 24 participants comprising four government officers, ten local government staff, six community leaders, two health volunteers, and two members of local organizations. Sub-group meetings and World Café method were employed to allow participants to voice, share, and discuss their opinions related to SEZ impacts. The issues were identified and prioritized by applying the Problem Prioritization Method. Data from brainstorming were analyzed.

**Data Credibility:** Methodological and data triangulation were used to ensure that the findings of the study provided useful results from different perspectives. Methodological triangulation was performed by using different method for gathering data. Data triangulation was conducted by using various data sources.

**Ethical Considerations:** This study was approved by the Health Human Research Ethics Committee of Health System Management Institute, Prince of Songkla University (EC 012/60).

**Results and Discussion**

SEZs are policies with potential socioeconomic, social, and environmental effects impinging on the health status of local people\(^{(15)}\). The issues arising from Songkhla SEZ were identified and prioritized within the scoping step of rapid HIA in four aspects: economic, social, environmental, and health.

**Economic Aspect:** Songkhla SEZ establishment benefits the community economically as it increases community income and provides employment for local inhabitants.

**Community Residents’ Income:** The community income should be increasing, as indicated in the following statements:
“It will stimulate the local economy. Local dwellers should have more income.” (Local government staff)

“More outsiders are coming, so the business is likely to be better” (Community resident)

Conversely, some opinions were stated that others, such as investors, would gain more income, as shown by the following:

“Investors will receive most benefit. We do not get any benefit.” (Community leader)

Community residents around SEZ areas generally expect to earn higher incomes. Mendoza found that cities in China with preferential policies for SEZs had higher income growth than other cities(16). While the growth in average workers’ remuneration in municipalities with SEZs was greater than that of cities without an SEZ(3).

Community residents’ employment: The community residents expected employment by the companies established in Songkhla SEZ. As one informant said:

“People in this area and nearby will be employed, get paid, and have a better living.” (Local government staff)

However, a different opinion was found, as the statement below:

“The investors and their capital have not brought any benefit to the communities.” (Local organization member)

SEZ has the potential to increase the local employment rate(17). However, SEZs in India required people who had special skills and expertise because most investments in SEZs were aimed at modern techniques and technologies(5). While, a large amount of employment was generated for low-skilled workers in some SEZs(18).

Social Aspect: Various issues were revealed, including the traffic problem, an influx of migrant workers, and illegal drug use. However, the community prioritized road traffic and an influx of migrant workers from Songkhla SEZ establishment.

Increase in road traffic: Heavy traffic congestion is now a problem in the Songkhla SEZ area, especially on the main road to immigration checkpoints, as can be seen from the statements below:

“There are a lot of articulated lorries waiting to pass through to Malaysia.” (Local government staff)

“There are often traffic jams, especially in the late afternoon, and this is our problem.” (Community leader)

Traffic is an important issue, especially in the area near to the border checkpoints with Malaysia. This problem is expected to increase and become worse for the communities. It is consistent with the International Institute for Trade and Development who found that community residents and entrepreneurs in the first five SEZs in Thailand were most concerned about traffic(2). Similarly, traffic congestion always follows when industrialization and urbanization occur in a city(19).

Influx of migrant workers: The influx of migrant workers was concerned since many outside workers could affect community safety and increase robberies, burglaries, and other crimes. As one said:

“When there are outsiders, there will be robbers, burglars, and crimes. Then, people in the community will not live peacefully anymore.” (Community leader)

It is consistent with other studies that a massive influx of migrant workers may cause problems, such as an increase in crime, fights and civil disturbances, and drug trafficking(2,7,8). Local government staff was much concerned about the safety of people and the protection of their property from migrant workers. Migrant workers also contributed to rapid population growth and an increase in the number of vehicles resulting in a higher volume of traffic and more road accidents(19).

Environmental aspect: The environmental concerns consisted of water pollution, air pollution, and waste and waste management. The issues ‘waste and waste management’ and ‘water quality’ were prioritized.

Waste and waste management: Waste and its management were the main issues in Songkhla SEZ area because there is only one sanitary landfill site with a fee charge in the area, as the following statements:

“We have a lot of garbage but we don’t have a place for disposal. We have to take our trash to disposal site and pay 50 Stang per kilogram or about 0.0014 USD per kilogram. That is over three hundred thousand baht (over nine thousand USD) a month.” (Local government staff)
“There will be waste from factories. How can it be managed? Where’s the dump site? How can it be treated? Who pays?” (Academic)

Waste and waste management issues were concerned because there is only one sanitary landfill site located in Sadao Municipality(20). This disposal site has been operated since 2000 and is expected to be available for the next 2-3 years(21). Samnak Kham Sub-district municipality was particularly concerned about waste because many restaurants, bars, and other entertainment venues are in the area.

Water quality: The water quality of U-taphao canal, a natural reservoir in the area, was another prioritized issue, as the statements below:

“This area is the water source of U-taphao canal. If we have factories that affect the environment, it will affect downstream.” (Local government staff)

“If the wastewater treatment system of factories is not sound, it will affect people. Initially, the water quality in U-taphao canal was not good. (Academic)

SEZs with industrial estates and other development projects may deteriorate water quality. In urban areas of Malaysia, residential, industrial, commercial, and recreational land-use activities have significant impacts on water quality(22). These development activities are a major source of water pollution and also affect groundwater(23). Besides, Nissaisuk found that the health of local residents around the eastern seaboard industrial development in Rayong province was affected by foul odors from industrial waste and chemicals leaking into the water supply(24).

Health aspect: Two issues were concerned, diseases brought in by migrant workers and the sufficiency, comprehensiveness, and readiness of the health service system.

Physical health: Local residents were concerned about diseases carried by migrant workers with either new infectious diseases or diseases that have been previously controlled in Thailand, such as malaria, tuberculosis, leprosy, and meningococcal disease, as indicated by the following:

“We worried about hemorrhagic fever. Sometimes diseases are brought into the area and spread here.” (Local government staff)
Acknowledgement: This article is a part of a thesis financially supported by the National Research Council of Thailand for 2018.

Conflict of interest: The authors declare that there is no conflict of interest.

References


2019;11(4):724.


Social Cognitive Intervention: Improving Coping Ability of Rural Adolescents with Educational Stress

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Abstract

Educational Stress affects both students’ mental health and physical health. Mounting demand of the society, and various academic requirements make some students to perceive education as stressful task. Particularly conditions of the students from the rural area are most vulnerable as they get lack of guidance and academic related support from their family. Students usually perceive high educational stress when they think that academic demands are unattainable or above their capacity. Objective of the current study is to find out the efficacy of social cognitive intervention in improving the coping ability of rural adolescent students with the educational stress. 100 students were selected as a sample from the rural area of Coimbatore district, Tamil Nadu by using purposive sampling method. Single group pre-test, post-test and follow up research design were used. Statistics used include mean, SD, repeated measure ANOVA and post-hoc were used to analyze the data. Results showed that rural adolescent students had gained their coping ability in educational stress after the social cognitive intervention.

Keywords: Educational Stress, rural adolescents, and social cognitive intervention.

Introduction

In India students from the rural area are still struggling to launch themselves into the mainstream of the society. Rural students are in the disadvantaged condition in terms of educational achievement, and career development. Transforming students from the underprivileged background to rapidly growing modern society is a challenging task. School is the crucial place for the rural students in which they can learn and acquire knowledge. The school education and education related activities may be strange or incompatible for many rural students. High expectation from the parents and examination related necessities are the major stressors among the rural students. Students are needed to meet various academic demands such as writing assignment, preparing for class tests and examination within the limited time period or simultaneously. As a result of their troubled adaptation toward school, they experience educational stress. Educational stress causes numerous problems include poor academic performance, mental health problems and physical problems. Often academic related stress become as a chronic stress.⁰ Educational stress affects the academic achievement of the students.²

Stress and Education: Academic learning is an important source of stress among students and it is high in the Asian countries³. As students experiencing educational related stress they will lose hope in their higher education that they wish to pursue. They determine themselves as unfit for the education and that they restrict themselves with the rural based jobs. Educational stress leads to a huge number of drop out of students from school happening in rural areas, therefore it is not a problem of student community alone but it has repercussions on the entire society. Students’ suicide is high in India particularly in Tamil Nadu this issue draws the wide attention since number of cases are high and which is related to the examination and grade. Rural adolescents are at the risk of developing depression and suicidal ideation due to the educational stress. Students with educational stress are likely to develop suicidal ideation⁴. Students from the rural areas may have skills and ability but their lack of stress coping ability affects their performance. Those who experienced educational stress have low achievement motivation⁵. We should have a clear policy in finding out to assist students, and then it would help many students to enter into right
career path. If bright and skillful students were restricted
themselves in simple village based jobs, then the society
will be suffer with inadequate human resource for many
professions. This problem of rural adolescents’ would
affect the human resource development of India.

Perceived outcome of examination is the important
predictor of the educational stress among the students. Education related stress affects Students’ interest
and perseverance. The high academic expectation
of parents leads to the maladaptive behavior of the
students. Health and wellbeing of the students are the
predictors of the academic success. Emond conducted
a study to find out the effect of academic stress on
adolescent students eating behavior. The results of
the study revealed that high academic stress is related
to the overeating behaviour. Brain regions including
ventromedial prefrontal cortex and amygdala which is
responsible to induce the eating desire is active during
the experience of academic stress. Subsequently student
with educational stress prefers to eat high calorie food.
Students experiencing examination related stress are
highly anticipated to the upcoming events.

Social Cognitive Intervention

Social cognitive intervention was developed based
on Bandura’s Social cognitive theory and Vygotsky’s
social developmental theory. Bandura proposed the
model called reciprocal determinism. In this model
behavior, cognition and other personal factors, and
environmental influences all operate as interacting
determinants that influence each other bidirectionally.
He also argued that each elements of reciprocal
determinism does not influence behavior equally, some
may be stronger than others. During the early years of
life, changes occur rapidly. People process and transform
passing experiences by means of verbal, imagination and
other symbols into cognitive models of reality that serve
as guides for judgment and action. Guided instruction
from others, verbal reinforcement and observing others
behavior effectively influence cognitive development
of the children. Self modeling video is the effective
technique to enhance the behavior and academic
participation of the school students. Modeling behavior
is useful for the basic life skills of adolescents with
developmental disorder. Schlichting revealed that self-
modeling video intervention significantly reduced the
public speaking anxiety of school students.

Method

Objective of the Study: Find out the efficacy of
social cognitive intervention on improving the coping
ability with educational stress of rural adolescent.

Hypotheses:
1. Rural adolescents’ pressure from study will be
   reduced after the social cognitive intervention
2. Rural adolescents’ Work Load will be reduced after
   the social cognitive intervention
3. Rural adolescents’ Worry about Grades will be
   reduced after the social cognitive intervention
4. Rural adolescents’ Self-expectation will be reduced
   after the social cognitive intervention
5. Rural adolescents’ Despondency will be reduced
   after the social cognitive intervention

Sample: 100 rural students studying 11th grade
were selected from the Government Higher Secondary
School located in rural area of Coimbatore district in
Tamil Nadu, sample included 50 male and 50 female
participants from underprivileged category. The
purposive sampling method was used to select the
sample. Inclusion criteria for selecting samples are first
generation school students and students from Scheduled
Caste (SC) Scheduled Tribe (ST) and Other Backward
Class (OBC). Exclusion criteria of students those whose
parents were educated and Students who were already
had exposure with similar training program.

Intervention: Social cognitive intervention was
developed in order to facilitate the rural students to
get exposure with new environment where they can
observe, imitate, and discuss the different skills and
behavior. During the intervention four method were
used as primary techniques namely modeling, role-
play, reinforcement, and feedback. Modeling videos
were shown with the theme of coping with educational
stress. Stories of great individuals those who have
overcome their stressful situation and achieved success
in their life were discussed. During the role play session
participants performed the play with the theme of coping
with educational stress. Facilitator gave feedback to the
role play performance in order to indicate the merits
and demerits of the strategy which was used by the
performers to cope with educational stress. Participants
those who performed most suitably in the role play were
reinforced by the facilitator. Socially guided learning will
encourage children to act self-directionally for dealing intelligently with difficult situations in future. Vygotsky argued that in the classroom, teachers have to provide space for peer instruction, collaboration, and small group interaction. Vygotsky believes that development is a lifelong process and social interaction is the major factor which predicts the individual’s cognitive development.

**Tools:**

- Educational stress Scale for Adolescents

**Research Design:** Single group Pre-test, Post-test, and follow up experimental method was used to identify the effectiveness of the social cognitive intervention.

**Statistics:** Mean, SD, ANOVA, Post hoc tests were used to analyze the data. SPSS 16 software was used to process the data.

**Results and Discussion**

The data collected analyzed and the results are discussed accordingly.

Table 1 Mean and SD of Educational Stress in Pre-test, Post-test and follow-up among the Rural Adolescents

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Pre-test</th>
<th></th>
<th></th>
<th>Post-test</th>
<th></th>
<th></th>
<th>Follow Up</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Pressure from Study</td>
<td>100</td>
<td>4.43</td>
<td>.671</td>
<td>2.30</td>
<td>1.124</td>
<td>1.69</td>
<td>.647</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work Load</td>
<td>100</td>
<td>4.46</td>
<td>.626</td>
<td>2.16</td>
<td>.662</td>
<td>1.54</td>
<td>.626</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Worry about Grades</td>
<td>100</td>
<td>4.57</td>
<td>.671</td>
<td>2.22</td>
<td>.799</td>
<td>1.69</td>
<td>.692</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-expectation</td>
<td>100</td>
<td>4.57</td>
<td>.655</td>
<td>2.21</td>
<td>1.047</td>
<td>1.62</td>
<td>.616</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Despondency</td>
<td>100</td>
<td>4.26</td>
<td>.872</td>
<td>2.21</td>
<td>1.047</td>
<td>2.12</td>
<td>1.018</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1 shows the mean differences of the participant’s academic pressure in pre-test, post-test and follow up in order to find out whether the skill-streaming intervention has made any impact on academic stress.

Pressure from study was $\bar{X}=4.23$ during the pre-test, after the intervention it got reduced with the mean value of 2.30 in the post-test. Follow up test was conducted after the three months gap from the time of intervention and there was a reduction in the mean value ($\bar{X}=1.69$). Work load which is perceived by the participants during the pre-test was $\bar{X}=4.46$ after the intervention they perceived it less ($\bar{X}=2.16$). Similarly they perceived less work load during the follow up ($\bar{X}=1.54$). Participants worry about grade was very high during pre-test with the mean score of 4.57 and their level of worry about grade was low in the post-test ($\bar{X}=2.22$). Their level of worry about grade reduced further during follow up test after the three months which revealed the mean score 1.69 and it is very less when compared to the mean scores of pre-test and post-test.

Table 1 shows that self-expectation of the students in the pre-test was $\bar{X}=4.57$ which was very high. The troubled self-expectation has been reduced after the intervention with the mean score of $\bar{X}=2.21$ and again in the follow up test self-expectation got highly reduced with mean score of 1.62. Likewise despondency of the student was very high in pre-test ($\bar{X}=4.26$) and in post-test there were a reduction ($\bar{X}=2.21$) in it. Follow up test shows that students’ level of despondency decreases ($\bar{X}=2.12$) however there was no notable difference between the mean of post-test and follow up.

Table 2: F Values for Pre-test, Post-test and Follow Up in Educational Stress among the Rural Adolescents

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Variable</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within group variance</td>
<td>Pressure From Study</td>
<td>413.887</td>
<td>1.802</td>
<td>229.625</td>
<td>308.592</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Work Load</td>
<td>473.360</td>
<td>1.925</td>
<td>245.879</td>
<td>611.465</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Worry about Grades</td>
<td>469.927</td>
<td>1.993</td>
<td>235.842</td>
<td>438.590</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Self-expectation</td>
<td>483.860</td>
<td>1.979</td>
<td>244.481</td>
<td>523.673</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Despondency</td>
<td>293.007</td>
<td>1.972</td>
<td>148.609</td>
<td>146.755</td>
<td>.000</td>
</tr>
<tr>
<td>Source of variation</td>
<td>Variable</td>
<td>Type III Sum of Squares</td>
<td>d.f.</td>
<td>Mean Square</td>
<td>F</td>
<td>Sig.</td>
</tr>
<tr>
<td>---------------------</td>
<td>------------------------</td>
<td>--------------------------</td>
<td>------</td>
<td>-------------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>Error</td>
<td>Pressure From Study</td>
<td>132.780</td>
<td>178.442</td>
<td>.744</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Work Load</td>
<td>76.640</td>
<td>190.592</td>
<td>.402</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Worry about Grades</td>
<td>106.073</td>
<td>197.262</td>
<td>.538</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Self-expectation</td>
<td>91.473</td>
<td>195.934</td>
<td>.467</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Despondency</td>
<td>197.660</td>
<td>195.195</td>
<td>1.013</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2 shows the results of ANOVA that there is a significant difference between the pre-test, post-test, and follow-up phases of academic stress that includes Pressure From Study, Work Load, Worry about Grades, Self-expectation, and Despondency. Further the post hoc comparison presented below gives a clear picture as to the significant differences that happened during the three phases of the study.

**Table 3 Post-Hoc test for Pre-test, Post-test and Follow up Phases in Educational Stress among the Rural Adolescents**

<table>
<thead>
<tr>
<th>Phase(I)</th>
<th>Phase(J)</th>
<th>MD</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure From Study</td>
<td>Pre-test</td>
<td>Post-test</td>
<td>2.13</td>
</tr>
<tr>
<td></td>
<td>Follow-up</td>
<td>Post-test</td>
<td>2.74</td>
</tr>
<tr>
<td></td>
<td>Post-test</td>
<td>Follow-up</td>
<td>0.61</td>
</tr>
<tr>
<td>Work Load</td>
<td>Pre-test</td>
<td>Post-test</td>
<td>2.30</td>
</tr>
<tr>
<td></td>
<td>Follow-up</td>
<td>Post-test</td>
<td>2.92</td>
</tr>
<tr>
<td></td>
<td>Post-test</td>
<td>Follow-up</td>
<td>0.6</td>
</tr>
<tr>
<td>Worry about Grades</td>
<td>Pre-test</td>
<td>Post-test</td>
<td>2.35</td>
</tr>
<tr>
<td></td>
<td>Follow-up</td>
<td>Post-test</td>
<td>2.88</td>
</tr>
<tr>
<td></td>
<td>Post-test</td>
<td>Follow-up</td>
<td>0.53</td>
</tr>
<tr>
<td>Self-expectation</td>
<td>Pre-test</td>
<td>Post-test</td>
<td>2.33</td>
</tr>
<tr>
<td></td>
<td>Follow-up</td>
<td>Post-test</td>
<td>2.95</td>
</tr>
<tr>
<td></td>
<td>Post-test</td>
<td>Follow-up</td>
<td>0.62</td>
</tr>
<tr>
<td>Despondency</td>
<td>Pre-test</td>
<td>Post-test</td>
<td>2.05</td>
</tr>
<tr>
<td></td>
<td>Follow-up</td>
<td>Post-test</td>
<td>2.14</td>
</tr>
<tr>
<td></td>
<td>Post-test</td>
<td>Follow-up</td>
<td>0.09</td>
</tr>
</tbody>
</table>

*Significant at 0.05 level

Table 3 shows the difference of pre-test, post-test and follow up with each other. Difference between the pre-test and post test of pressure from study was found to be significant (MD=2.13, p=.000). Significant difference was also found between the pre-test and follow up phase (MD=2.74, p=.000). Likewise difference between the post-test and follow up phase was also found significant (MD=.61, p=.000). Generally most of the adolescents were facing severe pressure as a result of mounting academic demands. From the students point of view many things are putting pressure on to them such as continuous class, time shortage, less time for sport and relaxation. After the social cognitive intervention they have perceived very less pressure. Techniques related to handling pressure have helped them to cope with academic pressure.

Difference between the pre-test and post-test was found to be significant (MD=2.30, p=.000) in the work load dimension of the educational stress. Similarly difference of the pre-test and follow up phase was found to be significant (MD=2.92, p=.000). Difference in the
Worry about grades got significantly reduced from pre-test to post-test phase (MD=2.35, p=.000). Similarly a comparison between the pre-test and follow up test phase revealed a significant (MD=2.88, p=.000) difference between these two tests. Likewise the post-test and follow up of worry about grades are significantly different (MD=.53, p=.000). Very high expectation from family, school and society toward a student make his/her thinking highly concerned about their grade or marks in the school. Particularly in India grades are considered as sole predictor of students' ability by the society. Therefore if there is any lacking in the grade then he/she will be labeled by the society as an 'unfit' person for successful career. This scenario will increase the worry of the students. In Tamil Nadu, students' suicide is frequently occurring incident because of low marks in public examinations. In the state a student committed suicide even before the results were announced, it costs his life just because of fear of low marks in upcoming 12th standard results. Brown, Johnson, and McPherson revealed that examination is the major cause for the academic stress of the students. Social cognitive intervention has reduced the students' worry about grade. Modeling and role play was performed with the theme of changing attitude toward grades followed by feedback from the facilitator which consisted with Logo therapy techniques including changing attitude toward conditions.

In the self-expectation dimension of the educational stress was found to be significant (MD=2.33, p=.000) when pre-test and post-test was compared. Likewise significant difference was found between the pre-test and follow up phase (MD=2.95, p=.000). Difference between the post-test and follow up was also found to be significant (MD=.62, p=.000). According to Rogers (1961) individuals those who are façade themselves in order to be an ideal person for others while failing to understand his/her own uniqueness will face mental health problems. Social cognitive intervention helped adolescents to improve their internal communication. They can understand their own uniqueness and potential, once their internal communication improves.

Students’ Despondency was found to be significantly different (MD=2.05, p=.000) while comparing the pre-test and the post-test. Difference was also found between the pre-test and follow up (MD=2.14, p=.000). There was no significant difference (MD=.09, p= NS) found between the post-test and follow up.

Since these students have uneducated or under educated parents that affect their relation with institutes. Students those who had parents without college education experience more stress than their counterpart those who have parents with college level education.

Internal communication improvement strategies and self-focused techniques were practiced by the participants during the examination in order to cope up with their despondency. Self-focused techniques will help to reduce the despondency of the students. Overall stress of the students was reduced significantly after the social cognitive intervention.

Stress is a major mental health problem of the adolescents and it affects the academic performance and leads to long term mental health problems. The risk of educational stress is that it is one of the major predictors of chronic stress. Academic stress is highly related to the eating related problems. Final exam stress is vulnerable to the students with asthma related problems. Academic stress is highly related to the internet addiction and negative emotions. Academic stress affects the students’ intrinsic motivation and improves the motivation. Students with skin picking behavior reportedly are affected by the Education related stress. Stress will inhibit the students from showing his/her ability on education and also stress will be a cause for dropping out from the school. Numerous researches have showed that education stress is a significant problem faced by the adolescent students. Particularly the cases of students from the rural area who are struggling to cope up with the stress are mostly related to their education. Lot of education related stress produces the short-term and long-term problems for the students. Therefore the educational stress should be reduced by providing necessary techniques to the students. Results of the present study showed that social cognitive intervention significantly reduced the educational stress.
related stress among the rural students. During the intervention students participated in intervention related actives including modeling, role-play, reinforcement and feedback with the theme of stress reduction and the results have proved that participants’ educational stress was significantly reduced. If the rural adolescents learnt to cope with the stress that they are facing in strange places and culture differences in school then they can meet the academic requirements like other students. Stress reduction programs are important to improve the academic performance of the high school students.  

Conclusions

Results supports that social cognitive intervention was effective technique in reducing the educational stress of the rural adolescents. Before the intervention students’ level of pressure from study, work load, worry about grades, self-expectation, and despondency was high. After the intervention they perceived very less in all the dimensions of the educational stress. As students acquired skills to cope up with educational stress they have perceived less educational stress after the intervention. Their coping ability with educational stress will help students to develop their mental health, and academic performance.

Implications:
• Social cognitive intervention can be implemented in the government schools were rural students are studying.
• Those Students who are preparing for public examination may undergo social cognitive intervention to tackle examination related stress.
• School psychologist can use the social cognitive intervention to students who are affected by the educational stress.
• Government and non-governmental organizations working in suicide prevention program may use the social cognitive intervention.

Ethical Clearance: Taken from Doctoral committee constituted by the University

Source of Funding: Self

Conflict of Interest: Nil

References


Utility of Spacing for Third Molar Teeth Along with its Eruption, for Determination of Age of an Individual: A Pilot Study

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Abstract

Background: Determination of individuality of person is one of the main objectives in any medico-legal examination. Age of an individual is one of the key indicators to establish identity. Eruption of third molar teeth is used frequently by forensic experts all over the world for age determination. Spacing for third molar is another known phenomenon and few studies have been done so far to establish its use in age determination. However we did not find any study to seek combined use of spacing for third molar and eruption of all third molar teeth, for age determination.

Aims and Objectives: To establish utility of spacing for third molar along with eruption of third molar in each socket for determination of age; and to devise an equation by using these characteristics to determine age.

Material and Methodology: Current study is descriptive observational type of a study, conducted on 201 consenting individuals of age ranging from 17 to 22 years, after applying inclusion criteria. Oral examination of individual was done and gathered information was later statistically analyzed using Microsoft excel.

Results: A linear regression equation – BJGMCFMT equation \( Y = 0.149 x + 15.57 \) is devised for age determination, by using unique scoring system for parameters like spacing for third molar tooth and its eruption.

Conclusion: Combined use of parameters like spacing for third molar and its eruption can be quantitatively used for age determination with certain amount of accuracy and precision.

Keywords: Third molar, spacing, age, BJGMCFMT equation, cumulative score.

Introduction

Identification means the determination of the individuality of a person. Article 6 of universal declaration of human rights states that everyone has the right to recognition everywhere as a person before the law. One of the factors helping in the complete identity of a person, either living or dead, is Age. The process of deterioration of different systems and morphology of the body occurs with aging of a subject. Resultant changes help us to determine the age of the person. Age of a person in the post-natal life can be estimated from physical or morphological features, laboratory test, teeth eruption, ossification activities and growth of bones. The estimation of age from teeth, with some degree of accuracy from after birth and during developing years by the presence of deciduous dentition and its stages of eruption, the period of mixed dentition, stages of eruption of permanent teeth can only be possible up to 17 to 25 years of age.
The time of eruption of the third molar tooth or wisdom teeth is more uncertain and it may also be impacted. After the eruption of second molar tooth the body of the jaw grows behind and ramus is elongated to make a room for the appearance of third molar tooth. Hence during the examination of minor for determination of his age a note should always be made as to whether there was space in the jaw behind the second molar teeth, if the third molar were absent. Overall prevalence of third molar impactions in the study population was only 27.4 percent. It mean around 72.6 had normal third molar eruption. This gives hint to use morphological parameters like third molar eruption and spacing for third molar, together, for age determination of an individual. Hence current study was performed on pilot basis to establish any utility of these parameters for age determination.

**Material**

Current study was done at Department of FMT, BJGMC and SGH Pune after approval of institutional ethics committee. It is a descriptive and observational type of study. The sample population for study was selected after applying following inclusion criteria.

**Inclusion Criteria:**

1. Individuals giving voluntary consent for oral physical examination.
2. Individuals not having any dental deformity/abnormality/injury or any of them.
3. Individuals in which second permanent molar tooth is erupted fully, in each socket.

Individuals satisfying criteria of inclusion were further examined and others were excluded from study.

**Methodology**

After taking consent from each individual, oral examination was done with the help of torch to illuminate posterior and darker portions of oral cavity. Details regarding appearance of retro-molar space and/or eruption of third molars in each half of maxilla and mandible were noted in master chart. Accordingly a fixed score was given to each parameter. (Table no. 1) Later for each individual a cumulative score was calculated by adding scores for different parameters. Thus, for an individual highest cumulative score was 40 and lowest was zero. The data was then analyzed using Microsoft excel.

**Results**

Present study was conducted on total 201 participants after applying inclusion criteria, of which 120 were males and 81 were females. (Table 2) Considering both sexes together, majority of participants were from age group of 20 - <21 years (29.85%), followed by 19 - <20 years (25.87%). (Table 2)

To find whether there is any significant difference between means of cumulative scores calculated for each age group, ANOVA test was performed. ANOVA test suggested P value of less than 0.01, meaning highly significant difference between means. Further as ANOVA test yielded significant results, to find correlation between age and cumulative scores, coefficient of correlation and coefficient of determination was calculated using Microsoft Excel, which showed value of coefficient of correlation as 0.98 and coefficient of determination as 0.96 (Table 3). Both these values suggest highly significant positive correlation between age groups and cumulative scores. This means with increase in cumulative score there is an increase in age. Hence regression analysis of the data was done, which yielded regression equation stating linear correlation between parameters under study. Henceforth, the regression equation is named as BJGMCFMT equation and is as follows,

\[ y = 0.149 x + 15.57. \]

Where ‘y’ is ‘dependent variable’ i.e. age in years, ‘x’ is ‘independent variable’ i.e. cumulative score and constant of equation (b) is 0.14. It means for every unit rise in ‘x’ (cumulative score), there is 0.149 unit rise in ‘y’ (Age in years).

**Table 1: Scoring System**

<table>
<thead>
<tr>
<th>Sr No</th>
<th>Parameter</th>
<th>Cumulative Scoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>No spacing/Spacing absent</td>
<td>0</td>
</tr>
<tr>
<td>02</td>
<td>Spacing present</td>
<td>2.5</td>
</tr>
<tr>
<td>03</td>
<td>Third molar erupting</td>
<td>5</td>
</tr>
<tr>
<td>04</td>
<td>Third molar erupted completely</td>
<td>10</td>
</tr>
</tbody>
</table>
Table 2: Age and Sex wise distribution of cases.

<table>
<thead>
<tr>
<th>Sr No</th>
<th>Age</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>Percentage (n=201)</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>17 - &lt;18</td>
<td>10</td>
<td>13</td>
<td>23</td>
<td>11.44</td>
</tr>
<tr>
<td>02</td>
<td>18 - &lt;19</td>
<td>19</td>
<td>13</td>
<td>32</td>
<td>15.92</td>
</tr>
<tr>
<td>03</td>
<td>19 - &lt;20</td>
<td>37</td>
<td>15</td>
<td>52</td>
<td>25.87</td>
</tr>
<tr>
<td>04</td>
<td>20 - &lt;21</td>
<td>32</td>
<td>28</td>
<td>60</td>
<td>29.85</td>
</tr>
<tr>
<td>05</td>
<td>21 - &lt;22</td>
<td>22</td>
<td>12</td>
<td>34</td>
<td>16.92</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>81</td>
<td>201</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

Table 3: Table of statistical analysis.

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Age group (in years)</th>
<th>Total no</th>
<th>Mean + S.D For cumulative score</th>
<th>Coefficient of variation (C. V.)</th>
<th>ANOVA–P</th>
<th>Coefficient of correlation (r)</th>
<th>Coefficient of determination (R²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>17 - &lt;18</td>
<td>23</td>
<td>8.91 +1.47</td>
<td>0.16</td>
<td>&lt;0.01</td>
<td>0.98</td>
<td>0.96</td>
</tr>
<tr>
<td>02</td>
<td>18 - &lt;19</td>
<td>32</td>
<td>16.4+4.25</td>
<td>0.25</td>
<td>0.10</td>
<td>0.21</td>
<td>0.21</td>
</tr>
<tr>
<td>03</td>
<td>19 - &lt;20</td>
<td>52</td>
<td>23.94+2.54</td>
<td>0.10</td>
<td>0.21</td>
<td>0.21</td>
<td>0.21</td>
</tr>
<tr>
<td>04</td>
<td>20 - &lt;21</td>
<td>60</td>
<td>32.08+6.68</td>
<td>0.21</td>
<td>0.21</td>
<td>0.21</td>
<td>0.21</td>
</tr>
<tr>
<td>05</td>
<td>21 - &lt;22</td>
<td>34</td>
<td>33.3+8.86</td>
<td>0.26</td>
<td>0.26</td>
<td>0.26</td>
<td>0.26</td>
</tr>
</tbody>
</table>

Graph 1: Regression analysis of mean age in years versus cumulative score.

Discussion

From 14 to 20 years, dental age estimation is based upon, the stage of development of third molar. There is much variation in these, and the accuracy of dental age estimation during this period varies by about, plus/minus three years. In one of the studies it is suggested that the third molar to an extent, is a reliable indicator for age estimation in adolescents and adults.

Considering the prevalence of eruption of third molar, one of the study conducted on population of 180 students between age group of 17 -24 showed that, 3.33 percent of third molar are congenially missing, approximately 94% of subjects had all four third molars, 2.78 percent had three molar, 1.11 percent had two third molar, and 0.5 percent had one third molar with 1.67 % having agenesis of all third molar. This means a large
number of population shows eruption of third molars. It is also known that body of jaw grows posteriorly and ramus is elongated after eruption of second molar teeth.7

Thus along with third molar eruption, spacing for third molar is an important morphological feature, for age estimation; especially in places where radiological facilities are not available to comment on impacted third molars. Eruption of third molar is part of dental growth process and it does not occur at same time and pace in each socket. This makes appearance of spacing for third molar an important parameter to look after for age determination. Secondly considering details of spacing for third molar tooth and eruption of third molar tooth in each socket collectively makes it more stringent activity for good amount of precision and accuracy. Hence in present study, a scoring system was devised including parameters like third molar eruption as well as presence of spacing for third molar in each socket.

In research, there are the different method of measuring data to be analyzed. The reason for these is to measure the level of dispersion. Dispersion is the tendency of values of variable to scatter away from the mean or midpoint.10 It is known fact that large value of standard deviation is an indication that the data points are far from their mean (or far from each other), while a small value indicates that they are clustered closely around their mean.11 Considering statistical analysis of present study, standard deviations for age groups 17 to <20 years is lower, as compared to that of for 20 to <22 years. (Table 3).

Coefficient of variation, measures the variability of a series of numbers, independently of the unit of measurement, used for these numbers.12 Higher the coefficient of variation, greater the level of dispersion around the mean. If the value measure one (or 100%), standard deviation equals mean. In present study C.V is less than one for all age groups, which means standard deviation is less than mean; i.e. lesser degree of variability.

Where there is linear relationship between two variables, there is said to be a correlation between them. The strength of that relationship is given by Correlation coefficient (r). Value of r between 0.8 to 1, is said to have very high correlation. R^2 value closer to 1 is also suggestive of higher correlation.13 In the present study ‘r’ value is 0.98 and ‘R^2’ value is 0.96.

Presence of all the four third molars indicate that the subject is over 18 years of age, but their absence gives no certain idea about age.5 In the present study eruption of all four third molar teeth gives a score of 40, which if incorporated in the BJGMCFMT regression equation, yields age as 21.53 years of age, i.e. more than 18 years.

Considering all these statistical facts, current pilot study can be considered as statistically significant study showing reasonable amount of correlation between parameters under study.

**Conclusion**

From current study it is concluded that, morphological features like third molar tooth eruption along with spacing for third molar, together can be used for age estimation with the help of statistically formulated regression analysis, with reasonable amount of accuracy and precision.

**Limitations of Study:**

1. Current study has not commented about any effect of parameters like nutritional status of an individual on cumulative score and age.
2. For scoring of different parameters, only end parameters have been chosen for scoring.
3. Study is conducted on small population size.

**Conflict of Interest:** Nil

**Source of Funding:** Nil

**Ethical Clearance:** Obtained from IEC.

**Reference**


Association between Behavioural Psychological Symptoms of Dementia and Caregiver Burden in a South Indian Rural Community

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Abstract

Background: Behavioural and psychological symptoms of dementia (BPSD) and caregiver burden are two major issues in dementia patients. This study was conducted to estimate the association of BPSD with caregiver burden in patients with dementia living in a south Indian community.

Method: In a cross-sectional study done in Thalikkulam village, Kerala, 71 elderly of minimum 60 years and living with a primary caregiver for minimum one year were first selected with purposive sampling and screened with Brief Community Screening Instrument for Dementia. Then BPSD and caregiver burden were measured by Neuropsychiatric Inventory Questionnaire and Zarit Burden Interview respectively.

Result: Statistical analysis revealed that all patients (100%) experienced at least one BPSD and apathy (76.1%), delusion (74.6%) and agitation (70.4%) were the most common BPSD reported. Majority (93%) of caregivers reported caregiver burden. Strong positive correlation (p>0.05) was found between BPSD scores and caregiver burden scores.

Conclusion: The study found that BPSD and caregiver burden is common among community dwelling patients with dementia and have significant association with various socio demographic variables. This study recommends that while identifying dementia in community, health professionals need to focus on management of BPSD and caregiver burden which can influence the outcome of dementia.

Keywords: Behavioural and psychological symptoms of dementia (BPSD); Caregiver burden; rural community; Elderly; South India.

Introduction

The proportion of older persons to global population will increase from 8.5% today to more than 21% in 2050.¹ Approximately 20% of elderly suffer from a mental disorder and dementia is the second commonest of these.² Dementia is an overall term that describes a group of symptoms associated with a decline in memory or other thinking skills severe enough to reduce a person’s ability to perform everyday activities. Worldwide, around 50 million people have dementia³ and every year, there are nearly 10 million new cases, equivalent to one new case of dementia in every 3.2 seconds are being diagnosed.⁴ It was the fifth leading cause of global death in 2016.⁵ Indian elderly population is currently the second largest in the world and there were 3.7 million elderly in India with dementia in 2010 and projected to rise to 7.6 million by 2030.⁶ South Indian states have the highest proportion of elderly in the country with Kerala at the peak with 12.6%.⁷ Thus south Indian states will be going to witness a significant rise in dementia cases in the coming years.

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Behavioural and psychological symptoms of dementia (BPSD) are heterogeneous range of psychological reactions, psychiatric symptoms and behaviours and are found in 90% patients with dementia. BPSD are distressing and difficult to manage, and have been associated with a poorer prognosis, faster illness progression, greater impairment in activities of daily living, increased hospitalization, and loss of quality of life for patients and their families.8

Caregiver burden is defined as a multidimensional response to the negative appraisal and perceived stress resulting from taking care of an ill individual. It threatens the physical, psychological, emotional and functional health and increases morbidity and mortality of the caregiver. More than 80% of dementia caregivers frequently reported high levels of stress and half of them were suffering from depression and anxiety,(Cooper C et al. 2014)9 Not much recent studies were found on the BPSD and caregiver burden among dementia patients in south India. This study was conducted to find the association between BPSD and caregiver burden among patients living in a south Indian rural community.

Materials and Method

An non-experimental descriptive cross-sectional design was adopted in this study. Elderly individuals living in Thalikkulam village of Thrissur district were screened with CSID BRIEF. Sample size was calculated using the formula and those who scored six or less in CSID BRIEF was selected by purposive sampling method. Seventy one elderly of more than 60 years of age and are living with a primary caregiver for a minimum of last one year were included in the study. Elderly who were diagnosed with vascular dementia or severe physical or psychiatric illnesses were excluded from the study.

Data collection tools: Brief Community Screening Instrument for Dementia (CSID-BRIEF):It has 13 self report items with two subscales and developed by Hall et al10 Cognitive subscale has seven questions which checks recall, comprehension and orientation of patients. Informant subscale has six questions for caregivers. On the basis of total scores elderly were categorized to no dementia, probable dementia and dementia. Elderly belonged to dementia and probable dementia was selected for the study. The tool has good diagnostic accuracy, sensitivity, specificity, content validity (CVI-0.90-0.95) and test retest reliability (r-0.92).(Prince M et al. 2011).11

Socio demographic variables were assessed by a 16 item self-report tool developed by the researchers. The tool reported a good content validity (CVI 0.75-0.85).

Neuropsychiatric Inventory Questionnaire (NPI-Q):It is an informant interview based instrument by JL Cummings.12 It measured the presence, severity as well as informant distress of twelve BPSD sub domains. NPI-Q reported good sensitivity, specificity, internal consistency,13 content validity (CVI 0.95- 0.98) and inter-rater reliability (r-0.87).

Zarit Burden Interview: It is a 22 item scale by Zarit et al14 and total score ranges from 0 to 88 and categorized to little or no burden, mild to moderate burden, moderate to severe burden and severe burden. The scale has good internal consistency, intra-class correlation, (Seng BK et al. 2010)15 content validity(CVI 0.85- 0.95) and test–retest reliability (r-0.88).

Findings: While doing descriptive analysis, it was found that most (75%) of the patients were females with a mean age of 80.03+7.67years and 64.8% of them were educated up to primary school. Mean duration of dementia was 38.04 months. The mean age of the caregivers was 50.38+13.21 years and most (98.6%) of them were females and 36.6% of them were educated up to primary school.

BPSD and caregiver burden: Fig 1 shows the distribution of BPSD severity and distress among the patients reveals that apathy (76.1%), delusion (74.6%) and agitation (70.4%) were the most common and severe BPSD found among the patients. At the same time, apathy (74.6%), and delusion (70.4%) were the most common distress producing symptoms. As shown in fig 2, 93% caregivers reported some form of burden and out of that,14% experience severe burden.

While analysing association, we found a strong positive correlation between BPSD severity and BPSD distress (Spearman’s correlation, p<0.05) among all sub domains. We also found that caregiver burden was positively correlated with BPSD total, delusion, hallucination, agitation, disinhibition, irritability, motor disturbances and night time disturbances. (Table 1).
**BPSD, caregiver burden and socio personal variables:**

Table 1 describes the association between BPSD and socio personal variables shows that age was positively correlated with hallucination and nighttime behaviour, duration of dementia was correlated with delusion, hallucination, motor disturbances and night time disturbances (Spearman’s correlation, \(p<0.05\)). Analysis also revealed that hallucination and motor disturbances were significantly associated with patient’s gender and hallucination, euphoria and motor disturbances was associated with patient’s marital status (Mann Whitney U, \(p<0.05\)). When analysed with Kruskal Wallis H test, we found that agitation and disinhibition was significantly associated with type of family, hallucination and agitation were significantly associated with type of caregiver and delusion and irritability were significantly associated with type of accommodation of patients (\(p<0.05\)). (Table 2).

Caregiver burden was found to be positively correlated with duration of dementia and with delusion, hallucination, agitation, depression, apathy, disinhibition, irritability, motor disturbances and night time disturbances (Spearman’s correlation, \(p<0.05\)). Care giver burden was found to be different in different levels of dependence (Kruskal Wallis H test, \(p<0.05\)).

**Table 1: Association between BPSD severity and distress, caregiver burden and socio personal variables**

<table>
<thead>
<tr>
<th>BPSD Severity</th>
<th>BPSD Distress</th>
<th>Caregiver burden</th>
<th>Age</th>
<th>Duration of dementia</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(r)(</td>
<td>p)</td>
<td>(r)(</td>
<td>p)</td>
</tr>
<tr>
<td>BPSD total</td>
<td>0.96*</td>
<td>0.58*</td>
<td>0.07</td>
<td>0.54</td>
</tr>
<tr>
<td>Delusion severity</td>
<td>0.88*</td>
<td>0.42*</td>
<td>-0.10</td>
<td>0.40</td>
</tr>
<tr>
<td>Hallucination severity</td>
<td>0.98*</td>
<td>0.36*</td>
<td>0.26*</td>
<td>0.03</td>
</tr>
<tr>
<td>Agitation severity</td>
<td>0.91*</td>
<td>0.39*</td>
<td>-0.11</td>
<td>0.38</td>
</tr>
<tr>
<td>Depression severity</td>
<td>0.92*</td>
<td>0.23</td>
<td>-0.09</td>
<td>0.48</td>
</tr>
<tr>
<td>Anxiety severity</td>
<td>0.96*</td>
<td>0.14</td>
<td>-0.03</td>
<td>0.83</td>
</tr>
<tr>
<td>Euphoria severity</td>
<td>0.97*</td>
<td>0.18</td>
<td>0.14</td>
<td>0.23</td>
</tr>
<tr>
<td>Apathy severity</td>
<td>0.91*</td>
<td>0.22</td>
<td>0.03</td>
<td>0.82</td>
</tr>
<tr>
<td>Disinhibition severity</td>
<td>0.94*</td>
<td>0.50*</td>
<td>-0.12</td>
<td>0.32</td>
</tr>
<tr>
<td>Irritability severity</td>
<td>0.93*</td>
<td>0.30*</td>
<td>-0.11</td>
<td>0.36</td>
</tr>
<tr>
<td>Motor Disturbances severity</td>
<td>0.99*</td>
<td>0.28*</td>
<td>0.16</td>
<td>0.20</td>
</tr>
<tr>
<td>Night time behavior severity</td>
<td>0.94*</td>
<td>0.38*</td>
<td>0.26*</td>
<td>0.03</td>
</tr>
<tr>
<td>Appetite changes severity</td>
<td>0.93*</td>
<td>-0.02</td>
<td>0.90</td>
<td>0.56</td>
</tr>
</tbody>
</table>

*\(p>0.05\)

† Spearman’s correlation

**Table 2: Association between BPSD severity and socio personal variables**

<table>
<thead>
<tr>
<th>BPSD Severity</th>
<th>Gender</th>
<th>Marital status</th>
<th>Type of family</th>
<th>Type of caregiver</th>
<th>Type of accommodation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Z)(</td>
<td>p)</td>
<td>(Z)(</td>
<td>p)</td>
<td>(\chi^2)(</td>
</tr>
<tr>
<td>BPSD total</td>
<td>-1.31</td>
<td>0.19</td>
<td>-1.54</td>
<td>0.12</td>
<td>2.70</td>
</tr>
<tr>
<td>Delusion severity</td>
<td>-0.36</td>
<td>0.72</td>
<td>-0.37</td>
<td>0.71</td>
<td>1.82</td>
</tr>
<tr>
<td>Hallucination severity</td>
<td>-2.07*</td>
<td>0.04</td>
<td>-1.93*</td>
<td>0.05</td>
<td>0.35</td>
</tr>
<tr>
<td>Agitation severity</td>
<td>-0.87</td>
<td>0.39</td>
<td>-0.53</td>
<td>0.60</td>
<td>6.40*</td>
</tr>
<tr>
<td>Depression severity</td>
<td>-1.71</td>
<td>0.09</td>
<td>-0.38</td>
<td>0.70</td>
<td>2.57</td>
</tr>
<tr>
<td>BPSD Severity</td>
<td>Gender Z</td>
<td>p</td>
<td>Marital status Z</td>
<td>p</td>
<td>Type of family $\chi^2$</td>
</tr>
<tr>
<td>------------------------</td>
<td>----------</td>
<td>----</td>
<td>------------------</td>
<td>----</td>
<td>------------------------</td>
</tr>
<tr>
<td>Anxiety severity</td>
<td>-0.92</td>
<td>0.36</td>
<td>-0.98</td>
<td>0.33</td>
<td>4.91</td>
</tr>
<tr>
<td>Euphoria severity</td>
<td>-0.97</td>
<td>0.33</td>
<td>-2.01*</td>
<td>0.04</td>
<td>0.46</td>
</tr>
<tr>
<td>Apathy severity</td>
<td>-0.99</td>
<td>0.32</td>
<td>-1.18</td>
<td>0.24</td>
<td>1.34</td>
</tr>
<tr>
<td>Disinhibition severity</td>
<td>-0.38</td>
<td>0.71</td>
<td>-0.78</td>
<td>0.43</td>
<td>8.09*</td>
</tr>
<tr>
<td>Irritability severity</td>
<td>-0.64</td>
<td>0.52</td>
<td>-0.68</td>
<td>0.50</td>
<td>3.51</td>
</tr>
<tr>
<td>Motor Disturbances</td>
<td>-1.99*</td>
<td>0.05</td>
<td>-3.06*</td>
<td>0.002</td>
<td>0.22</td>
</tr>
<tr>
<td>severity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Night time behavior</td>
<td>-1.269</td>
<td>0.21</td>
<td>-1.79</td>
<td>0.07</td>
<td>2.52</td>
</tr>
<tr>
<td>severity</td>
<td>-1.622</td>
<td>0.11</td>
<td>-0.61</td>
<td>0.54</td>
<td>2.67</td>
</tr>
</tbody>
</table>

*p>0.05

Mann Whitney U § - Kruskal Wallis

Fig 1: Distribution of BPSD severity and distress among patients with dementia
Discussion

This study is one among the few studies which examined the pattern of BPSD and caregiver burden among dementia patients in south India. It was ascertained that persistence of BPSD is associated with subsequent caregiver burden which needs further prospective exploration.

In our sample, mean age of patients was 80.03 years and 75% of them were females. Such percentages are similar to those reported in another study by Brunelle HL et al.\textsuperscript{16} Since the risk for dementia increases with age, most of the dementia studies reported a mean age of 75 to 85 years. As life expectancy of women is higher; most of the studies reported an increased percentage of females having dementia which is also confirmed by present study. Caregivers’ demographic characteristics also were matching with study findings by Kim Het al.\textsuperscript{17} Being a developing country, India has a conventional family system where women in family as the prominent caregiver is being reflected in this finding. 35.2% of patients were fully dependent compared to 50% in a previous study which indicates our study population is more independent.\textsuperscript{18}

The distribution of most common BPSD symptoms in a study by Baharudin AD et al\textsuperscript{19} such as apathy, irritability and agitation is fairly matching with the current study findings. Hsu TJ et al\textsuperscript{20} reported rarely found BPSD symptoms were mainly euphoria, motor disturbances, appetite changes and hallucinations which is also confirmed by the current study findings. There are findings that motor disturbances is also a common BPSD but the current study didn’t support this. However, this study’s finding confirms the universality of pattern in BPSD across the populations. This study also gives the understanding that apathy and agitation are the most common problem the family has to deal with. Current study reported a mean score of 42.25 in ZBI unlike studies which reported a mean score below 30, which points out that burden is found to be high in current study population which could be also because of social factors where caregivers are responsible for household works as well as rearing of children in addition to caregiving.\textsuperscript{19}

Current study confirmed that BPSD severity and distress are strongly correlated with caregiver burden similar to the reports of previous studies. Current findings can be interpreted that as age progresses, hallucination and night time behaviours tend to increase. Sensory deprivation and disturbed sleep due to ageing may add to the symptoms. But there are a few studies which contradicts the present study findings. Our findings also revealed that, like previous studies, delusion, hallucination, motor disturbances, and night time behaviour severity increases as dementia progresses\textsuperscript{21}. Thus caregivers shall be educated that they should expect BPSD to be increased as dementia advances. There
was a difference in hallucination, euphoria and motor disturbances severity between married and widowed patients. This could be a result of loss of partner, delayed grief, bereavement and loneliness in widowhood. There was a difference between nuclear family and joint family in agitation and disinhibition severity. This could be because of decreased perceived support and increased loneliness experienced by patients and caregivers in nuclear families. It was found that delusion and irritability severity was high in patients living at children’s home. This could be due to difficulty in retaining new memories of changed home environment and anxiety of being in an unknown place. In the current study, hallucination was found to be higher in patients looked after by daughter-in laws and higher agitation in patients looked after by spouses. This is in contrary to the findings of a previous study which said that no association was found between BPSD and type of caregivers. We can assume that less familiar caregivers like daughter-in-law may be a reason for hallucination and perceived freedom towards spouses might have increased the agitation.

Caregiver burden was found to be increased with duration of dementia. It adds to the current knowledge that burden increases with duration of caregiving. It can be explained in view of physical and mental exhaustion along with decreased support and increased financial burden for the caregiver as time progresses. Burden was found to be high in caregivers of fully dependent patients. It is expected as in addition to dementia care, caregivers were also supposed to do the palliative care of the patients which further increase the burden. No relationship was found with other sociopersonal variables of patients or caregivers.

Conclusion

The present study from Kerala shows that BPSD and caregiver burden is common among patients with dementia living in community. BPSD severity, distress and caregiver burden are strongly correlated to each other.

This study findings emphasise the need of screening of elderly for BPSD at community level. It also suggests the training of community health workers for identifying BPSD and also to teach patients and family how to manage them at home setting and also to support caregivers to reduce the burden. Improvising existing primary health care to elderly friendly especially to dementia clients is needed. Moreover, more research needs to be conducted on effect of pharmacological and non-pharmacological measures on BPSD and caregiver burden.

This study used purposive sampling which might have resulted in over or under representation of the symptoms. Another limitation is that the report of clinical diagnosis of dementia was lacking in many patients which we tried to minimize by cross checking the treatment documents.

This study helped to understand the magnitude of BPSD and caregiver burden among dementia patients living in community and their associated factors. It will help to plan and implement appropriate strategies to manage BPSD and caregiver burden in patients through training of community health workers and forming health care policies.

Conflicting Interest (If present, give more details): Nil

Source(s) of Funding: Self

Ethical Clearance: The research proposal was submitted to the institutional ethics committee and obtained permission. (IEC NO.B1/312/2015/CONTSR(2) Dated 15.07.2015).

References


Wife’s Support, Access to Health Services, Availability of Competent Health Personnel and Infrastructure and Intention to Have a Vasectomy for Married Men

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Abstract

Family planning (FP) including vasectomy has positive effects in terms of viable socio-economic development and in reducing maternal deaths. The percentage of married men who use condoms (3%) is higher than the percentage who choose vasectomy (less than 1%). The study was conducted in the Madiun town administration using a community-based cross-sectional study design. The town is found in East Java Province, Indonesia. The total sample of this study is 323 married man with fixed disease sampling. Age of wife, wife’s support for vasectomy family planning, access to vasectomy family planning health services and availability of health resources and health infrastructure for vasectomy family planning relates to the selection of men to use vasectomy. In general, vasectomy is seen as one of the least preferred method of family planning and is associated with fear and weakness.

Keywords: Family planning, structural equation model, theory planned behavior, vasectomy.

Introduction

The impact of the demographic bonus on economic growth and development has resulted in an increase in public saving and national saving, which leads to a better level of social welfare. Judging from the current demographic structure of Indonesia, in 2020-2030 Indonesia has the opportunity to experience a demographic bonus. The country of Indonesia will have around 180 million people of productive age, while those who are not productive will reduce to 60 million people. This means that 10 people of productive age will bear 3-4 people of non-productive age¹. This high number of people might result in a decrease in Growth Domestic Product (GDP) and increased pressure on resource distribution². It is also affected by high maternal morbidity and mortality related to unintended and unwanted pregnancies. The goal of family planning all over the world has attracted attention due to its importance in decision making about population growth and development issues³. Worldwide, using contraceptives potentially reduced maternal mortality by 44%⁴. Family planning (FP) including vasectomy has positive effects in terms of viable socio-economic development and in reducing maternal deaths⁵. Contraception has clear health benefits since the prevention of unintended pregnancies results in a subsequent decrease in maternal morbidity and mortality⁶.

Regrettably, most family planning programs in Indonesia have mostly targeted women, and men often do not take part in reproductive health matters. The male participation rate in using contraceptives in Indonesia is still very low, namely only 2.1% of male family planning participants and they generally use condoms. This percentage is lower when compared to other countries, such as Iran (12%), Tunisia (16%), Malaysia (9-11%), even in the United States it reaches 32%. Very few men want to use contraceptives, either condoms or vasectomy. Of the total number of family planning...
acceptors in Indonesia, around 97% are women. Therefore, the socialization of family planning programs among men must be increased\(^7\). The target of male family planning acceptors is 4.3% based on the strategic plan of the National Population and Family Planning Agency of Indonesia 2015-2019. The participation of men in East Java as family planning acceptors is only 1.66% (Puspita, 2019). Based on data from the health profile of the city of Madiun, the coverage of active family planning participants in 2018 was 67.7%, which is 20,335 participants from a total of 30,038 PUS (BPS estimation projections). When compared with the real fertile age couples, which was 26,241 couples of reproductive age, the coverage of active family planning participants was 77.19%. When compared with the achievements in 2017, active family planning participants were 77.2%, experiencing a decrease. Based on data on contraceptive use in active family planning participants in Madiun City in 2018, it was found that only 0.9% used the male surgery method\(^8\).

One way to foster male involvement in family planning is to provide couples more contraceptive choices through the promotion of male-oriented method including vasectomy. Vasectomy is a safe, simple, and effective method that is comparatively under used throughout the world. Although sterilization is the most widely used contraceptive method worldwide, tubal ligation accounts for more than five times as many procedures as vasectomy\(^9\)\(^–\)\(^12\). Vasectomy is a surgical method used in men to cut off the vas deferens. The vas is a tube that delivers sperm from the testicles. The purpose of vasectomy is to provide permanent birth control for men who do not want more children\(^13\). It is a permanent method of family planning, which is quite acceptable in many developed countries of the world\(^13\),\(^14\). However in Indonesia, there are still prevailing barriers to its acceptance by married men\(^7\). Worldwide 19% of women in combination are sterilized (through tubal ligation) versus 2.4% men by vasectomy\(^9\).

Different reviewed literature reports showed that the intention to use vasectomy was associated with different variables\(^15\)\(^–\)\(^18\). Age, educational status, occupation, religion, Cultural beliefs, societal norms, lack of knowledge about the procedure for a vasectomy, and misconceptions were found to be predictors of intention to use vasectomy. In addition, the duration of married time, number of living children, complete family size, the future desire of more children, accessibility of service, level of knowledge, and attitude of men towards vasectomy have an influence on intention to use vasectomy\(^18\)\(^–\)\(^21\). Based on the previous studies conducted on acceptance of vasectomy, this study is aimed at describing the factors affecting the intention to accept vasectomy among married men in East Java, Indonesia.

**Method**

The study was conducted in the Madiun town administration using a community-based cross-sectional study design. The town is found in East Java Province, Indonesia. The sampling method used for the case group and the control group is fixed disease sampling, which is a sampling scheme based on the disease status of the subject, which is diseased or has no disease studied, while the subject’s exposure status varies according to the subject’s disease status\(^22\). The estimated number of cases and control groups uses a ratio of 1:3 in each case. The case group in this study was the husband who was willing to be a vasectomy acceptor with a total of 85 married men while the control group was taken from a husband who did not use a vasectomy with a total of 248 married men. The total sample of this study was 323 married men. All of the questionnaires were prepared in Indonesian. The variables used in this study were wife’s support for vasectomy family planning, access to vasectomy family planning health services and availability of health resources and health infrastructure for vasectomy family planning. All questionnaires used in this study were valid for use\(^23\). Data were collected from January to February 2020. Tables, frequencies, and proportions are used to present the data. The association between dependent and independent variables was determined using the structural equation model. Logistic regression analysis was performed to analysis data.

**Results**

Characteristics of married men following the study are addressed in Table 1. Overall 323 married men were 45.5 years of age, where the average age of marriage was 26.5 years. The average age of a married man’s wife is 40.5 years. 65.63% of married men have a high school education level and 0.62% are out of school. 33.44% of married men’s jobs are entrepreneurs and 2.48% are farmers. 79% of respondents had positive wife support. 69% of respondents have good access to vasectomy family planning health services. 79% of respondents have a positive availability of health resources and health infrastructure for vasectomy family planning.
Table 1 Sample and variable characteristics for this study

<table>
<thead>
<tr>
<th>Characteristics of Respondents (n=323)</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (mean)</td>
<td>45.5 year</td>
</tr>
<tr>
<td>Wife’s age (mean)</td>
<td>40.5 year</td>
</tr>
<tr>
<td><strong>Education level</strong></td>
<td></td>
</tr>
<tr>
<td>No school</td>
<td>2 (0.62%)</td>
</tr>
<tr>
<td>Elementary school</td>
<td>19 (5.88%)</td>
</tr>
<tr>
<td>Middle School</td>
<td>57 (17.65%)</td>
</tr>
<tr>
<td>High school</td>
<td>212 (65.63%)</td>
</tr>
<tr>
<td>Higher education</td>
<td>33 (10.22%)</td>
</tr>
<tr>
<td><strong>Employment</strong></td>
<td></td>
</tr>
<tr>
<td>Government employees</td>
<td>21 (6.50%)</td>
</tr>
<tr>
<td>Private employees</td>
<td>96 (29.72%)</td>
</tr>
<tr>
<td>Labor</td>
<td>77 (23.84%)</td>
</tr>
<tr>
<td>Farmers</td>
<td>8 (2.48%)</td>
</tr>
<tr>
<td>Driver</td>
<td>13 (4.02%)</td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>108 (33.44%)</td>
</tr>
<tr>
<td><strong>Wife’s support for vasectomy family planning</strong></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>18 (21%)</td>
</tr>
<tr>
<td>Negative</td>
<td>67 (79%)</td>
</tr>
<tr>
<td><strong>Access to vasectomy family planning health services</strong></td>
<td></td>
</tr>
<tr>
<td>Less</td>
<td>19 (22%)</td>
</tr>
<tr>
<td>Enough</td>
<td>7 (8%)</td>
</tr>
<tr>
<td>Good</td>
<td>59 (69%)</td>
</tr>
<tr>
<td><strong>Availability of health resources and health infrastructure for vasectomy family planning</strong></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>67 (79%)</td>
</tr>
<tr>
<td>Negative</td>
<td>18 (21%)</td>
</tr>
<tr>
<td><strong>Choice of contraception</strong></td>
<td></td>
</tr>
<tr>
<td>Vasectomy</td>
<td>85 (26.32%)</td>
</tr>
<tr>
<td>Non vasectomy</td>
<td>248 (76.78%)</td>
</tr>
</tbody>
</table>

Table 2 Correlation between variable

<table>
<thead>
<tr>
<th>Characteristics of Respondents (n=323)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (mean)</td>
<td>0.09</td>
</tr>
<tr>
<td>Wife’s age (mean)</td>
<td>0.03</td>
</tr>
<tr>
<td>Education level</td>
<td>0.02</td>
</tr>
<tr>
<td>Employment</td>
<td>0.67</td>
</tr>
<tr>
<td>Wife’s support for vasectomy family planning</td>
<td>0.01</td>
</tr>
<tr>
<td>Access to vasectomy family planning health services</td>
<td>0.00</td>
</tr>
<tr>
<td>Availability of health resources and health infrastructure for vasectomy family planning</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Correlation between variables are addressed in Table 2. Wife’s age and occupation have nothing to do with the choice of vasectomy contraception. Age of wife, wife’s support for vasectomy family planning, access to vasectomy family planning health services and availability of health resources and health infrastructure for vasectomy family planning relates to the selection of men to use vasectomy.

**Discussion**

Family support is a form of interpersonal relationship that includes attitudes, actions and acceptance of family members, so that family members feel someone is paying attention[24]. The results of this study are supported by the results of previous studies where there is a significant relationship between family support (wife) on the choice of vasectomy family planning[25]. The wife’s support is very influential on the husband as an acceptor of family planning, namely the wife’s support in the form of communication between husband and wife in the choice of family planning method, namely counseling to increase men’s knowledge about family planning, it is also necessary to provide counseling to the wife so that the delivery of information about male FP is more easily accepted by men because it is given by his wife. The wife’s response to the vasectomy that the husband will do is support the husband. The wife’s response can be positive or negative depending on her knowledge, attitudes, beliefs and actions[26].

The simple logistic regression test results prove that access to vasectomy services is one of the variables that has an influence on the behavior of men doing vasectomy. The reality that occurs in the field is that access to health services for respondents is quite affordable. Most of the respondents went to health care facilities on foot and using private vehicles. The effect on access to affordable health services has not become a stimulation in Madiun City to increase the number of vasectomy acceptors due to other factors such as lack of support and access to information about vasectomy.

The availability of health resources and health infrastructure makes the tendency to participate in vasectomy family planning, on the other hand, the absence of health resources and health infrastructure becomes an obstacle for respondents to actively participate in vasectomy KB. This becomes natural if the respondent does not participate in the vasectomy family planning, because the availability of medical resources...
and infrastructure is quite negative by the respondents. Health service is one of the parameters to determine the health status of the community (27), besides that Ariyanti, Dasuki and Wilopo (2017) (28) in his research, he said that the availability (quantity and distribution) of health resources based on area played a role in achieving family planning programs, especially family planning needs were not met. One of the factors that influence health behavior is the availability of health resources and health infrastructure. Access to quality family planning (KB) services is an important element in the effort to achieve reproductive health services (29).

Conclusion

The choice of vasectomy contraception in men is influenced by several factors, namely the age of the wife, wife’s support for vasectomy family planning, access to vasectomy family planning health services and availability of health resources and health infrastructure for vasectomy family planning. Positive wife support, good access to vasectomy family planning health services and availability of good health resources and health infrastructure for vasectomy family planning will increase men’s intention to do vasectomy.

Acknowledgments: We would like to thank for married men who have participated in the research.

Conflict of Interest: We do not have any conflict of interest.

Source of Funding: None

Ethical Clearance: The study was approved by the Institute of Health Sciences Surya Mitra Husada.

References

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Intentions to Use Vasectomy Contraception: Application of Theory Planned Behavior

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1Doctoral student, Universitas Sebelas Maret, Solo, Indonesia, 2Professor Public health department, Universitas Sebelas Maret, Solo, Indonesia, 3Professor Agriculture department, Universitas Sebelas Maret, Solo, Indonesia

Abstract

In Indonesia, 8% of married men use a FP method, 3% use a modern FP method and 4% use a traditional FP method/method. The percentage of married men who use condoms (3%) is higher than the percentage who choose vasectomy (less than 1%). The study was conducted in the Madiun town administration using a community-based cross-sectional study design. The town is found in East Java Province, Indonesia. The total sample of this study is 323 married man with fixed disease sampling. The results showed that “attitude” (p=0.04) and “perceived behavioral control” (p=<0.01) are positive predictive factors of intention married man to chose vasectomy for contraception. This research has found the intention to limit the number of children affected by attitudes. Married men who participated in this study had negative attitudes towards vasectomy. In general, vasectomy is seen as one of the least preferred method of family planning and is associated with fear and weakness.

Keywords: Family planning, structural equation model, theory planned behavior, vasectomy.

Introduction

Unwanted pregnancy is an important public health problem because it deals with social and health conditions that are detrimental to mothers, children, and society as a whole. Pregnancy includes a higher incidence of abortion, late initiation and under-utilization of prenatal care and low birth weight(1). Men’s involvement in contraception is considered a fact that determines men’s lives. Effective participation in contraception can trigger significant individual, family, social and cultural changes(2). In various communities, family planning and reproductive health issues are still seen as the responsibility of women. Knowledge and awareness of men and families about family planning are still relatively low. Besides, there are limitations to the acceptance and accessibility of male contraceptive services. The knowledge of urban and rural communities towards family planning programs has not yet developed optimally, although in terms of education the urban community is generally more advanced than rural communities(3).

Over the past decade, to increase men’s involvement in reproductive health and family planning issues. Government and non-government agencies(4) and international health organizations(5,6) all acknowledged the need to involve men in reproductive health services and decision making and made convincing arguments that this would benefit both men and women. One way to encourage men’s involvement in family planning is to give couples more contraceptive choices through the promotion of male-oriented method such as vasectomy. Vasectomy is a safe, simple and effective method(7) which is relatively unknown and not used in most parts of the world. Although sterilization is the most widely used method of contraception worldwide, tubal ligation accounts for more than five times more procedures than vasectomy(8).

The choice method and the use of effective contraceptive method is a complex problem that is
influenced by various factors\textsuperscript{9,10}. In this study, the research approach is based on the Theory of Reasoned Action (TRA), added by Theory of Planned Behavior (TPB)\textsuperscript{11}, both of which require an examination of personal and contextual influence\textsuperscript{12}. In the case of TRA, intentions are considered to have 2 components: subjective attitudes and norms. Attitudes are beliefs that are involved in behavior that will be associated with positive outcomes (behavioral beliefs), as well as an assessment of how much a person evaluates these results (evaluation). Subjective norms consist of both beliefs about whether other individuals approve or disapprove behavior (normative beliefs), as well as a person’s motivation to obey that individual (motivation to obey). TPB contains the same components as TRA and adds perceived control behavior as the third major construct in the prediction of intention and behavior\textsuperscript{13}. Researchers have used TPB to predict intentions for physical activity\textsuperscript{14}, safer sex behavior\textsuperscript{15} and the intention of Muslim women to use oral contraceptives\textsuperscript{1,16}. Both TRA and TPB have demonstrated predictive capabilities\textsuperscript{17,18}.

**Method**

The study was conducted in the Madiun town administration using a community-based cross-sectional study design. The town is found in East Java Province, Indonesia. The sampling method used for the case group and the control group is fixed disease sampling, which is a sampling scheme based on the disease status of the subject, which is diseased or has no disease studied, while the subject’s exposure status varies according to the subject’s disease status\textsuperscript{19}. The estimated number of cases and control groups uses a ratio of 1: 3 in each case. The case group in this study was the husband who was willing to be a vasectomy acceptor with a total of 85 married men while the control group was taken from a husband who did not use a vasectomy with a total of 248 married men. The total sample of this study was 323 married men. All of the questionnaires were prepared in Indonesian. A value of 1 to 4 was given for each strongly disagrees and strongly agrees with the answer for the questionnaire attitude, Subjective Norm and Perceived Behavioral Control. A value of 0 and 1 was given for each No and Yes answer for the Choice of contraception questionnaire. The attitude questionnaire consisted of 8 items. The Subjective Norm questionnaire consisted of 10 items. The Perceived Behavioral Control Questionnaire consisted of 10 items. Behavioral Intention Questionnaire consists of 5 items. All questionnaires used in this study were valid for use\textsuperscript{20}. Data were collected from January to February 2020. Data were entered and analyzed using STATA. Tables, frequencies, and proportions are used to present the data. The association between dependent and independent variables was determined using the structural equation model. Logistic regression analysis was performed to control for potential confounders. Model fit was assessed by examining Chi-square (X\textsuperscript{2}) statistic (P-value >0.05 is considered an acceptable fit), root mean square error of approximation (RMSEA; <0.08 is acceptable fit), comparative fit index (CFI; values close to 1 indicates good fit), standardized root mean squared residual (SRMR; <0.08 is good fit) and coefficient of determination (CD, overall R; values close to 1 indicate good fit)\textsuperscript{21}.

**Results**

Characteristics of married men following the study are addressed in Table 1. Overall 323 married men were 45.5 years of age, where the average age of marriage was 26.5 years. The average age of a married man’s wife is 40.5 years. 65.63% of married men have a high school education level and 0.62% are out of school. 33.44% of married men’s jobs are entrepreneurs and 2.48% are farmers. 98.45% of married men show a positive attitude towards vasectomy. 58.82% of married men have sufficient Perceived Behavioral Control and 73.37% have sufficient intention for a vasectomy. 76.78% of married men choose the vasectomy contraceptive method.

<table>
<thead>
<tr>
<th>Characteristics of Respondents (n=323)</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (mean)</td>
<td>45.5 year</td>
</tr>
<tr>
<td>Husband married age (mean)</td>
<td>26.5 year</td>
</tr>
<tr>
<td>Wife’s age (mean)</td>
<td>40.5 year</td>
</tr>
<tr>
<td>Education level</td>
<td></td>
</tr>
<tr>
<td>No school</td>
<td>2 (0.62%)</td>
</tr>
<tr>
<td>Elementary school</td>
<td>19 (5.88%)</td>
</tr>
<tr>
<td>Middle School</td>
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<tr>
<td>High school</td>
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<td>Higher education</td>
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<td>Employment</td>
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<td>Driver</td>
<td>13 (4.02%)</td>
</tr>
<tr>
<td>Enterpreneur</td>
<td>108 (33.44%)</td>
</tr>
</tbody>
</table>

Table 1 Sample characteristics for this study
<table>
<thead>
<tr>
<th>Characteristics of Respondents (n=323)</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Attitude</strong></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>5 (1.55%)</td>
</tr>
<tr>
<td>Negative</td>
<td>318 (98.45%)</td>
</tr>
<tr>
<td><strong>Subjective Norm</strong></td>
<td></td>
</tr>
<tr>
<td>Less</td>
<td>82 (25.39%)</td>
</tr>
<tr>
<td>Enough</td>
<td>214 (66.25%)</td>
</tr>
<tr>
<td>Good</td>
<td>27 (8.36%)</td>
</tr>
<tr>
<td><strong>Perceived Behavioural Control</strong></td>
<td></td>
</tr>
<tr>
<td>Less</td>
<td>86 (26.63%)</td>
</tr>
<tr>
<td>Enough</td>
<td>190 (58.82%)</td>
</tr>
<tr>
<td>Good</td>
<td>48 (14.86%)</td>
</tr>
<tr>
<td><strong>Intention</strong></td>
<td></td>
</tr>
<tr>
<td>Less</td>
<td>7 (2.17%)</td>
</tr>
<tr>
<td>Enough</td>
<td>237 (73.37%)</td>
</tr>
<tr>
<td>Good</td>
<td>79 (24.46%)</td>
</tr>
<tr>
<td><strong>Choice of contraception</strong></td>
<td></td>
</tr>
<tr>
<td>Vasectomy</td>
<td>85 (26.32%)</td>
</tr>
<tr>
<td>Non vasectomy</td>
<td>248 (76.78%)</td>
</tr>
</tbody>
</table>

Table 2 Correlations among attitude, subjective norm, perceived behavioral control, intention and choice of contraception

<table>
<thead>
<tr>
<th>Variable</th>
<th>Std. Err.</th>
<th>p</th>
<th>[95% Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjective norm → Intention</td>
<td>.05</td>
<td>0.72</td>
<td>-.11 to .08</td>
</tr>
<tr>
<td>Attitude → Intention</td>
<td>.05</td>
<td>0.04</td>
<td>.00 to .23</td>
</tr>
<tr>
<td>Perceived behavioural control → Intention</td>
<td>.41</td>
<td>0.00</td>
<td>.75 to .91</td>
</tr>
<tr>
<td>Intention → Choice of contraception</td>
<td>.00</td>
<td>0.00</td>
<td>.05 to .07</td>
</tr>
<tr>
<td>X²</td>
<td>0.52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RMSEA</td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CFI</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SRMR</td>
<td>0.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CD</td>
<td>0.67</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 1 presents the standardized coefficients and significance levels obtained in the structural equation model using the maximum likelihood method as a parameter estimation procedure, as well as to determine the values of the explained variance (R) for the variable empowerment and satisfaction at work. The path analysis showed an adequate adjustment of the final model, with X² = .052. Root mean square error of approximation was 0.00, CFI = 1.00, SRMR 0.01 and CD = 0.67. Based on the data the model is valid. The results showed that “attitude” (p = 0.04) and “perceived behavioral control” (p = <0.01) were positive predictive factors of intention married man to choose vasectomy for contraception (Table 2).

Figure 1: Association between attitude, subjective norm, perceived behavioral control, intention, and choice of contraception using a structural equation model.
Discussion

This study applies the theory of planned behavior to the intention of married men to choose vasectomy as contraception to limit the number of children. This study found that low married men choose vasectomy. The low prevalence of vasectomy has also been shown by other studies\(^{22,23}\). This research has found the intention to limit the number of children affected by attitudes. Married men who participated in this study had negative attitudes towards vasectomy. In general, vasectomy is seen as one of the least preferred method of family planning and is associated with fear and weakness. Previous research found that there was a tendency to describe men who had been sterilized in negative terms, were often insulted, and even men who had positive experiences with vasectomy procedures chose not to disclose them to others in the community\(^{24}\). A recent study reports a list of factors that contribute to negative attitudes towards vasectomy, including the perceived negative impact on physical strength, ability to work and sexual performance, along with loss of masculinity, social status\(^{25}\). The findings from other studies on vasectomy are that the fear of decreasing libido in men will cause them to be unable to fulfill sexual needs adequately\(^{26–28}\).

Researchers have found 14.86% of perceived behavioral control of married men in either category. Poor understanding of the vasectomy procedure causes men to assume that vasectomy will pose certain health risks. For example, they equate vasectomy with castration and believe that the vasectomy procedure will have the same effect as castration in cattle. Shelton and Jacobson\(^{29}\) argue that myth and misunderstanding play an important role in accepting vasectomy as a method of birth control. They argue that even when men and women know this method, their knowledge is filled with misunderstandings; especially that vasectomy is castration or weakening men. This finding is the following research\(^{30–33}\) the participants expressed concern that vasectomy would weaken their sexual ability. Social norms about family planning receive general attention, requiring an enabling environment to create comprehensive awareness and provision of information to increase knowledge and understanding of the various types of reproductive services available.

Conclusion

The theory of planned behavior can be used as a prediction for married men to choose vasectomy as contraception. The low of married men to choose vasectomy is positively influenced by attitude and perceived behavior control. The negative attitude of married men is closely related to physical strength, ability to work and sexual performance, along with loss of masculinity and social status.

Acknowledgments: We would like to thank for married men who have participated in the research.

Conflict of Interest: We do not have any conflict of interest.

Source of Funding: None

Ethical Clearance: The study was approved by the Institute of Health Sciences Surya Mitra Husada.

References


Phenolic Profile and Antioksidant Activity of Trigona Honey in Bone, South Sulawesi, Indonesia

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Abstract

Introduction: Stingless bee honey has different characteristics from other types of bee honey in terms of colors, tastes, water content, and sugar. Trigona honey is one of the local products in South Sulawesi produced by stingless bees from Tetragonula species widely known to the public. This study determined the phenol content of trigona honey and its antioxidant activity.

Method: The compounds of trigona honey ethanol extract were identified using gas chromatography. The antioxidant activity of the extract was examined with the DPPH method.

Result Content test shows that trigona honey has bioactive compounds, flavonoids, alkaloids, and triterpenoids. DPPH show to trigona honey 104,25.

Conclusion: Trigona honey contains mild antioxidant activity and metabolite compounds such as polyphenols, flavonoids, alkaloids, and triterpenoids. The nutrient activity can reduce blood glucose and increase insulin plasma.

Keywords: Trigona honey, Nutritional, bioactive compounds, DPPH method.

Introduction

Honey is a natural compound made from nectar by bees. It has been used as a traditional natural therapy agent to increase immunity and prevent various diseases. Honey reduces GDP (4,2%) and CRP (3,2%) and increases the HDL cholesterol (3,3%)[1]. Stingless bee honey has some different characteristics compared to bee honey in terms of colors, taste, viscosity, water content, and sugar. In general, trigona honey has a darker color and a bit sour taste[2].

Trigona honey can produce honey containing vitamin C that has functions as antibiotics, antitoxin, antioxidant, and can improve the immunity because the bee has a smaller size than ordinary bees. Trigona bees can collect nectar from the deepest part of a flower. As result, the honey they produce contains higher nutritional values[3].

Trigona honey in South Sulawesi was identified to have 27 volatile compounds classified into some groups including hydrocarbon (46.06%), imines (21.83%), ketones (19.22%), acids (7.06%), amines (2.37%), phenolic (1.53%), alcohol (0.83%), oxime (0.72%), and aldehydes (0.38%), and there are compounds that have
potential as antihyperglycemic. Trigona honey contains vitamins that function as antibiotics, antitoxins, and antioxidants and increase the immune system. It also (Tetragonula Biroi) contains protein, fat, carbohydrates, sugar, energy, vitamin C, beta carotene, calcium, magnesium, zinc, flavonoids, and polyphenols because trigona bees can collect nectars from the deepest part of flowers. It results in the high nutritional values it contains[4].

The administration of honey with the dose of 1.0 g/KgBB can reduce the hyperglycemia and repair the oxidative stress of mice’s kidneys with diabetes symptoms induced with STZ. Besides that, supplementation of Tualang honey shows protective effects on the pancreas due to diabetic oxidative stress induced with STZ proven by the reduction of levels of lipid peroxidation markers, MDA. Treatment using tualang honey can also recover activities of SOD and catalase but still regulates the GPx activities[5].

Supplementation of honey on diabetic mice can reduce the concentration of serum glucose and fructosamine and increase the glycemic control and repairs some metabolic disorders that are usually found in diabetes, including to decrease the levels of liver transaminases, triglycerides, and glycosylated hemoglobin (HbA1c), increases HDL cholesterol and improves cellular oxidative stress[6]. Antioxidant activities in Trigona honey contains some bioactive compounds including alkaloid, flavonoid, triterpenoid, and polyphenol[7].

Material and Method

Plant Material: The main material used in this study was trigona honey (Tetragonula Biroi) obtained from a bees farm in Bontocane Subdistrict, Kahu District, Bone Regency, Sulawesi-Selatan. Other materials include methanol p.a (Merck), ethanol p.a (Merck), n-hexane p.a (Merck), ethyl acetate p.a (Merck), gallic acid p.a (Sigma-aldrich), reagent Folin-Ciocalteu p.a, quercetin, Dimethyl sulfoxide (DMSO) p.a (Merck), aluminum chloride (Al Cl3) (Merck), potassium acetate (CH3COOK) (Merck), ascorbic acid (Merck) and 1,1-diphenyl-2-picrylhydrazil (DPPH) (Sigma-aldrich).

Some tools which were used included (Philips HR 2115 Blender tango Plastik), vortex (Stuart SA8 Vortex Mixer, 230V, 50-60Hz, 20-2500rpm), rotary evaporator (Heidolph Instrument Laborota 4000), microplate 96-well (IWAKI), spectrophotometer UV-Vis (U-2800 Hitachi), orbital shaker (Wise Shaker), analytical scales (Sartorius), and glasses[8,9].

Preparation of extract: Making Trigona honey Ethanol Extract: Trigona honey was first washed and dried, then weighed as much as 100 grams, followed by the maceration process for 24 hours with 100 mL 95% ethanol. The extract obtained was then evaporated in an oven at a temperature of 45-50 °C to have a volume of approximately 10 mL. The extract was then cooled at room temperature, extraction is a process of separating the desired substance from a plant material.

Research Method

Multilevel Extraction: 100 gram of honey was macerated with non-polar solvent (n-hexane) (1:5 b/v) and mixed using an orbital shaker (150 rpm for 3x24 hours). The extract was filtered using Whatman 42 filter paper to get the filtrate and residue. Residue from the n-hexane solvent was reused for maceration using ethyl acetate semi-polar solvent with the same procedure with n-hexane solvent. Residue from ethyl acetate solvent was macerated again using polar solvent (methanol). Filtrates from three solvents were evaporated using a rotary vacuum evaporator at 40 °C.

Determination of Total Phenolic Content: The total phenolic is determined using the principle of Wan-Ibrahim et al. (2010). The honey extract is dissolved to form a concentration of 1 mg/mL. 10 μL of the solution was mixed into a 96-well microplate containing 160 μL of aquadest. 10 μL Folin-Ciocalteureagent 10% and 20 μL Na2CO3 10% solution were added into each well and incubated for 30 minutes at room temperature. The total phenolic content was identified by reading the absorbance at the wavelength of 750 nm using a microplate reader. The total phenolic of the sample was determined using a standard curve of gallic acid with various concentrations (20, 40, 60, 80, 100 μg/mL) and the result was in milligram per gram gallic acid (mg/g GAE). The total phenolic content of each extract was stated as Gallic Acid Equivalent, which was a general reference to measure the phenolic compounds in a material[10].

Determination of total flavonoid: The determination of total flavonoid content refers to Son et al. (2015). The honey extract was dissolved using ethanol to form the concentration of 1mg/mL and 10 μL of the solution was taken and mixed into a 96-well microplate containing 120 μL of aquadest. Aluminum chloride 10%
and acetic acid solution (10 μL of each) and 60 μL of ethanol were added into each well and incubated for 30 minutes in the temperature room. The total phenolic content was identified by reading the absorbance at the wavelength of 415 nm using a microplate reader. Quercetin was used as a standard. The total flavonoid content of the sample was determined based on quercetin standard curve with various concentrations (50, 100, 150, 200, 250, and 300 μg/mL) and the result was in milligram per quercetin (mg/g QUE) that is the milligram of quercetin equivalent per 1 g extract[11].

**Analysis of Antioxidant Activities Using the DPPH (2,2-diphenyl-1-picrylhydrazyl) method:**
Analyzing the antioxidant activities using the DPPH method referred to Li et al. (2012). 10 mg of the extract was dissolved with 1000 μL Dimethyl sulfoxide. 200 μL extract solution was pipetted into a microplate and added with 100 μL DPPH solvent with a concentration of 125 micromolar in ethanol p.a. The mixture was homogenized and incubated at a temperature of 37°C for 30 minutes. The positive control was ascorbic acid with a concentration of 1,25-20 ppm. Ethanol p.a. was used as a negative control. The absorption was measured using a microplate reader at a wavelength of 517 nm. Radical inhibition activities DPPH (%) can be calculated using the following formula[12].

The table 1 show that of Trigona Honey, show that there was polyphenol was 133.52 ppm, while the total flavonoid of trigona honey (ethanol test of 96%) was 159.62 ppm. 0.15% vitamin C, 1.32% Protein, 0.23% Fat, 64.12% carbohydrates, 10.61 ppm beta carotene, 273, 23 calcium, 338.94 magnesium, and 12.49 ppm zinc and the pH was 5.76.

<table>
<thead>
<tr>
<th>No</th>
<th>Test Parameter Penangkapan radikal bebas DPPH (IC50)</th>
<th>Result</th>
<th>Unit</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Aktivitas Penangkapan radikal bebas DPPH (IC50)</td>
<td>104,25</td>
<td>mg/l (ppm)</td>
<td>Spektrofotometri-Uv</td>
</tr>
</tbody>
</table>

**Discussion**

The test results in table 2 above indicated that the lower the absorbance percentage, the higher the honey concentration (104,25mg/l). Antioxidant activities were tested to identify the free radical scavenging activity (IC50) of trigona honey (Tetragonula biroi). The test showed a score of 104,25 mg/l (ppm). According to Molyneux, P (2204) value IC50 100-150 ppm indicates average antioxidant activities. The working principle of the DPPH test was that the bioactive compound as an antioxidant will reduce the free radicals DPPH into 1,1-diphenyl-2-picrylhydrazine. DPPH reacts with antioxidant to form reduced diphenyl picryl hydrazine and antioxidant radicals.

An antioxidant is a compound that can protect the cell from damages caused by an unstable molecule called free radicals (Sies, 1997). Antioxidant activities are presented in decoloration percentage (%) using spectrophotometer UV-Vis. Radical compounds used in testing the antioxidant activities were 2,2-diphenyl-1-picrylhydrazyl (DPPH). The maximum absorbance of DPPH compounds is at the wavelength between 515 – 520 nm (Martysiak-Żurowska and Wenta, 2012)[13].

In the Antioxidant activities of trigona honey (Tetragonula Biroi), there are some bioactive compounds including alkaloid, flavonoid, triterpenoid, and polyphenol. Flavonoid is a compound that is closely related to substances with antioxidant capacity for the body. The administration of antioxidants can reduce the oxidative stress level so that premature aging and complication of various diseases can be inhibited. Trigona honey has potentials as an antioxidant, antibacterial, antihyperglycemic and antidiabetic.
Polyphenols contain antioxidant compounds that can reduce the oxidative stress by preventing changes in the superoxide chain ($\text{O}_2$) into hydrogen peroxide ($\text{H}_2\text{O}_2$) due to habe wells reaction dan Fentor will form hydroxyl radical (OH). Polyphenols donate hydrogen atoms from the aromatic hydroxyl group (-OH) to bind free radicals and get rid of them from the body through the excretion system (Eliasson, L et al 2008). Polyphenol has some benefits to prevent and cure degenerative diseases like diabetes, cancer, and blockage of blood vessels. The polyphenols in honey can scavenge hydroxyland peroxyl alcoholoxyl radicals because they can act as hydrogen donors. That is why they have antioxidant properties. Besides phenolic and flavonoid compounds, honey also contains Vitamin C as an antioxidant compound.

Researchers found that flavonoid is a very useful antioxidant as an anti-inflammatory by interrupting the effects of the arachidonic acid metabolic pathway, influencing the production of prostaglandins and release of histamine, cutting off tumor promoter activity (antitumor activity), and interrupts nucleic acid synthesis (antivirus)\cite{14, 15, 16, 17}.

An in vivo study shows that honey can stimulate antioxidant defense system in mice’s pancreas, serum, kidney, and liver by stimulating the activity of cellular antioxidant enzymes such as superoxide dismutase, CAT, glutathione peroxidase, glutathione S-transferase and more significant reduction of glutathione levels\cite{18}.

Another study showed that food rich with an antioxidant like honey can inhibit the damaging effects of free radicals and ROS like protecting the cardiovascular by preventing and reducing the induction of lipoprotein density ROS (LDL) oxidation (Schramm et al. 2003); cell death in some cell line cancers (Jaganathan et al. 2015); increase the antioxidant immunity in humans \cite{19}.

An in vivo study using 28 Wistar mice induced with streptozotocin and randomly divided into four groups. The result showed that the administration of honey was considered as an anti-atherogenic factor. Honey can increase glucose and lipid metabolisms and lipid profiles but can reduce the oxidative stress-mediated by lipid peroxide through the reduction of the MDA level. It is because honey has anti-radical properties and antioxidant activity thus can reduce the free radicals \cite{20}.

**Conclusion**

Trigona honey contains polyphenol (133,52 ppm) and flavonoid (159,62ppm). Antioxidant activities of trigona honey are in the medium category that is 104,25 mg/I, therefore trigona honey (TetragonulaBiroi) has a big potential as a natural antioxidant for Diabetes mellitus therapy.

**Acknowledgment:** The authors would like to thank my supervisor in Hasanuddin university, Mappaoudang Nursing of academy, for warm support LPDP, and the Ministry of Research Technology and Higher Education of Republic Indonesia, for providing the scholarship during this study and

**Conflict of Interest:** Nil

**Funding Source:** By self

**Ethical Clearance:** The ethical committee of Hasanuddin university, medicine faculty confirmed the protocol and the ethical code is as follow UH19020081.

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Moral and Legal Update of Landmark Decision in Judicial Activism Perspective

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Abstract
The essence of the main duties of a judge is to receive, examine, try and decide cases submitted to court. In carrying out their duties, they often face concrete events that must be decided, while the existing laws and regulations are not necessarily complete and clear. Therefore, judges in deciding cases can carry out rechtsvinding. Legal finding (rechtsvinding) is also an important component in landmark decisions because it is related to the breakthroughs made by judges in carrying out their duties. In the perspective of judicial activism, rechtsvinding and landmark decisions are closely related because in practice they can significantly change the existing norms in modern law.

Keywords: Judge’s decision, rechtsvinding, landmark decision.

Introduction
The discussion of law enforcement cannot be separated from the role of the judiciary as the executor of judicial power. The exercise of judicial power essentially has an important role in upholding law and justice in Indonesia. In court, the judge is the main component who has the task of receiving, examining and deciding cases submitted to him. The role of judges is vital given the authority they have in deciding cases in court.

The court at the normative level functions to administer the judiciary to uphold law and justice, and is also an important aspect of the implementation of the constitutional state of the Republic of Indonesia. In court, a court decision is the final result of the case settlement process in court. This court decision is a statement by a judge as a state official who is authorized to do so, pronounced in court and aims to end or settle a case or dispute between the parties.

A judge’s decision in a court process can be referred to as a crown of judges which contains legal considerations at its core. Apart from being the settlement of cases or disputes, judges’ decisions also function as reformers, not only at the normative level, but also at the practical level, especially in relation to the dynamics of community law. Rapid changes in society often because a legal gap between law in the books and law in action. It is in this context that judges are required not only textually based on rules but also contextually by making legal breakthroughs by conducting re-screening.

Rechtsvinding is a breakthrough in law enforcement in Indonesia because judges in carrying out their duties are based on a deeper meaning of the law, not only based on the sound of the law, so that judges’ decisions in addition to guaranteeing legal certainty can also reflect justice. Indonesia can be called a country that adopts a civil law system, so that it does not recognize judge made law as in the Common Law system, however, judge decisions have a role in legal reform.

Judges in conducting rechtsvinding are closely related to judicial activism, where judges not only base the provisions of the law, but also dare to leave the text of the law. Judicial activity, if it is understood more deeply, also relates to efforts to produce important court decisions or landmark decisions. In this regard, this article will analyze the rechtsvinding and landmark decision from the perspective of judicial activism.
Analysis and Discussion

Judges play an important role in the judiciary and have the authority to receive, examine and decide cases. As a country that inherits a civil law system from the Netherlands, this condition affects judges in carrying out their duties. In the civil law system, one of the characteristics that can be observed is related to law as the main source of law. Thus the law can be said to be the source of law for judges in deciding cases. On the other hand, the view that laws are considered clear, complete and can be used to solve all problems is not quite right. Given the rapid development of society in its deliberations, it is often not followed by provisions in laws. Legal issues as rules can be explained by some indicators. First, the existing legal regulations are out of date. The existing legal regulations are no longer in accordance with the current ideals of society which are constantly moving and developing dynamically.

Second, the existing legal regulations are not harmonious or have not been integrated into a positive legal system. The existing legal regulations are no longer in accordance with other legal regulations due to the existence of new legal regulations (legislation) in other areas of life, both in substance have a high position (regulate/provide a basis/umbrella act).

Third, there are aspects of human life that have not been regulated by law. This problem arises after the existing legal regulations cannot be refined through legal science technology to respond to the problems of daily life.

Fourth, the practice of implementing or enforcing the law that is felt directly by the community (law in action/law in concreto) is not in accordance with the law in the positive law (law in book/law in abstracto) because it is not implemented or not enforced law enforcement officials should have been due to irregularities in law enforcement and application.

Generalization of case settlement by using law as the main source of law by judges in practice is not always appropriate. It is in this context that judges can rechtsvinding. Mertokusumo (2002) stated that what is meant by rechtsvinding is usually the process of forming a law by a judge or other legal apparatus assigned to the application of general law regulations on concrete events. Rechtsvinding is the process of concretizing or individualizing general legal regulations (das sollen) by remembering certain concrete events (das sein).

Considering that statutory regulations may not be complete completely or clearly as clearly as possible, when dealing with a case that must be decided, Indonesian judges can carry out rechtsvinding as regulated in some regulations.

Article 10 Paragraph (1) Law number 48 of 2009 concerning Judicial Power which explains that the court is prohibited from refusing to examine, hear and decide a case that is filed on the pretext that the law does not exist or is unclear, but is obliged to examine and judge it.

Article 5 paragraph (1) of Law number 48 of 2009 concerning Judicial Powers, stated that judges and constitutional judges are obliged to explore, follow, and understand the legal values and the sense of justice that live in society.

Rechtsvinding carried out by judges is basically related to judicial activism in the context of realizing justice. The terminology of judicial actives according to the Black’s Law Dictionary is a philosophy of judicial decision making whereby judges allow their personal views about public policy, among other factors, to guide their decisions usually with the suggestion that adherents of this philosophy tend to find constitutional violations and are willing to ignore precedent.

Parameters or restrictions on judicial activism cannot be equated from one country to another. These differences are caused by differences in the system and structure of the state administration, the history of the role of the judiciary, and what the public hopes for the judiciary today. Canon (1982) creates a general concept and structure by categorizing six dimensions of judicial activism which consist of: (1) majoritarianism (2) interpretative stability (3) interpretative fidelity (4) substance/democratic process distinction (5) specificity of policy and (6) availability of an alternative paymaker.

In the context of Indonesian courts there is a close relationship between rechtsvinding and judicial activism by judges. The practice of judicial activism shows that judges are not shackled by positive norms in the Law as in the flow of legism. Judicial activism is carried out by judges through rechtsvinding with the aim of realizing justice in deciding cases. Rechtsvinding in the perspective of judicial activism is important considering that not all cases can be decided based on positive law, especially law as the main source of law for judges. Judges who carry out reconstruction in the perspective
of judicial activism are a combination of knowledge or intellectuality, namely relating to the reasoning of the judge and the experience of the judge as a profession. The importance of experience in the profession of judge is as stated by Holmes (1991) as the life of the law has not been logic, it is has been experience. The felt necessities of the time, the prevalent moral and political theories, institution of public policy avowed with their fellas.

The view that judges are not mouthpieces of the law but must carry out surveillance in carrying out their duties is also in line with progressive law in Indonesia. According to the viewpoint of progressive law, law is for humans not the other way around so that in addition to guaranteeing legal certainty, law should also pay attention to the value of justice for society. Based on the characteristics of a progressive law, the progressive method of retro finding is detailed in some characters. First, it is a visionary method of legal discovery by looking at legal issues for the long term interest in the future by looking at case by case. Second, it is a method of legal discovery that is courageous in carrying out a breakthrough (rule breaking) by observing the dynamics of society, but is still guided by law, truth and justice and is impartial and sensitive to the fate and condition of the nation and country. Third it is a method of legal discovery that brings welfare and prosperity to society and can also bring the nation and state out of the downturn and social instability it is today.

Judges in the view of progressive law have the meaning of daring to make legal breakthroughs with the main objective of realizing justice. Judicial activism in the context of the Indonesian legal system is also an implementation of the provisions of Article 5 and Article 10 of Law number 48 of 2009 concerning judicial power. Apart from that, the results of judges’ judgment in judicial activism are also closely related to the effort to realize quality judges’ decisions. The quality of judges’ decisions and the professionalism of judges cannot be separated from the ability of judges’ legal reasoning on a case. With legal reasoning, it will reflect how judges guide and make appropriate legal arguments in their decisions.

One of the judges’ decisions with quality is in the form of important decisions or landmark decisions. Black’s Law Dictionary which is called Landmark Decision is a decision of the Supreme Court that significantly changes the existing Law. In countries with a Common Law legal system, every decision can be ensured that it always follows the existing precedent, decisions that create new precedents must be supported by the new decidendi ratio. This is what has the potential to be called a landmark decision.

A decision can be categorized as a landmark decision if it meets the criteria of decision that has permanent legal force; decisions containing rechtsvinding; decisions that are able to answer social dynamics problems; decisions that reflect the direction of legal development; decision is made for the first time and has not been followed by another judge.

One of the important things in a landmark decision is rechtsvinding, so that the judge’s decision in this case contains a legal breakthrough, including a breakthrough in positive legal provisions.

Landmark decisions in Indonesia can come from decisions of the Supreme Court or the Constitutional Court which can be in the form of jurisprudence or non-jurisprudence. In a landmark decision, in essence, it must contain rechtsvinding by the judge. With this rechtsvinding in the perspective of judicial activism, it is an attempt by a judge if there is an incompleteness or absence of norms in positive law in deciding cases. This judicial activism is also related to the behavior of judges in deciding cases against objective criteria or are results obtained against possible results.

rechtsvinding and landmark decisions in the perspective of judicial activism are related to one another. A landmark decision has to offer a judgment conducted by a judge in case of incompleteness, unclear norms in positive law or no one has even regulated it. Rechtsvinding can be called an effort if there is a legal gap between law in the books and law in action. Landmark decisions that contain rechtsvinding are also a form of judicial activism for judges in realizing justice in their decisions.

Conclusion

Judges are the core actors in the court who exercise judicial power in Indonesia. In carrying out their main duties, judges will base their decisions on statutory provisions, however, not all cases have been regulated by law or regulated but are not yet complete or clear. In response to this condition, the judge must rechtsvinding as an effort to decide the case submitted to him. rechtsvinding also has an important role in creating landmark decisions as part of judicial activism by judges.
Conflict of Interest: There is no conflict of interest.

Source of Funding: This research was funded by the Diponegoro University Faculty of Law Research Grant Fund for the 2020 Fiscal Year.

Ethical Clearance: Ethical Clearance from the institutional ethical committee obtained for the study.

References
QTc Interval Prolongation in Drug Resistant-Tuberculosis Patients Treated with Shorter Treatment Regimen

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Abstract

Background: Shorter Treatment Regimen (STR) is a combination of treatments with a shortened period from 20-24 months to 9-11 months. Shortened treatment requires a higher dose of drug to kill resistant bacteria. Corrected QT (QTc) interval prolongation is one of the severe side effects of treatment.

Objective: This study aimed to find the factors of QTc prolongation in Drug Resistant-Tuberculosis (DR-TB) patients treated with STR during an intensive phase.

Method: An analytical retrospective study was conducted at Dr. Soetomo General Academic Hospital, Surabaya, Indonesia. DR-TB patients on the STR regimen were collected based on medical records between September 2017 to August 2018. QTc interval was calculated by Fredericia formula. The relationship between QTc interval at baseline and occurrence of QTc prolongation was analyzed using Chi-Square of fisher’s exact test.

Results: Among 108 patients on the STR regimen, there were 20 (28%) patients experienced moderate QTc prolongation (471-500 ms), and 31 (28%) patients had severe QTc prolongation (>500 ms) during four months observation period in STR treatment. The prolonged QTc interval was significantly related to QTc interval at baseline (p = 0.001). The QTc interval at baseline correlated significantly with the start time of QTc prolongation (p < 0.001). Risk factors of age, gender, comorbid, hypertension, and potassium level at baseline had a significant negative correlation to QTc prolongation.

Conclusion: The prolonged QTc interval was significantly related to QTc interval at baseline. The QTc interval at baseline correlates significantly with the start time of QTc prolongation.

Keyword: Prolonged QTc, Drug Resistant-Tuberculosis, Shorter Treatment Regimen.

Introduction

Drug Resistant-Tuberculosis (DR-TB) is known for long-duration treatment (20-24 months) and unsatisfactory outcomes. Five hundred fifty-eight thousand new cases of DR-TB emerge each year globally, with success rate only 55%(1). In May 2016, World Health Organization (WHO) recommended Shorter DR-TB Regimen (9-11 months) with a success rate of 84% (95CLs:79%-87%)(2). Indonesia start adopting and implementing a shorter DR-TB treatment regimen.
(STR) in September 2017. The Indonesia National TB Program is expecting STR can increase enrollment and success rate of treatment, also giving better outcomes rather than long-duration regimen\(^3\).

The STR contains new drugs such as a high dose of Moxifloxacin\(^3\). Moxifloxacin becomes an essential drug in the treatment of resistant tuberculosis\(^4\) that causes high bactericidal activity\(^5\). Nevertheless, these drugs have the ability to delay cardiac repolarization, represent as corrected QT (QTc) interval prolongation on electrocardiogram (ECG)\(^6\). QTc interval prolongation can disrupt normal cardiac rhythms and lead to fatal arrhythmias such as torsades de pointes\(^7\) and lead to sudden cardiac death\(^8\). Thus, TB program recommends monitoring QTc interval to ensure patient safety and optimum patient outcome\(^3\).

The risk of drug-induced QT interval prolongation appears to be frequently overlooked in clinical practice\(^8\). A literature review of 249 patients with TdP associated with non-cardiac QTc-prolonging drugs reported that, apart from the drugs, 71% had at least two other risk factors\(^9\). Clinically significant QTcF changes (QTcF > 500 ms or an increase 60 ms) were observed in 10/60 patients (17%, 95%CI; 8.0–30.7) without clinical events\(^10\).

However, there is not enough information regarding the relationship between QTc interval baseline, the occurrence of QTc prolongation among DR-TB patients on STR regimen, the dosage of moxifloxacin with QTc prolongation, and outcome treatment. This study aimed to find the factors of QTc prolongation in DR-TB patients treated with STR during the intensive phase.

**Method**

A descriptive retrospective study was conducted in 123 DR-TB patients treated with STR from September 2017 to August 2018 at Dr. Soetomo General Academic Hospital, Surabaya, Indonesia. Only 108 patients were eligible for this study. DR-TB was confirmed by rapid molecular test XpertMTB/RIF and Drugs Sensitivity Test (DST). This study reviewed the medical records of patients with STR during the intensive phase.

STR is a 9-month regimen consisting of kanamycin, ethionamide, moxifloxacin, clofazimine, ethambutol, and high dose isoniazid\(^3\). The intensive phase lasts a minimum of four months and could be extended up to 6 months because of delayed sputum smear conversion\(^11\).

This study obtained data on demographics, comorbidities, potassium (K+) baseline, baseline QTc interval, serial QTc interval, and the onset of QTc prolongation. Patient with missing serial ECG, incomplete medical record, and less than six-month treatment were excluded from this study.

Patient routinely has a 12-lead ECG before starting the treatment and each month when begin taking medication. QT interval defines as the time from the beginning of ventricular depolarization to completion of repolarization\(^7\). Measurement of the QT should be based on leads that normally show the earliest QRS onset and the latest end of the T wave (T-wave offset), which are II and V5. The end of the QT interval is the point at which the T wave reaches the iso-electric line\(^12\).

Baseline QTc was evaluated though first ECG recording before taking STR regimen therapy. QTc interval was measured from the onset of Q wave of QRS complex to the end of the T wave (T-wave offset). Frederica formula (QTc Fri = QT/RR\(^{1/3}\)) was employed to count QT correction\(^14\).

QTc >500 ms is considered as severe prolongation; QTc 471-500 ms is considered as moderate prolongation that requires further evaluation\(^15\). QTc prolongation was classified according to the Common terminology criteria for adverse events (CTCAE) guidelines version 4.03 (grade 0, QTc < 450; grade 1, QTc 450–479 ms; grade 2, QTc 480–499 ms; grade 3, QTc > 500 ms; grade 4, QTc>500 ms with life-threatening signs or symptoms; grade 5, death)\(^16\).

Patient data were collected via Microsoft Excel and analyzed using IBM SPSS statistic 20.0 (IBM Corp., Armonk, NY, USA). A Multivariate logistic regression model was used to determine a risk factor relating to baseline QTc. The relationship between baseline QTc interval and occurrence of QTc prolongation was analyzed using Chi-Square of fisher’s exact test. P-values < 0.05 were considered statistically significant.

**Results**

Of 123 patients with STR, only 108 patient were eligible for this study that consisted of 63 (58.3%) males and 45 (41.7%) females. In this study, patients were divided into two groups, normal QTc and prolonged QTc groups. There were 57 (53%) patients with normal QTc (<470msc) and 51 (47%) patients with prolonged QTc (>470msc). Thirty (28%) patients had severe
QTc prolongation (QTc > 500 ms), and 21 (19%) had moderate QTc prolongation (QTc between 470-500 ms).

The demographic data from this study were noted in Table 1. The mean age patient was 46.4 ± 12.1. There were 42 (38.9%) patients with diabetes mellitus and 8 patients with hypertension (7.4%). The mean of kalium at baseline was 4.08 ± 0.6. Based on multiple regression model, there was no significant correlation between age, gender, diabetes mellitus, potassium at baseline, and smoking (p > 0.05).

Baseline QTc was divided into four groups (Table 2). There were 10 patients with baseline QTc with >470msc, 15 patients with QTc 451-470, 73 patients with QTc 400-450, and 10 patients with QTc < 400 ms. The results of chi-square of fisher exact showed that baseline QTc had a significant correlation with QTc interval prolongation after taking STR (p = 0.001).

This study found that baseline QTc had a significant correlation with the onset of QTc (p < 0.001). From 10 patients, 9 (90%) patients had QTc prolongation at first month after taking STR drugs and one patient (10%) in the second month. All patients developed into QTc prolongation as seen at Table 3. From baseline QTc 451-470, 2 (13.3%) patients had QTc prolongation at first month, and 3 (20%) patients had QTc prolongation at second month, and 6 (40%) patients did not develop into QTc prolongation. Forty-six patients with baseline QTc 400 – 450 ms did not have prolonged QTc during the intensive phase (63%), and 7 (70%) patients from baseline QTc < 400msc did not have prolonged QTc.

Of 109 patients with moxifloxacin, six (10.5%) patients with normal QTc had 400 mg oral moxifloxacin, 29 (50.9%) had 600 mg oral moxifloxacin, and 22 (38.6%) had 800 mg oral moxifloxacin. There were fifteen (71.4%) patients with moderate prolong QTc (471-500) had 600 mg oral moxifloxacin, 18 (58.1%) patients with severe prolong QTc > 500 ms had 600 mg. Almost all patients took 600 mg oral moxifloxacin (Table 4). There was no significant difference in the dosage of moxifloxacin with QTc interval prolongation.

There was a significant correlation between outcome therapy with QTc prolongation (p < 0.001; table 5). A favorable outcome was cured, while an adverse was defined as death. There were 22 (47.8%) patients on treatment had severe QTc prolongation (>500ms), 8 (44.4%) death patients had severe QTc prolongation and they were more likely died because of sudden death. Compared with moderate QTc (471-500msc), 6 (13%) patients on treatment STR and 6 (28.6%) died.

Discussion

This study found that 47% patients with STR treatment developed into QTc prolongation. Cellular mechanism of QTc prolongation involves inhibition of rapid component of the delayed rectifier potassium current (IKr). Locking IKr leads to prolongation of the ventricular action potential duration, leading to an excess sodium influx or a decreased potassium efflux (17). This excess of positively interaction with the ion channels is responsible for myocardial contractility that leads to an extended repolarization phase (18), resulting in a prolonged QT interval and causing arrhythmias such as Torsades de Pointes (17).

Table 1 showed that age, gender, diabetes mellitus, hypertension, smoking, and potassium at baseline had negative correlations with QTc prolongation. Therefore, the incidence of QTc prolongation might have been caused by the use of QT drugs. In this study, moxifloxacin was the strongest predictor of drug-induced QTc prolongation. Moxifloxacin inhibition of hERG/IKr occurred at concentrations higher than those observed clinically during treatment (19).

A recent study demonstrated that the risk of cardiac arrest in hospitalized patients with several underlying diseases was increased two-times with the use of non-antiarrhythmic QT-prolonging drugs. The risk of cardiac arrest is higher if receiving more than one daily dose if treated with more than one QT-prolonging drug, and with drugs that interfere with the metabolism or elimination of the QT-prolonging agent (20). The individual variability in drug sensitivity and the variable influence of factors that affect QTc prolongation on each patient’s drug exposure (e.g., dose, drug metabolism, and route of administration) might reduce the predictive accuracy of study (21).

Moxifloxacin 400 mg is known to cause a mean increase in the QTc interval of between 10 and 14 ms in 2–4 hours after a single oral dose. In addition, a supratherapeutic dose of moxifloxacin (800 mg) results in a nearly two-times increase in the QTc interval from baseline compared with the 400-mg dose (22). Unfortunately, this study did not mention 600 mg dose.

Baseline QTc shown in Table 2 indicated that patients with longer baseline QTc significantly would develop
into prolonged QTc. Increased 10 ms from baseline on QTc interval results in a 6% increase for the risk of a cardiac event. The risk of TdP also increases with the QTc interval more than 60 ms compared with the baseline value. Therefore, physicians should anticipate this possible increase in QTc intervals and perform ECGs before treatment to identify baseline QTc which may be the result of drug-induced Long QT Syndrome.

Treated patient with QTc Baseline > 470msc more likely developed QTc prolongation at first month of administered drugs (Table 3). Drug-induced QTc prolongation can occur at different times while the patient is receiving offending oral agent, as it usually corresponds with the expected time of the medication’s peak concentration. An increase in plasma moxifloxacin concentration is associated with QTc prolongation.

The regulatory of QTc study is identified by the EMA, the US FDA, and the International Conference on Harmonisation (ICH E14) of Technical Requirements for Registration of Pharmaceuticals for Human Use as a positive control in thorough QTc studies. The FDA further concludes that the risk of arrhythmias appears to increase with the extent of QT/QTc prolongation.

Moxifloxacin, a new generation of fluoroquinolone, has been shown to have better activity against mycobacterium tuberculosis than floxacin. Moxifloxacin is an 8-methoxy quinolone antimicrobial drug, which is often used as a positive control in thorough QT (TQT) studies. Moxifloxacin is a reversible blocker of the rapid component of the delayed rectifier, potassium current of the cardiac Ikr potassium channel and causes a mean increase of the QTc interval of 10–14 ms between 2 and 4 hours after a single oral dose of 400 mg. Moxifloxacin binds to and inhibits the human ether-a-go-go-related gene (hERG) IKr α subunit and thereby prolongs the cardiac repolarization interval. Patch-clamp studies indicate that moxifloxacin can bind with high affinity to the open IKr and block the conductance.

Yew and chang (2018) reported that 1-10% of patients with shorter MDR-TB treatment regimen containing high-dose moxifloxacin had QTc prolongation. From systematic review, it summarises 15 years of research demonstrate that moxifloxacin is well absorbed orally and highly active against M. tuberculosis.

QT prolongation has been described previously as a risk factor for all-cause mortality and more specifically, cardiovascular mortality. On a study of 172 patients, the most common cause for QTc prolongation was QTc interval-prolonging medication and was deemed most responsible in 48% of patients, with 25% of these patients taking ≥ two offending drugs. A study conducted by Haugaa et al. showed the death diagnosis itself does not directly reflect arrhythmic death. It is important to analyze clinical courses in the group of patients with a QTc interval of 500 ms or higher to fill the gap between the death diagnosis and the real number of patients with nervous system or the sinoatrial node. Drugs block the delayed rectifier potassium channel, which is coded by human ether-a-go-go-related gene (hERG). The distinct molecular structure of the hERG channel makes it more susceptible to medications. IKr currently plays an important role in phase-3 of ventricular action potential (ventricular repolarization).

The pharmacokinetics of this moxifloxacin make it suitable to be an anti-TB drug. The oral dosing achieves a peak serum concentration of >4 mg·L⁻¹. Maximum concentration in serum and the area under the concentration (AUC)–time curve from 0 to 24 h has been reported as 3.4 mg·L⁻¹ and 30.2 mg·h·L⁻¹. Respectively, high values were found on day 10. Peak concentrations of the drug are achieved rapidly, with all patients achieving this within two hours. The half-life is reported as ~12 h.

Different absorption characteristics per dose were assumed, so a different parameter was estimated by dose in the absorption model. The absorption rate of 400 mg moxifloxacin was faster than that of 800 mg. Clinical vigilance and constant monitoring are important for all potential toxicities associated with high-dose moxifloxacin are imperative, especially for cardiotoxicity, which needs periodic electrocardiographic assessment throughout the treatment for all patients, with possibly 24 hours. Holter monitoring for selected cases is needed to comprehensively detect potentially dangerous arrhythmia.
arrhythmia-related death (33). Thomas et al. found that acutely ill patients with prolonged QT intervals had nearly a three-time odds ratio for an adverse event in ICU (34). Patients with clinically significant QT prolongation should undergo continuous ECG monitoring (35).

In our study, 22 patients who were still undergoing STR and moxifloxacin treatment had severe QTc prolongation. A cohort study in South Korea in 373 patients receiving anti-tuberculosis drugs found 16% incidence of ECG abnormalities, and 0.8% presented with cardiac adverse events. The study concluded that, despite QTc prolongation, clinically meaningful events appeared to be minimal (18). Survival curves of those with/without prolonged QTc separated well within 50 days of hospital admission (7).

Table 1. Demographics data

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Total n (%)</th>
<th>Normal QTc n (%)</th>
<th>Prolong QTc n (%)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age*</td>
<td>46.4±12.1</td>
<td>45.5±13.8</td>
<td>47.5±9.7</td>
<td>0.162</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>63(58.3%)</td>
<td>39(68.4%)</td>
<td>24(47.1%)</td>
<td>0.278</td>
</tr>
<tr>
<td>Female</td>
<td>45(41.7%)</td>
<td>18(31.6%)</td>
<td>27(52.9%)</td>
<td></td>
</tr>
<tr>
<td>Diabetes Melitus</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>42(38.9%)</td>
<td>20(35.1%)</td>
<td>22(43.1%)</td>
<td>0.836</td>
</tr>
<tr>
<td>No</td>
<td>66(61.1%)</td>
<td>37(64.9%)</td>
<td>29(56.9%)</td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>8(7.4%)</td>
<td>4(7%)</td>
<td>4(7.8%)</td>
<td>0.946</td>
</tr>
<tr>
<td>No</td>
<td>100(92.6%)</td>
<td>53(93%)</td>
<td>47(92.2%)</td>
<td></td>
</tr>
<tr>
<td>Smoking</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>41(38%)</td>
<td>25(43.9%)</td>
<td>16(31.4%)</td>
<td>0.679</td>
</tr>
<tr>
<td>No</td>
<td>67(62%)</td>
<td>32(56.1%)</td>
<td>35(68.6%)</td>
<td></td>
</tr>
<tr>
<td>Kalium Baseline*</td>
<td>4.08±0.6</td>
<td>4.12±0.6</td>
<td>4.03±0.6</td>
<td>0.200</td>
</tr>
</tbody>
</table>

*p<0.05

Table 2. Correlation between baseline QTc and QTc interval prolongation

<table>
<thead>
<tr>
<th>Baseline</th>
<th>Severe QTc &gt;500</th>
<th>Moderate QTc 471-500</th>
<th>Normal QTc &lt;470</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>QTc &gt;470 (n=10)</td>
<td>6(60.0)</td>
<td>3(30.0)</td>
<td>1(10.0)</td>
<td>0.001*</td>
</tr>
<tr>
<td>QTc 451-470 (n=15)</td>
<td>4(26.7)</td>
<td>7(46.7)</td>
<td>4(26.7)</td>
<td></td>
</tr>
<tr>
<td>QTc 400-450 (n=73)</td>
<td>18(24.7)</td>
<td>10(13.7)</td>
<td>45(61.6)</td>
<td></td>
</tr>
<tr>
<td>QTc &lt;400 (n=10)</td>
<td>3(30.0)</td>
<td>0(0.0)</td>
<td>7(70.0)</td>
<td></td>
</tr>
</tbody>
</table>

*p<0.05

Table 3. Correlation between baseline QTc with prolong QTc onset in DR-TB Patients

<table>
<thead>
<tr>
<th>Baseline</th>
<th>Month 1</th>
<th>Month 2</th>
<th>Month 3</th>
<th>Month 4</th>
<th>Month 5</th>
<th>No prolong QT</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>QTc &gt;470 (n=10)</td>
<td>9(90.0)</td>
<td>1(10.0)</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
<td>0.000**</td>
</tr>
<tr>
<td>QTc 451-470 (n=15)</td>
<td>2(13.3)</td>
<td>3(20.0)</td>
<td>1(6.7)</td>
<td>2(13.3%)</td>
<td>1(6.7)</td>
<td>6(40.0)</td>
<td></td>
</tr>
<tr>
<td>Baseline QTc 400-450 (n=73)</td>
<td>6(8.2)</td>
<td>13(17.8)</td>
<td>5(6.8)</td>
<td>2(2.7%)</td>
<td>1(1.4)</td>
<td>46(63.0)</td>
<td></td>
</tr>
<tr>
<td>Baseline QTc &lt;400 (n=10)</td>
<td>1(10.0)</td>
<td>1(10.0)</td>
<td>0(0.0)</td>
<td>1(10.0)</td>
<td>0(0.0)</td>
<td>7(70.0)</td>
<td></td>
</tr>
</tbody>
</table>

**p<0.001
Table 4. Correlation between QTc prolongation with moxifloxacin dose

<table>
<thead>
<tr>
<th>Dosage moxifloxacin</th>
<th>400 mg</th>
<th>600 mg</th>
<th>800 mg</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal QTc &lt;470</td>
<td>6 (10.5)</td>
<td>29 (50.9)</td>
<td>22 (38.6)</td>
<td>0.565</td>
</tr>
<tr>
<td>Moderate prolong QTc 471-500</td>
<td>2 (9.5)</td>
<td>15 (71.4)</td>
<td>4 (19.0)</td>
<td></td>
</tr>
<tr>
<td>Severe prolong QTc &gt;500</td>
<td>3 (9.7)</td>
<td>18 (58.1)</td>
<td>10 (32.3)</td>
<td></td>
</tr>
</tbody>
</table>

Table 5. Correlation between outcome therapy with QTc Prolongation

<table>
<thead>
<tr>
<th></th>
<th>Severe QTc &gt;500</th>
<th>Moderate QTc 471-500</th>
<th>Normal QTc &lt;470</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cured (n=9)</td>
<td>1 (11.1)</td>
<td>4 (44.4)</td>
<td>4 (44.4)</td>
<td>0.000**</td>
</tr>
<tr>
<td>Death (n=18)</td>
<td>8 (44.4)</td>
<td>6 (28.6)</td>
<td>4 (12.9)</td>
<td></td>
</tr>
<tr>
<td>Dropout (n=20)</td>
<td>3 (15.0)</td>
<td>0 (0.0)</td>
<td>17 (29.8)</td>
<td></td>
</tr>
<tr>
<td>Lost to Follow Up (n=16)</td>
<td>1 (6.2)</td>
<td>5 (31.2)</td>
<td>10 (62.5)</td>
<td></td>
</tr>
<tr>
<td>On Treatment (n=46)</td>
<td>22 (47.8)</td>
<td>6 (13.0)</td>
<td>18 (39.1)</td>
<td></td>
</tr>
</tbody>
</table>

**p < 0.001

Conclusions

Short term regimen DR-TB has the potential to prolong QT interval. The prolonged QTc interval is significantly related to the QTc interval at baseline. The QTc interval at baseline correlates significantly with the start time of QTc prolongation. This study presents different approaches that balance the need for life-saving regimens and medications, raise awareness of cardiac events, propose a strategy for ECG monitoring in STR DR-TB.

Conflict of Interest: The authors declare that they have no conflict of interest. The authors have written the ICMJE Authorship form.

Funding: None

Data Availability: The data set used and/or analyzed during the current study are available from corresponding author on reasonable request.

Ethics Statement: All procedures performed in studies involving human participants were in accordance with the ethical standards of the Ethics Committee in Dr. Soetomo General Academic Hospital, Surabaya, Indonesia (1491/KEPK/IX/2019).


References


Comparison of Knowledge, Attitude and Practice Regarding Usage of Mobiles During Driving amongst Medical and Engineering Students Aged 18-21 Years in Bengaluru North

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Abstract

WHO categorizes driver distraction like mobile usage as an important risk factor for road crash injuries, as driver’s reaction time increases causing difficulty in: maintaining correct positions in their lanes, maintaining appropriate speeds and judging safe gaps in traffic.

Descriptive study with objective of assessing knowledge, attitude and practices regarding mobile usage while driving amongst medical and engineering students aged 18-21 years was carried out using proforma after taking consent.

During driving, most of medical (61%, 79%) & engineering (60%, 69%) students called & received calls; 55% & 60% knew it is distracted driving & only 43% & 46% always considered it as punishable respectively. 42% & 30% read and 34% & 18% texted message; 53% & 26% used social media (WhatsApp, Facebook etc); most viewed maps/directions on their phone and felt that pedestrians using mobile are prone for accidents. Although 87% & 88% would advice others, only 52% & 55% would restrain mobile usage during driving respectively.

This study suggest for improving on-ground situation through formal education to bring about moral responsibility amongst youth and propose automatic electronic system in vehicles for early detection of this globally identified risk factor.

Keywords: Mobile; Distracted driving; Medical; Engineering.

Introduction

India accounts for over 10% of global road crash fatalities while it has just 1% of world’s vehicles. In a decade, India lost 1.3 million people to road crash & another 5.3 million were disabled for life.1 Road accidents kill 17 people every hour in India and yet, drivers fail to give up risky habits. WHO categorizes driver distraction as an important risk factor for road crash injuries. Distracted driving refers to the act of driving while engaging in other activities which distract the driver’s attention away from the road. The type of distracted driving includes the usage of mobile phone, eating and drinking conversation with co-passengers, self-grooming, reading or watching videos, adjusting the radio or the music player and even using a GPS system for navigating locations. Amongst these, mobile phone usage is said to be most distracting factor.2 Young adults

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Mobile No.: +91-8867249976, +91-8123422114
e-mail: tyagarajumr@gmail.com, udayashankarbs83@gmail.com
have been found to higher rates of texting and driving than older drivers.\textsuperscript{3}

Distractions are shown to compromise the safety of driver, passengers, pedestrians and people in other vehicles. Researchers have shown that the reaction time of drivers increases by 0.5 to 1.5 seconds when they are talking on handheld phones, and drivers have difficulty maintaining the correct positions in their lanes, maintaining appropriate speeds and judging and accepting safe gaps in traffic.\textsuperscript{4} Despite the high risks associated with distracted driving; there is little knowledge about its extent and nature in India. While distracted driving includes any activities that take eyes or attention away from driving, there has been particular and intense interest on texting and other Smartphone-associated distraction as smart phones have become widely available over the past 10 years.\textsuperscript{5}

**Aims and Objectives::**

1. To assess the knowledge, attitude and practice regarding distracted driving amongst engineering and medical students.

2. To compare and analyze knowledge, attitude and practice regarding distracted driving amongst engineering and medical students.

**Materials and Method**

Type of Study: Descriptive cross sectional study

**Source of Data:** Undergraduate medical and engineering students of Bengaluru north.

**Method of Collection of Data:** Students were explained about nature and purpose of study, their consent was taken after assuring them full confidentiality and requested to fill questionnaires which was distributed in classrooms just after completion of classes.

The collected data was analyzed using descriptive and analytical statistics.

**Inclusion Criteria:** All engineering and medical students aged 18-21 years, willing to participate in study.

**Exclusion Criteria:** Students who did not give consent to participate and those who don’t drive vehicles.

**Sampling Method:** Purposive sampling

**Sample Size:** 174 medical students and 174 engineering students of Bengaluru north.

**Study Duration:** 2 months.

Prior ethical clearance was obtained.

**Results**

From prospective recording of students aged 18-21 years over a period of 2 months, 174 students each from engineering and medical colleges were eligible.

Amongst 174 students; 114 were females and 60 were males.

Out of 174 medical students, 105 (60%) medical students thought that they can never safely text and drive [Table 1], females (65%) more than males (52%) [Fig 1]; thus, 59 students (36%) texted message while driving; more males (37%) texted than females (32%); and 73 students (42%) read text message while driving; more males (53%) read message than females (36%) [Fig 3]. Most of medical students (61%) called while driving, males (75%) more than females (54%); and 79% received calls while driving, males (90%) more than females (74%) [Fig 5].

96 medical students (55%) knew that mobile usage during driving was considered always as distracted driving (60% males & 53% females) but only 75 medical students (43%) always considered it as punishable (43% both in males & females) [Fig 4]. 92 students (53%) read message or viewed information on social media apps (Whatsapp, Facebook, Twitter, Snapchat, etc) while driving; wherein all male students (100%) used social media compared to female students (28%). Almost all (94%) viewed maps or directions on phone while driving; more males (98%) than females (91%) [Fig 6].

All females (100%) & maximum (99%) male medical students felt that pedestrians using mobile phone are at risk and can cause accidents. Although most of them (87%) advised others to never use mobile phone during driving (89% females & 82% males); only 52% always restrained themselves/family/friends from using mobile phone during driving (55% females & 47% males) [Fig 2].

Out of 174 engineering students, 121 (70%) engineering students thought that they can never safely text and drive [Table 1], females (74%) more than males (62%) [Fig 1]; thus, 32 students (18%) texted message while driving; more males (25%) texted than females (15%); and 53 students (30%) read text message while driving; more males (42%) read message than females...
(24%) [Fig 3]. Most of engineering students (60%) called while driving, males (70%) more than females (52%); and 69% received calls while driving; males (78%) more than females (65%) [Fig 5].

104 engineering students (60%) knew that mobile usage during driving was considered always as distracted driving (63% males & 58% females) but only 80 engineering students (46%) always considered it as punishable (50% in males & 44% in females) [Fig 4]. 128 engineering students (74%) never read message or viewed information on social media apps (Whatsapp, Facebook, Twitter, Snapchat, etc) while driving; nevertheless male students (34%) used social media quite often compared to female students (23%). Almost all (89%) viewed maps or directions on phone while driving; more males (92%) than females (87%) [Fig 6]. Almost maximum female (99%) & male (97%) engineering students felt that pedestrians using mobile phone are at risk and can cause accidents. Although most of them (88%) advised others to never use mobile phone during driving (90% females & 85% males); only 55% always restrained themselves/family/friends from using mobile phone during driving (57% females & 52% males) [Fig 2].

Table 1: Comparison of responses to questions regarding knowledge, attitude & practices of mobile usage during driving amongst medical & engineering students

<table>
<thead>
<tr>
<th>Questions:</th>
<th>Medical</th>
<th>Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you think that you can safely text and drive?</td>
<td>Always</td>
<td>Most of the time</td>
</tr>
<tr>
<td></td>
<td>3(2%)</td>
<td>8(4%)</td>
</tr>
<tr>
<td></td>
<td>24(14%)</td>
<td>34(20%)</td>
</tr>
<tr>
<td></td>
<td>105(60%)</td>
<td>7(4%)</td>
</tr>
<tr>
<td></td>
<td>6(3%)</td>
<td>15(9%)</td>
</tr>
<tr>
<td></td>
<td>25(14%)</td>
<td>121(70%)</td>
</tr>
<tr>
<td>Do you read text messages while driving?</td>
<td>3(2%)</td>
<td>4(2%)</td>
</tr>
<tr>
<td></td>
<td>23(13%)</td>
<td>43(25%)</td>
</tr>
<tr>
<td></td>
<td>101(58%)</td>
<td>2(1%)</td>
</tr>
<tr>
<td></td>
<td>13(8%)</td>
<td>37(21%)</td>
</tr>
<tr>
<td></td>
<td>122(70%)</td>
<td></td>
</tr>
<tr>
<td>Do you read e-mail while driving?</td>
<td>5(3%)</td>
<td>14(8%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25(14%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>144(83%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1(1%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10(6%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>106(62%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>153(87%)</td>
</tr>
<tr>
<td>Do you view maps or directions on your phone while driving?</td>
<td>2(1%)</td>
<td>41(24%)</td>
</tr>
<tr>
<td></td>
<td>80(46%)</td>
<td>40(23%)</td>
</tr>
<tr>
<td></td>
<td>11(6%)</td>
<td>5(3%)</td>
</tr>
<tr>
<td></td>
<td>27(16%)</td>
<td>79(45%)</td>
</tr>
<tr>
<td></td>
<td>43(25%)</td>
<td>20(11%)</td>
</tr>
<tr>
<td>As a driver, do you feel that pedestrians using mobile phone are at risk and can cause accidents?</td>
<td>53(30%)</td>
<td>82(47%)</td>
</tr>
<tr>
<td></td>
<td>35(20%)</td>
<td>3(2%)</td>
</tr>
<tr>
<td></td>
<td>1(1%)</td>
<td>49(28%)</td>
</tr>
<tr>
<td></td>
<td>65(37%)</td>
<td>47(27%)</td>
</tr>
<tr>
<td></td>
<td>10(6%)</td>
<td>3(2%)</td>
</tr>
<tr>
<td>Do you text messages while driving?</td>
<td>2(1%)</td>
<td>15(9%)</td>
</tr>
<tr>
<td></td>
<td>15(9%)</td>
<td>115(66%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3(2%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>29(16%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>142(82%)</td>
</tr>
<tr>
<td>Do you call while driving?</td>
<td>4(2%)</td>
<td>6(3%)</td>
</tr>
<tr>
<td></td>
<td>45(26%)</td>
<td>52(30%)</td>
</tr>
<tr>
<td></td>
<td>67(39%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3(2%)</td>
<td>36(20%)</td>
</tr>
<tr>
<td></td>
<td>66(38%)</td>
<td>69(40%)</td>
</tr>
<tr>
<td>Do you receive calls while driving?</td>
<td>7(4%)</td>
<td>9(5%)</td>
</tr>
<tr>
<td></td>
<td>68(39%)</td>
<td>54(31%)</td>
</tr>
<tr>
<td></td>
<td>36(21%)</td>
<td>4(2%)</td>
</tr>
<tr>
<td></td>
<td>13(7%)</td>
<td>48(28%)</td>
</tr>
<tr>
<td></td>
<td>56(32%)</td>
<td>53(31%)</td>
</tr>
<tr>
<td>Do you read message or view information on social media apps while driving? (WhatsApp, Facebook, Twitter, Snapchat, etc)</td>
<td>3(2%)</td>
<td>34(19%)</td>
</tr>
<tr>
<td></td>
<td>22(13%)</td>
<td>33(19%)</td>
</tr>
<tr>
<td></td>
<td>82(47%)</td>
<td>1(1%)</td>
</tr>
<tr>
<td></td>
<td>1(1%)</td>
<td>1(1%)</td>
</tr>
<tr>
<td></td>
<td>13(7%)</td>
<td>31(17%)</td>
</tr>
<tr>
<td></td>
<td>128(74%)</td>
<td></td>
</tr>
<tr>
<td>Do you think usage of mobile phone during driving is considered as distracted driving?</td>
<td>96(55%)</td>
<td>59(34%)</td>
</tr>
<tr>
<td></td>
<td>3(2%)</td>
<td>10(6%)</td>
</tr>
<tr>
<td></td>
<td>6(3%)</td>
<td>104(60%)</td>
</tr>
<tr>
<td></td>
<td>43(24%)</td>
<td>19(11%)</td>
</tr>
<tr>
<td></td>
<td>3(2%)</td>
<td>5(3%)</td>
</tr>
<tr>
<td>Do you think usage of mobile phones during driving is punishable?</td>
<td>75(43%)</td>
<td>63(36%)</td>
</tr>
<tr>
<td></td>
<td>29(17%)</td>
<td>2(1%)</td>
</tr>
<tr>
<td></td>
<td>5(3%)</td>
<td>80(46%)</td>
</tr>
<tr>
<td></td>
<td>49(28%)</td>
<td>30(17%)</td>
</tr>
<tr>
<td></td>
<td>10(6%)</td>
<td>5(3%)</td>
</tr>
<tr>
<td>Do you advice others to use mobile phone during driving?</td>
<td>1(1%)</td>
<td>3(2%)</td>
</tr>
<tr>
<td></td>
<td>7(4%)</td>
<td>12(6%)</td>
</tr>
<tr>
<td></td>
<td>151(87%)</td>
<td>5(3%)</td>
</tr>
<tr>
<td></td>
<td>3(2%)</td>
<td>4(2%)</td>
</tr>
<tr>
<td></td>
<td>8(5%)</td>
<td>154(88%)</td>
</tr>
<tr>
<td>Do you restrain yourself/family/friends from using mobile phones during driving?</td>
<td>91(52%)</td>
<td>50(29%)</td>
</tr>
<tr>
<td></td>
<td>18(11%)</td>
<td>6(3%)</td>
</tr>
<tr>
<td></td>
<td>9(5%)</td>
<td>96(55%)</td>
</tr>
<tr>
<td></td>
<td>38(22%)</td>
<td>19(11%)</td>
</tr>
<tr>
<td></td>
<td>10(6%)</td>
<td>11(6%)</td>
</tr>
</tbody>
</table>

Total: 174
Fig. 1: Comparison of knowledge of mobile usage during driving amongst medical (Me) & engineering (En) Female (F) students

Fig. 2: Comparison of attitude & practice of mobile usage during driving amongst medical (Me) & engineering (En) Female (F) students
Fig. 3: Comparison of practice of mobile usage during driving amongst medical (Me) & engineering (En) Female (F) students

Fig. 4: Comparison of knowledge of mobile usage during driving amongst medical (Me) & engineering (En) Male (M) students
Fig. 5: Comparison of attitude & practice of mobile usage during driving amongst medical (Me) & engineering (En) Male (M) students

Fig. 6: Comparison of practice of mobile usage during driving amongst medical (Me) & engineering (En) Male (M) students
Discussion

In our study in the age group of 18-21 years, out of total 348 students (174 each), 42% medical & 30% engineering students read text message while driving; and 36% medical & 18% engineering students texted the message during the same. Although engineering students are considered as tech-savvy, more engineering (70%) than medical (60%) students thought that they can never safely text and drive. Similarly, out of 228 drivers (18–24 year old), they found that 59.2% reported writing text messages, 71.5% said they read text messages while driving & 36.4% said it was never safe to text and drive. Although females are best known for their multi-tasking nature, more females (74% engineering & 65% medical) thought that they can never safely text and drive. Thus, females (15% engineering & 32% medical) texted less than males (25% engineering & 37% medical) while driving. And less females (24% engineering & 36% medical) read text message than males (42% engineering & 53% medical) while driving. Surveys in US confirmed that the young adults are at high risk for distracted driving; in one, 81% of 348 college students stated that they would respond to an incoming text while driving, and 92% read text while driving. And in other, 41.4% reported texting.  Most of both medical (61%) & engineering (60%) students made calls while driving & that’s dangerous. Although women are considered to be more talkative, men (75% medical & 70% engineering) called quite often while driving compared to females (54% medical & 52% engineering). Similarly, most of both medical (79%) & engineering (69%) students received calls while driving; and men (90% medical & 78% engineering) received calls quite often while driving compared to females (74% medical & 65% engineering).

Only 55% medical & 60% engineering students knew that mobile usage during driving was considered always as distracted driving and only 43% medical & 46% engineering students always considered it as punishable. This emphasizes the need of formal education & awareness about distracted driving & punishment for its violation in both professional course students or in their early education before they attain majority to be eligible for driving a vehicle. More than 3300 people were killed and 421,000 injured in distraction related crashes in US in a study done in 2012, with worst levels of distraction in youngest drivers. Whereas 53% medical students read message or viewed information on social media apps (Whatsapp, Facebook, Twitter, Snapchat, etc) while driving; in contrast 74% engineering students never used social media while driving. All medical males (100%) used social media while driving is an alarming sign compared to females (28%). But, in contrast, 83% medical & 87% engineering students never read e-mail while driving.

In a study, reading and writing e-mail and browsing social media were less common. This often usage of social media by medical students could be due to more students whatsapp groups that they are enrolled into & compulsion to see into the instructions given through whatsapp message, especially in a formal group of an institution; though in no way they are asked to see into it during driving.

Almost all medical (94%) & engineering (89%) students viewed maps or directions on phone while driving; more males than females. Maps were used on a phone by 74.6% in a study. Almost maximum medical (99%) & engineering (98%) students felt that pedestrians using mobile phone are at risk and can cause accidents.

Although most of them (87% medical & 88% engineering) advised others to never use mobile phone during driving; only 52% medical & 55% engineering students always restrained themself/family/friends from using mobile phone during driving. Females were better advisors & had better capacity to restrain in this regard compared to males in both medical & engineering students.

Conclusion

In our study, both medical & engineering students practiced mobile usage quite often during driving, in the form of making & receiving calls and responding to text message. Only about half of them knew that mobile usage while driving is distracted driving & is punishable. Engineering students were slightly better off in this regard and females were better compared to males. Although more males had knowledge about distracted driving compared to females, it was the male students who frequently indulged in mobile usage during driving than females. Most of them advised others not to, but only about half restrained from mobile usage always during driving.

Recommendations: This study suggests policy makers for improving the on-ground situation with requisite interventions including awareness of stringent laws (section 184 MV Act, 1988) to control mishaps due
to distracted driving. And, proposes usage of anti-texting cell phone applications and an automatic electronic system for early detection of incoming or outgoing calls during driving.

Also, recommends requirement of formal education about this globally identified risk factor, to bring about moral responsibility amongst the youth who shall be the driving force for others to follow the rules and regulations while driving.

**Funding:** None

**Conflicts of Interest:** None

**References**


Victimization and Post-traumatic Stress Disorder of Victims of Terrorism in Indonesia

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Abstract

Terror attacks result in prolonged traumatic effects on both victims and survivors. Previous studies have analyzed the effects of terror attacks on the psychological condition of post-traumatic stress disorder from exposure to terrorist attacks. This article discusses victims of terrorism in Indonesia based on data from 2008-2018. The use of data over the span of several years is important to determine the trend of victimization so that a response can be made to reduce the suffering of victims. This perspective also includes counter-terrorism efforts to minimize the suffering of victims directly or indirectly due to terrorism. The criminal justice system can also reform paradigmatically, providing fulfillment of the rights of victims in accordance with applicable legal norms.

Keywords: Victims, post-traumatic stress disorder, legal protection, victimization, terrorism.

Introduction

Terror attacks result in prolonged traumatic effects on both victims and survivors. However, active efforts so far have been aimed at handling and preventing action, and have not yet fully addressed these psychological effects. Deliberate targeting of innocent people in general plays a central role in terrorists’ ability to terrorize. However, to date, little attention has been focused on victims of terrorist attacks whether they are survivors themselves or family members, friends or colleagues who have been directly exposed to this violence. It is appropriate for the justice system to change paradigmatically, from the discourse of protecting perpetrators to serving victims. Fulfilling the rights of victims is prioritized in the form of physical, economic and psychological recovery. The discourse of serving terrorism victims must also be placed in the framework of prevention and counteracting terrorism itself as an ideology that spreads fear.

Many previous studies have analyzed the effects of terror attacks on the psychological condition of victims. Some have also investigated post-traumatic stress disorder from exposure to terrorist attacks. It should also be noted that the provision of psychological support to terrorist victims in developing countries is less than that of developed countries. This is linked not only to a lack of social and financial resources, but also to a lack of policies and legal protections that specifically accommodate these interests.

This article reviews the problem of the victimization of terrorism in Indonesia. Terrorism has long been described as a violence choreographed by groups of people who wish to influence fundamental political change. The violence perpetrated by terrorists is designed not only to draw attention to them. Terrorism also aims, to coerce and intimidate, to create an atmosphere of fear and worry that terrorists can take advantage of.

Perpetrators and Prevalence of Terror Attacks:

Terrorist attacks have two patterns, namely focused and indiscriminate aspects. Terror is used as an instrument for politically motivated actions, targeting government officials, political figures as well as for the purpose of achieving certain political goals. Contemporary terrorism is characterized by the increasing frequency
Victimization of Terrorism: Some experts argue that victimization is an invasion of a victim’s personal self or victimizations are invasions into the self of the victim.33-37 The victimization of terrorism is somewhat unique and different from the victimization of ordinary crimes. Victims of terrorist attacks are usually not specifically targeted based on individual characteristics, but they are “accidental” victims. Just happen to be in the wrong place at the wrong time. These victims, however, function as instruments designed to influence third party actors.25,27,28,38-40

It is this element of uncertainty and randomness in the selection of victims that gives terrorism more power. A force that is multiplied by mass media broadcasts and reruns of its victimization. Direct victims of terrorist attacks are rarely the final targets of violence. In contrast, the act of selecting targets serves as reinforcement to convey messages and to influence a wider audience, such as a country that is an opponent of a terrorist organization. This victimization pattern can also be seen from the modus operandi of terror carried out by organizations or groups that have been anti-government since the beginning. They launched their actions to convey anti-Indonesian government political propaganda.26,27

Victims in terrorist attacks serve as symbols of common group or class characteristics, which in turn form a basis for their selection as victims.39 In this case, victims of terrorism become instrumental targets/targets.41 When viewed based on the number of victims, both dead and injured, 2002 was the year with the most victims, with 781 victims, 246 died and 535 were injured. The highest number of victims occurred during the bomb blasts in two places, namely Paddy’s Pub and Sari Club on Jalan Legian, Kuta, Bali. This incident is known as the Bali Bombing I. The incident masterminded by Jamaah Islamiyah (JI) caused 202 people to lose their lives and injure 300 victims. The second highest number of victims occurred in 2000 with a total of 482 victims, namely 146 victims and 336 injured. In 2004, a terror incident also left 238 injured. The major attack was a suicide bomb that was detonated by means of a large car bomb outside the Australian Embassy in Jakarta. This incident caused 180 people to be injured.

Typology of Victims: Given the erratic pattern of attacks and the absence of victims who were specifically targeted as victims of other types of crimes, discussing terrorism victims is unique in nature, relating to their specific harmful causes. An expert argue that there are two basic typologies to distinguish victims of terrorism namely primary victims or primary victims and secondary victims.26 Primary victimization often occurs as a result of initial victimization. Secondary victimization, which sometimes blurs the line between victim and perpetrator, refers to the social damage that occurs, not as a direct result of the crime, but through the response of social institutions and individuals to the victim.27,42 In addition to the typology proposed,26 there is also an alternative typology of victims of terrorism put forward by Ben Emmerson, a UN Special Rapporteur on the promotion and protection of human rights and basic freedoms in countering terrorism.43 In the report numbered (A/HRC/20/14), the Special Rapporteur identifies the following four main categories of victims
of terrorism: Direct victims of terrorism; Secondary victims of terrorism; indirect victims of terrorism and potential victims of terrorism.43

Post-Traumatic Stress Disorder on the Victims of Terrorism: The main objective of counter-terrorism efforts is to prevent victimization. Data on the number of victims who died and were injured due to terrorist attacks from 2000 to 2018 in Indonesia. The significant impact for victims of terrorism is in addition to losing their lives, serious injuries but also prolonged feelings of trauma. The lives of victims have changed forever.42,44 Victims of crime may have difficulty sleeping or concentrating, may be easily startled, may fail to participate in activities they once enjoyed, and may feel their self-esteem has dropped.42,45,46 Some victims may also experience post-traumatic stress disorder which, in addition to depressive symptoms, may also include disturbing phenomena such as flashbacks and nightmares, and which can last for months or years.47 Unfortunately, even though the victims of terrorism experience a significant impact, the Indonesian criminal justice system has not guaranteed the rights that must be received by victims such as compensation or restitution. Until now, only 56 victims of terrorism have received compensation from the government in accordance with Government Regulation Number 77 of 2018.48

Conclusion

The results showed that victimization of terrorism in the 2008-2018 periods experienced a downward trend. Protection and fulfillment of the rights of victims of terrorism are still limited to victims of death and injury, not including indirect victims who are also affected by terrorist attacks. In the future, the criminal justice system must be able to answer the challenges and complexities of the victimization of terrorism which can be fluid and at any time in accordance with the threat of terrorism that can occur at any time. This results are theoretically important to include counter-terrorism actions to minimize the suffering of victims directly or indirectly due to terrorism. Moreover, it is suggested that the reform of criminal justice system paradigmatically to provide fulfillment of the rights of victims in accordance with applicable legal norms.

Conflict of Interest: There is no conflict of interest.

Source of Funding: This research was funded by the Diponegoro University Faculty of Law Research Grant Fund for the 2020 Fiscal Year.

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Ethical Clearance: Ethical Clearance from the institutional ethical committee obtained for the study.


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Screening of Thyroid Function Test During First Trimester of Pregnancy

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Abstract

Introduction: During pregnancy maternal thyroid dysfunction has been associated with a number of adverse outcomes, like preterm birth, placental abruption, fetal death and impaired neurological development in the child. The presence of Thyroid Peroxidase Antibody (TPO-Ab) results miscarriage, preterm birth and maternal post-partum thyroid disease. Hypothyroidism is closely associated with the presence of Thyroid Peroxidase Antibody. If a pregnant woman is positive for TPO-Ab in early pregnancy, her chances to developing thyroid abnormalities.

Objective: To find out the level of TPO-Ab and thyroid status in first trimester of pregnancy.

Method: Observational cross-sectional Study was designed in Department of Biochemistry, Medical college, Vadodara, Gujarat, India.

Sample Size: 200 Normal pregnant women that randomly selected from the first trimesters of pregnancy. The study parameters were - thyroid peroxidase anti-body (TPO-Ab); serum thyroid stimulating hormone (TSH); serum T₃ and serum T₄.

Result: Our study found that 30(15%) pregnant women of first trimester was hypothyroidism (TSH >2.5mIU/l) Out of these 30 females, 9(4.5%) had overt hypothyroidism & 21 (10.5%) had subclinical hypothyroidism, among these 30 subjects, 26(13%) had found TPO-Ab positive (TPO-Ab >35 IU/mL) there was a significant positive correlation between positive TPO-Ab and serum TSH level of study subjects and there was a negative correlation between serum TSH and serum T₄,T₃ level in study subjects.

Conclusion: In this study we found 15% prevalence of hypothyroidism (4.5 % overt & 10.5 % subclinical) in first trimester of pregnancy. We found positive TPO-Ab in 13% of pregnant females and all these had some thyroid dysfunctions, subclinical or overt hypothyroidism, subclinical being much more common than overt hypothyroidism.

Keywords: Thyroid Peroxidase Antibody, Thyroid Stimulating hormone, Tri iodothyronine, Tetra iodothyronine.

Introduction

Pregnancy is a physiological state associated with many significant changes in thyroid function. The role of thyroid hormone in embryogenesis and fetal development during pregnancy is well known. During the first trimester of pregnancy, the fetus is reliant on trans- placental passage of maternal thyroxine, as the fetal thyroid is not fully functional until about 16 weeks of gestation.¹

It has been seen that thyroid dysfunction during pregnancy is associated with many complications during pregnancy and delivery like miscarriage, preterm birth, placental abruption and the child may have low I/Q, cretinism and developmental disorders. Many studies have shown that hypothyroid state in pregnancy is associated with maternal and fetal complications.²³

During the 1st trimester, the fetus is completely dependent upon thyroxin produced by the mother. Even
a small unnoticed malfunction of the thyroid gland, which doesn’t endanger the course of pregnancy, can affect the psychomotor development of the child.  

Thyroid function is frequently assessed during pregnancy, both to diagnose suspected thyroid abnormalities and to monitor the status of pre-existing thyroid disease. In addition to conventional TFT(T<sub>3</sub>, T<sub>4</sub> & TSH) tests, many studies have suggested testing of TPO-Ab.  

Thyroid Peroxidase antibodies [TPO-Ab] work against thyroid peroxidase, an enzyme that plays a part in T<sub>4</sub> to T<sub>3</sub> conversion and synthesis process. It also causes tissue destruction in other forms of thyroiditis such as postpartum thyroiditis. Thyroid autoantibodies may be considered as a marker of generalized autoimmune dysfunction in the body. TPO-Ab positive women have a risk for post partum thyroid dysfunction, hypothyroidism, miscarriage, preterm delivery and perinatal death. Screening for TPO-Ab level in early pregnancy may help to diagnose women at risk of hypothyroidism and thereby prevent adverse outcome of pregnancy.  

Many cases of hypothyroidism especially subclinical hypothyroidism remain undiagnosed during pregnancy leading to complications. Early treatment significantly reduces these complications. Hence early diagnosis of hypothyroidism and initiation of treatment is necessary. The thyroid peroxidase antibody is an important biochemical marker which can predict thyroid dysfunction in early stage of pregnancy, can help to identify the patients at risk and thereby start early treatment and decrease complications. Early treatment of hypothyroidism will prevent impaired neuropsychological development in the fetus and adverse outcomes.  

Not much clinical studies have been done on screening for thyroid disorders in pregnancy and in literature search I could not find any clear-cut guidelines for the diagnosis of thyroid dysfunction during pregnancy.

The present study is designed to correlate the TPO-Ab levels with thyroid function test in first trimester of pregnancy.

**Aim and Objective:**

**Aim:** To assess the utility of serum Thyroid Peroxidase Antibody(TPO-Ab) status in early pregnancy for timely diagnosis of thyroid dysfunctions.

**Objective:**

1. To study Thyroid Peroxidase Antibody (TPO-Ab) status in first trimester of pregnancy.
2. To measure T<sub>3</sub>, T<sub>4</sub> and TSH levels during first trimester of pregnancy.
3. To correlate the TPO-Ab levels with thyroid function test in first trimester of pregnancy.

**Material, Method and Statistics**

The study was carried out at Sir Sayajirao General Hospital and Medical College, Vadodara. Approval of institutes Scientific Review Committee was obtained and Ethical Clearance was obtained from the Institutional Ethics Committee for Human Research, Medical College and S.S.G. Hospital, Vadodara. (Approval No: ECR/85/Inst/GJ/2013).

The study was done for period of 4 months, from April 2014 to August 2014, 200 pregnant women in 1<sup>st</sup> trimester were enrolled in study, who attain obs & gynec department at SSG Hospital.

**Data Collection:** Informed consent of subjects was obtained for participation in study and for blood collection. Detailed medical history of the subjects including personal data, present complaints and complication, treatment history, past history, family history and personal history was taken. Examination was carried out as per proforma.

**Inclusion Criteria:**

(a) Pregnant women in first trimester of pregnancy.

**Exclusion Criteria:**

(a) Patients with known thyroid dysfunction.
(b) Patients with Thyroid surgery.
(c) Patients with autoimmune disorders.
(d) Patients with any known endocrinopathy.
(e) Refusal of women to enrol into study.

All the mothers were screened for thyroid function test and TPO antibody. fasting serum sample was collected in plain vacutte, thyroid function test (T<sub>3</sub> T<sub>4</sub> TSH) & TPO antibody estimation was done by ELISA method.
Depending on their TPO-Ab levels they were divided in two groups,

**Group A:** (TPO-Ab positive group) TPO-Ab positive pregnant females (TPO-Ab >35 IU/ml)

**Group B:** (TPO-Ab negative group) TPO-Ab negative pregnant females (TPO-Ab <35 IU/ml)

Statistical analysis was done by using t-test to find out significance of difference between two groups and correlation coefficient was calculated to find out statistical correlation between two variables and its significance.

**Results**

Total 200 pregnant women of first trimester were enrolled. Mean maternal age was 25.56 ± 3.32 years. Table-1 showed Thyroid dysfunction found in first trimester of pregnancy. Out of 200, 30 (15%) pregnant women had hypothyroidism (TSH >2.5mIU/l). Out of these 30 hypothyroid women, 9 (4.5%) had overt hypothyroidism & 21 (10.5%) had subclinical hypothyroidism. Among these 30 hypothyroid women, 26 (13%) had found anti-TPO positive (TPO-Ab >35 IU/ml, p<0.001). Table-2 showed anti-TPO status in hypothyroid women. There was a significant positive correlation between positive TPO-Ab and serum TSH level (r=0.6330) of study subjects.

### Table 1: Hypothyroidism in 1st trimester of pregnant females.

<table>
<thead>
<tr>
<th>Group</th>
<th>Total no of cases</th>
<th>Hypothyroidism number of cases (%)</th>
<th>Euthyroid number of cases (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td>26</td>
<td>26 (13%)</td>
<td>0</td>
</tr>
<tr>
<td>Group B</td>
<td>174</td>
<td>4 (2%)</td>
<td>170 (85%)</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>30 (15%)</td>
<td>170 (85%)</td>
</tr>
</tbody>
</table>

Table 1 show that prevalence of hypothyroidism in group A & B. In TPO-Ab +ve group all cases had hypothyroidism (26 cases of hypothyroidism out of 26 TPO-Ab +ve cases) whereas in group B (TPO-Ab –ve group) 4 cases out of 174 had hypothyroidism out of total 200 subjects included in study 30 had hypothyroidism.

**Subclinical and overt hypothyroidism:** Table 2 shows subclinical and overt hypothyroidism.

### Table 2: Hypothyroidism in 1st trimester pregnant females.

<table>
<thead>
<tr>
<th>Group</th>
<th>Group A Number of cases (%)</th>
<th>Group B Number Of Cases (%)</th>
<th>Total no of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subclinical Hypothyroidism</td>
<td>17 (8.5%)</td>
<td>4 (2%)</td>
<td>21</td>
</tr>
<tr>
<td>Overt Hypothyroidism</td>
<td>9 (4.5%)</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>Total no of cases</td>
<td>26 (13%)</td>
<td>4 (2%)</td>
<td>30</td>
</tr>
</tbody>
</table>

Table 2 shows the percentage of subclinical hypothyroidism and overt hypothyroidism in group A & B. TPO-Ab +ve group 17 cases had subclinical hypothyroidism and 9 cases had overt hypothyroidism (26 cases of hypothyroidism out of 26 TPO-Ab +ve cases) whereas in group B (TPO-Ab –ve group) 4 cases out of 174 had subclinical hypothyroidism out of total 200 subjects included in study.

### Table 3: TPO-Ab levels in group A & group B.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Group A</th>
<th>Group B</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TPO-Ab (IU/l)</td>
<td>Mean (Range) 43.73(37-52) SD 5.44</td>
<td>Mean (Range) 23.24(10-34) SD 6.23</td>
<td>p&lt;0.0001</td>
</tr>
</tbody>
</table>
Table 3 shows that the mean ± SD of the study group A was 43.73 ± 5.44 IU/l (Range 37-52 IU/l) and group B was 23.24 ± 6.23 IU/l. (Range 10-34 IU/l). There was statically significant difference in TPO-Ab levels between two groups (p<0.0001).

- Correlation of TPO-Ab with thyroid function test

To find correlation between TPO-Ab & thyroid function tests I performed regression analysis.

**Figure 1: Correlation of serum TSH with TPO-Ab.**

As seen in figure 1, a good positive correlation was found between TSH levels and TPO-Ab with r=0.6330.

**Figure 2: Correlation of serum T3 with TPO-Ab.**

Figure 2 shows that moderate negative correlation was found between T3 levels and TPO-Ab, with r = -0.3037.
Figure 3 shows that moderate negative correlation was found between T₄ levels and TPO-Ab with $r = -0.4871$.

Figure 3: Correlation of serum T₄ with TPO-Ab.

**Discussion**

There is a significant prevalence of clinical and subclinical hypothyroidism in pregnant women. Thyroid dysfunction is associated with many complications during pregnancy and delivery like miscarriage, preterm birth, placental abruption and the child may have low I/Q, cretinism and developmental disorders. Many pregnant females have thyroid autoantibodies. The presence of thyroid autoantibodies might be a marker of underlying subtle alteration in thyroid reserve.⁸

This study was conducted 200 females in 1st trimester of pregnancy. It was observed that hypothyroidism (TSH level >3.5 mIU/l) in 30 (15%) patients. Out of these 30 cases, 9 (4.5%) had overt hypothyroidism (TSH >3.5 mIU/l & $T₄$<50 ng/ml) and 21 (10.5%) had subclinical hypothyroidism (TSH>3.5 mIU/l & $T₄$>50 ng/ml).

There are only few reports on prevalence of hypothyroidism during pregnancy from India with prevalence rates ranging from 4.8% to 24%. Dhanwal et al. reported 14.3% prevalence of hypothyroidism in the first trimester of pregnancy⁹ we have reported 15% prevalence of hypothyroidism. Our results match this study. The prevalence rates may be found difference in different geographic areas and it is also due to the selection of TSH normal level and normal value may vary from laboratory to laboratory. Pavana et al. showed a prevalence of 7.5%.⁶ Studies of Sahu et al. showed prevalence of hypothyroidism as 6.4%.¹⁰ K Lata et al. have found 24% prevalence of hypothyroidism among pregnant females with history of two or more consecutive miscarriages.¹¹

**Conclusions**

Hypothyroidism especially subclinical hypothyroidism is prevalent among pregnant females. Since thyroid dysfunction during pregnancy is associated with many fetal & maternal complications, TPO-Ab status of pregnant females should be tested in early pregnancy so that in case of thyroid dysfunction, early treatment can be started to prevent complications.

**Source of Funding:** Self

**Issue of Conflict:** None

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A Clinical Study to Assess the Efficacy of Anterior Trans-articular C1-C2 Screw Fixation for Stabilization of Atlanto-Axial Instability

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Abstract

Introduction: The upper cervical spine includes the atlas (C1) and Axis (C2). The anatomy of upper two vertebrae is unique from each other. Atlanto-axial articulation is the most unique, mobile segment of spine, which largely depends on ligamentous supports based on integrity of odontoid for its stability. Historically, atlanto-axial subluxation was treated by reduction and fusion of C1-C2 joint. However, High riding vertebral artery precludes the placement of posterior trans-articular screw, which is liable to injury during screw placement. So computed tomography scans can be used to evaluate the risk of “high riding” vertebral artery during the management of atlanto-axial subluxation. Hence, anterior trans-articular screw fixation technique avoids the course of high riding vertebral artery.

Material and Method: Nine patients underwent NCCT cervical spine with 3-D reconstruction and clinical evaluation of pain was done by recording the VAS score done pre operatively and after surgery.

Results: All surgical cohorts underwent anterior C1-C2 fixation with an average follow up for 24 months. All patients were assessed as per fixed protocol of our local hospital guidelines of orthopaedics department. Pain score was clinically evaluated by VAS score before and after surgery yielding 90% excellent result.

Conclusion: Anterior Trans-articular C1-C2 screw fixation is a minimally invasive technique with less blood loss, shorter skin scar and faster post-operative recovery. It is an appropriate technique for stabilization of Atlanto-Axial instabilities.

Keywords: Anterior trans-articular C1-C2 screw fixation, high riding vertebral artery, visual analog scale.

Introduction

The anatomy of upper two vertebrae, atlas (C1) and axis (C2) is unique from each other. Atlanto-axial articulation is the most mobile segment in spine and largely depends on ligamentous supports due to integrity of odontoid for its stability¹. The criteria for instability in literature is defined as atlanto-dens interval (ADI) greater than 3 mm in adults and 5 mm in children, respectively². Common causes of Atlanto-axial instability include trauma, tumour, rheumatoid arthritis, infection and congenital anomalies². Historically, clinically or radiological significant Atlanto-axial subluxation is traditionally treated by reduction and fusion of C1-C2 joint by wiring method which includes Gallie’s fusion with Halifax clamps³, Brooks method along with Jenkins fusion⁴, Sonntag posterior C1-C2 technique⁵ and Magerl technique⁶ which comprises of posterior trans-articular screw fixation along with bone graft. Currently, Goel’s and Harm’s technique⁷ has been popular amongst spine...
“High riding” vertebral artery precludes the placement of posterior trans-articular screw and which is liable to injury during screw placement. So, during the management of atlanto-axial instability, computed tomography scans can be used to evaluate the risk of “high riding” vertebral artery. Percutaneous atlanto-axial anterior trans-articular screw fixation combined with mini-open posterior C1-C2 fusion has been described to overcome this hurdle, and avoid injuring vertebral artery.

Smith-Robinson approach of anterior cervical spine has been associated with satisfactory clinical outcome, reduced infection and complication rate. Anterior approach to C1-C2 permits prevention of occipital nerve exposure and potential for post-operative C2 neuralgia. This technique has various advantages among different method of atlanto-axial instability management. This technique is considerably less traumatic and utilizes an essential space rather than going through muscles, thereby lowering the rate of infection and gives more cosmetically justifiable scar. This approach also reduces the risk of vertebral artery injury because the starting point is far away from the vertebral artery foramen. Additionally, the occipital condyles restrict potential migration of a Kirschner wire or positioning of a long screw that would otherwise risk injuring adjoining nervous structures.

With the standard anterior approach, percutaneous anterior trans-articular screw fixation can be achieved with a minimal skin incision. The benefit includes that it is minimally invasive with lower blood loss, shorter skin scar and faster post-operative recovery.

Material and Method

A total of nine patients from Nov. 2018 to Oct. 2019, (6 men and 3 women) were selected for atlanto-axial, anterior trans-articular screw fixation was done in our department. The mean age was 34.4 (range 10-56) years. All patients having atlanto-axial instability were investigated with Magnetic resonance imaging (MRI) and non-contrast computed tomography (NCCT) scanning with angiography. Out of nine patients, eight patients came to our hospital with traumatic injury of C1-C2 junction (90%) and one patient suffered from C1-C2 degenerative osteoarthritis. Patients were assessed as per standard protocol of our hospital in our orthopaedic department. The standard radiograph included antero-posterior and lateral view along with open mouth view of the cervical spine, (Figure 1 a, 1b and 1c). Further imaging included NCCT Cervical spine with 3-D Reconstruction along with MRI Cervical spine with screening of whole spine (Figure 1d). Clinically, VAS score was recorded pre-operatively and after surgery.

**Fig. 1 showing preoperative X-rays of Cervical spine AP, Lateral and open mouth view with 1 MRI image**

**Surgical Technique**: All patients were operated under general anaesthesia. The head was pulled in the straight line with Crutchfield skull tongs to attain anatomic reduction of odontoid fracture. High-quality intra-operative fluoroscopic visualization of the upper cervical spine was ensured before draping the patient sterile. A clear visualization of C1 lateral masses and C1-C2 joints is a prerequisite. It is preferable to verify opening of the mouth, in order to use simultaneously, two C-arms one for latero-lateral and another for an antero-posterior open-mouth view, to limit the operative time and trajectory inaccuracy. A classic C4-C5 left anterior retropharyngeal approach was carried out after having fluoroscopic latero-lateral and AP open mouth images. The prevertebral dissection must be lengthened proximally to anterior tubercle of C1. On anterior arch of C1, a radiolucent retractor was placed. Joint capsule was then incised, and the articular surfaces of C1-C2 joint were carved with the help of long curved curettes.
The technique described by Lu et al\(^9\) and first applied by Reindl et al\(^{10}\) recognized the entry point of k-wire on the undersurface of the overhanging lip of the lateral mass of C2, 4 to 5 mm lateral to base of the odontoid process, with 25\(^\circ\) of lateral inclination. Two 3.5 mm self-cutting cannulated partially threaded cortical screws were preceded from anterior-to-posterior and medial-to-lateral along threaded Kirschner wires under image intensifier. It is advisable to avoid further advancement of K-wires beyond the anatomic limits, already detailed. A drain is left in place after final radiological check; the platysma muscle and skin are sutured in standard manner. All patients were able to consume meals and mobilize actively on first postoperative day with Philadelphia collar in situ up to 30 days.

Fig. 2 showing postoperative X-rays AP, Lateral and open mouth view after ATS

**Result**

All patients underwent surgery within 3 days of hospital admission. The mean operative time was 76.7 (range 53-136) minutes and none of the patient had blood loss more than 30 ml. Complications such as nerve injury, spinal cord injury, oesophageal injury, soft tissue injury were not reported in any of patients. All of the 9 patients were followed up (Table 2) for an average of 30 months (range from 24 to 48 months). No loosening or breakage of screw was seen. The pain and functional outcomes were recorded. For all the 9 patients VAS\(^11\) of neck pain (Table 1) was enhanced significantly from 4.93+/−1.20 at pre-operation to 1.18+/−0.64 at 3 months after operation (p = 0.000) and maintained at the final follow up, with 1.02+/−0.36 (p = 0.420). With the use of a Philadelphia collar, early mobilization could be possible in all patients. The mean time until mobilization was 2.4 (range 1.5-4 days) including the interval between surgery and drain removal. All patients should wear Philadelphia collar for 30 days. Eventually, there was no infection, implant failure, or morbidity after the procedure in any of the cases.

**Table 1. VAS score done pre and postoperatively with p value**

<table>
<thead>
<tr>
<th></th>
<th>VAS score</th>
<th>p value</th>
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<tr>
<td>Pre-operation</td>
<td>4.93+/−1.20</td>
<td></td>
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<tr>
<td>Post-operation at 3 months</td>
<td>1.18+/−0.64</td>
<td>0.000</td>
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<tr>
<td>Final follow up</td>
<td>1.02+/−0.36</td>
<td>0.420</td>
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Table 2. Surgical and postoperative clinical data of 9 patients treated with ATS

<table>
<thead>
<tr>
<th>Patient</th>
<th>Treatment</th>
<th>Operative time (min)</th>
<th>Blood loss (ml)</th>
<th>Neurological impairment: ASIA Preop</th>
<th>Neurological impairment: ASIA post op at follow up</th>
<th>Follow up (month)</th>
<th>Bone fusion (wk)</th>
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<tbody>
<tr>
<td>1</td>
<td>ATS</td>
<td>60</td>
<td>30</td>
<td>E</td>
<td>E</td>
<td>6</td>
<td>18</td>
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<tr>
<td>2</td>
<td>ATS</td>
<td>65</td>
<td>40</td>
<td>E</td>
<td>E</td>
<td>12</td>
<td>14</td>
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<tr>
<td>3</td>
<td>ATS</td>
<td>70</td>
<td>60</td>
<td>C</td>
<td>E</td>
<td>29</td>
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<td>ATS</td>
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<td>E</td>
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<td>ATS</td>
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<td>80</td>
<td>45</td>
<td>D</td>
<td>E</td>
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<td>14</td>
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</table>

Discussion

Atlanto-axial instability has been treated by variety of method such as wiring techniques\(^3\), posterior trans-articular screw fixation with bone graft\(^6\), Goel-Harm’s technique\(^7\). In 2003, Reindl et al\(^10\) conducted a study on cadavers using the classic Smith-Robinson retropharyngeal approach\(^8\) to perform anterior trans-articular C1-C2 fixation in traumatic aetiology. Anterior trans-articular C1-C2 fixation has clear superiority over posterior approaches. Anterior trans-articular C1-C2 screw fixation superiority minimizes vertebral artery injury and spinal cord injury. Anterior screw fixation was relatively secure and safer for anatomic variations of the vertebral artery. The supine position with head in slight extension, via anterior approach for trans-articular screwfixation, minimizes the risk of spinal cord compression and is especially favourable in poly-trauma patients. Surgical anatomy of anterior Trans-articular screw fixation decreases the risk of trauma to spinal cord and C2 roots and decreases bleeding from venous plexus around vertebral artery\(^1\). The anterior C1-C2 Trans-articular screw fixation had comparable biomechanical properties to the posterior C1-C2 Trans-articular screw fixation according to human cadaveric biomechanical studies\(^3\). Anterior retropharyngeal approach wasmore acceptable because it was minimally encroaching and associated with negligible muscle trauma, minimal or no blood loss, and faster recovery\(^2\).

The potential complications of Atlanto-axial anterior Trans-articular screw fixation are connected to the trajectory of K-wire and screws in order to avoid damage to vertebral artery, dural sac and spinal cord. Atlanto-axial anterior Trans-articular screw fixation is not feasible in fixed rotatory atlanto-axial subluxation and certain conditions where spinal cord decompression is deemed necessary. Cranio-cervical malformations, basilar invagination and platybasia are relative contraindications of atlanto-axial anterior trans-articular screw fixation.

Conclusion

In conclusion, anterior trans-articular C1-C2 screw fixation is minimally encroaching, achievable and secure technique. The authors established the anatomical suitability of anterior trans-articular screw fixation as an acceptable technique for stabilization of atlanto-axial instability. The above described approach has various advantages in comparison to posterior approach. In cases of failed percutaneous odontoid screw fixation, percutaneous anterior C1-C2 fixation is a finepossible salvage technique and it is minimally encroaching\(^2\).

Ethical Clearance: Taken from institutional ethical committee of Rohilkhand medical college and hospital.

Source of Funding: Self

Conflict of Interest: Nil


Clinical Study to Determine the Efficacy of Percutaneous Vertebroplasty in Management of Osteoporotic Compression Fracture

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Abstract

Introduction: Back pain and spinal deformity are common presentation in majority of senile osteoporotic vertebral compression fracture. Vertebroplasty provides pain relief with correction of spinal deformity and least period of hospital stay.

Material and Method: Twenty patients underwent vertebroplasty and clinical evaluation of pain was done by recording the VAS score done preoperatively and after surgery.

Result: Percutaneous vertebroplasty with 1 year followup VAS score 52% were excellent, 14% good and 34% fair result.

Conclusion: Vertebroplasty is useful in management of vertebral compression fracture which are refractory to conservative treatment & helps in early mobilization.

Keywords: Osteoporotic compression fracture, Visual Analog Scale (VAS), Local anaesthesia (LA).

Introduction

Senile osteoporotic vertebral compression fracture takes place spontaneously or after minor trauma, commonly in elderly female patients.

One third to three fourth of such patients may develop chronic pain due to osteoporotic spinal deformity. Analgesic, muscle relaxant, bed rest and physiotherapy are used as conservative management. Variable analgesic effect shown by calcitonin in osteoporotic vertebral compression fracture.

Percutaneous vertebroplasty was primarily introduced for management of osteolytic tumors (firstly used in hemangiomas C2 vertebra) and later for osteoporotic vertebral compression fracture. Primary aim of percutaneous vertebroplasty is to reduce pain caused by vertebral fracture.

The purpose of our study is to determine the efficacy of percutaneous vertebroplasty in management of osteoporotic compression fracture and to evaluate pain relief after the procedure.

Material and Method

A study was conducted in the Department of Orthopaedics, Rohilkhand Medical College & Hospital, Bareilly, for one year from November 2018 to October 2019. Twenty patients who were diagnosed as a case of osteoporotic compression fracture were included in the study.

Patients Selection Criteria Includes: Anterior vertebral vertebral height loss at least 15%. Patients refractory to conservative treatment for > 6 weeks.

Prior to surgery clinical examination was...
performed on selected patients: Varius causes were ruled out by blood investigations. Visual Analog Scale (VAS) used to compare pain pre-op and post-op. Radiological evaluation done pre-op and post-op after procedure include radiograph of spine both antero-posterior view and lateral view with additional flexion and extension views for stability. MRI was done in selected cases as per existing recommendations³. Before vertebroplasty location of patients pain correlated with physical examination under fluoroscopy. A written and informed consent taken from each patient before procedure and an ethical committee approval was taken.

Procedure: Under local anaesthesia (LA) or sedation vertebroplasty was performed. Patient was positioned prone on the operating table with bolsters under chest and pelvis to increase the anterior widening of the vertebra. Patient was painted and draped under all aseptic precautions.

Affected vertebrae marked by fluoroscopy. A small incision given over and a 11 or 13 gauge vertebroplasty needle with trocar and cannula (Jamshedi needle) introduced through the pedicle keeping in mind that the tip of needle is at center of affected vertebrae which is confirmed by C- arm. Fig 1a, Fig 1b. Tip is moved forward 1 cm approx posterior to anterior vertebral body. Similarly, the contralateral pedicle is cannulated. Bilateral cannulation forms safe cementing. Radio-opaque dye mixed with normal saline pushed by cannula till resistance in vaccum is felt. This vaccum signifies that now there is no leakage in vertebras and by measuring the amount of radio-opaque dye mixed normal saline pushed we will get an idea of how much amount of bone cement to be used. The radio-opaque dye mixed normal saline is sucked out and bone cement is introduced into the vertebral body. All this procedure take place under guidance of c-arm. Expansion of vertebral height noted on C-arm. To avoid leakage of cement through perforated pedicle cannula are removed by rotatory manner until the cement hardens.

Follow-up: Patient was instructed to lie supine flat position for 1 hour after procedure. Patient was mobilized 6 hours following the procedure. Patients pain level assessed by VAS score after procedure and compared with pre-operative VAS score. Neurological status was assessed post-operatively. X-ray on next day, then at 1, 6, 12 months after percutaneous vertebroplasty. MRI scan was done after 3 month. Pre-op and post-op vertebral height assessed and compared to each other.

Results

• 14 patients operated for L1 vertebra osteoporotic compression fracture. Fig 2a & 2b
• 6 patients operated for D12 vertebra osteoporotic compression fracture. Fig 3a & 3b

A total of twenty patients were followed up for one year. Patient was able to respond to verbal commands while the procedure being carried out as local anaesthesia or mild sedation given. Post-op improvement in pain assessed by VAS score. 52% patients showed excellent results, 14 % good and 34 % fair by VAS score. Post-operatively vertebral height improved from 3 to 5 mm.
Discussion

In osteoporosis, there is decrease in bone mass and bone strength which lead to increase risk of fracture. Chronic pain makes daily activity difficult. Hence, patients who have shown failed response to conservative treatment are treated by percutaneous vertebroplasty. Significant pain reduction was attained in 70% to 95% of patients within 24 hours [4,5] as per current literature.

In our study pain relief after percutaneous vertebroplasty was achieved 74.2% pt after 24 hour of procedure as per by VAS score (Figure 4) (Table 1). After 6 months of followup, following percutaneous vertebroplasty 93.3% of patients had pain relief in comparison to the result reported by Liliang (2005) [5]. Pain relief occurred due to structural reinforcement of fractured vertebrae.
In our study, the mean pre-op VAS score was 8.8±1.1 were decreased significantly (P<0.001) to 4.5±2.3 within 1 month of percutaneous vertebroplasty, to 2.9±1.4 after 6 months (P<0.001) and to 2±1.1 after 1 year which is highly significant results are comparable.6,7.

The main determinant of achieving satisfactory pain reduction depends on age of fracture and degree of osteoporosis.8,9. However recurrent fracture at the level of treated vertebrae is not being reported in our study.

Vertebroplasty has been simple interventional procedure with evidence based treatment in treating severe chronic disability cause by osteoporotic vertebral fracture.10

**Conclusion**

Vertebroplasty is a minimally invasive surgical procedure where the vertebral height is maintained following the procedure. It is extremely useful in management of vertebral compression fracture which are refractory to conservative treatment & helps in early mobilization. Percutaneous vertebroplasty is a very cost effective procedure compare to other spinal surgeries.

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**Source of Funding:** Self

**Conflict of Interest:** Nil
Utilization Review of Imaging Equipment:  
An insight into CT Scanning  

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Abstract  

Introduction: Radio diagnosis service plays a crucial role in diagnosis of the patient’s disease. The volume  
of patients utilising this service is very high. This service also takes away the sizeable share of total capital  
investment and therefore, the optimal utilization of this service becomes important.  

Methodology: Literature review was done through Google scholar, electronic database of PubMed and  
other relevant databases. The query terms like Utilization Review of Imaging Equipment, Utilisation of CT  
Scanners, Capacity of Scanners in Radiology and Waiting Times for Imaging were used to fetch the relevant  
data sources. Around 130 articles were reviewed and analysed.  

Results: The number of CT Scans per 1 million of population in High Income (HI), Upper Middle Income  
(UMI), Lower Middle Income (LMI) are 14.7, 7.3, 3.7. The CT scanners are one of the most expensive  
pieces of medical equipment in hospitals, with CT scanners costing between $1 million (₹7 crore) and $2  
million (₹14 crore).  

There is a substantial variation in the utilisation of these services, including number of scans per day and  
wait times. Increasing the scanner efficiency and utilisation can significantly decrease the cost per scan and  
increase access to imaging services.  

Expanding capacity, improving operating procedures by reducing change-over times, and improving  
capacity allocation in combination with scheduling procedures can contribute to the overall reduction of CT  
access time.  

Discussion and Conclusion: By acquiring Utilization data about CT Scanners, we get to know a complete  
and accurate overview of how Scanners are used. The CT scanner utilisation can be improved in both public  
and private health sector by analysing the key information about the utilisation of their own and other health  
services’ CT scanners.  

Keywords: Imaging Utilization, CT Scanner Efficiency, Radiology Productivity.

Introduction  

Modern radiology departments and imaging centres are complex organizations that require costly equipment,
capital investment and therefore, the optimal utilization of this service becomes important.

**Methodology**

Literature review was done through Google scholar, electronic database of PubMed and other relevant databases. The query terms like Utilization Review of Imaging Equipment, Utilisation of CT Scanners, Capacity of Scanners in Radiology and Waiting Times for Imaging were used to fetch the relevant data sources. Around 130 articles were reviewed and analysed.

**Results**

The number of CT Scans per 1 million of population in High Income (HI), Upper Middle Income (UMI), Lower Middle Income (LMI) are 14.7, 7.3, 3.7. In India, the number of CT Scanners available per million population is 3. There were about 3000 scanners throughout India in year 2008. Internationally, rates of CT exams per 1,000 range from highs of 275 (Estonia), 265 (United States) and 126 (Canada) to lows of 50 (Chile) and 66 (Netherlands).

Although conspicuous consumption is common, when it comes to CT scanners, quality is vastly superior to quantity. The goal of a successful CT installation should be to acquire more scans, not more scanners, through proper workflow management, according to a presentation at the International Symposium on Multidetector-Row CT, sponsored by Stanford University of Stanford, CA.

The importance of productivity with expensive imaging equipment has been brought to the forefront of public discussion due to rising cost of healthcare. In particular, the use of imaging modalities such as magnetic resonance (MR) imaging, computed tomography (CT), and positron emission tomography (PET) have been considered as contributing to the rising costs of healthcare.

Public healthcare routinely use computed tomography (CT) scanners to diagnose, manage and treat many conditions. These scanners take high-quality images of internal organs and tissues. They are critical to clinical decisions in a patient’s treatment, and can significantly influence patient outcomes. CT scanners are one of the most expensive pieces of medical equipment in hospitals, with CT scanners costing between $1 million (₹7 crore) and $2 million (₹14 crore). These equipment represent a considerable financial risk for hospitals due to their short life cycle of seven to 10 years, excluding major upgrades, and their high replacement and maintenance costs—up to $180 000 or more annually.

The Victorian Auditor-General’s Report 2014-15 revealed that the cost-effectiveness of delivering CT and MR imaging services varies widely across health services. Some CT and MR imaging services operate at a surplus while others incur losses each year. It further added that public health services were not managing CT and MR scanners efficiently or cost effectively. There was a substantial variation in the utilisation of these services, including number of scans per day and wait times. Hospitals were not able to compare the efficiency and economy of their scanners. Without the data that would enable this comparison it was difficult for health services and the Department of Health and Human Services to know whether costly imaging equipment was being used efficiently. The high capital and maintenance costs of computed tomography (CT) and magnetic resonance (MR) scanners mean that they should be used to their full capacity. Increasing the scanner efficiency and utilisation can significantly decrease the cost per scan and increase access to imaging services. The managers of health services do not know whether costly imaging equipment is being utilised efficiently, which makes it difficult to take appropriate action to increase the efficiency. The findings of the report also revealed that there was a widespread variation in the utilisation of CT and MR imaging equipment—from 351 to over 21000 scans per machine per year; public health services did not systematically collect the information necessary to determine or improve the efficiency of the scanners; public health services had no means to compare their efficiency with that of other health services. The auditor analysed data from 315297 CT scans across 15 health services in 2012–13. There was wide variation in the total number of scans and operating hours of CT machines located within and outside EDs. Scanner productivity also varied in the number of scans performed per hour and the estimated downtime of scanners in operating hours. Scanner efficiency varied from less than one CT scan every two hours to more than three an hour, with an average of 2.3 scans per hour. Higher performing CT scanners completed eight times as many scans per hour as lower performing scanners. Thus, there is a significant opportunity to increase the efficiency of public CT scanners.

The quantum of sophisticated technology and cost
of diagnostic imaging, such as CT and MRI, has increased substantially over the years. At the same time, hospitals are forced to contain their costs and consequently do not extend their capacity at the same rate. Without taking steps for utilization management, the access (waiting) times shall remain prolonged. Increasing the productivity is a pragmatic option to maintain costs, but this may conflict with achieving acceptable access times. Expanding capacity, improving operating procedures by reducing change-over times, and improving capacity allocation in combination with scheduling procedures can contribute to the overall reduction of CT access time. Capacity expansion is a rather expensive solution. Improved operating procedures may create more CT capacity.

Dr. Sanjay Saini, Director of CT services at Massachusetts General Hospital (MGH) and a Professor of Radiology at Harvard Medical School, both in Boston had commented at the presentation made at the International Symposium on Multidetector-Row CT, sponsored by Stanford University of Stanford, CA. that the key was to focus on room turnaround time. He had further added that theoretically, one patient can be scanned every 15 minutes and it takes 20 seconds to do the examination and 14 1/2 minutes to do everything else and typically, a CT scanner does about 10,000 exams (annually)." Boland et al (2006) report that some emergency department CT scanners perform more than 20,000 examinations annually. The Victorian Auditor-General’s Report 2014-15 also mentioned that utilisation of CT imaging equipment can go as high as 21,000 scans per machine per year.

Boland et al (2008) in a study entitled, “Maximizing Outpatient Computed Tomography Productivity Using Multiple Technologists" pointed out that Patients can be scheduled at shorter time intervals, preferably every 10 to 15 minutes with the 2-technologist model or every 10 minutes with the 3-technologist model.

At 1st Biograph World Summit, Munich, Germany, Paul Shreve of Spectrum Health Grand Rapids (Grand Rapids, MI USA) recommended a time slot of 15 minutes between CT Scans for Optimized CT Utilization.

In a study by Van Lent WAM et al at the Netherlands Cancer Institute – Antoni van Leeuwenhoek Hospital (NKI-AVL), a comprehensive cancer centre, located in The Netherlands, the available capacity of One CT Scanner was divided in assigned places in the schedule of 10 min (also called slots). The slots were filled with CT requests, once a request was performed they called it an examination. An examination usually consumed one slot, but one examination may sometimes be composed of multiple procedures that may require multiple slots. The CT access time decreased from 9.8 to 7.3 days; this effect was caused by the new capacity allocation. They used Monte Carlo Simulation Model to see the effects of proposed scenarios to change the capacity allocated to different requests. Simulation was selected as a preferred OR technique as it is commonly applied in healthcare. They collected the data from Radiology Information System (RIS). They commented that this was first study of its kind reporting on operations research based change in Radiology that presented results of pre and post implementation analysis. By increasing the number of slots, the capacity allocation was optimized. The modelled outcomes included a growth of 6% in slots, the post implementation analysis showed a 1% growth in slots and 14% growth in examinations. Besides the tangible effects, the model increased the awareness that optimizing capacity allocation can reduce access times.

A prospective study for a period of six months carried out at Sher-i-Kashmir Institute of Medical Sciences, Srinagar, India for the calculation of unit cost of radiological investigations of CT head, CT chest, CT abdomen found out that the actual cost incurred by the hospital on CT head was Rupees 581.40 (US $10.89), CT abdomen Rupees 2339.20 (US $43.83), CT chest Rupees 2339.20 (US $43.83). Out of this, the material cost of CT film, film covers and other stationary items was 16.9% of total cost in case of CT Head and 15.6% of total cost in case of CT Chest/CT Abdomen. This makes a case for effective utilization of CT Scanners.

According to American Board of Radiology, all imaging departments are expected to establish and maintain effective quality, safety, and performance improvement programs. Essential components of such programs include adherence to the basic principles of quality management and appropriate utilization of quality tools. Quality improvement efforts can facilitate continuous improvement in safety, performance, and outcomes in the radiology department. Many of these efforts are now mandated by regulatory organizations. For example, radiologists must actively participate in a Practice Quality Improvement project approved by the American Board of Radiology to meet ongoing
Maintenance of Certification requirements. In radiology, the focus of quality improvement is to improve the performance of and processes related to diagnostic and therapeutic procedures, the selection of imaging and procedural services, the quality and safety of healthcare delivered, and the effectiveness and management of all imaging services.\textsuperscript{13}

The Imaging Center Subcommittee of the Radiology Business Management Association (RBMA) conducted a survey of its members and collected information on imaging center characteristics and equipment utilization by major imaging machine/modality (with data collected for each of the elements of the Medicare formula used to calculate equipment cost per minute)\textsuperscript{14}. Web-based and Excel-based surveys were utilized because of the ease with which respondents could share it with others and print it for their own records. An invitation to participate in the survey with a link to the questionnaire was e-mailed on April 20th, 2009 to 1,084 RBMA members who have previously indicated they have imaging centers; this list included duplicate members from some practices.

### Table 1. Results of Equipment Utilization Rate (RBMA)

<table>
<thead>
<tr>
<th></th>
<th>CT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability-based</td>
<td></td>
</tr>
<tr>
<td>Utilization Rate</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>30</td>
</tr>
<tr>
<td>Q1</td>
<td>31%</td>
</tr>
<tr>
<td>Mean</td>
<td>62%</td>
</tr>
<tr>
<td>Median</td>
<td>59%</td>
</tr>
<tr>
<td>Q3</td>
<td>90%</td>
</tr>
<tr>
<td>Medicare-based</td>
<td></td>
</tr>
<tr>
<td>Utilization Rate</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>29</td>
</tr>
<tr>
<td>Q1</td>
<td>30%</td>
</tr>
<tr>
<td>Mean</td>
<td>56%</td>
</tr>
<tr>
<td>Median</td>
<td>50%</td>
</tr>
<tr>
<td>Q3</td>
<td>79%</td>
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<tr>
<td>Medicare-modified</td>
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<tr>
<td>Utilization Rate</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>25</td>
</tr>
<tr>
<td>Q1</td>
<td>39%</td>
</tr>
<tr>
<td>Mean</td>
<td>57%</td>
</tr>
<tr>
<td>Median</td>
<td>63%</td>
</tr>
<tr>
<td>Q3</td>
<td>75%</td>
</tr>
</tbody>
</table>

In a study by Katherine P. Andriole, “Productivity and Cost Assessment of Computed Radiography, Digital Radiography, and Screen-Film for Outpatient Chest Examinations”, the overall speed of service was calculated from the time of examination ordering as stamped in the radiology information system (RIS), to the time of image availability on the picture archiving and communication system (PACS), to the time of interpretation rendered (from the RIS). It was considered an objective assessment of computed radiography (CR) for performing upright chest examinations on outpatients is presented in terms of workflow, productivity, speed of service, and potential cost justification\textsuperscript{15}.

In Quality Initiatives: Key Performance Indicators for Measuring and Improving Radiology Department Performance\textsuperscript{16}, Hani H. AbuJudeh, MD et al describe radiology-specific Key performance indicators (KPIs) that may help provide a framework for measuring performance in radiology practice. In healthcare organizations, performance assessment is especially critical for the development of best practices that can lead to improved outcomes in patient care, and KPIs have been incorporated into many healthcare management systems. Under operations management, it describes Utilization as one of the Strategic Areas of Radiology Department Performance. According to the Joint Commission on the Accreditation of Healthcare Organizations (JCAHO), a KPI is “a measurement tool used to monitor and evaluate the quality of important governance, management, clinical, and support functions”.\textsuperscript{17}

A World Wide Web–based productivity tool called the Imaging Exam Time Monitor was developed to accurately and remotely monitor imaging efficiency with use of Digital Imaging and Communications in Medicine (DICOM)\textsuperscript{18} combined with a picture archiving and communication system. Five device efficiency metrics—examination duration, table utilization, interpatient time, appointment interval time, and interseriestime—were derived from DICOM values. These metrics allow the standardized measurement of productivity, to facilitate the comparative evaluation of imaging equipment use and ongoing efforts to improve efficiency\textsuperscript{19}.
Mengqi Hu in a study entitled, “A Study on Medical Imaging Equipment Productivity and Utilization” used DICOM Index Tracker to obtain accurate examination information in real time. In addition, they used Imaging Exam Time Monitor, a web based productivity tool is developed to accurately and transparently monitor imaging scanner efficiency for all devices and patients. They focussed on one of the productivity metrics called Examination Duration Time (EDT). The Examination Duration Time (EDT) has been defined as the time period during which a patient is being interrogated by an imaging device as recorded by PACS. It would be the time duration representative of the very first image on the first series to the time representative of last series last acquired image time as obtained from PACS. They conclude that such metrics allow us to continuously and automatically analyze the productivity data for all imaging equipment (e.g., CT, MG, MRI, et al.) which can be located in different departments, and hospitals, or even internationally in a comprehensive manner.

Like scientific data, quality data can be analyzed, and with a variety of similar tools. Flow charts (discussed earlier), cause-and-effect diagrams, Pareto diagrams, check sheets, control charts, histograms, and scatter diagrams are commonly referred to as the seven basic tools of quality.

The National Maximum Wait Time Access Targets for Medical Imaging (CT and MRI) have been given by Canadian Association of Radiologists (CAR), a member of the Wait Time Alliance (WTA) established by the CAR for the Wait Time Alliance (WTA) were as follows:

- Emergency cases - Immediate to 24 h
- Urgent cases - Within 7 days
- Scheduled cases - Within 30 days.

Priority or urgency levels are defined as follows:

- Emergency = Immediate danger to life, limb or organ
- Urgent = Situation that is unstable and has the potential to deteriorate quickly and result in an emergency admission
- Scheduled = Situation involving minimal pain, dysfunction or disability

**Discussion and Conclusion**

To capitalize fully on the investment made on state-of-the-art technology it is desirable to minimize the wasted time. By acquiring Utilization data about CT Scanners, we get to know a complete and accurate overview of how Scanners are used.

A defined set of nonarbitrary efficiency metrics are available that can be used and fully standardized across
facilities. When coupled with other critical metrics developed from RIS-based utilization data such as interpretative report accuracy, completion time, number and types of patients examined, patient flow tracking systems, and so on, these standards provide a more complete picture of overall service productivity.

The key performance indicators for measuring and improving Radiology Department\textsuperscript{16} as given by Massachusetts General Hospital and Harvard Medical School, recommend the use of Imaging Exam Time Monitor, a web-based productivity tool to accurately and transparently monitor CT Scanner efficiency.

Boland et al (2008)\textsuperscript{8} have demonstrated that parallel processing of tasks by two and three technologists during CT Scanning process can significantly reduce the total time to perform an examination. Their study shows that many tasks could be performed simultaneously by using additional personnel. Boland et al evaluated how many additional patients can be scanned using a 2- or 3-technologist model with outpatient multidetector CT and its impact on CT capacity. Their study concluded that CT room time per patient for 1-, 2-, and 3-technologist models was 12, 9.7, and 8.0 minutes, respectively. The number of patients scanned per hour for 1-, 2-, and 3-technologist models was 2.2, 5.2, and 7.5, respectively. There was an increase of more than 12,000 potential patient CT slots made available using 2 technologists 7 days per week and 22,000 additional slots for a 3-technologist model when compared with a single-technologist model.

Similarly, Kutz et al (2005)\textsuperscript{24} applied Queuing Model to see the impact of extra technical assistant. They compared both a day and a week elapse based on ED CT data for 3 months and found that in case of one day lapse it led to 27% decrease in longest length of time a patient waits and 73% had CT within 30 minutes of being ordered. For one week lapse there was 33% decrease in longest length of time a patient waits and 53% patients were having CT’s in 18 minutes from being ordered. The new tech assistant was used to transport patient to CT Scanner.

At Newton-Wellesley Hospital, radiology turnaround stood at 45 minutes. After examining patient and technician flow, the hospital found that technicians spent too much time walking around. By redesigning the work flow, turnaround times fell to 25 minutes, making the planned addition of another $500,000 (₹3.3 crore) x-ray machine unnecessary\textsuperscript{25}.

Massachusetts General Hospital’s proton beam facility was fully booked, or at least so the hospital thought until it did a little analysis. By batching patients requiring anaesthesia on the same day and scheduling an anaesthesiologist for that day, throughput increased from 29 patients per day to 39 patients—a 33 percent increase\textsuperscript{25}.

Intermountain Health Care (IHC) in Salt Lake City, Utah underwent a project to apply lean techniques to their processes. The project addressed a variety of issues and made a wide range of improvements. The processes that were improved significantly reduced amounts of wasted time by the workers. The reduction of hours required by employees can be translated into real savings almost immediately. Other savings could include reduced numbers of errors or increased patient satisfaction. Some examples of savings or benefits from the project included decreases in treatment delays and an immediate savings of nearly $1 million (₹7 crore) through the implementation of an electronic payment system\textsuperscript{26}.

**Recommendations:**

1. It is recommended that different device efficiency metrics should be used for the Utilization Management of Radiology Equipment. DICOM tags (time stamps, patient exam type, device, etc) can be used to create customized and automatically generated Efficiency Reports. The Self-Generated Utilization Reports can save lot of tax payers money as subscription based services are chargeable.

2. Taking a clue from the Victorian Auditor-Generals Report 2014-15, a data repository to understand and compare the CT scanner utilisation in public health sector can be developed so that the public health services analyse and use key information about the utilisation of their own and other health services’ CT scanners to maximise utilisation\textsuperscript{6}.

3. More technologist(s) can be employed for each CT Scanner to increase the efficiency of CT Scanners further. Dr. Sanjay Saini, Director of CT services at Massachusetts General Hospital (MGH) and a Professor of radiology at Harvard Medical School, both in Boston has laid out some basic steps to keep a CT department running smoothly at maximum capacity\textsuperscript{4}. One of which is, “Idle technicians, not scanners”. A good CT workflow strategy should be
technologist-centered. Downtime for technologists is preferable to downtime for expensive machines. In the long run, overstaffing costs can be offset by having more people to do more exams and generating more income.

4. The Utilization Management Report for CT scanner provides with a large amount of useful data to help optimize system usage. The Utilization Management Report for CT helps to improve the usability and efficiency of Scanners. Utilization Management Services by Vendors like Siemens, Philips etc can be utilized to make best use of CT Scanners. Alternatively, in-house Utilization Management Dashboard can be developed for all CT systems. Utilization Management must be an inbuilt feature in all the tenders/orders.

5. As detailed data on imaging equipment utilization is already collected remotely and electronically by equipment manufacturers, it is recommended to follow suggestion made by Radiology Business Management Association (RBMA) to work with imaging providers, equipment manufacturers and other stakeholders, leveraging the use of existing information technology systems, to more accurately measure actual equipment utilization rates across a large and geographically diverse number of imaging centres.

6. A futuristic recommendation would be to set up National Wait Time Alliance based on Canadian Wait Time Alliance. The National Maximum Wait Time Targets can be set for Medical Imaging (CT Scanning) similar to model of Canadian Association of Radiologists (CAR), a member of the Wait Time Alliance (WTA).

7. The DICOM time stamps do not in themselves fully describe the time the patient spends on the imaging table. But they record highly accurately the consistent measurements of exactly when patient imaging acquisition actually occurs in the context of a specific device. These times can be calibrated to the enterprise clock and the medical record, which can be coupled with other enterprise data systems.

8. It is suggested that different device efficiency metrics should be used for the Utilization Management of Radiology Equipment. DICOM tags (time stamps, patient exam type, device, etc) can be used to create customized and automatically generated Efficiency Reports. The Self-Generated Utilization Reports can save lot of tax payers money as subscription based services come at a premium from Vendors like Siemens, GE and Philips.

**New Developments:** The workflow of the existing scanning procedure depends heavily on the experience and subjective decisions of the technician, which often results in suboptimal image quality, large inter-technician variability, unnecessary radiation to the patient in case of CT, and prolonged scanning time. Therefore, Singh et al\(^2^8\) have proposed to equip the scanner with visual capability and the knowledge about the patient surface geometry to improve scanning in all these aspects. In order to provide the knowledge about the 3D patient surface, they have used a novel framework to obtain a detailed body surface model of the patient (on the table) using a range imaging device, which can ease scan planning in several ways. The estimated surface model includes a detailed body surface mesh as well as the location of various anatomical landmarks (such as the shoulders, thyroid, etc.) in the coordinate reference frame of the scanner. These surface landmarks provide a rough estimate of the organ positions which enables automatic table height adjustment. Use of such a technology can help to increase the efficiency of CT Scanners further.\(^2^8\)

**Conflict of Interest:** Nil

**Source (s) of Support:** Nil

**Ethical Clearance:** Not Required

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Primary Versus Delayed Wound Closure Technique in Infected Laparotomy Wounds

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Abstract

Background: Contaminated laparotomy wounds have garnered little attention with high incidence of wound infections. Many techniques have been proposed for their management. The aim of this study is to compare the infection rates of laparotomy wounds using primary closure vs delayed closure in cases of peritonitis. The purpose is to identify a better wound closure technique for their management.

Method: This study included 105 patients, who were divided into two groups. Group A underwent primary closure and Group B underwent delayed closure, in which the wound was left open without suturing and saline irrigation was given to be sutured once the wound is clean. The wound infection was assessed using Southampton scoring system.

Results: A total of 54 patients, 30 (55.6%) males and 24 (44.4%) females were included. Group A, 27 patients with 55.6% males and 44.4% females. In Group B, 27 patients with 55.5% males and 44.4% females. The mean age in A was 39.4 ± 11.8 while that in B was 37.02 ± 12.5. Group A had an infection rate of 77.4% whereas Group B had infection rate of only 34%. The duration of hospital stay for Group B was 9.8 and for Group A was 11.7.

Conclusions: The delayed closure is an effective technique for wound closure in contaminated wounds, like perforation. Peritonitis, as it reduces wound infection rates and hospital stay.

Keywords: Laparotomy, closure, primary, delayed, infection.

Introduction

Exploratory laparotomy is one of the most common surgical procedures. This procedure is mostly done in emergency conditions like, DU perforation, gastric, ileal perforation, traumatic conditions etc.(¹)

Surgical site infection (SSI) is clinically demonstrated as presence of pain over the surgical wound, which is accompanied by erythema, local tenderness, induration or presence of purulent discharge at wound site. This is one of the most common complications of the laparotomy wounds following clean-contaminated and contaminated abdominal operations.(²)

Incidence of surgical wound infections can be minimized by different considerations such as use of surgical drapes, use of prophylactic antibiotics, adequate post-operative wound care in addition to a good surgical technique.(³)

Despite the redundant use of antibiotics and choosing scrupulous surgical techniques, a surgical site infection continues to be a major problem in the vast majority of emergency surgeries conducted for perforation peritonitis.

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To have SSI and their complications like wound dehiscence, stitch granulomas or stitch abscesses is discouraging for the surgeon and a great discomfort for the patient. These complications increase the cost of treatment as well as prolong the hospital stay. In majority of emergency surgeries, in order to control and reduce the rate of wound infections, various techniques of wound closure as well as preventive measures are being used but all efforts had uncertain outcomes.\(^{(4-5)}\)

There are mainly two types of techniques for wound closure, which are primary and delayed wound closure. In primary wound closure, after the procedure, the wound edges are approximated intraoperatively with consideration to placement of a wound drain. Primary wound closure is routinely used as it is simple and no further procedures are required for later on.\(^{(6-8)}\)

On the other hand, in delayed wound closure, skin is not approximated primarily, until thorough irrigation and dressing with saline for 3-5 days, following which it is closed. Regular dressings in delayed closure helps to decrease the anaerobic load at surgical sites but indirectly increases the exposure to staphylococci.\(^{(12,13)}\)

Some surgeons favor delayed closure while a few of them advocate primary closure technique after a thorough lavaging with saline.

**Objectives:** The purpose of the present study was comparison of primary wound closure technique and delayed wound closure technique with respect to rate of wound infection and duration of hospital stay.

**Method**

This study was a prospective observational study on patients admitted in the surgery emergency department of Dhiraj Hospital, with perforation peritonitis, who underwent exploratory laparotomy during 2019-2020.

Patients with the diagnosis of perforated appendix, ileal perforation, colon perforation were chosen and distributed into two groups. In the study group, Group A, primary closure technique was used and in Group B, delayed closure technique was performed.

In group A, primary closure of musculo peritoneal and facial layer was done. Later thorough lavaging of the wound was done. A subcutaneous drain was inserted in some cases followed by skin closure. Sutures were removed on the 10th postoperative day.

However in delayed wound closure (Group B), after closure of musculo-peritoneal layers, subcutaneous and skin were packed with saline soaked gauze pieces. The wounds were dressed for 3-5 days. Thereafter the skin was closed with tightening sutures. The sutures were removed after 10 days.

Both the groups were started empirically on third generation cephalosporin and metronidazole. The surgical site infections were assessed using Southampton scoring system on day 3, day 5, day 7, day 10. All patients were followed for early complications like wound infection, wound dehiscence or stitch abscess.

**Results**

This study was conducted among 54 patients. Study subjects were divided into two groups, with primary closure being done in 27 subjects and delayed wound closure in the remaining 27 subjects.

Among the primary wound closure group 11.1% had wound infection on post-op day 3, whereas among those who underwent delayed closure, only 3.7% had wound infection on post-op day 3. (Table 1).

<table>
<thead>
<tr>
<th>Type of Closure</th>
<th>Present N(%)</th>
<th>Absent N(%)</th>
<th>Total N(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infection on POD 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary Closure</td>
<td>3(11.1)</td>
<td>24 (88.9)</td>
<td>27 (100)</td>
</tr>
<tr>
<td>Delayed Closure</td>
<td>1 (3.7)</td>
<td>26 (96.3)</td>
<td>27 (100)</td>
</tr>
<tr>
<td>Infection on POD 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary Closure</td>
<td>15 (55.5)</td>
<td>12 (44.5)</td>
<td>27 (100)</td>
</tr>
<tr>
<td>Delayed Closure</td>
<td>6 (22.2)</td>
<td>21 (77.8)</td>
<td>27 (100)</td>
</tr>
<tr>
<td>Type of Closure</td>
<td>Infection on POD 7</td>
<td>Infection on POD 10</td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td>-------------------</td>
<td>-------------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Present N(%)</td>
<td>Absent N(%)</td>
<td>Total N(%)</td>
</tr>
<tr>
<td>Primary Closure</td>
<td>12 (44.4)</td>
<td>8 (29.6)</td>
<td>21 (77.7%)</td>
</tr>
<tr>
<td></td>
<td>7 (25.9)</td>
<td>2 (7.4%)</td>
<td>12 (44.4%)</td>
</tr>
<tr>
<td>Delayed Closure</td>
<td>15 (45.6)</td>
<td>19 (70.4)</td>
<td>24 (88.9%)</td>
</tr>
<tr>
<td></td>
<td>20 (74.1)</td>
<td>25 (92.6)</td>
<td>27 (100%)</td>
</tr>
</tbody>
</table>

Among the primary wound closure group 55.5% had wound infection on post-op day 5, whereas among those who underwent delayed primary closure only 22.2% had wound infection. (Table 1).

Among the primary wound closure group 44.4% had wound infection on post-op day 7, whereas among those who underwent delayed primary closure only 25.9% had wound infection on post-op day 7.

Among the primary wound closure group 29.6% had wound infection on post-op day 10, whereas among those who underwent delayed primary closure only 7.4% had wound infection on post-op day 10.

Table 2: Distribution of study population based on type of wound closure and overall infection rate

<table>
<thead>
<tr>
<th>Type of Wound Closure</th>
<th>Infection Present</th>
<th>Infection Absent</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Closure</td>
<td>21 (77.7%)</td>
<td>6 (22.3%)</td>
<td>27</td>
</tr>
<tr>
<td>Delayed Closure</td>
<td>12 (44.4%)</td>
<td>15 (55.6%)</td>
<td>27</td>
</tr>
</tbody>
</table>

On exploring the overall infection rates in both groups, among the primary wound closure group 77.7% had wound infection and in delayed primary closure only 44.4% had wound infection. (Table 2)

Table 3: Distribution of study population having complications

<table>
<thead>
<tr>
<th>Type of Wound Closure</th>
<th>Wound Dehiscence</th>
<th>Stitch Abscess</th>
<th>Stitch Sinus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Closure</td>
<td>6 (22%)</td>
<td>2 (7.4%)</td>
<td>1 (3.7%)</td>
</tr>
<tr>
<td>Delayed Closure</td>
<td>1 (3.7%)</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

On observing the wound dehiscence rates, primary closure had 22% cases, while in delayed closure 3.7% had wound dehiscence. Stitch abscess was found in 7.4% in primary closure while delayed closure had none.

Table 4: Mean duration of hospital stay based of closure type

<table>
<thead>
<tr>
<th>Closure Type</th>
<th>Duration (Days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Closure</td>
<td>11.7</td>
</tr>
<tr>
<td>Secondary Closure</td>
<td>9.8</td>
</tr>
</tbody>
</table>

Figure 1: Showing wound dehiscence post laparotomy in a case of perforation peritonitis
Figure 2: Showing wound after delayed closure of laparotomy wound

Discussion

The current study was conducted among 54 patients who underwent exploratory laparotomy for perforation peritonitis, of whom 27 subjects had undergone primary wound closure and 27 underwent delayed wound closure.

The two groups were similar with respect to age and gender as well as indication for surgery. There was a slight male preponderance (55.6%) in the study population.

The overall infection rate in the study population was 61.1%. On comparing primary and delayed wound closure with respect to wound infection rates, it was seen that there was a significantly higher rate of wound infection after primary closure as compared to delayed closure (77.7% vs 44.4%) (Table 3).

This difference in the rate of wound infections between the two may be explained by the fact that, in the patients undergoing primary closure, the microorganisms are trapped in the subcutaneous tissue. This space has poor drainage causing collection of surgical debris which provide an excellent medium, allowing bacteria to grow and multiply rapidly leading to increased incidence of wound infection. On the other hand delayed wound closure prevents the formation of seroma and anaerobic environment in the wound, thus avoiding bacterial proliferation.

Another explanation in favour of delayed wound closure is that, leaving the wounds open, as in delayed wound closure, prevent infection as repeated dressing change accomplishes adequate drainage.14,15

Thus the current study strengthens the view that delayed wound closure is associated with significantly less wound infection rates.

Conclusion

There was significant reduction in rates of wound infection after delayed closure of contaminated wounds. Hence, the strategy of delayed wound closure seems to be better than primary closure in decreasing the rate of SSI.

Ethical Clearance: Taken from sumandeep vidyapeeth institutional ethics committee

Source of Funding: Self

Conflict of Interest: Nil.

References


World War 1 Antiseptic Working Miraculously in Complicated Wounds

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Abstract

Introduction: Diabetic foot and complicated ulcers are relatively common occurrence in daily surgical to patient department for managing them various dressing materials and solutions are available. One of such is acriflavine emulsion.

Case Presentation: Both patients were diabetic having large ulcers over leg 2nd was Hepatitis B positive also having large leg ulcer due to insect bite. In both Acriflavine emulsion was used as dressing material. STSG was performed in both and graft were accepted with uneventful post op course

Discussion: Acriflavine made from acridine has a local antiseptic property with Antimicrobial and antiviral action it does have a skin irritant property but to neutralise that glycerine was used in 1:1000 emulsion

Conclusion: Acriflavine which was used in world war1 as antiseptic solution for war wounds can be used for dressing of complicated ulcers and wounds to gain better results.

Keywords: Acriflavine, ulcer, dressing, wound.

Introduction

More and more cases of diabetic ulcers and complicated wounds are coming in routine Surgery opd. They are a relatively common occurrence for their dressing various method and materials are available such as EUSOL, povidone iodine, cadomeraseoxidase, natural honey[1,2]. One such solution is acriflavine which is made from acridine. It is having a skin Irritant property so to rectify that various method of preparing acriflavine have been developed . One such is acriflavine emulsion made using glycerine in 1:1000 amount.

Case Presentation:

Case 1: A 60 year old male patient presented to surgery opd with a large ulcer over left leg. A 10*10 cm ulcer was noted over left leg which was extending from knee joint to ankle joint . Patient was a known diabetic. From 2 years and was on metformin 500mg bd. He gave a history of small abscess formation over anterior Aspect of knee joint which then turned into a large ulcer in 4 days. On examination the base was covered with thick pus with no healthy granulation tissue. The margins were not clearly defined .Edges were sloping.

On admission hb was 10.5 gm/dl tlc was 27000 per microlitre of blood. Urgent debridement was done. Which was followed by acriflavine emulsion dressing for 5 days and then STSG was performed. The graft was accepted and the post op course was uneventful.

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Case 2: A 38 year old male working as a farmer came to casualty with a small ulcer over left thigh on examination the ulcer base was filled with pus and the whole leg from medial side of the ankle to lateral aspect of thigh filled with toxic material. Hb was 8.5 and total count was 45000 on doing serology patient was found to be hbsag positive. Urgently debridement was done following which EUSOL dressing was done for 5 days but no positive results were found then acriflavine emulsion was tried for 7 days following which STSG was done and 3 pcv were transfused meanwhile to the Patient. The graft was fully accepted with uneventful post op course

Discussion
Acridine and its derivative posses specific antiseptic properties. Acriflavine being acridine derivative has broad spectrum coverage against bacterias. Unlike other antiseptics acriflavine can act even in highly infective conditions with minimal adverse effects Glycerine has
satisfying action over wounds and ulcers. Glycerine possesses hygroscopic action. When acriflavine is used with glycerine (1:1000), glycerine provides hygroscopic action which helps acriflavine to penetrate more and directly in wounds and ulcers. Generally, pads and bandages soaked in this solution (1:1000, acriflavine:glycerine) are directly applied over contaminated wounds and ulcers. Thus, this solution provides antibacterial, antioxidant, and hygroscopic action over highly contaminated wounds and ulcers.

**Conclusion**

Acriflavine which was used in world war era for wound dressings can give positive results in complicated wounds.

**Conflict of Interest:** Nil

**Source of Funding:** Self

**Ethical Clearance:** Taken from Sumandeep Vidyapeeth Institutional Ethics Committee.

**References**


Quality Circles in Hospital: An Exploratory Study

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Abstract

Introduction: Quality circle (QC) consists of people working in a common work area, coming together voluntarily to identify, analyze and solve various quality related problems within their area.

Methodology: The exploratory study was done in a hospital in India that was part of large public sector organisation that ran the program of QC across its institutions and also in its non-core areas like the hospitals. Primary data was collected from the staff working in the hospital that was part of quality circles.

Results: Most of the QC members reported an improvement in terms of the Job satisfaction and accomplishment that was measured on the 6 parameters. The perception of the Non-members about the general organizational climate was on the lower side in comparison to the members of the QCs. The members of the QC seemed to fare better than the Non-members.

Discussion and Conclusion: If the top and middle management develop faith and conviction in the efficacy of the QC program, then rolling this out is not an issue at all. Most of the members were appreciative of the fact that program of this kind was great learning experience. There was a unanimous agreement on the fact that this activity should continue and be extended to the whole of the organization in the whole country.

The findings suggested that the employees saw positive changes after becoming part of QCs in regard to their personal growth and they also perceived positive changes in certain important organizational aspects which helped them to function effectively.

The organizational climate seemed to have improved with QC as reflected in job satisfaction and sense of accomplishment between QC members and non-Members.

Keywords: Quality Circle, Work Satisfaction, Organizational Climate.

Introduction

Quality circle (QC) consists of people working in a common work area, coming together voluntarily to identify, analyze and solve various quality related problems within their area. This approach is unique because it revolves around the concept that the people who are actually doing the work identify, analyze and find solution to their work area and present it to the management.¹ The whole crux lies in building the capacities of the people rather than offering them with solutions to every day to day problem.²

The concept of Quality circles (QCs) has its origin in Japan and was primarily used to get the Japanese economy on its feet after the II World war. The commander of the occupied Forces in Japan was instrumental in bringing Dr. Demings who along with Dr. J. Juran was responsible for the introduction of the total quality control concept in Japan.³ Quality circles came to India when BHEL (Bharath Heavy Electricals Ltd) Hyderabad established the first circle.⁴
A hospital setup where the safety of the staff and patients is important, the application of these concepts can prove beneficial as in the case of other industries. A QC team identified three specific targets for them to achieve to ensure a safe work environment for its workers. After having identified the causes of the problems, the team members were able to analyze the problems, generate alternative solutions, and eventually implement the best solutions. Consequently, the members were able to achieve all their targets. The implementation of the concept is not that rosy if it is accompanied by the intent of just cutting cost or saving on certain areas and forgets it main emphasis of empowering the employees then the circle is bound to fail. Organizational issues at the background stage; circle-formation issues at the implementation stage; and operational issues at the operating/running stage of Quality Circle implementation, are the three main key areas of the problems which generally limit the success of the Quality Circle.

To assess the effects of a Quality Circles program within a dynamic organizational environment, it has been strongly recommended that the collection of both outcome and process type data within the context of a rigorous experimental design. Taken together, outcome and process measures can shed a great deal of insight into a more complete understanding of the effects of the QC process on individual and organizational functioning.

**Methodology**

The exploratory study was done in a hospital in India that was part of large public sector organisation that ran the program of QC across its institutions and also in its non-core areas like the hospitals.

Primary data was collected from the staff working in the hospital that was part of quality circles. The sample frame was the members who participated in quality circle process.

The study samples were drawn from the organization as:

1. Top Management-Senior manager and above.
2. Middle Management-Below senior manager to frontline supervisor.
3. Workers who were part of the Quality circle activities (Members).
4. Workers who had not joined QCs (Non-members).

Convenience Sampling was used to select the managers. The workers who had not joined Quality Circles from those areas where the QC was functioning were included as Non-QC members. The QC members were selected from almost all the operational areas - support services as well as clinical services.

The total number 33 QC groups were included for the study of which 18 were from the clinical and the rest were from the non-clinical areas. Same number of members and non-members were taken from the same areas.

The QC members in the study were mostly comparable in age and length of service. Their educational and technical backgrounds were similar except in some cases. In cases of non-members too, there was not much deviation in case of age or qualifications except in some cases.

The variables included in the study were two fold:

1. Opinions, attitudes and reactions of the top and middle level management, QC members and non-members
2. Variables related to quality of worklife

Data on these variables was collected through questionnaires and interviews.

For collection of the data, top and middle management personnel were approached personally, interview schedules were used for the members and questionnaires were distributed to non-members.

**Results**

The data was analyzed with regard to the benefit to the member of quality circle and to the organization. Comparison analysis of clinical staff and non-clinical staff and members of quality circles with non-members was done.

**Top Management:** Most of the top management personnel had an opportunity to understand the QC concept and they believed in the efficacy of quality circles. Many of the top management personnel stated that launch of QCs was justified and it could be extended to other areas also. The interest of top management was indirectly gauged from the number of presentations they had attended. Most of them had attended 4-5 meetings per year.
Middle Management: Most of the middle level managers working in the areas where QC was functioning were aware of the concepts and its activities. The responses of middle level managers are discussed below (Figure 1).

Majority of the respondents said that they had perceived positive changes in the attitudes of the members of the QC towards their work. When asked about their perception of the employees engaging in purposeful activities most of them believed that they did it to some extent. The Non-clinical managers felt that the QC was improving the time spent on purposeful activities. There was not much difference among clinical and non-clinical managers with regard to the perception about the interaction with other agencies and team work in the department. The middle managers are not very convinced that the time and effort that goes into the QC activities as worthwhile. It was observed that a larger proportion of the respondents seldom sought help from the QC groups.

Figure 1: Influence of QC activities on organizational issues as perceived by middle managers (Mean)

Figure 2: Percentage of Middle Managers reporting about the effect of QCs on their work role
Most of the middle managers were not apprehensive of losing their authority (Figure 2) as a result of QC. A small percentage of respondents felt that because of QC activities, their difficulties would show up while a few were unsure.

The Clinical mangers were confident that the QC would neither make their superiors find fault with them, nor would it dilute their authority which was the apprehension to a lesser extent of the non-clinical managers. In the case of clinical managers, most of their authority was statutory and most of the functions they performed were exclusive unlike the Non-Clinical counterparts.

Most of the respondents (96%) accorded recognition to the good work done by QC members. A high percentage (75%) of managers also gave recognition by the way of attending the QC meetings. 84% of the non-clinical managers said that they offered voluntary assistance to circle members and 64% of the clinical managers said that they adopted this method as a means to recognize the QC effort.

The clinical managers were of the view that the greatest impact of the QCs was appreciable in aspects like, removal of barrier between management and workers and improved morale and communication. The non-clinical managers were also of the same view except in certain areas where they thought that removal of the barriers can be a problematic thing. Most of the middle managers expressed that the approach of voluntary discussions and problem solving would be helpful among the executives too.

Non Members:

Most of the non-members from the non-clinical areas (97%) stated that the management had made them aware of the concepts of QC and its scope. A larger proportion of the non-members from the non-clinical areas had attended some form of presentation program on the QC activities when compared to their counterparts in the clinical areas. The discussion with circle members about the QC activities was more prevalent in the Non-Clinical areas than in the Clinical areas. To the question, “if there is a circle in your area, would you like to

![Figure 3: Percentage of non-members from the Clinical and non-clinical areas reporting on the way they got information about Quality Circles.](image)

Most of the non-members from the non-clinical areas (97%) stated that the management had made them aware of the concepts of QC and its scope. A larger proportion of the non-members from the non-clinical areas had attended some form of presentation program on the QC activities when compared to their counterparts in the clinical areas. The discussion with circle members about the QC activities was more prevalent in the Non-Clinical areas than in the Clinical areas. To the question, “if there is a circle in your area, would you like to
join?”, a large majority of the non-members responded in affirmative.

**Quality circle Members:**

**Formation of QC groups:**

- 63% of the respondents said that they became members of the QC voluntarily and almost all of them reported that they had fully understood the concept of QCs.
- 22% reported that they were asked by the departmental heads to become members
- 15% said that they were nominated.

![Figure 4. Percentage response of QC members towards various aspects relating to QC operations](image)

- All the QC members were able to participate in the meetings freely.
- All the members felt that the management presentations should be continued.

**Selection of QC members:**

- Over 50% of the respondents in both the clinical and the non-clinical areas stated that it was by consensus.

  **The respondents said that the selection of the leaders was by**
  - Nomination (21%),
  - Seniority (16%)
  - Elections (6%)

**Adequacy of training:** More than 50% of the respondents said that it was not adequate.

**Operational Aspects:**

- Most of the respondents stated that the frequency of meetings was weekly and that they attended the meetings often.
- Most of the QC members were able to participate in the meetings freely.
- All the members felt that the management presentations should be continued.
Assessment of Quality of Work Life:

- The self-reported changes: The members rated themselves as experiencing positive changes before and after joining quality circles.
- A positive change in the perceived organizational climate
- Rating about changes in work and organizational aspects was also positive side.
- Job Satisfaction and Accomplishment

Figure 5: Assessment of changes as perceived by QC members on work and organizational climate

Figure 6: Percentage of QC members reporting about changes due to QC activities on various work-related matters.
Most of the QC members reported an improvement in terms of job satisfaction and accomplishment that was measured on the 6 parameters (Figure 6). Though it was not be a very holistic way of measuring job satisfaction but it did give an indication into what things were like.

![Figure 7: Assessment of factors relating to organizational climate by members and nonmembers](image)

The perception of the Non-members about the general organizational climate was on the lower side in comparison to the members of the QCs. The members of the QC seemed to fare better than the Non-members. This is an important aspect with regard to the work life quality assessment as the feeling of alienation i.e. that of powerlessness and that their destiny was not controlled by someone else was less in case of members of the Qc in comparison to the non-Members.

**Discussion and Conclusion**

If the top and middle management develop faith and conviction in the efficacy of the QC program, then rolling this out is not an issue at all. Sometimes it requires a little bit of push from the side of the top management to reach out to those areas that are reluctant to take part in the QC process.

The middle managers were highly skeptical about the QC to start off with slowly embraced the whole idea when they saw positive changes in the form improved organizational work culture and environment started to appear.

Most of the non-members most of them were aware of the QC activities in the work area and many of them wanted to join it. There were only few pockets of resistance especially from people who were a little older because they thought that QC might include things like statistics that they might not be able to master and hence can make themselves vulnerable to the younger group who might actually grasp these things better.

Most of the members were appreciative of the fact that program of this kind was great learning experience. There was a unanimous agreement on the fact that this activity should continue and be extended to the whole of the organization in the whole country.

The effectiveness of the QC program can be gauged from the fact that the alienation among the members decreased. On the other hand, the non-members felt powerlessness and alienated. The QC shall be practiced by following systematic approach and based on the philosophies of QC rather than only for tangible gains.

Most of the non-members didn’t have any problem in principle with the concept of QC and they were waiting for the appropriate opportunity to be in QC themselves. From this it can be deduce that most of the Non-members are potential members. It is an onus on the organizations to identify as much avenues as possible to explore this opportunity to help perpetuate the Idea of QCs.
Majority of the members had reported that they joined the QC groups voluntarily which was a good sign, some of them have reported that they were asked by the departmental heads or were nominated. In most of the cases the leaders were selected by consensus. This points toward a healthy trend in maintenance of the QCs. It is also important to note that almost all the members expressed their satisfaction about the help received from their managers.

All QC members gave importance to factors like training, management support, recognition, and enthusiastic facilitators for the success of the program. The least significant for success of the QC program according to them was the monetary rewards.

The findings suggest that the employees saw positive changes after becoming part of QCs in regard to their personal growth and they also perceived positive changes in certain important organizational aspects which helped them to function effectively.

The organizational climate seemed to have improved with QC as reflected in job satisfaction and sense of accomplishment between QC members and non-Members.

The members belonging to the QC group enjoyed a high quality of work life. For a QC program to succeed the organizational leadership plays a particularly important role.

**Conflict of Interest:** Nil

**Source (s) of Support:** Nil

**Ethical Clearance:** The study was conducted as a dissertation for Master in Hospital Administration.

**References**

The Relationship between Preeclampsia with the Occurrence of Postpartum Depression in Masyita Delivery Hospital Makassar, Indonesia

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Abstract

Preeclampsia in Indonesia remains a huge problem during pregnancy with high morbidity and mortality. Many risk factors influence the occurrence of preeclampsia, such as the family history of preeclampsia, kidney disease, diabetes mellitus, chronic hypertension that has been suffered previously by pregnant mothers before pregnancy (preeclampsia superimposed), obesity, and postpartum depression. The research objective was to determine the relationship between preeclampsia and the occurrence of postpartum depression in Masyita Delivery Hospital Makassar. This study used quantitative research method with a cross-sectional design. Sampling using purposive sampling with a sample size of 61 postpartum mothers. Collecting data using a questionnaire and analyzed using the Chi-Square test. This study found that pregnant mothers who experienced mild preeclampsia were 34 subjects with 8.8% of them had postpartum depression, severe preeclampsia experienced by 7 subjects with 71.4% of them had postpartum depression. The results of statistical tests using Chi-square obtained the p-value=0.001. This study concluded that there is a significant relationship between preeclampsia and the incidence of postpartum depression in Masyita Delivery Hospital Makassar, Indonesia.

Keywords: Postpartum depression, preeclampsia.

Introduction

Preeclampsia is a group of symptoms arising during pregnancy, childbirth, and clinically manifested by hypertension, edema, and proteinuria, and usually appear at 20 weeks of gestation and persisted until the end of the first week after delivery. Preeclampsia is a pregnancy disorder with high morbidity and mortality. The appropriate cause of preeclampsia is still unknown, but there are risk factors that are considered related to the incidence of preeclampsia. Those risk factors which is linked with the occurrence of preeclampsia, such as a family history of preeclampsia, kidney disease, diabetes mellitus, chronic hypertension that has been suffered before pregnancy (superimposed preeclampsia), obesity, and postpartum depression.1

Global Burden Diseases (GBD) found in pregnancy with hypertension were in 1990 ranked 75th, this disorder responsible for 6% of the burden in all of the maternal condition.

The Data also showed that preeclampsia responsible for 16% of maternal mortality rate in the developing countries, 9% in Africa, 26% in the Caribbean, and Indonesia estimated at least 7-10%.2 The incidence of preeclampsia in Indonesia was 3-10% in 20123 and found that maternal and child mortality rate in preeclampsia about 24% of 58.1%. Indonesia had increased preeclampsia by about 15-25%.4

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Health Profile Data of South Sulawesi Province in 2013 showed that preeclampsia becomes the 2nd caused by maternal mortality rate in South Sulawesi and estimated about 28%.\(^5\) Another research reported that the incidence rate in Makassar, the main city in South Sulawesi showed data 120 cases in 2011, 146 cases in 2013, and 81 cases 2016.\(^6\)

Preeclampsia is not the direct cause of maternal mortality but this affects the occurrence of postpartum depression. The research\(^7\) showed that 26.67% of postpartum depression was caused by preeclampsia and it is estimated that about 10 pregnant women per 1000 live birth would experience mild preeclampsia and 30–200 pregnant women per 1000 live birth would experience severe preeclampsia.

The incidence of postpartum depression in India was 8.5%, Malaysia 3.9%, Taiwan 40%, and Indonesia 11.3%. The research\(^8\) reported the incidence of postpartum depression range between 16-22.35%. The initial study by the researcher in Delivery Hospital Masyita in Makassar found 26 cases of postpartum depression during 2017, 30 cases during 2018, and 16 cases found in January up to April 2019.

Materials and Method

This research design using a quantitative study with a cross-sectional approach. This study was conducted in Delivery Hospital Masyita in Makassar started from June up to July 2019. The research population was postpartum women with a history of preeclampsia. The total sample participated in this study were 41 women obtained by accidental sampling.

The inclusion criteria of the sample were postpartum women with a history of preeclampsia, declare their agreement to participate in this study, could understand and fill in the questionnaire, and showed a cooperative attitude during the research. The exclusion criteria were the postpartum women had not complete to fill all the research questionnaire.

Data collection is an approach process to the subject and subject characteristic collection process required in a study.\(^9\) Data collection in this study was conducted in Delivery Hospital Masyita in Makassar. Data were collected by using a questionnaire.

The collected questionnaire before analysis was checked by the researcher to ensure all of the questions were answered by subjects. The incomplete questionnaire was removed and dropped out. Data then coded manually and then entered into table data as its group and purposes.

Data was analyzed univariately to have a brief description of each research variable. Bivariate analysis was performed to explain the correlation between independent and dependent variables. The data were analyzed using the Chi-square test.

Results

The results of this study were presented in the table below:

| Table 1. Characteristic of subjects in Delivery Hospital Masyita Makassar (n=41). |
|------------------------------------|--|--|
| **Demographic Data** | 61 | % |
| **Age** | | |
| ≤19 years old | 3 | 7.3 |
| 20-29 years old | 28 | 68.3 |
| 30-39 years old | 10 | 24.4 |
| **Parity** | | |
| Primiparity | 11 | 26.8 |
| Multiparity | 28 | 68.3 |
| Grand multiparity | 2 | 4.9 |
| **Abortion history** | | |
| No | 32 | 78.0 |
| Yes | 9 | 22.0 |
| **Level of Education** | | |
| No School | 1 | 2.4 |
| Elementary school | 5 | 12.5 |
| Yunior high school | 5 | 12.5 |
| Senior high school | 22 | 53.7 |
| University | 8 | 19.5 |

Based on Table 1, this study showed that among 41 subjects participated in this study, it was found that dominant of the subject were in the age group 20-29 years old amounted 28 subjects (68.3%) and the least in age group <19 years old amounted 3 subjects (7.3%). Parity of subject distributed dominantly were multiparity were 28 subjects (68.3%) and the least was Grand multiparity amounted 2 subjects (4.9%).

Characteristic subjects regarding abortion history found that 32 subjects had no history and there were
9 subjects has abortion history. The education level of subjects dominantly was graduated from Senior high school 22 subjects (53.7%) and the least were no school 1 subject (2.4%).

**Table 2. The relation of preeclampsia and the occurrence of postpartum depression in Delivery Hospital Masyita Makassar**

<table>
<thead>
<tr>
<th>Preeclampsia</th>
<th>Postpartum depression</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Mild</td>
<td>3</td>
<td>8.8</td>
</tr>
<tr>
<td>Severe</td>
<td>5</td>
<td>71.4</td>
</tr>
<tr>
<td>Total</td>
<td>8</td>
<td>19.5</td>
</tr>
</tbody>
</table>

Based on Table 2, this study found statistically by Chi-square test the significant ($p=0.015$) relation between preeclampsia and postpartum depression occurrence in Delivery hospital Masyita Makassar ($p<\alpha=0.05$).

**Discussion**

Based on this study conducted in Delivery Hospital Masyita Makassar, it was shown that there was a significant correlation between preeclampsia and postpartum depression. Pregnant women with severe preeclampsia more experience postpartum depression than mild preeclampsia, while pregnant women with mild preeclampsia dominantly were in the mild category of preeclampsia.

Nevertheless, three subjects had mild preeclampsia but also experienced postpartum depression. This was may occur because of their level of education dominantly in Senior high school. Pregnant women with a high level of education more are opened with an idea and information about any changes for getting proportional health services and realized the benefit of health services they received. Level of education also determined the ease of understanding the information and knowledge about the baby delivery process they received. Thus, the older the gestational age approaching the delivery process, the more mother could prepare mature psychology to reduce the burden on the mother’s thinking.

This study also found two subjects with severe preeclampsia but not experienced postpartum depression. This was maybe occurred because of their age and experience with the previous pregnancy. Age is related to a person’s maturity. Maturity is technical maturity in carrying out tasks as well as psychological maturity. The older a person is, the more his technical and psychological maturity will also increase, as well as showing mental maturity. Increasing age will increase the policy of a person’s ability to make decisions, think rationally, control emotions, and tolerate the views of others.

Age is related to the psychological state of the mother. Mothers with the age of 20-35 years will be calmer in facing childbirth and the puerperium because the age is considered safe for pregnancy and childbirth. After all, the physical conditions, especially the reproductive and psychological organs, are 100% ready to face pregnancy, childbirth, and the puerperium.

This study match with the previous study found that postpartum depression caused by preeclampsia in women giving birth will indicate mild postpartum depression of about 10 per 1000 live births and severe postpartum depression of 30-200 per 1000 live births.

Preeclampsia is a condition in which hypertension is accompanied by proteinuria, edema, or both that occur as a result of pregnancy after the 20th week or sometimes earlier. There are extensive hydatidiform changes in the villi and chorialis. Preeclampsia (toxemia gravidarum) is high blood pressure accompanied by proteinuria (protein in the urine) or edema (fluid build-up) that occurs at 20 weeks of pregnancy until the end of the first week after delivery.

Depression is a period of disruption to human function related to feelings of sadness and accompanying symptoms, including changes in sleep and appetite patterns, psychomotor, concentration, anhedonia, fatigue, feelings of hopelessness and helplessness, and suicide. Depression is a mood disorder characterized by loss of feeling of control and subjective experience of severe suffering. The mood is an internal emotional state that permeates a person, and not affects, which is an expression of the emotional content at that time.

Maternal depression is a term used across a spectrum of depressive conditions that can affect both the mother (up to 12 months after delivery) and the expectant mother. These depressive conditions include prenatal depression, postpartum depression, and postpartum psychosis. Maternal depression is increasingly recognized as a public health problem worldwide and
can affect the lives of individuals which can affect work, family, and the health and development of infants.\textsuperscript{16}

Postpartum depression results from preeclampsia. In this condition, postpartum depression that lasts a long time has a negative long-term impact on the development of intellectual behavior.\textsuperscript{17}

According to the researcher’s opinion, there is a relationship between preeclampsia and the incidence of postpartum depression, because subjects who experience severe preeclampsia are more likely to experience postpartum depression. So it can be concluded that the heavier the preeclampsia experienced by the mother, the higher the potential for the mother to experience postpartum depression. In general, all emotions felt by postpartum women are quite unstable. A pregnant woman can have extreme reactions and her moods often change rapidly. Emotional reactions and perceptions about life can also change, plus the symptoms of preeclampsia are felt.

**Conclusion**

Most of the subjects experienced mild preeclampsia at the Delivery Hospital Masyita in Makassar. There was a significant relationship between preeclampsia and the incidence of postpartum depression at the Delivery Hospital Masyita in Makassar. The more severe the preeclampsia condition, the more likely the mother will experience postpartum depression and vice versa, the milder the preeclampsia condition, the less likely the mother will experience postpartum depression.

Pregnant and childbirth mothers need to increase their knowledge and consult with health workers to reduce the possibility of experiencing postpartum depression. Nurses from maternal and child health are more developing an understanding of nursing in overcoming postpartum depression disorder in mothers and making evaluation materials for hospitals to maximize therapeutic communication to pregnant women. Researchers who are interested in this topic need to develop this research by adding variables, samples, and using different method to be able to see a more complete relationship.

**Ethical Clearance:** The present study was carried out following the research principles. This study implemented the basic principles of ethics of respect, beneficence, nonmaleficence, and justice. This study had been approved by the Ethical Board of Nani Hasanuddin Makassar Health Science, Document Number. 001/STIKES-NH/KEPK/1/2019.

**Conflict of Interest:** There was no report of the conflict of interest involved with this study so far.

**Source of Funding:** This study was funded by authors.

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Assessment of Pentraxin 3 (PTX3) and Sclerostin (SOST) Levels in Serum of Patients with Chronic Kidney Disease

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Abstract
In the present study, 70 of patients were 35 males and 35 females were suffering from chronic kidney disease, and 20 of control group. The samples were collected from Specialized Center for Diseases and Kidney Transplant in AL-Sadder Medical City/Najaf Governorate/Iraq, during the period from July till August, 2019. The ages of control and patients ranged 30 to 69 y old. The patients group was divided into subgroup according to the age and gender, Patients without a complete medical record were excluded and those with other diseases were excluded.

The present study revealed a significant enhance (p<0.05) inserum PTX3 and SOST levels in CKD compare with control group, while a significant decline (P<0.05) in serum HDL level of CKD in comparison with control group. The result indicated no significant differences (p>0.05) in serum of PTX3 and SOST levels between female and males groups of CLD patients. Also, The results showed a significant increase (p>0.05) in serum PTX3 and SOST levels there was a significant increase(p<0.05)among different groups ages. There is a positive association between PTX3 and SOST concentrations of CKD patients.

Conclusion: The current study conducted that PTX3 and SOST levels were good markers for diagnosis and detection of chronic kidney disease in both genders the males and females.

Keywords: Chronic Kidney disease (CKD), Pentraxin 3 (PTX3) and Sclerostin (SOST).

Introduction
The chronic kidney disease (CKD) is refer to along term loss function of kidney, Its identified via the presence of an abnormality of kidney function or structure or both for at least three months\(^1\). The inflammation is might to assume an important role in both atherogenesis and advancement of chronic kidney disease\(^3\),\(^4\).

Pentraxins (PTXs) a superfamily of evolutionarily conserved proteins characterize via acyclic multimeric structure\(^5\). The Pentraxin-3 (PTX3) is protein encoded by PTX3 gene and produced via a variety of cells and tissues, and especially via innate-immunity cells in responses to endothelial cells and proinflammatory signals\(^6\),\(^7\), as a consequence of this extra- hepatic synthesis, and also in contrast to C-reactive protein(CRP), the PTX3 levels are thought to be a true independent marker of disease activity produce at site of the inflammations\(^8\).

Sclerostin (SOST) is an 190 amino acid residue glycoprotein encode via SOST gene, with a molecular mass of 24 kilo dalton and sequence homology analogous to that of other bone morphogenetic protein antagonist\(^9\),\(^10\). Sclerostin (SOST) is one of biomarkers as the link between vascular and bone disease\(^11\). Sclerostin is inhibitors of Wingless Int (Wnt) signaling produced via osteocytes and potentiall play important role in obstruct bone formation\(^12\). Sclerostin may perhaps affect bone metabolism through chronic kidney disease and the endstage renal undergoing maintenances dialysis\(^13\),\(^14\),\(^15\).

Method and Materials
Healthy and Patients groups: In the present study, 70 of patients were 35 males and 35 females were
suffering from chronic kidney disease, and 20 of control group. The samples were collected from Specialized Center for Diseases and Kidney Transplant in Al-Sadder Medical City/Najaf Governorate/Iraq, during the period from July till August, 2019. The ages of control and patients ranged 30 to 69 y old. The patients group was divided into subgroup according to the age and gender, Patients without a complete medical record were excluded and those with other diseases were excluded.

Blood samples collection: Five ml of venous blood was acquired by antecubital venipuncture utilizing needle drained from CKD and control subjects between 8:30- 10 AM following 12 hour fasting. The blood was permitted to clot in plain test tube at room temperature. The serum was suctioned after centrifugation at 3000rpm for 10min, divided into aliquots in epindroff tubes and stored at -20°c.

Determination of serum Pentraxin3 (PTX3) level: Human Pentraxin3 Elisa kit (PTX3) was supplied via Bioassay technology laboratory Co., Ltd. A Catalog No: E1938Hu.

Determination of serum Sclerostin (SOST) level: Human sclerostin Elisa kit (SOST) was supplied via Bioassay technology laboratory Co., Ltd. A Catalog No: E3068Hu.

Statistical analysis: The data of present study were articulated as (Mean±Standard Error), the statistical analysis (Descriptive statistics, Correlation coefficients, P-value) were calculated by using Graphpad prism. The comparison between two groups were analyzed by t-test and the comparison among subdivided groups were analyzed by one-way ANOVA. when P-value < 0.05 was statistically a significant.

Results

Evaluation of serum level Pentraxin 3 and sclerostin: The result in figure (1) and (2) exhibit a significant increased (p<0.05) in serum levels of pentraxin 3 and sclerostin in CKD group compared with in HT group.

(*) :Statistically significant differences (p<0.05).

Fig (1): Serum level of Pentraxin 3 between chronic kidney disease Patients and control groups.

(*) :Statistically significant differences (p<0.05).

Fig (2): Serum level of Sclerostin between chronic kidney disease patients and control groups.
Evaluation of serum levels pentraxin 3 and sclerostin in CKD patients between males and females groups: In Table (1), The results of present study revealed there is no significant differences (p>0.05) in of pentraxin 3 and sclerostin levels of CKD between female and males groups.

Evaluation of serum levels pentraxin 3 and sclerostin in CKD patients at different ages groups: Table (2), The result showed a significant increased (p<0.05) in pentraxin 3 and sclerostin levels of CKD at different ages groups.

Table (1): Comparison of serum levels pentraxin 3 and sclerostin between males and females groups of CKD patients.

<table>
<thead>
<tr>
<th>Groups Markers</th>
<th>Mean±S.E.</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pentraxin 3 (ng/ml)</td>
<td>15.163±0.086</td>
<td>17.32±0.148 ns</td>
<td></td>
</tr>
<tr>
<td>Sclerostin (pg/ml)</td>
<td>58.235±2.316</td>
<td>61.145±2.913 ns</td>
<td></td>
</tr>
</tbody>
</table>

(NS): Statistically mean no significant differences (p>0.05).

Table (2): Evaluation of serum levels pentraxin 3 and sclerostin CKD patients at different ages groups.

<table>
<thead>
<tr>
<th>Groups Markers</th>
<th>Mean±S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-39y</td>
<td>40-49y</td>
</tr>
<tr>
<td>Pentraxin 3 (ng/ml)</td>
<td>7.583±0.516 a</td>
</tr>
<tr>
<td>Sclerostin (pg/ml)</td>
<td>40.813±1.261 a</td>
</tr>
</tbody>
</table>

The different letters mean significant differences (P<0.05).

Correlation between serum pentraxin 3 and sclerostin levels: Results of the correlation coefficient between pentraxin 3 and sclerostin concentrations at the chronic kidney disease patients revealed in figure (3):

![Fig (3): The Correlation between PTX3 and SOST in patients with CKD.](image)

Discussion

The present study revealed a significant enhanced (p<0.05)in serum level pentraxin 3 and sclerostin in CKD patients in comparison with healthy group. Also the study indicated a positive association between PTX3 and SOST concentrations of CKD patients.

Many studies have confirmed that PTX3 was significantly related with kidney dysfunction and with activity or severity of the inflammatory, autoimmune and cardiovascular diseases16-19. The pentraxin3 (PTX3) is “acute phase protein belongs to the same family of C-reactive protein(CRP)”, the inflammatory marker broadly used in clinical laboratories, unlike CRP, the PTX3 rapidly produced at inflamed sites20. Many recent studies confirmed that PTX3 was a sensitive and rapid marker of inflammation in CKD patients21. High systemic PTX3 levels were related with increment risk of cardiovascular mortality and morbidity in CKD patients22-24. The study of25 indicated that PTX3 affect on lipid accumulation promoting uptake of oxLDL via macrophages, supporting a proatherogenic mechanism for the PTX3. Other studies are confirm the actual of the balance between pro and antietherogenic mechanism.
of PTX3 in progression and development of atherosclerosis in CKD patients. Also PTX3 was shown to be involved in repair and tissue remodeling under an acidic environment and hypoxia conditions, which may possibly support an aprotective role of PTX3 through renal damage. The increment in PTX3 levels are related with decrement of Glomerular filtration rate (GFR) and independently predict occurrence of the CKD in elderly women and men. The inflammatory processes are activated in early stages of the CKD and impairment of kidney function. The gradual increment of PTX3 associated to the decrement in Glomerular filtration rate may possibly due to PTX3, is a large molecular weight substance (molecular weight 40.6 kDa) characterized via a multimeric, generally pentameric structure, also be explain via an enhanced release and synthesis and stimulation in the peripheral tissues and decline in functioning kidney.

During the studies that indicated the correlation CKD with MBD and demonstrated that sclerostin (SOST), a glycoprotein derived from osteocyte, the SOST seems as a soluble inhibitor of Wingless Int (Wnt) signaling-pathway and it’s have important physiological role to reduced the increment in bone formation. The increment in serum SOST level related with progression of chronic kidney disease. These changes are probable explain via changes in creation of SOST in bone and also explain the changes in kidney function. The research of Fang and et al. who indicated, that increment in “osteocytic-protein release, vascular osteoblastic-transition and vascular calcification which happen in early phase of chronic kidney disease. Previous studies indicated a positive correlations between serum SOST and MBD in CKD patients. The Mutations in sclerostin structure, especially in SOST gene that encoding of SOST and enhanced Wnt signaling-pathway which lead to a phenotype characterized via increase in levels of sclerostin. And enhanced in circulating of SOST have revealed to predict the increment of mortality and decrement of mortality.

The bone volume, Mineral density, and bone formation. Many physiological factors that increase the circulating SOST level including men gender and older age. Also the increment of SOST levels were related positively with Body mass index, BMD, and serum uric acid levels But negatively related with total Kt/V for urea. Multiple regression analysis in study of indicated that SOST increment were the associated with other factors including, the GFR, serum calcium and serum phosphorus. Other studies have indicated that serum SOST increases with ageing, the Ageing is an independent risk factor for vascular disease and chronic kidney disease, And many traditional risk factors for CKD such smoking, diabetes, hypertension, and hyperlipidemia, nontraditional risk factors such as oxidative stress, inflammation, anemia, mineral bone abnormalities.

**Acknowledgements:** I would like express my thanks to all staff of Diseases and Kidney Transplant center and catheterization units at Al-Sadder Teaching Hospital for their cooperation and help, and My thanks and appreciation to the Head of the Department and teaching staff at the Faculty of Medical Laboratories Techniques, Al-Toosi University College.

**Ethics Clearance:** This article does not contain any studies with human participants directly or animals.

**Conflict of Interest:** The others declare that there is no conflict of interest

**Funding:** None, Self-financing source

**Data Availability:** All data were analyzed during this work are included in the manuscript.

**References**


23. Tong M, Carrero J, Qureshi A et al. Plasma pentraxin 3 in patients with chronic kidney disease:


Psychosocial Impacts of Imprisonment among Youth Offenders in Correctional Administration Center, Kellem Wollega Zone, Ethiopia

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Abstract

A research study was conducted to assess the psychological impact of imprisonment among youth offenders at selected correction administrative center, Kellem Wollega zone, Ethiopia.

The objectives were to assess the respondent’s socio-demographic characteristics, to investigate the psychosocial impacts of imprisonment on Youth Offenders and to identify the difference on Youth imprisonment level with the residence and gender of offenders.

Crosses sectional study was conducted with 83 youth offenders were selected by systematic sampling technique. The data were collected by using standardized questionnaires. The collected data was tabulated and analyzed with SPSS. Descriptive and inferential statistics were used.

Researchers observed that causes of imprisonment in three different categories as follows: 42(50.6%), 18(21.7%) and 23 (27.7%) of the respondents reported psychological, social and economic interconnected reasons respectively. Psychological impacts of imprisonment as tracks: 68(81.9%), 59(71.1%) of the respondents reported diminished sense of self-worth, personal value due to imprisonment and Self-harm and drug abuse are the result of long periods of time spent in the prison correspondingly. It is vital and utmost necessary to identify the level of psychological impact and alleviate the fear and other associated symptoms and arrange for counselling to provide positive mental health.

Keywords: Psychological impact, Imprisonment, youth offenders, Ethiopia.

Introduction

Youth is best understood as a period of transition from the dependence of childhood to adulthood’s independence. The United Nations defines ‘youth’, as those persons between the ages of 15 and 24 years (http://undesadspd.org/Youth.aspx). Ethiopia’s national youth policy (2004) defines youth as those aged between 15-29. The national youth policy of Ethiopia was adopted in 2004. The national youth policy (2004) aims to enable youth to participate, in an organized manner, in the process of building a democratic system, good governance and development endeavors¹,².

Young people are expected to take on more mature roles and responsibilities and figure out how to become healthy and responsible members of society. Adult outcomes depend heavily on what happens during these years because the experiences of adolescence lay the foundation for what individuals will be able to accomplish in the next stage of their lives³. Making
a successful transition from the dependency of adolescence to the self-sufficiency of adulthood is a process that requires the coordination of many skills. These capacities are epitomized in a concept called psychosocial maturity (Greenberger, 1984) and require development across three important domains: mastery and competence, interpersonal relationships and social functioning, and self-definition and self-governance. To achieve sufficient psychosocial maturity and, along with it, the abilities to function as independent and productive adults, youths in contemporary industrialized society need to complete a series of developmental tasks in each of these three areas.

However, young people often involved in crime which lead them fall in imprisonment which affects their psychosocial maturity. There are a number of factors that lead to commit criminal behavior for a person at an everywhere in every time. Among different factors social, psychological influences that affect youth to commit crime like, personality disorders, family related influences, sibling influences; spiritual and cultural influences and many other factors that affect youth to commit crime.

Ethiopia is one of the developing countries where the majority of the people live below the poverty line. Young people constitute the majority of the poor. Moreover, the wide spread poverty, rapid urbanization, drought and famine, armed conflict, destabilizations of family life etc. have left millions of children in Ethiopia without care and protection. A Part of this, Ethiopia is a country where traditional values have existed for centuries and deep rooted. These and other related socio-cultural factors have led to the abuse, neglect and/or mal-treatment of children in Ethiopia. It is not only the increase in number that should be of concern, but also the seriousness and the proportion of offenses committed by young people as compared with adults. In Ethiopia, a survey research done in urban centers have shown many street boys were migrants from the surrounding rural areas who moved to the cities in search of employment and education when they failed to get what they wanted they stayed on the streets and started begging and or doing odd jobs which lead them to fall in crime.

Objectives:

General Objective: The general objective of the study was to assess the psycho-social impacts of imprisonment on youth offenders in correctional administrative center, kellem wollega zone correctional administration office

Specific Objectives:

• To assess the respondents socio-demographic characteristics
• To investigate the psychosocial impacts of imprisonment on Youth Offenders
• To identify whether there is difference on Youth imprisonment level by the residence and gender of offenders

Materials and Method

Mixed method of research approach and descriptive design was adopted. The source population was all the imprisoned youth found in correctional administrative center, Kellem Wollega Zone during the study period. Youth’s offenders who satiating the inclusion principles such as age group between 18-29 years with a simple random sampling technique participants were chosen for the study.

Sample size determination and sampling procedure: Neuman (1997) pointed out for conventional social science researchers for selecting representative samples for quantitative studies, if the study population is 1000 or under, the sample ratio would need to be about 30%. Therefore, based on this guide, the sample size was determined for this study. From the secondary data source of kellem wollega zone correctional administration Centre target population was 275, the following 30% of target population found in the prison were selected as sample size means 83 samples through systematic sampling technique.

Table 1: Population and sample selection

<table>
<thead>
<tr>
<th>Label</th>
<th>Target population</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sex Rural Urban Total</td>
<td>Sex Rural Urban Total</td>
</tr>
<tr>
<td>Youth Offenders at that time in prison of KWZCAO</td>
<td>M 140</td>
<td>116</td>
</tr>
<tr>
<td></td>
<td>F 12</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>123</td>
</tr>
</tbody>
</table>

Source: Kellem Wollega Zone Correctional Administration Office
Data collection instrument and Questionnaires development: The questionnaires were adopted from, Sisay (2016) & Mebrihit (2008) in open source even though permission also obtained from the researchers. In order to gather relevant information for the study; some of questionnaires were developed by the researcher and validated the same. The questionnaire was translated into Afan Oromo and again translated back in to English, and comparisons was made on the consistency of the two versions. Recruited data enumerators were collected the necessary information by Structured Interview Schedule. The questionnaires were consisting of closed-ended and Likert scale items.

Data collection procedure: Data collectors were educated on the purpose of the research and method of questioning the offenders how to record the responses of the literate and not literate participants to minimize social desirability effects. Utterly 5 data collectors involved as one psychologist & 4 police who were working in Kellem Wollega Zone Correctional Administrative Office. Data enumerators were piloted face to face interview. Researcher followed the doings of data collectors daily for the consistency of the data.

Data Processing and Analysis: Questionnaire was the instruments used for collecting relevant data from the participants. The overall analysis of collected data to describe the psychosocial impacts of imprisonment on Youth Offenders was done using the statistical analysis software ‘Statistical Package for the Social Sciences’ (SPSS) Version 23.0.

Specifically, Descriptive statistics was used to compute socio-demographic characteristics of respondents; and to analyses psychosocial impacts of imprisonment on Youth offenders while Independent sample t-test was used to analysis whether there is difference of Youth imprisonment level by gender and residence.

Results

This section focuses on examining the results intended to provide answers for the questions raised. The data which was collected from a total of 73 male and 10 female totally 83 Youth offenders was analyzed as follows.

Part 1: General information of Youth offenders

The total number of the youth offenders who participated in the study was 83. Regarding their residential area, from the total 83 offenders, 46 (55.4%) lives in rural area while 37 (44.6%) lives in urban area. Out of the total offenders, 73 (87.9%) were male while 10 (12.1%) were female. Majority of the offenders 45 (54.2%) were found within age interval of 26-29. The least number, 13 (15.7%) of the offenders were found within the age interval of 18-20 while 25 (30.1%) of the offenders fall between age interval of 21-25.

Concerning the offenders job before their incarceration, majority of them were student 25(30.1%) and unemployed 24(28.9%) while the rest 8(9.6%), 10(12%) and 16(19.3%) were farmer, daily laborer, and merchant respectively.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Response</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your Educational status</td>
<td>Grade 5-8</td>
<td>30</td>
<td>36.1</td>
</tr>
<tr>
<td></td>
<td>Grade 9-12</td>
<td>30</td>
<td>36.1</td>
</tr>
<tr>
<td></td>
<td>Certificate</td>
<td>14</td>
<td>16.9</td>
</tr>
<tr>
<td></td>
<td>Diploma &amp; above</td>
<td>9</td>
<td>10.8</td>
</tr>
<tr>
<td>If your educational status is not at the level of your interest, what is the reason behind your educational status?</td>
<td>Fail (lack of point in order to pass to next educational status)</td>
<td>26</td>
<td>42.6</td>
</tr>
<tr>
<td></td>
<td>Dropout</td>
<td>35</td>
<td>57.4</td>
</tr>
<tr>
<td>What is your main reason to dropout from school?</td>
<td>Economic problem</td>
<td>14</td>
<td>40.0</td>
</tr>
<tr>
<td></td>
<td>Make crime &amp; fail in jail</td>
<td>10</td>
<td>28.6</td>
</tr>
<tr>
<td></td>
<td>Lack of interest to learn</td>
<td>3</td>
<td>8.6</td>
</tr>
<tr>
<td></td>
<td>Peer influence</td>
<td>8</td>
<td>22.9</td>
</tr>
</tbody>
</table>

Table 2: Educational information of Youth imprisonment N=83
Educational information of Youth imprisonment was analyzed with descriptive statistics and discussed in detail in Table 2.

### Table: 3 Socio-economic information of Youth imprisonment

<table>
<thead>
<tr>
<th>Variable</th>
<th>Response</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are your parents alive?</td>
<td>Yes</td>
<td>75</td>
<td>90.4</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>8</td>
<td>9.6</td>
</tr>
<tr>
<td>From your parents who is alive?</td>
<td>Both parents alive</td>
<td>27</td>
<td>36.0</td>
</tr>
<tr>
<td></td>
<td>Mother only</td>
<td>32</td>
<td>42.7</td>
</tr>
<tr>
<td></td>
<td>Father only</td>
<td>16</td>
<td>21.3</td>
</tr>
<tr>
<td>If your parents are alive do they live together?</td>
<td>Yes</td>
<td>20</td>
<td>74.1</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>7</td>
<td>25.9</td>
</tr>
<tr>
<td>Do you have positive relationship with your parents?</td>
<td>Yes</td>
<td>50</td>
<td>66.7</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>25</td>
<td>33.3</td>
</tr>
<tr>
<td>If you have no positive relations with your parents, why?</td>
<td>Because of my conduct problem, they do not like me</td>
<td>13</td>
<td>52.0</td>
</tr>
<tr>
<td></td>
<td>Because I use different substance abuse they do not like me</td>
<td>2</td>
<td>8.0</td>
</tr>
<tr>
<td></td>
<td>Because they do not fulfill my interest I do not like them</td>
<td>10</td>
<td>40.0</td>
</tr>
</tbody>
</table>

Here the descriptive analysis of socio-economic information of 83 youth offenders was analyzed as follows. Among the total 83 youth offenders, 75(90.4%) of them were their parents are alive while 8(9.6%) of them were their parents are not alive and other related details are clearly specified in Table:3.

### Part 2: Causes of Youth imprisonment

#### Table 4: Close-ended items on Causes of Youth imprisonment

<table>
<thead>
<tr>
<th>Variable</th>
<th>Response</th>
<th>F</th>
<th>%</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Which of the following Psychological related Causes of imprisonment are the reasons for you to commit crime?</td>
<td>Antisocial personality disorder anxiety and being angry</td>
<td>23</td>
<td>54.8</td>
<td>1.76</td>
<td>0.906</td>
</tr>
<tr>
<td></td>
<td>Uses of substance abuse like alcohol, chat, smoking</td>
<td>6</td>
<td>14.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Personal behavior like aggressiveness &amp; conduct problem</td>
<td>13</td>
<td>30.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Which of the following Social related Causes of imprisonment are the reasons for you to commit crime?</td>
<td>Bad relationship with parents</td>
<td>8</td>
<td>44.4</td>
<td>2.06</td>
<td>1.110</td>
</tr>
<tr>
<td></td>
<td>Broken family (divorce, death of one parent or both, migration)</td>
<td>3</td>
<td>16.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peers influence</td>
<td>5</td>
<td>27.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Being orphaned</td>
<td>2</td>
<td>11.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Which of the following Economic related Causes of imprisonment are the reasons for you to commit crime?</td>
<td>Lack of basic needs due to lack of support</td>
<td>8</td>
<td>34.8</td>
<td>1.65</td>
<td>0.487</td>
</tr>
<tr>
<td></td>
<td>Lack of work opportunity</td>
<td>15</td>
<td>65.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What is the type of crime that you were found guilty currently/came to this institution?</td>
<td>Robbery/Stealing</td>
<td>9</td>
<td>10.8</td>
<td>3.81</td>
<td>1.142</td>
</tr>
<tr>
<td></td>
<td>Rape</td>
<td>4</td>
<td>4.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Physical fighting</td>
<td>42</td>
<td>50.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Damage to property</td>
<td>14</td>
<td>16.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gambling</td>
<td>5</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>9</td>
<td>10.8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Part 3: Psychological impacts of Youth Imprisonment

![Psychological Impact of Youth Offenders](image1)

**Fig: 1 Showing the Severity of psychological impacts of youth offenders**

Part 4: Social impacts of Youth Imprisonment

![Social Impact of Youth Imprisonment](image2)

**Fig: 2 Showing the Social impacts of youth offenders**

Part 5: Youth imprisonment level by the residence and gender of the offenders

The result of t-test revealed that there were significant differences in youth imprisonment level by the gender of offenders (t (83) = -8.602, p < 0.05). The findings show that there were significant differences between male and female youth offenders in their imprisonment level i.e. more offenders are male.

Discussion

The finding of the study regarding Educational information of Youth imprisonment reveals that majority of the offenders was those who attended grade 5 to 12 educational level while some offenders were those who have certificate, diploma & above educational status. From respondents of this study, 26(42.6%) offenders educational status is not at the level of their interest for
two main reasons. The first reason is fail (lack of point in order to pass to next educational status) and the second one is due to dropout from school. Among offenders who dropout from school majority of them were dropout due to the economic problem while some of them were due to making crime & fail in jail. Lack of interest to learn and due to Peer influence.

Similar to the present study, Antonescu and Birau (2014) have found that high school students with a history of juvenile delinquency.

Regarding the Causes of Youth imprisonment, majority 42(50.6%) offenders main reason to make crime was psychological related causes such as Antisocial personality disorder anxiety and being angry, Uses of substance abuse like alcohol, chat, smoking, and Personal behavior like aggressiveness & conduct problem while 18(21.7%) offenders main reason to make crime was social related causes such as bad relationship with parents, broken family (divorce, death of one parent or both, migration), Peer influence and being orphaned; and 23(27.7%) offenders main reason to make crime was economic related causes such as lack of basic needs due to lack of support and lack of work opportunity.

Similar to the present study, John (2012) studied poverty as cause of juvenile delinquency. Selamawit (2014) study shows that the primary cause of juvenile delinquency in Addis Ababa is poverty, peer pressure, substance abuse, poor academic performance and family dysfunctions.

Findings relating to psychological impacts of imprisonment on youth offenders were reveals that, majority 68(81.9%) offenders feel diminished sense of self-worth and personal value due to imprisonment while 15(18.1%) offenders have undecided feelings whether they feel diminished sense or not. Pertaining to beneficial access in the prison, some offenders agree that there was beneficial access to education and psychological therapy and physical treatment in the correctional administration center while some offenders disagree that there was beneficial access to education and psychological therapy and physical treatment in the correctional administration center, and some offenders have undecided feelings to say there was or not.

Majority of the offenders have high level of healthy problem feelings while some offenders have low level of healthy problem feelings. All of the offenders’ response reveals that they failed in the feeling of shame and guilt due to imprisonment even if their level feeling is different.

Similar to the present study, Fagan & Freeman, 1999 study reveals that Young people fall in imprisonment may face many psychosocial challenges. In particular, they are notorious for experiencing educational failure and having problems securing later employment. It is not surprising that incarcerated adolescents have a hard time finding employment as adults, and their contact with the justice system has lasting adverse effects on their legal earnings.

And also Bullis et al., 2002 study reveals that young offenders show worrisome adult outcomes even when compared to other vulnerable groups. The most discouraging comparisons are in the domains of educational attainment and employment. Young offenders use to describe their transition from residential facilities back to the community—only about 30% of young adults were engaged in either school or work 12 months after their release.

**Conclusion**

Research study discovered that the most of the offenders were reported diminished sense of self-worth and personal value due to imprisonment; antisocial behavior, psychological disturbance and emotional instability such as feelings of anger, stress and frustration due to lack of mental stimulation and activity; Investigators intensely endorsing that the Psychological therapy training for professionals in correctional administrative centre and followed by psychological first aid. After availing the training concern offenders will receive the same to stabilize the mental health by reducing their emotional instability. It is more important to reduce the psychological disturbances among offenders and offer affirmative metal health.

**Acknowledgement:** The authors wish to thank Heads of Dambi Dollo University, Oromia, Ethiopia for their support for completing the Research.

**Conflict of Interest:** Nil

**Source of Funding:** The authors received funding from the Dambi Dollo University for conducting the research and also obtained Permission for Publication of this article.

**Ethical Clearance:** Ethical Clearance obtained from the Institutional research ethics committee, Dambi
Dollo University. Written consent was obtained from each participant.

References

Rare Case of Mediastinal Synovial Sarcoma in an Indonesian Woman

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Abstract

Background: Synovial sarcoma mediastinum is a rare tumor, with a few cases having been reported.

Case Presentation: A 27-year-old Indonesian woman had a complaint of shortness of breath and left chest pain. Chest X-ray showed a massive pleural effusion with reddish-yellow pleural fluid. Thorax CT scan showed a clear demarcated mass in the anterior mediastinum until left mediastinum, with value of lactic acid dehydrogenase of 561 U/L. The patient was diagnosed with mediastinal tumor and performed left anterolateral thoracotomy with tumor weight of 2.354 mg. Tumor histopathology consisted of positive Vimentin, BCL2 and CD99 antibodies. The patient performed 3 cycles of chemotherapy after surgery using doxorubicin, ifosfamide, and mesna. Post-chemotherapy results of CT showed metastases in the left hemidiaphragm with an expansion of mass defects and lymphadenopathy in the upper right paratracheal.

Conclusion: The prognosis synovial sarcoma mediastinum is worse than synovial sarcoma in other organs as seen in most recurrent cases.

Keywords: Synovial sarcoma mediastinum, malignant tumor, poor prognosis.

Introduction

Mediastinal synovial sarcoma is a rare neoplasm, with only a few cases having been reported. It has overlapping histological and immunophenotypic features with other tumors in the differential diagnosis, and comprise <1% of malignant neoplasm and <0.01% of all malignant thoracic neoplasms¹. This translocation is the gold standard for diagnosing synovial sarcoma, where 100% of the biphasic subtype and 96% of monophasic subtype show this translocation². Mediastinal synovial sarcoma is a malignant tumor that can invade organs that are close to or metastasize to more distant organs³. In some literatures, therapeutic modalities for mediastinal synovial sarcoma include surgery, chemotherapy and radiation⁴. The prognosis of this neoplasm depends on location, size, stage, histology, tumor resection, and metastasis⁵. Based on the description above we report a rare case of mediastinal synovial sarcoma in a 27-year-old Indonesian woman.

Case Presentation: A 27-year-old Indonesian woman presented intermittent shortness of breath since the past 4 months. She also complained of coughing with white phlegm for 1 month, intermittent fever from 3 weeks and left chest pain 6 months before being admitted to hospital. There was no history of haemoptysis or weight loss. The patient had undergone breast tumor surgery and thyroid surgery 8 months and 5 years before hospitalization. Physical examination did not reveal anything significant. Chest X-ray examination
showed homogeneous opacity in the entire left lung, chest markers X-ray ultrasound was performed for later puncture, and obtained reddish-yellow fluid. Thoracic computerized tomography (CT) scan with contrast revealed a left anterior-medial mediastinal mass measuring $11.95 \times 16.79 \times 24.45$ cm with a necrotic area and multiple punctate calcification with suspicion of a teratoma with a differential diagnosis of lymphoma (Figure 1). Tumor marker examinations showed Lactic Acid Dehydrogenase (LDH) as much as 561 U/L, but Beta human chorionic gonadotropin (β-HCG) and Alpha-fetoprotein (AFP) levels were within normal limit. Bone survey examination and upper lower abdominal ultrasound did not show any metastases.

The patient performed explorative thoracotomy with wedge resection for diagnosis. Tumor tissue was obtained with a total weight of 2.354 mg (Figure 2). Macroscopic examination showed gray-white, partially brownish, partially yellowish tissue had a densely brittle solid density. Microscopic examination revealed proliferation of oval to spindle, pleomorphic, hyperchromatic, narrow cytoplasm cells. Some subnuclei were prominent, mitosis 14/10 high power fields (HPF) and necrotic areas appeared between them. The results of the examination demonstrated a malignant spindle mesenchymal tumor with a differential diagnosis of malignant peripheral nerve sheath tumor and synovial sarcoma. Immunohistochemical examination (IHC) results confirmed a synovial sarcoma (Figure 3).

The patient complained of pain after surgery. Thoracic CT scan evaluation showed metastases process. The patient received adjuvant chemotherapy with doxorubicin, ifosfamide, and mesna for three cycles. During first and second chemotherapy, the patient complained of nausea, vomiting, thrush, and grade-2 leukopenia. In the third cycle of chemotherapy, the patient complained of cancer sores, nausea, vomiting and grade-3 anaemia. The patient received intravenous injection of 4 mg ondansetron, subcutaneous injection of 250 mcg leucogen, and nystatin drop to treat the side effects. Two weeks after the third cycle of chemotherapy, the patient underwent thoracic CT scan evaluation that showed aggressive metastases process. She declined further treatment and died 3 months later.

![Figure 1. Thoracic CT CT scan with contrast](image)
Discussions

Mediastinal synovial sarcoma is a rare and aggressive malignant soft tissue tumor occurring most commonly in male and young adults. Only few case reports and series of primary synovial sarcoma are described in the literature so far. Witkin et al. in 1989 reported 4 cases of biphasic mediastinal synovial sarcoma. The patients were all adult males and the tumor frequently adherent to the adjacent pleura or pericardium but none were arising from them. Suster and Moran described 15 cases of primary synovial sarcoma, 9 of their cases presented with anterior mediastinal masses with chest pain and shortness of breath. Thoracic CT scan demonstrates a well-defined homogenous or heterogeneously enhancing mass containing necrotic areas and soft tissue components. Peripheral calcifications were described in
some cases. In advanced stages, invasion and infiltration of surrounding tissue, and ipsilateral pleural effusion may be presented (6).

Synovial sarcoma is morphologically classified into three subtypes, namely monophasic, biphasic, and poorly differentiated. The monophasic type is dominated by spindle cells, the biphasic type contains epithelial cells and spindle cells, while the poorly differentiated type contains large variants of epithelial cells and spindle cells (5). Tissue specimen of our case morphology showed proliferation of round nucleated, oval to spindle, pleomorphic, hyperchromatic cells, narrow cytoplasm with several prominent subnuclei, and 14/10 HPF mitosis that revealed monophasic type. Immunohistochemical examination of synovial sarcoma was found to be positive for epithelial membrane antigen BCL-2, CD99, S-100, and Vimentin (2). S100 and EMA antibodies were found negative, thus further examination of cytogenetic analysis examination is needed to confirm the presence of chromosome t (x; 18) (p11; q11) translocation that is found in 90% of synovial sarcoma cases (7).

Mediastinal synovial sarcoma in patient was at stage IV according to the 8th edition of the American Joint Committee on Cancer (AJCC). The classification of soft tissue sarcoma is based on histological profile (G), tumor size (T), lymph node enlargement (N), and metastasis (M). Synovial sarcoma histological profile adapted from the Federation Nationale des Centers de Lutte Contre Le Cancer (FNCLCC) consists of three parameters, namely differentiation, mitotic activity, and the expansion of the necrotic area (8,9).

Mediastinal synovial sarcoma therapy includes surgery, radiotherapy and chemotherapy (3). Complete resection of tumor tissue is a standard management related to survival rates. Synovial sarcoma has a moderate sensitivity to chemotherapy regimens from alkylating agent group consisting of doxorubicin and ifosfamide with varying degrees of response from 30 to 55%. Neoadjuvant chemotherapy with doxorubicin and ifosfamide in mediastinal synovial sarcoma can reduce the size of a large tumor, making it easier for surgery. The most common side effects of chemotherapy from alkylating agent group are nausea, vomiting, leukopenia, and thrombocytopenia. Haemorrhagic cystitis can occur in ifosfamide chemotherapy. To reduce these side effects, medical experts can provide adequate fluid hydration and additional mercaptoethanesulfonate (mesna) therapy according to the patient’s weight (2). In several studies, a combination of surgery and radiotherapy showed significant outcome for the survival rate of a patient with high-grade synovial sarcoma. Radiotherapy can be given before surgery, after surgery, or in these two periods using the External Beam Radiation Therapy (EBRT) method (10).

Prognosis of mediastinal synovial sarcoma is worse than synovial sarcoma in other organs, as seen in most cases that often experience recurrence. The prognosis of this tumor is estimated at 35.7% for the 5-year survival rate. Factors causing poor clinical and microscopic prognosis include age more than 20 years, male patient, incomplete resection, tumor size more than 5 cm, neurovascular infiltration, extensive tumor necrosis, high rates of mitotic features (>10/10 HPF), tumor histology of undifferentiated high grade, biphasic variant, reciprocal SYT-SSXI chromosome translocation, and the presence of distant metastases (7, 11). The difference between mediastinal synovial sarcoma and tumor of thymic origin is radiological results. The radiological results of mediastinal synovial sarcoma are located in the lung organs and mediastinal organs while the tumor of thymic origin has no specificity (12).

**Conclusion**

Mediastinal synovial sarcoma is a rare case of malignancy in lung tissue. Management includes surgery, radiotherapy, and chemotherapy. The prognosis is quite poor in this reported case.

**Funding:** None.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Statement of Ethics:** The present case report adhered to the Declaration of Helsinki. Informed consent for publication was obtained from the patient.

**References**

3. Chatterjee AS, Kumar R, Purandare N, Jiwani...


Association between ABO Blood Group and Radiographic Findings in Periodontal Disease

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Abstract

Background: Periodontal disease is one of the most common diseases in the oral cavity that may be influenced by the blood grouping system among individuals. The purpose of this study was to determine whether there was an association between radiographic findings and ABO blood groups in patients with periodontal diseases.

Material and Method: A prospective study carried out on 200 subjects (99) male and (101) female, aged (18 to 65) who diagnosed clinically with periodontitis who were requested for panoramic and were asked for ABO blood group and Rh factor determination. The subjects were divided into two groups according to these findings, as those with (localized chronic periodontitis) and (generalized chronic periodontitis). The association between blood groups and periodontal health were investigated.

Result: There is more predominance of the localized chronic periodontitis (60%) of subjects. The distribution periodontitis with different blood group of the study population (41%, 30%, 20% and, 9%) of blood group O followed by B, A, AB respectively. There is more predominance of subjects with Rh positive group (86.5%). The association between ABO and Rh with age groups and with gender were found to be statistically not significant, while the association between both localized and generalized chronic periodontitis and Rh factor was a significant.

Conclusion: The association between periodontal diseases and blood group show the high risk people to determine a perfect treatment plan strategy.

Keywords: ABO, Rh factor, Periodontal disease, Radiographic findings.

Introduction

ABO blood group is considered one of the most investigated system that has been utilized as genetic markers to study the relations with many diseases. Although several studies have been carried out to investigate relationships between the ABO blood group and the incidence of certain diseases like duodenal ulcer, gastric ulcer and gastric carcinoma, ischemic heart disease and atherosclerosis, little investigation has been made to explore the relationships between ABO blood groups and the incidence of oral and dental diseases. The ABO blood types have used by anthropologists as a guide to investigate the modern humans development. The other important blood system is the Rhesus (Rh) system; this system is determined by the nature of different proteins present on the surface of erythrocytes.

Periodontal diseases have the high incidence among population. It is the main cause of teeth loss in later adult life. The main extrinsic etiologic factor in periodontal diseases is bacterial plaque, but many studies are carried out to assess whether there is a relationship between ABO blood groups and periodontal diseases in addition to other factors such as gender, age, education level, smoking habits through simple analysis and research methodology.
Radiography plays an integral role in the assessment of periodontal disease. Periodontitis examination is incomplete without accurate radiographs. An overall assessment of periodontal disease is based on both the clinical and radiographic findings whether in localized or generalized periodontitis that is characterized by pocket formation, gingival recession, evidence of alveolar bone loss, furcation involvement. The radiography role is not only in the diagnosis aspect, but in guiding periodontal treatment planning decisions. \(^{(10)}\) Panoramic radiograph of optimal quality is proposed as an alternative radiographic view to the full mouth intra-oral survey, and may offer a dose advantage over large numbers of intraoral radiographs. \(^{(10,11)}\)

**Material and Method**

The present investigation was carried out on (200) subjects, (99) male and (101) female, aged (18 to 65) who diagnosed clinically with periodontitis at faculty of dentistry/university of Baghdad in 4 months duration with inclusion criteria: (All subjects should be dentate with no history of any systemic disease, no smoking, they had nearly equal socio-economic level) they were asked for their consent to participation after full explanation about the method and purpose of the study, then they were requested for radiographic investigation using panoramic x-ray unit (Planmeca Romexis device) with scanning parameter. kVp (60.0KV), s (18.35), mA(0.4). Any image with poor quality was excluded from this study. All subjects were asked for ABO blood group and Rh factor determination with detailed consent form.

The panoramic images were carefully interpreted for the evidence of radiographic bone loss (vertical and/or horizontal bone loss) at least in one site, furcation involvement; alveolar crest level that is greater than 2mm below CEJ, and periodontal pockets depth more than 4 mm, then the subjects were divided into two groups according to the findings as those with (localized chronic periodontitis) and (generalized chronic periodontitis). The association between blood groups and periodontal health were investigated separately and all data were analyzed statistically.

Figure 1: Generalized chronic periodontitis in (AB) blood group patient.
Result

Out of the total 200 subjects, 99 were males (49.5%) and 101 were females (50.5%). The mean age was (37.29±11.05) years. There is more predominance of the localized chronic periodontitis (60%) of subjects, while the generalized chronic periodontitis found in only (40%).

The distribution periodontitis with different blood group of the study population was observed in 41% individuals of blood group O followed by 30% study participants of blood group B, 20% of blood group A, and 9% of blood group AB. There is more predominance of subjects with Rh positive group (86.5%) than those with Rh negative group (13.5%) and the prevalence of gingivitis was higher in Rh positive group table (1).

The association between ABO and Rh with age groups and with gender were found to be statistically not significant, the significances were as follows: ABO with age groups (0.196), ABO with gender (0.725), Rh with age groups (0.803), and Rh with gender groups (0.275).

Table (2) illustrates that both localized and generalized periodontitis were found in blood group O and B followed by blood group A while the lowest were found in AB blood group with significant association P-value (0.024).

There was a significant association between both localized and generalized chronic periodontitis and Rh factor as shown in table (3). It is evident that the total percentage 60% of the study participants who were localized chronic periodontitis (Rh + 49.50%, Rh- 10.50%) against 40% who were generalized chronic periodontitis (Rh + 37%, Rh- 3%) and this was statistically significant P-value (0.043).

Table 1: Characteristics distribution of the study sample

<table>
<thead>
<tr>
<th>Variables</th>
<th>Categories</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Years)</td>
<td>18-33y</td>
<td>76</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>34-49y</td>
<td>92</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>50-65y</td>
<td>32</td>
<td>16</td>
</tr>
<tr>
<td>Gender</td>
<td>Males</td>
<td>99</td>
<td>49.5</td>
</tr>
<tr>
<td></td>
<td>Females</td>
<td>101</td>
<td>50.5</td>
</tr>
<tr>
<td>Periodontitis</td>
<td>Localized</td>
<td>120</td>
<td>60.0</td>
</tr>
<tr>
<td></td>
<td>Generalized</td>
<td>80</td>
<td>40.0</td>
</tr>
<tr>
<td>Variables</td>
<td>Categories</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>-----------</td>
<td>------------</td>
<td>-----</td>
<td>----</td>
</tr>
<tr>
<td>ABO</td>
<td>A</td>
<td>40</td>
<td>20.0</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>60</td>
<td>30.0</td>
</tr>
<tr>
<td></td>
<td>O</td>
<td>82</td>
<td>41.0</td>
</tr>
<tr>
<td></td>
<td>AB</td>
<td>18</td>
<td>9.0</td>
</tr>
<tr>
<td>RH</td>
<td>+VE</td>
<td>173</td>
<td>86.5</td>
</tr>
<tr>
<td></td>
<td>-VE</td>
<td>27</td>
<td>13.5</td>
</tr>
</tbody>
</table>

Table 2: Distribution of ABO blood groups among localized a generalized chronic periodontitis patients

<table>
<thead>
<tr>
<th>ABO blood group</th>
<th>Chi-square</th>
<th>P-value</th>
</tr>
</thead>
</table>
| A               | 30         | 34      | 50    | 6   | 9.394 | 0.024 [Sig.]
| B               | 25.00      | 28.33   | 41.67 | 5.00 |
| O               | 75.00      | 56.67   | 60.98 | 33.33 |
| AB              | 15.00      | 17.00   | 25.00 | 3.00 |

Table 3: Distribution of Rh factor among localized an generalized chronic periodontitis patients

<table>
<thead>
<tr>
<th>Rh</th>
<th>Chi-square</th>
<th>P-value</th>
</tr>
</thead>
</table>
| Rh+     | 99         | 21      | 4.110 | 0.043 [Sig.]
| Rh-     | 82.50      | 17.50   |
|         | 57.23      | 77.78   |
| % of Total | 49.50      | 10.50   |

Discussion

The essential factor in inflammatory periodontal disease is the presence of microorganisms, but the progression of disease is also related to numerous host-based risk factors, so it consider to be multifactorial in nature. Genetics factors are the most important one. ABO blood group and Rhesus (Rh) system is the most investigated erythrocyte antigen system. (12)

The ABO blood group and Rh system distributions show distinct variation all over the world. This variation may even have existed in different areas within the same country (6) that is explains the various established percentage of ABO blood group and Rh system distributions among the study sample. In this study, 41% of patients were of group O; 30% were of group B; 20% were of group A, and only 9% were of group AB this proportion was very closed to the ABO blood distributions in Habeeb et al. study (13) in Iraqi population, Sarhan et al. study (14) in Saudi population, and Agrawal A, et al. study (15) in India they found that the most common blood group was group O and the lowest was AB group. This study concluded that in the localized periodontitis group a high percentage of
individuals were observed with O blood group (41.67% with periodontitis) and A blood group (75% within ABO), while in the generalized periodontitis group. Similarly, a high percentage distribution of blood group B and O (12.92%) and a smaller percentage of blood group AB (5.12%) was observed.

This association can be due to various blood groups antigens acting as receptors for infectious agents associated with periodontal disease.

The results of this study regarding Rh factor showed a significant relationship with localized and generalized chronic periodontitis, Rh factor distributions was 86.5% of the study population with Rh-positive and only 13.5% were Rh-negative. These are in agreement with studies of Moradi and sheikhaddinib, 2016(16), Vivek et al. 2013(17), Pai et al., 2012(18) showed that patients who were Rh-positive were more likely to have periodontitis as mean there is a better periodontal health among the Rh-negative group, but this may be due to the low number of Rh-negative patients in the sample. As a conclusion the association of the ABO blood groups of patients and the severity of periodontal disease may be important to determine a perfect treatment plan strategies, and it also points toward susceptibility of the subjects with certain blood groups to periodontal disease.

Conflict of Interest: Nil

Source of Funding: Nil

Ethical Clearance: This research has exemption as it a routine treatment (no new materials were used).

References

A 3D Cone-Beam Computed Tomographic Assessment of Styloid Process Length and Patterns of Segments Ossification

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²Assistant Professor, University of Baghdad, College of Dentistry, Department of Oral Diagnosis

Abstract

Background: To determine the radiographic assessment of the styloid process using 3D images provided by cone beam computed tomography (CBCT).

Materials and Method: In this study, (50) CBCT scans of the (25) patients 13 females, 12 males, age range (18-65 years) were retrospectively evaluated for full length and number of segments ossification analyzed statically for both side and gender.

Results: The study results revealed that the mean length of styloid process according to gender was (18.7) mm in male and (20.4) mm in females, while according to side the mean length of styloid process on the right side was (19.7) mm and on the left side was (19.4) mm. The higher percentage of segments ossification was in one segment then followed by two and three segments respectively in both left and right sides.

Conclusion: The full length and morphology of the styloid process can be measured accurately by 3D views provided by CBCT.

Keywords: Styloid Process length, ossification, 3D cone beam computed tomography.

Introduction

The word styloid is derived from the Greek word Stylos which means “pillar”.¹ Styloid process is a cone-shaped eminence of the petrous region of the temporal bone. It projects downwards, forwards, and slightly medially from the temporal bone and it develops from Reichert’s cartilage of 2nd branchial arch.²,³,⁴ The average length of the styloid process is approximately 25 mm in length as described by Eagle in 1937 and it is considered elongated when the length is greater than 30 mm. However, there are many authors who considered 30 mm as normal value for the length of styloid process.⁵,⁶ The elongation of styloid process that accompanied with calcification is known as Eagle’s syndrome that characterized by recurrent pain in the oropharynx and face it may be unilateral or bilateral.⁷

Styloid process assessment is based on thorough clinical examination which includes proper history, palpation of the tonsillar fossa and radiological imaging.⁸ Previously the conventional radiographic imaging such as orthopantomogram (OPG) and lateral oblique view of the mandible has been used to detect elongated styloid process, However, numerous factors lead to difficulty in estimate an accurate length of styloid process such as magnification in different panoramic machines and the angle between the styloid and skull base can affect the measurements and management of patients⁹,¹⁰ therefore cone beam computed tomography (CBCT) has been recommended for evaluation of these anatomical structures, so the length and morphology of styloid process can be clearly shown with elimination for the errors that caused by magnification or superimposition as it allows creation of images not only in the axial plane, but also three dimensional views.⁸,¹¹,¹²

The variations of styloid process depend on

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sociodemographic factors such as age and the geographic distribution, so the aim of this study is to determine the radiographic assessment of the styloid process in a sample of Iraqi population.

**Material and Method**

A retrospective study performed on CBCT images for patients referred to the CBCT imaging unit at Ghazi Al-Hariri hospital as part of their radiographic assessment for different clinical problems in maxillofacial region during the period from January 2019 to June 2019. The study consists of (50) scans of the (25) patients (12) male and (13) female patients with age range 18-65 years using Kavo OP3D CBCT imaging device. The field of vision is 13x15cm working at (90) KV and (9.2) mA, and with specific exposure time seconds. 3D reconstruction was created for all images. Any patients with fracture or pathology in the region of the styloid process were not included in the study. The images were evaluated carefully to measure the full length and the patterns of the styloid process according to gender, side, and the number of styloid process segments ossification. The collected data analyzed statistically.

**Figure 1:** 3-dimensional CBCT image showing measurement of left side styloid process.

**Figure 2:** 3-dimensional CBCT image showing two segmented styloid process.
Result

Out of the 50 scans of the 25 patients, 13 (52%) were females and 12 (48%) were male patients, (Figure 3). In males the mean length of styloid process was (18.7) mm, while in females it was (20.4) mm, (Table 1). According to the side this study showed that the mean length of styloid process on the right side was (19.7) mm and that on the left was (19.4) mm, (Table 2).

The styloid process segments were subdivided into 3 types as one segment ossification, two segment ossification and three segment ossification segments, on the right side there were 13 (52%) one segment ossification, 8 (32%) with two segment ossification and 4 (16%) showed three segment ossification. On the left side there were 15 (60%) one segment ossification, 8 (32%) with two segment ossification and 2 (8%) showed three segment ossifications (Table 3).

![Figure 3: Gender distribution of the study group.](image)

Table 1: Mean length of styloid process.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Mean of length/(mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>18.7</td>
</tr>
<tr>
<td>Female</td>
<td>20.4</td>
</tr>
</tbody>
</table>

Table 2: Side distribution of styloid process.

<table>
<thead>
<tr>
<th>Side</th>
<th>Mean of length/(mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lt</td>
<td>19.4</td>
</tr>
<tr>
<td>Rt</td>
<td>19.7</td>
</tr>
</tbody>
</table>

Discussion

Cone beam computed tomography (CBCT) is an imaging technique that provides a real time image in all planes axial, coronal, and sagittal with the ability of producing a three dimensional image at low dose of radiation as compared with medical CT scans (12).

In this study, the CBCT scans of 50 styloid processes distributed among 12 male and 13 female with a mean length of styloid processes 18.7 mm in male and 20.4 mm in female this results was close to a similar CBCT study on styloid processes assessment by Ilguy et al (13) with 22.2mm mean length. In many studies there was no significance difference between right and left side measurements, this study show close measurements between both side, 19.4mm mean of length at left side and 19.7 mm at right side which is in agreement with Ramadossand Sha (14) and Kosar et al. (15) studies. In the present study the styloid process was classified morphologically according to number of ossified segments. The higher percentage was at one segment then followed by two and three segments respectively in both left and right sides as follow: on the right side there were (52 %) one segment ossification, (32 %) with two segment ossification and (16 %) showed three segment ossification. On the left side there were (60%) one segment ossification, (32%) with two segment ossification and (16%) showed three segment ossification. This result was nearly the study result by Ramadan et al. (16), while Ilguy et al (13) study revealed that two segments having the highest percentage. The variation in ossified segments number may be as a result of different number of the study samples. As a conclusion the CBCT imaging technique considered a necessary way for complete assessment of styloid process morphology and measurement using 3D view.

Table 3: Distribution of ossified segments.

<table>
<thead>
<tr>
<th>Number of ossified segments</th>
<th>Side</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rt</td>
</tr>
<tr>
<td>One Segment</td>
<td>13 (52 %)</td>
</tr>
<tr>
<td>Two Segments</td>
<td>8 (32 %)</td>
</tr>
<tr>
<td>Three Segments</td>
<td>4 (16 %)</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
</tr>
</tbody>
</table>
Conflict of Interest: Nil

Source of Funding: Nil

Ethical Clearance: This research has exemption as it a routine treatment (no new materials were used).

References


Survey Based Study on Stress Level and Sleep Quality among Hostelers

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²Student Researcher, BPT Galgotias University, Greater Noida, India

Abstract

Objective: The aim of this study is to evaluate the stress level and quality of sleep among hostelers using PSS & PSQI scales.

Method: The current study is observational study. A sample of 272 subjects of both the genders between 18-28 years were recruited for the study. All the subjects has been explained the procedure and were asked to give their demographic data and to fill the stress and sleep questionnaire forms for the interpretation of the result.

Result: The google analyser was used to analyse the data and result shows that In this study after analysis of data we got that 50% of students are upset sometimes, 13.7 % are not upset at all, 15.2% are fairly upset and 8.5 % are very often.45.9% students are in stress sometime in the month, 16.7% are fairly in stress, 12.2% are very stressed in last month. 44.4% students are sometimes irritated in the last month and 13.3 are very irritated in last month. 84.4% of students have not taken any medicine for sleeping at night but rest had taken medicine to sleep at night once, twice, or thrice a week. 71.1% students don’t have any issue while awake at night due to driving/eating or social activity rest 29.1% have an issue while awaking at night. 50.4% students say their sleep quality is fairly good in last month, 19.3% says fairly bad, 4.7 says very bad and 25.6% don’t have any issue in sleeping.

Conclusion: It was concluded that there is less stress present in the students of hostel and also only some students were found with the bad quality of sleep

Keywords: Hostellers, Stress, Sleep, Sleep Quality, PSS.

Introduction

“Environment of the home and the role of the family members play an important role in the development of the children. Differences of the factors such as the socioeconomic status of the family, educational difference, biological endowment starts making enduring differences in the development children behaviours, changes the personality of the children. Surroundings of a children residential area also affect socialization process. A expand or limit of educational opportunities of the children can be seen as a result¹². Hostel life is living away from home in another place all the educational institutes usually have their hostels. Whole environment becomes so different of the hostel to the environment of the home, as some rules can be so strict that students may not enjoy living in the hostel. Here students have to come up with all the problems by themselves. Any of these factors may become the reason of one’s stress and may have impact on one’s sleep quality. All these problems may induce deviant behaviours or may cause psychological problems further³. Stress is a psychological response to the threat perceived by the
Numerous readjustments that require in any changes of life can be perceived as stressful. Physical, social, emotional and family problems of these students may affect their academic performance and ability of learning. When pressure crosses its perceived ability to cope with problems than the pressure occurs stress. “Stress is a complex, multidimensional negative emotion” defined by defined stress is directly relates to features of psychology such as relaxation, broadening, reframing and creativity. A specific and crucial role sleep plays in consolidation of the memory. Also lack of sleep may results in poor cognition and attention. Lack of sleep along with the worsening of cognition also increases the sleepiness and fatigue. A study shows that the person who has been awake for 17h his cognition function would be equivalent to the person whose concentration of blood alcohol is 0.05%. In general, academic performances in school are associated with sleep. Lack of sleep may lead to poor attention and concentration during the class. Most of the studies show that the better and longer sleep quality is linked to the better academic performances such as more efforts towards the study or getting better grades in the exams. The purpose of this study is to evaluate the stress level and sleep quality among the hostellers. This study will help us to determine the level of stress and quality of sleep among the hostellers.

Methodology

Study Design: Observational

Sample selection criteria: 272 normal, healthy hostel students will be taken, aged between (17-30) years. The subjects will be taken randomly from the colleges and universities. Subjects will be given a questionnaire-based forms for the collection.

Sampling Method:
Randomized selection of the subjects
Sample of the convenience

No. of sample: 270 hostel students

Questionnaires used for the study:
1. Stress level (PSS-Perceived Stress Scale) questionnaire.
2. Sleep quality (PSQI-Pittsburgh Sleep Quality Index) questionnaire.

Inclusion Criteria:
1. Hosteller
2. Age: (17-30)
Both male and female

Exclusion criteria:
1. Devoid of any psychosomatic disorder

Procedure: The participants volunteered to participate in the study were all guaranteed about the confidential nature of the study. All the participants were informed that their participation in this study is fully voluntary and they may withdraw themselves at any time and informed that this if fully academic study. After fulfilling the subject’s inclusion and exclusion criteria and given explanation about the study. The subject demographic data was collected. Subjects were explained the PSS and PSQI and then asked to fill these questionnaire-based form for the data collection. On the basis of result obtained the stress level and sleep quality will be evaluated among the hostellers.

All subjects were undergone demographic assessment first and then asked to fill the questionnaire on the stress level and sleep quality. Data collected from the subjects was recorded and analysed by using the Google Analyser. Readings were used to interpret the result of the stress level and sleep quality among the hostellers in the form graphs and charts. All the required data was collected by the researcher. Manual entry of the data was done on a pre- planned format. The individual record of each subjects was noted in the his/her own form.

Ethical Consideration: All the subjects were informed about the study objectives. No unnecessary harm was caused to subjects involved. No interference was done with the subject privacy. Subject personal details privacy was maintained.

Results

In this study after analysis of data we got that 50% of students are upset sometimes, 13.7% are not upset at all, 15.2% are fairly upset and 8.5% are very often. 45.9% students are in stress sometime in the month, 16.7% are fairly in stress, 12.2% are very stressed in last month. 44.4% students are sometimes irritated in the last
month and 13.3 are very irritated in last month. 84.4% of students have not taken any medicine for sleeping at night but rest had taken medicine to sleep at night once, twice, or thrice a week. 71.1% students don’t have any issue while awake at night due to driving/eating or social activity rest 29.1% have an issue while awaking at night.

50.4% students say their sleep quality is fairly good in last month, 19.3% says fairly bad, 4.7 says very bad and 25.6% don’t have any issue in sleeping. So by this data, we can say that the many students are having stress and their mental health is not in good condition.

Graphs:
Discussion

The purpose of this study was to evaluate the stress level and sleep quality among the hostellers. The study was designed to determine whether there is any stress level and to evaluate the quality of sleep among the hostellers. The previous studies have shown the quality of life, mental health status, mobile usage among the hostel students etc. The stress level and sleep quality are yet been not checked among the hostellers unlike in the different courses of college or university students, so the current study was taken to evaluate the stress level and quality of sleep by using questionnaire among the students of the hostel.

In the current study the result nearly 50% of the students shows low stress level, moderate to severe stress level observed among about 23.7% students and on the other hand 13.7% students shows no stress at all. In a study of Vivek B. et al in Sultan Qaboos University, Maharashtra, India, stress was present in 24.4% students of the university, in which moderate to severe stress was observed in 14.4% of the respondents. In another study of Mumbai medical students, Supe et al found out 73% students had perceived stress. Abu-Ghazaleh et al, observed in Jordan, on dental students that stress present among the 70% of the students. In addition, it is also necessary to note that applied the scale was DASS-21, measures stress. In the study used the perceived stress for the subjects and considered a 12-item general health questionnaire (GHQ-12) that measures the psychiatric morbidity. Whereas in present study the Perceived Stress Scale was used to evaluate the stress level among the hostlers. Supe et al in 1998 noticed that stress was respective of the class and semester of the students whereas irrespective of the present accommodation of those students. On the other hand vivek et al observed that stress had no association with class and semester, the present accommodation proved as a highly important feature, they concluded that students living in the hostel becomes more sensitive and prone to stress. Might be due to reason that students found hostel condition quite unsatisfactory as they come from a very comfortable place ‘home’, that results into reason for great stress among hostlers. Abu-Ghazaleh also researched about the significance of the variant factors of academics. Another researcher Barikani et al determined probability that among the medical students of Iran the residence and the finance associated problems were proved as stressors among the students. Harshini et al in 2015 conducted a study to measure the stress in the hostellers and the day scholars, he used a PSS (Perceived Stress Scale) to determine the result and observed that stress was present in the both the groups as hostellers, when they come to hostel’s very new environment from their comfortable homes and their parents’ supportive hands it becomes quite difficult to them to mould themselves according to new place and people that might leads to separation stress. He concluded in the study that statistically the day scholars had more stress comparatively to the hostlers, as according to him day scholars have laxity of time for the fulfilment of study tasks and also interactions to their friends as they can only meet them during college hours due to their exhausted travelling time.

Limitation of the study:

• One of the limitations of this study the result was not based on any factors like gender, socioeconomic, environment.
• The study was limited to some geographical boundaries.
• Factors such as current status of person’s personality or emotions might be present.
• And also, the different time spans of the students such as the period of examination, pre-examination, or post-examination were not included in the study.

Future Studies:

• Future studies could evaluate pre and post exam stress level as well as quality sleep among the hostlers.
• There could be a comparison done of stress level and quality of sleep between males and females hostlers.
• There could also be a comparison between sleep quality and stress level among the different year hostel students such as first, second, third, and fourth year.

Conclusion

The current study is dealt with the stress level and quality of sleep among hostlers. The result of the study shows that there is almost no effect on the sleep quality
of the hostellers. The evaluated data show a very less effect on the stress level of the hostellers.

**Funding Sources:** Self

**Conflict of Interest:** NA

**References**


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Histopathology Study of the Platelet Rich Plasma on the Wound Healing in Rabbits

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Abstract

The study aimed to evaluate the beneficial effect of platelets rich plasma (PRP) on wound heal in rabbit. Eighteen healthy male adult rabbit were used they were randomly divided into two equal groups (control group 9, treated group 9). Under aseptic technique 3 cm skin incision was made in the back (dorsal) of animal by scalpel, after that the incision was sutured immediately by silk suture materials 0.2 USP used simple interrupted technique treated group receive immediately post operation PRP (1ml) was injected at the site of the wound, while control group left without treatment. Skin healing process follow up 1, 2 and 3 weeks post operation by histopathological examination, the result display in treated group on the first week post operation development of granulation tissue with epithelial regeneration. 2 weeks post operation show intense inflammatory infiltration with desquamation tissue, granulation tissue and new blood vessels formation. 3 weeks post operation showed proliferation of fibroblast with deposition of collagen, while in control group histopathological examination in the first week show intense inflammatory infiltrate with desquamated tissue and hemorrhage, 2 weeks post operation show area of intensive acute inflammatory infiltrate, 3 weeks post operation show area of chronic inflammatory infiltrate with tissue debris and giant cells, the healing of treated group better than control group.

Keywords: Platelet Rich Plasma, Wound Healing, Rabbits.

Introduction

Skin is that the largest and most visible organ of the body, comprising up to 15-20% of the whole weight. It receives around one third of the body’s blood offer at a rate of three hundred mls/minute. Traditional skin consists of 2 layers: stratum and stratum. Underneath the stratum lies the connective tissue (or hypodermis), a layer of loose animal tissue. The skin has six major functions. They’re protection, thermoregulation, elimination of waste product, synthesis of D, sensation and communication(1).

Wound may be a consequence of wound fatal if not treated timely and square measure aggravated by secondary microorganism infection. Improper development of animal tissue tissues, angioblasts and fibroblasts additionally the facts of wound complications(2). There square measure several factors which will have an effect on wound healing that interfere with one or a lot of phases during this method, therefore inflicting improper or impaired tissue repair. Wounds that exhibit impaired healing, as well as delayed acute wounds and chronic wounds, usually have didn’t progress through the conventional stages of healing. Such wounds often enter a state of pathologic inflammation because of a deferred, incomplete, or uncoordinated healing method. Most chronic wounds square measure ulcers that square measure related to ischaemia, diabetes, blood vessel stasis illness, or pressure.

Sometimes the healing of wounds square measure
delayed and therefore the success of the wound healing another extra taxes to the homeowners. Numerous biomaterials, proteins, antibiotics, vitamins and minerals come back to the scene because the angel to accelerate the repair of the wound by stimulating growing, fibroblastosis and epithelialization of wound(2,3,4,5). Platelets are incontestible to be the natural supply of many growth factors and cytokines that promote blood clotting, tissue repair, and therefore the method of bone mineralization(6,7,8,9). Platelet-rich plasma (PRP) is that the second price effective supply of protein that effectively hemostasizes and stimulates cellular regeneration(11,12,13). Application of PRP may be a new approach for tissue regeneration used as gel formulation containing completely different bioactive substances(10,14). PRP gel exhibits fast animal tissue differentiation and enhance organization of dermal scleroprotein in contemporary wound(15). Degranulation of platelets causes unleash of remodeling growth factor-ß1 (TGF-ß1), platelet-derived protein (PDGF), fibrinogen, epidermic protein (EGF), histamine, and hydrolytic enzymes(16,17). These square measure concerned within the angiogenic cascade that assists in arduous and soft tissue wound healing(7,9).

Materials and Method

Experimental Animals: A total of 18 apparently healthy adult local breed male rabbits were recruited for this study. All animals were evaluated clinically by physical examination before initiation of the experiments. The animals were housed in metal cages 30/70/60 cm in an air- conditioned room in the animal house along the period of the experiments. They were received free accesses to water and food. The animals were left two weeks for adaption with experimental condition with using of prophylactic drug, the animals were divided into two equal groups (control and treatment groups). Control group left without treatment, Specimens from the injured skin were taken three animals per group at 1, 2 and 3 weeks postoperative for histopathological examination to evaluate the progress of wound healing process.

Surgical Procedure: Surgical operations were made under general anesthesia by a mixture of xylazine ketamine given by IM injection (50mg/kg. B.W. ketamine, and 10mg/kg. B.W. xylazine) (11). The operation site was prepared aseptically. Skin incision (3cm) on the back (dorsal) was made by use of scalpel, then the incision sutured immediately using silk suture material 0.2 USP by using simple interrupted technique. Treated group receive immediately post operation PRP (1ml) was injected at the site of the wound, while control group left without treatment.

PRP Preparation: 3ml of Blood were collected from each rabbits using a 3ml disposable syringe. The samples were transferred into anticoagulant tubes containing 0.35ml of 10% sodium citrate. The blood was initially centrifuged at 160 rpm, for ten minutes at room temperature. After the first centrifugation, two layers were observed in each sample. A red lower layer that consists of packed red blood cells and an upper straw-yellow layer that contains plasma component. The upper surface of packed red blood cells called Buffy coat is rich in platelets and leukocytes. Plasma and buffy coat were transferred to new sterile tubes. The retained component of blood samples was centrifuged again at 160 rpm for two minutes to obtain more concentrated platelets. Then, the plasma and Buffy coat was centrifuged for the second round at 400 rpm, for 15 minutes. Two layers eventually appeared: the upper two thirds of the sample was designated as platelet poor plasma (PPP) and was discarded, on the other hand, the lower third was PRP (Fig5).Moreover, the platelets were activated by 0.05 ml of 10% calcium chloride solution to each 1 ml of PRP (Maghsoudi et al., 2015).

Results

1. Control group: Shows section of skin of control positive animals reveals the site of surgical incision after one week containing intense inflammatory infiltrate (INF), with desquamated tissue (DE) and
hemorrhage (H). Skin of control positive group after two weeks shows area of intensive acute inflammatory infiltration (INF) at the site of skin wound. Skin of control positive group after three weeks shows area of intensive chronic inflammation (CIN) at the site of skin wound with tissue debris (TD). And in another section of Skin of control positive group after three weeks shows area of intensive chronic inflammation (CIN) at the site of skin wound with giant cells (GS).

2. **PRP treated group:** Section of Skin of PRP treated group after one week shows development of granulation tissue at the site of skin wound figure (1) and another section of Skin of PRP treated group after one week shows development of granulation tissue (GT) at the site of skin wound with epithelial regeneration (ER) figure (2). The section of skin of PRP treated animals reveals the site of surgical incision after 2 week containing intense inflammatory infiltrate (INF), with desquamated tissue (DE) and granulation tissue (Gr) new generated blood vessels figure (3). Skin of PRP treated group after three weeks shows proliferation of fibroblast (FB) with collagen deposition (CD) at the site of skin wound figure (4) and another slide shows proliferation of fibroblast (FB) with collagen deposition (CD) at the site of skin wound figure (5).

Figure (1) Skin of PRP treated group after one week shows development of granulation tissue at the site of skin wound (GT) H & E 50X

Figure (2) Skin of PRP treated group after one week shows development of granulation tissue (GT) at the site of skin wound with epithelial regeneration (ER) H & E 500X
Figure (3): Section of skin of PRP treated animals reveals the site of surgical incision after 2 week containing intense inflammatory infiltrate (INF), with desquamated tissue (DE) and granulation tissue (Gr) new generated blood vessels A) 50 H & E

Figure (4) Skin of PRP treated group after three weeks shows proliferation of fibroblast (FB) with collagen deposition (CD) at the site of skin wound H & E 50X

Figure (5) Skin of PRP treated group after three weeks shows proliferation of fibroblast (FB) with collagen deposition (CD) at the site of skin wound H & E 500X
Discussion

The wound healing growth factors which are activated by platelets is greater to continue this process more quickly and smoothly. When these factors are at the wound site, recruitment and differentiation of cells in tissue repair increase and so tissue repair occurs more quickly and well (20), is a process which consists of hemostasis, inflammation, proliferation, maturation and remodeling. The effect of growth factors which are activated by platelets is greater to continue this process more quickly and smoothly. When these factors are at the wound site, recruitment and differentiation of cells in tissue repair increase and so tissue repair occurs more quickly and well (20). (Platelet-rich plasma is defined as a platelet concentration of at least 10,00,000 platelets/μL in 5 ml of plasma. It contains a 3-5 fold increase in the concentration of growth factors. 10 Proteomic studies have shown that platelets contain over 800 proteins with numerous post-translational modifications, resulting in over 1,500 protein based bioactive factors (21).)

In our study the treated group at 7 days post operation showed development of granulation tissue at site of incision with epithelial regeneration this agreement with (22) who explained that wounds treated with PRP gel has more rapid epithelial differentiation and enhanced organization of dermal collagen compared to control groups in horses. In present study in treated group 2 weeks post operation showed intense inflammatory cells and granulations tissue this agreement with (23). In a study on dogs performed it revealed of PRP which was injected into the wound site was investigated on wound healing and then it was reported to have positive effects on granulation formation, collagen deposition, and re-epithelialization. The recent study achieved to show the effect of PRP on the healing of acute wounds in rabbits displayed that the PRP treated group enhanced angiogenesis at the wound beds as compared to control group(24) and this has agreement with the present study in an experimental study on rabbits conducted by Ostvar et al. (24), PRP was topically applied to the lesions created on the backs of animals and then it was reported that re-epithelialization, angiogenesis, and collagen deposition were statistically significantly increased compared to the control group, this agreement with the our study. It has been reported in different studies that PRP accelerated the inflammatory process (25). This agreement with our study the treated group at 2 weeks post operation showed high inflammatory process by intense inflammatory infiltrate at site of injury. While Application of PRP in cutaneous regeneration and wound healing in dogs, who revealed that there were no significant differences between median of epithelialization, inflammatory cell infiltration, presence of dermal granulation tissue, fibroblast arrangement, fibroblast proliferation, collagen deposition in the both of treated and non-treated wounds and this disagreed with our study because we found wide differentiation between treated and control group in treated group appear better wound healing by high inflammatory cells, collagen deposition, angiogenesis, a granulation tissue, re-epithelialization and high proliferation of fibroblast.

Conflict of Interest: None

Funding: Self

Ethical Clearance: Not required

References


Knowledge, Attitude and Awareness of Medical Students towards Medico-Legal Autopsy in Sangli, Maharashtra

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Abstract

For centuries, autopsy has been instrumental in establishing the cause of death both in clinical and forensic cases. Even though it helps in arriving at a decision regarding the cause of death and many other things, its use is declining recently, which should be a cause of concern. With this background, the present study has been carried out in January 2020 on 150 medical students of 2nd year MBBS by using set of questionnaires, to assess their knowledge and attitude towards autopsy at department of Forensic Medicine and Toxicology at BVDU & MC, Sangli, Maharashtra. This study shows the students had a reasonable knowledge and good attitude towards medico-legal autopsy. Majority of the students agreed that need of autopsy in all unnatural, sudden, unexpected and suspicious death is mandatory and collection of viscera for histo-pathological and toxicological analysis is useful. Majority of the students think that autopsy helps in solving crimes and gives information to police. Most of the study population shows interest in attending and performing a greater number of autopsies. Majority of the students agreed that post mortem examination is useful in medical education. Majority of the study population says that autopsy is disrespect to human body. Most of the study population is not aware of virtual autopsy.

Keywords: Medico-legal autopsy, Medical students, Medical education and Forensic medicine.

Introduction

Autopsy in Greek means “to see with one’s own eyes”. Medico-legal autopsy is a scientific study of a dead body and is categorized into clinical and medico-legal autopsies. It plays a crucial role in finding out the cause and the time of death, possible medico-legal issues surrounding death, providing data on disease and injury and also aiding in administration of justice. Doctors with poor knowledge in autopsy may result in injustice¹. The use of autopsy in medical education has been declining; just as autopsy rate has been falling worldwide this is further worsened by authorities deterring medical students from attending autopsy sections in some areas². In India, according to the curriculum of the Medical Council of India, a medical student should witness a minimum number of medico legal autopsies in the second year so that they can observe and interpret various findings³. It is only when students attend an autopsy section, they can appreciate the large number of pathological conditions in different patients. An intern is supposed to acquire the skill of doing a medico-legal autopsy. Thus, every medical graduate is presumed to be capable of doing a medico-legal autopsy after registering as medical practitioner⁴. The knowledge and attitude of medical students towards forensic autopsy is a significant factor that influences...
the quality of autopsy reports. Therefore present study was conducted to ascertain the knowledge, attitude and awareness of medical students towards medico-legal autopsy examination.

Materials and Method

To assess the knowledge and attitude of medical students towards medico-legal autopsy, a cross sectional study was conducted in January 2020 on 150 medical students of 2nd year MBBS at department of Forensic Medicine and Toxicology at BVDU & MC, Sangli, Maharashtra. Before starting the study, written approval from the institutional ethics committee was obtained. The questionnaires consisting of 16 questions related to the knowledge and attitude towards medico-legal autopsy were distributed to the aforementioned participants. Medical students of 2nd year MBBS who refused to participate or were not available on second visit were excluded from the study.

Results

Total 150 medical students of 2nd year MBBS were selected for this present study and the following observations are made.

<table>
<thead>
<tr>
<th>Questionnaires:</th>
<th>a.</th>
<th>b.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medico- legal post-mortem examination is mandatory in all unnatural, sudden, unexpected and suspicious death</td>
<td>Yes (n=145, 96.66%)</td>
<td>No (n=5, 3.33%)</td>
</tr>
<tr>
<td>Is there any utility of taking out of viscera for histo-pathological examination and toxicological analysis in medico legal autopsy?</td>
<td>Yes (n=137, 91.33%)</td>
<td>No (n=13, 8.66%)</td>
</tr>
<tr>
<td>Post-mortem examination</td>
<td>Done to know the cause of death (n=145, 96.66%)</td>
<td>Harassment to the relative of the deceased (n=3, 2.0%)</td>
</tr>
<tr>
<td>Do you think that autopsy helps in solving crimes and give important information to police?</td>
<td>Yes (n=148, 98.66%)</td>
<td>No (n=2, 1.33%)</td>
</tr>
<tr>
<td>Student should attend more post-mortem examination?</td>
<td>Yes (n=142, 94.6%)</td>
<td>No (n=8, 5.4%)</td>
</tr>
<tr>
<td>Wished to have post-mortem examination on self/relative when required?</td>
<td>Yes (n=114, 76%)</td>
<td>No (n=36, 24%)</td>
</tr>
<tr>
<td>Given a chance would you choose not to watch post-mortem examination at all?</td>
<td>Yes (n=140, 93.33%)</td>
<td>No (n=10, 6.66%)</td>
</tr>
<tr>
<td>The utility of post-mortem examination in medical education?</td>
<td>Yes (n=144, 96.66%)</td>
<td>No (n=5, 3.33%)</td>
</tr>
<tr>
<td>Whether doing post-mortem examination causes disfigurement of the body?</td>
<td>Yes (n=80, 53.33%)</td>
<td>No (n=70, 46.66%)</td>
</tr>
<tr>
<td>Post-mortem examination is disrespect to human body?</td>
<td>Yes (n=140, 93 %)</td>
<td>No (n=10, 7%)</td>
</tr>
<tr>
<td>Should medical students actively participate in performing autopsies?</td>
<td>Yes (n=139, 92.66%)</td>
<td>No (n=11, 7.33%)</td>
</tr>
<tr>
<td>Can relatives request the doctors for doing autopsy n without police inquest report?</td>
<td>Yes (n=140, 93.33%)</td>
<td>No (n=10, 6.66%)</td>
</tr>
<tr>
<td>Do you think body can be handed over to the relatives without post-mortem examination if the cause of death is known in a MLC Cases?</td>
<td>Yes (n=55, 36.33%)</td>
<td>No(n=95, 63.33%)</td>
</tr>
<tr>
<td>Before conducting the medico legal autopsy following is necessary.</td>
<td>Consent of relatives is must (n=20, 13.33%)</td>
<td>Inquest report from investing officer is must (n=63, 42%)</td>
</tr>
</tbody>
</table>
15. During medico legal autopsy following procedure should be followed

<table>
<thead>
<tr>
<th>Option</th>
<th>Number of Students</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. External examination only</td>
<td>142</td>
<td>94.66%</td>
</tr>
<tr>
<td>b. Internal examination only</td>
<td>3</td>
<td>2%</td>
</tr>
<tr>
<td>c. Both external and internal examination</td>
<td>5</td>
<td>3.33%</td>
</tr>
</tbody>
</table>

16. Virtual autopsy is a new form of post-mortem examination?

<table>
<thead>
<tr>
<th>Option</th>
<th>Number of Students</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Yes</td>
<td>48</td>
<td>32%</td>
</tr>
<tr>
<td>b. No</td>
<td>13</td>
<td>8.66%</td>
</tr>
<tr>
<td>c. Don’t know</td>
<td>89</td>
<td>59.33%</td>
</tr>
</tbody>
</table>

Majority of the study population (96.66%) agreed that need of autopsy in all unnatural, sudden, unexpected and suspicious death is mandatory. Out of 150 students 137(91.33%) students are aware of collection of viscera for histo-pathological and toxicological analysis is useful. Majority of the study population 145(96.66%) says post-mortem examination is done to know the cause of death, where as 2% of the study population says it is a harassment to the relative of the deceased and 1.33% of the study population thinks that it is a mere legal formality. It is also observed that 98.66% of study population agreed that autopsy helps in solving crimes and gives important information to police.

Majority of the students agreed that they should attend a greater number of autopsies (94.66%) and wished to have post-mortem examination on self/relatives when required. Most of the students (96.66%) say that post-mortem examination is useful in medical education. 80 students (53.33%) think that autopsy causes disfigurement of body and 140 students (93%) think that autopsy is disrespect to human body. Majority of the study population (92.66%) agreed that students should actively participate in performing autopsies.

Most of the study population (93.33%) thinks that no relatives can request the doctor for doing autopsy without police inquest report. Majority of the study population (63.33%) thinks that body cannot be handed over to the relatives without autopsy in medico-legal cases. 13.33% of the study population thinks that consent from relatives is must before conducting autopsy. 42% of the study population thinks inquest is must and 16.66% of study population thinks that request letter from investigating officer is must.

Majority of the study population (94.66%) thinks that only external examination is followed in autopsy, where as 3.2% of study population thinks that only internal examination should be followed and just 2% of study population thinks that both external and internal examinations should be followed during autopsy. Majority of the study population (59.33%) is not aware of virtual autopsy, where as 32% of study population says virtual autopsy is the new form of post-mortem examination.

**Discussion**

The medico-legal examination of dead body is instrumental in accurately establishing the cause and manner of death. It plays a crucial role in acquiring medical knowledge, and has been an important part of medical education for centuries. In this present study we have tried to know the knowledge and attitude of medical students towards the medico-legal autopsy.

In the present study it is observed that the knowledge of the necessity of the forensic autopsy in unnatural, sudden unexpected and suspicious death cases and for the utility of using viscera for the histo-pathological and toxicological analysis was present with 96.66% and 91.33% of the medical students respectively. These findings were similar to results of the study conducted by Madhusudhan S and Murugesa B.

In this present study it is also observed that majority of the students think that an autopsy is not the harassment to the relatives of the deceased. This observation is in agreement with the study conducted by Ahmad M and others.

It is also observed that majority of the study population agreed that autopsy will help in solving crimes and give important information to the investigating officer. These findings are similar to the study conducted by Inderjit S.

In this present study it is also observed that majority of the medical students think that an autopsy is not the harassment to the relatives of the deceased. This observation is in agreement with the study conducted by Ahmad M and others. But in our study majority of the students are not aware of virtual autopsy as a new form of post mortem examination, this finding is not in agreement with the study conducted by Ahmad M and others.

In this present study we have observed that majority of the study population agreed that postmortem examination is done to know the cause of death. These findings were similar to results of the study conducted by Madhusudhan S.
The results of the present study concluded that majority of the medical students had sufficient knowledge about the procedures and had positive attitude towards observing the autopsies. These findings are similar to the study conducted by Shamshuddin RK and others\textsuperscript{4}.

In this present study we have observed that majority of the study population agreed on the importance of autopsy in medical education curriculum and are in support of watching and participating in a greater number of autopsies. These findings are in agreement with the study conducted by Jadeep CJ and others\textsuperscript{10}. But in our study majority of the students believed that postmortem examination is disrespect to the human body, this finding is not in agreement with the study conducted by Jadeep CJ\textsuperscript{10}.

**Conclusion**

To assess the knowledge and attitude of undergraduate medical students towards medico-legal autopsy, a cross sectional study was conducted at BVDU & MC, Sangli, Maharashtra. The findings of this present study show that undergraduate medical students have a reasonable knowledge and positive attitude about medico-legal autopsy. But the knowledge, awareness and positive attitude alone may not be enough for increasing the post-mortem/autopsy as an education tool, unless they acquire the skills required for the procedure as currently, they are not provided with any training during their medical curriculum. Hence, we recommend revising the forensic medicine curriculum and for increased training in the autopsy procedure and other medico-legal issues during their clinical and internship years so that medical students will be able to make rational conclusions in criminal and other medico-legal cases.

**Conflict of Interest:** Nil

**Source of funding:** Self

**Ethical clearance:** Taken from IEC, BVDUMC & H, SANGLI.

**Reference**


Preferred Mode of Delivery in Iraqi Primiparous Women

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Abstract

Background: Pregnancy is a physiological action that ends with pain, fear, anxiety and fear of death for the mothers. Delivery is a multi-dimensional process associated with physical, emotional, social, physiological, cultural and psychological dimensions.

Objectives: To identify the preferred mode of delivery in Iraq primiparous women and factors make them chose this mode of delivery.

Methodology: a descriptive/analytical cross-sectional study performed among 150 Iraqi primiparous women who attended the gynecology clinic in Baghdad teaching hospital/medical city from July to November 2019 the information regarding socio-demographical data and asking the women about the causes of this choice.

Results: Total of 150 primiparous women was enrolled in the study. Majority of them preferred vaginal delivery (68.7%) while women who preferred cesarean section were (31.3%). high rate of vaginal delivery preference was seen in women because of faster recovery, easy baby bonding, fear from cesarean section and short hospital stay, while those who preferred cesarean section thought that they can avoid labor pain and fear on baby’s life.

Conclusion: Majority of primiparous women interviewed in our research preferred the vaginal delivery, while the remaining women preferred the cesarean section due to lack of knowledge or fear from vaginal delivery. Doctor’s recommendation and medical advices play a major role in enhancing the awareness toward vaginal delivery.

Keywords: Primiparous, vaginal delivery, cesarean section, preferred mode of delivery.

Introduction

Pregnancy is a physiological action that ends with pain, fear, anxiety and fear of death for the mothers. Delivery is a multi-dimensional process associated with physical, emotional, social, physiological, cultural and psychological dimensions.[¹]

The decision of mode of delivery is explained as preferring either the vaginal or cesarean section delivery.[²] It’s important for the pregnant woman to choose between the two modes of delivery. Some factors will effect on this decision like friends, media, health professionals, effective antenatal, fear of childbirth, the balance between the desires of the mother, the risks of a repeat operation, the risks to her child during labor and the risk of labor on the strength of the old scar.[³-⁵]

Childbirth can be divided into ‘vaginal delivery’ which is a complex interaction between the uterine contractions, the bony pelvis, the soft tissues of the pelvic floor and perineum and the fetus. Contractions are important to start the dilatation of the uterine cervix and descent of the fetus.[⁵]

Each pregnancy and delivery are different, and

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DOI Number: 10.37506/mlu.v21i2.2875
prolonged, painful, stressful labor, urinary incontinence, 4% of women giving birth shows fecal incontinence as a serious problem.[13-16]

‘Cesarean section’ is two steps of surgical intervention. Initially an incision is made through the mother’s abdomen (laparotomy) after that another one is done to the uterus (hysterotomy) to deliver the fetus.

**Method**

**Study design and participants:** This descriptive/analytical research was designed as a cross-sectional study. The setting was composed of all primiparous women who visited the gynecology clinic in Baghdad teaching hospital/medical city. The sample size that we collected from the pregnant women that visit antenatal care (ANC) was 150. The sampling method was a convenience sample. The inclusion criteria were primiparous women in the first, second, and third trimester who agreed to participate after we explained to them the purpose of this study. The exclusion criteria were the multiparous women and the women who had communication and participation error and who disagreed to participate in the study. This study was approved by College of medicine/University of Baghdad from July to November 2019.

**Instruments:** The data were collected by a researcher-designed questionnaire and was composed of two sections. The first section contained the preferred mode of delivery and the reason make them chose this mode of delivery [contains vaginal delivery and its three reasons (easy baby bonding, short hospital stay, faster recovery and other reasons) and contain cesarean section and its three reasons (avoid labor pain, fear on baby, can be scheduled and other reasons)]. The second section has 13 items include:

1. Name of participant.
2. Age of the pregnant woman: We divided the age into three intervals (The first interval is from the age of 15 to 25, the second interval is from the age of 26 to 35 and the third interval is from the age of 36 to 45).
3. Age of husband: We divided the age of husband into four intervals (The first interval is from the age of 15 to 25, the second interval is from the age of 26 to 35, the third interval is from the age of 36 to 45 and the fourth interval is from the age of 46 to 55)
4. Residency.
5. Occupation of participant.
6. Level of education: We divided the level of education into five items (Illiterate, primary, secondary, college student and post-graduate)
7. Occupation of husband.
8. Period of infertility: (We considered that the women has a period of infertility if her period of infertility is 1 year and above, so any period below 1 year, we considered it as no infertility).
9. Gender of fetus if known.
10. Gestational age at time of enquiry: We divided the gestational age into three trimesters (The first trimester is from 1 week to 16 week, the second trimester is from 16 week to 28 week, and the third trimester is from 28 week to 40 weeks)
11. Previous surgery.
12. Bad previous family experience with cesarean section or vaginal delivery.
13. How many doctors she has follow.

In order to be sure about the validity of the data, various steps were taken as follows: long-term involvement with the participants during data collection; ongoing observations; trying different method of data collection and providing in depth descriptions.

**Ethical Concept:** Before we started collecting the data, approval was obtained from the Local Medical Research Ethics Committee, the hospital where the research was conducted and verbal approval was taken from each participant after we explained the purpose of the questionnaire.

**Limitation:** One of the limitations of the study is that it can’t be generalized to all primiparous women because it was done in a single hospital in Baghdad and the second one is the small sample size.

**Statistical Analysis:** SPSS version 23 (Statistical
Package for the Social Sciences) used for data entry and data analysis. Results presented in the form of tables and graphs. Chi square test used to assess association between descriptive data and Fisher exact test used if the chi square test is not applicable. P value <0.05 will be considered significant.

**Results**

In total 150 primiparous women complete the questionnaire. As shown in table 1 the vaginal delivery was presented in (68.7%) and Cs in (31.3%). The main reason for preferring Cs was to avoid labor pain (13.3%) and the lesser cause was to be schedules (1.3%), while main reason for preferring vaginal delivery was faster recovery (38%) all these were found in table 1.

Table 2 shows the relationship between the number of doctors she has follow and preferred mode of delivery. no association between the number of doctors she has follow and preferred mode of delivery.

Table 3 shows the relationship between the bad previous family experience with cesarean section or vaginal delivery and preferred mode of delivery.

Because the minimum expected count is less than 5, the chi square test is not applicable, so we reject the result of chi square and apply another test called fisher’s exact test and according to this test the p-value is more than 0.05, so we found no association between the bad previous family experience with cesarean section or vaginal delivery and preferred mode of delivery.

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**Table 1: Preferred and reason of mode of delivery**

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaginal delivery</td>
<td>103</td>
<td>68.7%</td>
</tr>
<tr>
<td>Cesarean section</td>
<td>47</td>
<td>31.3%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>150</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Reasons for preferring Cs**

<table>
<thead>
<tr>
<th>Reason</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>To avoid labor pain</td>
<td>20</td>
<td>13.3%</td>
</tr>
<tr>
<td>Fear on baby</td>
<td>17</td>
<td>11.3%</td>
</tr>
<tr>
<td>Fear from vaginal delivery</td>
<td>5</td>
<td>3.3%</td>
</tr>
<tr>
<td>Can be scheduled</td>
<td>2</td>
<td>1.3%</td>
</tr>
<tr>
<td>Other reasons</td>
<td>3</td>
<td>2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>150</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Reason for preferring vaginal delivery**

<table>
<thead>
<tr>
<th>Reason</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faster recovery</td>
<td>57</td>
<td>38%</td>
</tr>
<tr>
<td>Easy baby bonding</td>
<td>15</td>
<td>10%</td>
</tr>
<tr>
<td>Fear from Cs</td>
<td>9</td>
<td>6%</td>
</tr>
<tr>
<td>Easy baby bonding, faster recovery</td>
<td>7</td>
<td>4.7%</td>
</tr>
<tr>
<td>Short hospital stays</td>
<td>7</td>
<td>4.7%</td>
</tr>
<tr>
<td>Short hospital stays, faster recovery</td>
<td>4</td>
<td>2.7%</td>
</tr>
<tr>
<td>Other reason</td>
<td>4</td>
<td>2.7%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>4</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Table 2: How many doctors she has follow * Preferred mode of delivery Crosstabulation**

<table>
<thead>
<tr>
<th>How many doctors she has follow</th>
<th>Preferred mode of delivery</th>
<th>Total</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cesarean section</td>
<td>Vaginal delivery</td>
<td></td>
</tr>
<tr>
<td>1 Doctor</td>
<td>30</td>
<td>65</td>
<td>95</td>
</tr>
<tr>
<td>2 Doctors</td>
<td>7</td>
<td>19</td>
<td>26</td>
</tr>
<tr>
<td>3 Doctors</td>
<td>8</td>
<td>16</td>
<td>24</td>
</tr>
<tr>
<td>&lt;3 doctors</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>47</td>
<td>103</td>
<td>150</td>
</tr>
</tbody>
</table>

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## Discussion

Women’s preferences for mode of delivery can differ according to their expectations and experiences. Some women are afraid about the health or the survival of baby during pregnancy or childbirth. So due to these reasons, it is important to respect the wishes of the primiparous women.[17] Recent study showed that in developing countries, lower education level is the cause of poorer knowledge of human reproduction than women in developed countries.[18]

This study is about preferred mode of delivery in Iraqi primiparous women and factors that influence their decision. Data were analyzed to find association of certain demographic factors and their lifestyle with the decision-making.

The results of this study showed that majority of primiparous women preferred vaginal delivery in a percentage of (68.7%). Similar to our study finding, another study conducted in Turkey, vaginal delivery rates are high in a percentage of (87.7%).[19] Also similar to other study in Iran, vaginal delivery is higher than cesarean section in a percentage of (80.4%).[20]

Another study performed by Ryding, Lukasse, and Krisjansdottir in six countries found that the primiparous women in these countries (Germany, Iceland, Denmark, Estonia, Norway, Sweden) preferred VD (85.1%), (61.7%), (77.5%), (60.0%), (71.1%), (71.1%), respectively.[21]

Primiparous women in our study prefer vaginal delivery due to faster recovery, easy baby bonding, fear from cesarean section, short hospital stay, better for health and less complication. Some of these reasons are similar to previous studies.[19]

On the other hand, the percentage of primiparous women who preferred caesarean section were (31.3%). Similar to our study finding, in turkey the rate of pregnant women who preferred cesarean section was (7.6%) similar findings were obtained from other countries the percentage in Singapore (3.7%) and Sweden (8.7%).[19]

Primiparous women in this study preferred cesarean section to avoid labor pain, fear on baby, it can be scheduled and fear on herself some of these reasons are similar to previous studies. In our study the percentage of primiparous women who preferred cesarean section to avoid labor pain were (13.3%), fear on baby (11.3%) and fear on herself (0.7%). As compared to Dilek Bilgic et al. study the percentage were (73.3%) for avoid labor pain, (53.3%) for fear on baby and (60%) fear on herself.[17]

In our study no association was found between preferred mode of delivery and level of education. Although all the education levels chose vaginal delivery more than cesarean section. In contrast to a study done in bander Abbas in which those of lower education level chose cesarean section more than others.[20] In our study no association was found between preferred mode of delivery and occupation. Most of the employed showed less tendency toward the cesarean section which is similar to the study conducted in Bandar Abbas. [20]

## Conclusion

Majority of primiparous women interviewed in our research preferred the vaginal delivery, while the remaining women preferred the cesarean section due to lack of knowledge or fear from vaginal delivery. Doctor’s recommendation and medical advices play a major role in enhancing the awareness toward vaginal delivery.

**No conflicts of interest**

**Source of funding:** self

**Ethical clearance:** was taken from the scientific committee of the Iraqi Ministry of health
References


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Abstract

Treatment of injuries to peripheral nerves after a segmental defect is one of the most challenging surgical problems. Therapies for peripheral nerves injury are largely ineffective. Therefore, the current study was conducted to investigate effects either acellular human umbilical cord tissue powder on repair 1 cm critical size defect radial nerve guided by bovine urinary bladder matrix conduit alone or seeded with mesenchymal stem cells derived from human umbilical cord. For this purpose, sixteen healthy mongrel dogs were used. They were randomly divided into two equal groups (n=8), before proceeding with the surgical procedures, the dogs were generally anesthetized and aseptic conditions were established. Then, the surgery was carried out with the aid of magnifying lens. All dogs subjected to radial nerve neurotmesis from the right limb. In the scaffold group, a 1 cm of radial nerve was transected and resulted gap bridged with a portion of 14 mm acellular bovine urinary bladder submucosa conduit which was then filled with 0.05 mg acellular human umbilical cord powder and then sutured to the two stumps using 6-0 nylon epineural by simple interrupted pattern. In combination group, the gap was bridged with acellular bovine urinary bladder submucosa conduit which was filled with 0.05 mg acellular human umbilical cord powder then seeded with 50 µl (5x10⁶) mesenchymal stem cells derived from human umbilical cord, then fixed onto two stumps using 6-0 nylon epineural by simple interrupted pattern. Each group was further divided into two equal subgroups (n=4) categorized according to the post operation periods, that were 8 and 16th weeks for neurohistopathological examinations. The histopathological examination of regenerated nerve sections (two samples of 5 mm length each) were collected from the middle (coaptation site) and distal segments were used to determine the degree of the radial nerve regeneration. The histopathological findings relative convergence between the scaffold and combination groups in their components such as the increased number of Schwann cells proliferation, parallel arrangement of nerve fibers and remarkable angiogenesis on 16th weeks. In conclusion; this study showed that the decellularized both scaffolds alone or seeded with mesenchymal stem cells derived from human umbilical cord could support the radial nerve regeneration and allow the reinnervation of the target organ.

Keywords: Umbilical Cord, Decellularization, Mesenchymal Stem Cells, Peripheral Nerves, Dogs.

Introduction

Peripheral nerve injuries are a major medical problem in the present time and most commonly seen in young adults. These injuries can cause loss of sensory and motor functions and lifelong disabilities(¹). In dogs the most common etiologies of nerve injuries are compression, stretching or traction, laceration, crushing and incorrect local injections of drugs(²). Several approaches have been applied to improve regeneration, such as administration of neurotrophic factors, hormones, various biochemical substances, applications of an electric field and lasers. However, the
clinical results were often disappointing, indicating the need for novel therapeutic approaches\(^3\). Cell therapy is a promising treatment strategy for promoting repair in the injured peripheral nerves. These cells could create a more favorable environment for limiting damage and promoting regeneration via immunoregulation\(^4\) and combination of several features such as trophic factor production, extracellular matrix synthesis, axon guidance and sorting, remyelination, micro environmental stabilization, and immune modulation support peripheral nerve regeneration and function\(^5\). Various cell types have been tested for promotion of repair the injured peripheral nerves. Including, embryonic stem cells\(^6\), Schwann cell \(^7\), neural stem cells \(^8\) and mesenchymal stem cells\(^9\). In association with the development of tissue engineering, several studies have investigated the characteristics of an ideal nerve conduit in terms of its scaffolds, growth factors, and supportive cells to enhance peripheral nerves regeneration\(^{10}\).

Another approach for the peripheral nerve regeneration is biomaterials seeded with stem cells, biomaterial provides a broader platform for stem cell-based regenerative medicine\(^{11}\). The role of biomaterials serving as bioactive scaffolds to promote stem cell culture and differentiation *in vitro*, and providing niche for transplanting stem cell to enhance therapeutic effects\(^{12}\). \(^{13}\) investigated that seeding of undifferentiated adiposederived MSCs onto decellularized nerve allografts permit the secretion of neurotrophic and angiogenic factors that can stimulate nerve regeneration. \(^{14}\) used a nerve conduit filled with a vascular bundle and bone marrow stromal cells seeded on decellularized nerve matrix in rat sciatic nerve model with a 20-mm defect concluded that the nerve conduits constructed with vascularity, cells, and scaffolds could be an effective strategy for the treatment of peripheral nerve injuries. \(^{15}\) evaluated Laminin-chitosan-PLGA nerve guidance conduit combined with schwann and neural stem cells and showed significantly higher nerve regeneration when compared to acellular grafts in 5mm, laryngeal nerve defect in rat. \(^{16}\) constructed a nerve regeneration characteristics-containing nerve graft through integrating xenogeneic acellular nerve matrix seeded with autologous differentiated adipose-derived mesenchymal stem cells (ADSCs) repaired 1cm rat sciatic nerve defect. Therefore the aim of the study is to evaluate the efficacy of human umbilical cord mesenchymal stem cells seeded with acellular and lyophilized human umbilical cord powder guided by acellular bovine urinary bladder matrix conduit in radial nerve regeneration in dogs models.

**Materials and Method**

**Experimental Design:** Sixteen male adult local breed dogs aged (8-12) months and weighting (15-20) kg were divided into two groups consisting of (8) animals each. In the first group, the radial nerve was transected of (1 cm) and the resulted gap was bridged by (14mm) acellular bovine urinary bladder matrix (UBM) conduit using (0-6) nylon perineural sutures of the proximal stamp then filled intraluminally with 0.05mg acellular human umbilical cord (HUC) powder and then sutured to the distal stamp of the nerve, which was served as scaffold group (SG). While the second group, the gap was bridged with UBM-conduit which was filled with 0.05mg acellular HUC powder seeded with 50µl (5x10\(^6\)) human umbilical cord mesenchymal stem cells (HUC-MSCs) then coaptated two stumps using 6-0 nylon epineural simple interrupted pattern and served as combination group (CG). The animals of each group were sacrificed on two periods after 8th and 16th weeks post operation for evaluation of histopathological examinations. All Procedures used in this study were approved by Scientific Committee, College of Veterinary Medicine, University of Baghdad-Iraq.

**In Vitro Protocols: Fabrication of Conduit Derived from Bovine UBM-ECM:** Fresh urinary bladders were collected as a whole from slaughtered cows at the local abattoir and the urinary bladder matrix (UBM) was prepared as a decellularized scaffold, according to method described by\(^{17}\). The urinary bladder was filled with tap water to facilitate the trimming and removing of external connective tissues and adipose tissue by scissors then washed with tap water. Tunica serosa, tunica muscularis and most of the muscularis mucosa were mechanically delaminated from the bladder tissue by scraping with the knife, and finally flattened rectangular sheet. The remaining (sub-mucosal layer) was then decellularized and disinfected by immersion the sheet in a mixture of 0.1% peracetic acid (PAA) and 4% ethanol solution on a shaker for two hours. After that, the ECM was rinsed in phosphate buffered saline (PBS) (pH 7.4) to returned the pH to 7.4, containing 100 IU/ml penicillin, 100 µg/ml streptomycin and 100 µg/ml amphotericin B at 25 °C with shaking, then in two changes deionized water and finally one change of PBS, 15 min each. The decellularized ECM scaffolds were sterilized by immersion in 0.1% PAA solution for
five hours\textsuperscript{(20)}. Finally the disinfected and decellularized sheets were cut at certain sizes and used for wrapping the UBM around the stainless steel pin at different sizes depending on the diameter of the tube (wall thickness of 0.18 mm, and a length of 14 mm). Then, they were adhered to the two edges of the tube by using biological adhesive.

**Fabrication of Powder Derived from HUC-ECM:**
The human umbilical cord tissue powder was obtained as described by\textsuperscript{(21)}. About 20-25 cm of umbilical cord tissue was collected in phosphate-buffered saline (PBS) (Sigma, USA) and transported to the laboratory. UCs were washed with PBS under a sterile laminar flow cell culture hood and cut into 5 cm segments. The segments were cut longitudinally, and blood vessels were removed, and then transferred in 50 ml conical tube to freeze (24 h at -20°C), aseptically transported into the laboratory, and subsequently thawed and transversely cut into pieces (~ 0.5cm length). Tissue pieces were agitated in 0.1M phosphate-buffered saline bath (48h at 4°C). The PBS bath was exchanged three times before the tissue pieces were soaked in 0.02% trypsin/0.05% EDTA (120 min. with shaking) and afterward in 0.1% peracetic acid in 4.0% ethanol bath (120 min. with shaking), and then soaked in a series of PBS and deionized water (dH\textsubscript{2}O) for 15 min two times of each. The decellularized HUC-ECM was allowed to set slightly before being transferred to −20°C for 24 hours then transferred to the deep freezer at -80°C for 5 days. The tissue was subsequently lyophilized for 24 hours at -56°C under 5 mm Hg in a lyophilizer for lyophilization till it was completely dried. The samples were then grinded with mixer mill device.

**Isolation and culturing of HUC-MSCs by Explant-Enzymatic Method:** Human umbilical cords (HUCs) were obtained from women with healthy pregnancies during caesarean deliveries at the end of gestation after signing informed consents. UCs collected under sterile conditions and transported to the laboratory in Dulbecco’s Modified Eagle’s Medium (DMEM) (Gibco. USA), 10U/ml penicillin G, 10 U/ml streptomycin, 25 mg/ml amphotericin B (Gibco. USA). MSCs were isolated and cultivated according to protocol described by\textsuperscript{(22)}; briefly, about 10-15-cm of HUC was transferred to a biosafety cabinet II and was washed several times with sterilized PBS to remove traces of blood, then immersed in 70% ethanol for 30 second and then immediately washed in PBS. The tissue then placed in a 10-cm sterilized petri dish and was divided into 5-cm pieces and longitudinally cut each piece and the blood vessels were removed from each piece. Each piece then minced into small pieces (~ 2-3 mm\textsuperscript{3}) and washed with PBS. Explants were then placed in 50 ml falcon tube containing a solution of 1mg/ml Collagenase I (Gibco USA) in low glucose DMEM (Gibco USA) which were then incubated for 1 h at 37°c in a humidified atmosphere containing 5% CO\textsubscript{2}, the explants pieces then were washed with PBS solution and 6 - 9 pieces were transferred onto tissue culture 75-cm\textsuperscript{2} T-flasks and were left undisturbed for 3 - 5 minutes until attachment onto flask. Then, complete culture medium was added. For the digested suspension was diluted 1:2 with PBS solution and centrifuged at 80 g for 10 min at cool centrifuge 4°C. Supernatant discarded and cell pellets resuspended in complete culture medium in tissue culture 75-cm\textsuperscript{2} T-flasks. The culture flasks were left undisturbed for 3 - 4 days and maintained at 37°C in a humidified atmosphere 90% containing 5% CO\textsubscript{2} for 3 days. Non-adherent cells were removed and fresh medium was replaced from 3 to 12 days After 12 days when the culture reached confluence at passage zero (P0), monolayer cell cultures were subculture for collecting homogenous stromal stem cells. The number of cells in each culture flask was quantified using a haemocytometer. The total number of cells harvested from the tissue culture flasks was determined by using the following equation (NCxDx10\textsuperscript{4}/#Q) NC=number of count vital cells (non-vital cells were stained blue), D=sample dilution (10) and Q=number of squares used haemocytometer\textsuperscript{(23)}.

**Immunocytochemistry Analysis of HUC-MSCs:**
At the second passage, the fibroblast-like cells became morphologically homogeneous, the following CD markers were used (primary antibodies) for detection of MSCs (anti- dog CD90) and (anti- dog CD 34). The procedure of immunocytochemistry of MSCs was applied according to the manufacture instruction of (Santa Cruz biotechnology Company).

**Modified Surgical Procedure:** Dogs were premedicated with atropine sulfate in dose rate of 0.03 mg/kg, then after 10 minutes the dog was anaesthetized by a mixture of 5 mg/kg of Xylazine hydrochloride) and 15mg/kg Ketamine hydrochloride I/M respectively. The skin was disinfected with chlorhexidine gluconate, Isopropyl alcohol 70% and finally with 1.8 % tincture iodine. The paw was extended by placing a latex glove over the distal extremity and securing it to the limb with a tape. The glove was covered with sterile skin towel and secured to the limb with towel clips. Then, the animal
was placed on left lateral recumbency and an aperture of fenestrated drape was made on the right forelimb at the targeted operation area. The proximal and central humeral diaphysis were used as landmarks through a craniolateral approach. Skin incision about (5-7 cm) from the cranial border of the tubercle of the humerus and distally to the middle level of the humerus and the incision follow the normal curvature of the humerus was made. The subcutaneous fat and brachial fascia was incised along the same line; the cephalic vein was protected and isolated. The brachial fascia along the border of the brachiocephalicus muscle and lateral head of the triceps was incised bluntly to avoid rupture of the radial nerve and by aid of gelphi retractor; the lateral head of triceps brachialis and brachiocephalicus muscles were retracted to expose the nerve. Caution was used when incising the fascia along the cranial border of the triceps overlying the brachialis muscle until the radial nerve is visualized. After the radial nerve was exposed, the nerve was severed proximally by using sterile scalpel blade size (No. 10) and then distally transected the 1 cm segment mid portion of the right radial nerve. In the scaffold group (SG), the single 6-0 nylon suture was employed in an epineurial grasping stitch pattern to fix the proximal stump of the nerve into the conduit. Then, the conduit was filled with 0.05mg acellular and lyophilized human umbilical cord scaffold. While in the combination group (CG), it was treated by implantation of the same conduit which was filled with 0.05mg acellular human umbilical cord tissue ECM scaffold seeded with HUCMSC 50 µl (5x10^6). Then the distal end was also sutured in the same way as the proximal end. Finally, the brachiocephalicus muscle and the superficial pectoral muscles were sutured to the fascia of the brachialis muscle with 3-0 Polydioxanone simple continuous sutures. Suture the subcutaneous tissue and skin with standard method.

**Results**

**Neurohistopathology:** Histopathological examination of the mid-segment of the radial nerve in the scaffold group (SG), on 8th weeks PO showed moderate number of Schwann cells, undulation arrangements of regenerative nerve fibers and improved angiogenesis (Fig. 1A). The distal segment showed presence of thick eosinophilic remyelination sheaths with new regenerated nerve fibers at the site of nerve transection surrounded by polymorphonuclear inflammatory cells (Fig. 1B).

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Fig. 1: Longitudinal section of the radial nerve in (SG)at 8th weeks PO. A. middle segment shows undulation arrangements of regenerative nerve fibers with few degenerated nerve fibers (head arrow), and improved angiogenesis (thin arrows). B. distal segment shows new regenerated nerve fibers at the site of nerve transection (thin arrows) surrounded by polymorphonuclear inflammatory cells (head arrows). H & E X 20
Histopathological examination of middle section in scaffold group at 16 weeks PO showed minimum vacuolated degenerated nerve fibers, improved myelination and increased number of schwann cells (Fig. 2A). The distal segment, there were a higher number of basophilic nerve fibers, rich in schwann cells with apparently slight derangement of the architecture of nerve fibers (slight undulation) with few remnant of conduit (Fig 2B).

![Fig. 2: Longitudinal section of the radial nerve in (SG) at 16th weeks PO. A. middle segment shows minimum vacuolated degenerated nerve fibers, (thin arrows) with improved myelination and increased number of Schwann cells (arrows head). B. distal segment shows good remyelination, regeneration of the nerve fibers (thin arrows) and few remnant of conduit (head arrows). H & E X 20](image)

In combination group (CG), the histopathological examination of the middle segment of the radial nerve 8th weeks PO showed numerous nerve fibers with good angiogenesis and highly basophilic schwann cells (Fig 3A). The distal segment illustrated dark eosinophilic regenerative nerve fibers with extensive proliferative schwann cells, good angiogenesis and fibrous tissue at internal perineurium and no presence of fibrous tissue inside the nerve (Fig 3B).

Histopathological findings of the conduit nerve section in the combination group at 16 weeks PO revealed no to occasional presence of swollen vacuolated degenerate nerve fibers, and no any undulation in the arrangement of the nerve fibers. Increase in number of nerve fibers prominent presence of schwann cells (Fig 4A). The distal segment showed normal parallel orientation of the nerve fibers, a bundle of newly regenerated nerve fibers extended inside the conduits from the proximal stump increased the existence of schwann cells; it was nearly normal section of peripheral nerve (Fig. 4B).
Fig. 3: Longitudinal section of the radial nerve in (CG) at 8th weeks PO. A. middle segment shows good angiogenesis (head arrows) and highly basophilic Schwann cells (thin arrows). B. distal segment shows dark eosinophilic regenerative nerve fibers (thin arrows) with extensive proliferative Schwann cells, and good angiogenesis (head arrows) H & E X20.

Discussion

The histopathological outcomes which were obtained by the present study at 8 weeks PO, observed that the variation in the level of nerve regeneration process between the treatment groups may be related to the variation in the cells quantity and quality and due to release a wide range of neurotrophic factors that promote myelin sheath formation, neovascularization and reduced inflammatory reaction that’s precipitated in the regeneration process. The increased number of Schwann cells observed on 8th weeks PO in the scaffold group was similar to that observed in the combination group resulting from a high concentration of stem cells in the scaffold. It is reported that scaffold utilized in the present study contains a large number of stromal stem cells which are directly released from this scaffold to the transected peripheral nerve. Effectively, increased angiogenesis, VEGF, FGF and proximity to associated nerve tissue combined to stimulate differentiation of stem cells into Schwann cells. Previous studies confirmed that the Schwann cells release proteases and also work in conjunction with macrophages to phagocytise and remove myelin and axon debris. There is thus a co-dependence between these two cells as macrophages are mitogenic to Schwann cells and participate with Schwann cells in the provision of trophic (feeding) and trophic (guidance) factors for regenerating axons. These results were in agreement with the use of the decellularized human umbilical artery (hUA) as nerve guidance conduit, the authors showed that decellularized hUAs after implantation were rich in nerve fibers and characterized by improved sciatic functional index (SFI) values and supported elongation and bridging of the 10 mm nerve gap in rats. The study by implanted a fetal porcine urinary bladder extracellular matrix (IUB-ECM) in a trigeminal, infra orbital nerve branch transection and direct end-to-end repair model in rat, significantly improved epi- and endoneurial organization and increased both neovascularization and growth associated protein-43 (GAP-43) expression at PN repair sites. Scaffolds seeded with HUC-MSCs of which the environment had been conditioned in such a way to obtain the factors supporting nerve regeneration. The results of the present study are in agreement with the results of study of injected UCMSC-derived extracellular vesicles (EVs) into the tail veins of rats and sutured a silicone rubber tube into the sciatic nerve gaps of 24 rats. The authors found that UCMSC-EVs promoted motor function recovery and regeneration of axons and attenuated muscle atrophy at 8 wk. Another study by confirmed that using of BMSCs were then engrailed via UBM-implant as a powder in the hemisected dog spinal cord, showed minimal scar
tissue formation and proliferation and orientation of regenerative nerve fiber compared to control group at 8 wk. The molecular and cellular mechanisms regulating neovascularization and axon regrowth after peripheral nerve injury are poorly understood (31,32). However, many studies suggest angiogenesis and neurogenesis are closely linked and likely modulated by the innate immune response to peripheral nerve injury (33,34). Macrophages are hypothesized to respond to and direct endothelial cell migration and the formation of new blood vessels in hypoxic tissues. In turn, newly formed blood vessels have been shown to guide Schwann cells and hence axon regrowth across PN injuries (35,36).

Interestingly, the sections of the proximal segment in combination group at the end of 16th week PO showed the absence of degeneration and vacuolation, increased number of Schwann cells, good orientation and scanty scar tissue in the epineurium of nerve fibers. The mid and distal segments showed remarkable angiogenesis, good orientation and myelination of nerve fibers. This result suggested that employ both biological implants (UBM and HUC) seeded with HUCMSCs synergistically promoted regeneration and improved the functional recovery of radial nerve injury by release a wide range of neurotrophic factors that greater myelin sheath formation in the middle part of the graft, neovascularization and reduced inflammatory reaction. However, the functional (UBM and HUC) may provide good support for the newborn regenerating fibers and guide their growth in the right direction to bridge the nerve gap. As expected, the scaffolds seeded with HUCMSCs combination resulted in better functional recovery compared with the scaffolds alone. This result is consistent with of study of (37) used longitudinally oriented collagen conduit (LOCC) loaded with MSCs after sciatic nerve transection in dogs models we found that the use of an LOCC seeded with MSCs results in the acceleration of sciatic nerve regeneration and the combination resulted in better functional recovery compared with the LOCC alone. In addition, (38) investigated the efficacy of a muscle-stuffed vein seeded with neural trans differentiated human mesenchymal stem cells as an alternative nerve conduit to repair a 15-mm sciatic nerve defect in athymic rats, conclusion that combinations promote peripheral nerve regeneration through the secretion of neurotrophic factors. In contrast, a study by (39) indicate that the small intestine submucosa and poly (caprolactone-co-lactide)-nerve guidance conduit are promote nerve regeneration at 15-mm sciatic nerve defect gap after 16 weeks in rats model. As well as, the results obtainedby a study of (40) reported that the histopathology of sciatic nerve treated with BMSCs showed an increased number of Schwann-like cells. The BMSCs are believed to act as Schwann cells in that they function to prevent neuronal cells death and promote directional axonal growth. As they proliferate to fill endoneurial sheaths, they form longitudinal columns commonly known as bands of Bungner(41). Within days after injury, Schwann cells begin to divide and create a pool of dedifferentiated daughter cells without axon contact. Schwann cells down-regulate their normal proteins such as peripheral myelin protein-22 (PMP-22), myelin basic protein (MBP), myelin associated glycoprotein (MAG), P0 and connexin-32 to convert the phenotype of premyelinating cell(42). These dedifferentiated Schwann cells upregulate expression of the nerve growth factor (NGF), neurotrophic factors, cytokines, and other compounds that lead to Schwann cell differentiation and proliferation. The latter are important in preventing neuronal apoptosis in response to injury and potentiate the migration and adhesion of Schwann cells to axonal projections(43).

Conclusions

The biological implants urinary bladder matrix and human umbilical cord extracellular matrix may have the potential to regenerate radial nerve defect, seeded on HUC-MSCs transplantation being more effective.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Department of Surgery and Obstetrics, College of Veterinary Medicine/University of Baghdad and all experiments were carried out in accordance with approved guidelines.

References

3. Gaudin R, Knipfer C, Henningsen A. Approaches to peripheral nerve repair: Generations of biomaterial conduits yielding to replacing autologous nerve


Knowledge, Awareness and Attitude of Pharmacy Students towards Epilepsy in Iraq

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¹Assistant Lecturer, Department of Clinical Pharmacy, College of Pharmacy, University of Baghdad, Baghdad, Iraq, ²Stagiaire at college of pharmacy, University of Baghdad

Abstract

Background: The undergraduate students in pharmacy colleges represent a well-educated group of the community according to the use of drugs and they are required to hold the appropriate knowledge of drug use and have positive attitudes toward health problems, this good knowledge about the diseases and their treatment will give good pharmacists in the future and this will reflect positively on patient knowledge, and their compliance with treatment, this due to direct contact of pharmacists with the patients.

Aim: To know the knowledge, Awareness and Attitude of a sample of Iraqi pharmacy students towards epilepsy.

Method: Cross-sectional study used a structured questionnaire validated by previous studies to collect data about knowledge, Awareness and Attitude about epilepsy from all stages of undergraduate pharmacy students, this survey involves 260 respondents from different universities in Iraq.

Results: The questionnaire was responded by 260 students. The main part of the respondents were of age group between 21-25 years (84.2%). The majority of the respondents were female (67.3%), and (32.7%) were male. Overall knowledge was moderate (60.1±17.8), awareness was poor (42.6±33.5) but the attitude toward epilepsy was very good (83.3±13.1).

Conclusions: The results of this study showed that, majority of the students had knowledge of the disease however, the knowledge score was moderate. While Awareness score was low, we need to have focused education and efforts to increase the knowledge and awareness towards epilepsy among pharmacy students. At the same time the attitudes of pharmacy students toward epilepsy in this study was very good.

Keywords: Epilepsy, knowledge, awareness, attitude, Pharmacy students.

Introduction

Epilepsy is a chronic disorder of the brain that affects people worldwide¹ and in all age groups². Epilepsy is a syndrome characterized by unprovoked, recurring seizures and to be epileptic should have at least more than two seizures or more, It is frequent neurological illness affecting an estimated 50 million people in the world, characterized by unusual electrical activity in the brain that lead to change in the movement of the body or can affect the sensation, consciousness or behavior³.

In approximately 80% of patients with epilepsy, the underlying etiology is unknown. The most common causes of epilepsy are head trauma and stroke (⁴).

The causes of epilepsy depending on the age, where stroke and neoplasia being the most common factors among the elderly. In younger men, traumatic brain injuries appear to influence, as do cerebral palsy and cortical structures malformations in the younger age groups (⁵).
The WHO’s 2010 Global Burden of Disease study ranks epilepsy as the second most problematic neurologic disorder worldwide in terms of disability-adjusted life years. Previous studies of the prevalence of epilepsy focused on specific regions (China, Europe, Latin America, and Arab countries) (6).

Estimates suggest that 50-70 million people worldwide have epilepsy, and the yearly incidence is 4.6 million. Global burden estimates a wide spread in populations of low- and middle-income countries (LMIC), regardless of country income, the public health burden of epilepsy carries with it high risks of disability, loneliness, economic loss, and early death (7).

Stigma and inequity in general cause more difficulty to epileptics than the true fits. The absence of knowledge about epilepsy has been considered to be an important decided factor in the bad attitudes towards people with this clinical condition. The deficiency of knowledge about epilepsy has been exposed in a large part of the populations throughout the World (8).

It was established that patients with epilepsy in Western societies are more prone to have problems in their education (9), employment (10,11), and marriage (12,13), and this has been attributed partly to absence of knowledge, bad attitudes, and misinterpretation about the disease among patients themselves (14,15).

The undergraduate pharmacy students constitute a well-educated section of the community regarding drugs and have the potential to generate awareness, improve concepts and influence attitudes towards the disease since they have positive attitudes toward health problems (16,17). In the Middle East, a small number of studies (18,19,20) have scanned the knowledge and attitudes toward epilepsy in general population, but have not done so among pharmacy students, an important group likely to form the opinion in their community and become template for others (21,22). Therefore, it is important that they have the appropriate and updated knowledge and suitable attitude towards epilepsy and antiepileptic drugs (23). Because the pharmacists play a vital role in the care of patients with epilepsy. The community pharmacists not only supply information to patients that help them understand their conditions and manage the treatment by giving self-care advice, but also educate patients and their families concerning the development of adherence to their therapy, and then improving health related quality of life for those patients (24).

The aim of this study was to assess knowledge, Awareness and Attitude of pharmacy students towards epilepsy in Iraq.

Method

Study design and respondents: This descriptive cross-sectional study was performed in 17 December 2019 among pharmacy students from different universities in Iraq. The number of respondents were 260 pharmacy student.

Study instruments and collection of data: The survey questionnaire was prepared in English language after reviewing the literature for similar studies (16,17). The questionnaire was framed to gather information on demographic data, knowledge, awareness and attitude towards epilepsy, then it was transferred to electronic form using google forms and then published on the internet in a small group (30 student) in order to check the ease of performing it and if there is any problem about understanding the questions, after that it was published on a large scale and includes undergraduate pharmacy students, the results obtained from the pilot study were excluded from the major study.

Data entry and statistical analysis: Data were collected from the electronic response of the questionnaire and entered into Microsoft excel program, while Statistical analysis were performed using SPSS statistical package for Social Sciences (version 20.0 for windows, SPSS, Chicago, IL, USA).

Data are presented as mean ± SD for quantitative variables and number with percentages for qualitative data. Relations were studied using Chi-square $X^2$ test. $P$ value of <0.05 was considered statistically significant.

Results

Two hundred and sixty pharmacy students accepted to participate in this study. The participants responded completely to the questionnaire. The demographic properties of the study population are shown in Table (1).

The age of the students was grouped as 16-20, 21-25 and 26-30 years, and the main part of them were between 21-25 years (84.2%). Among the respondents 67.3% were female, and 32.7% were male.

About 2.7% of the respondents were first stage, 8.8% second stage, 9.6% third stage, 20.4% fourth stage, and 58.5% of them were fifth stage. Positive clinical
orientation considered for 4th and 5th stage pharmacy students and represent 78.8% of the study population, 1st, 2nd, and 3rd stages were considered as negative clinical orientation they represent 21.2% of the study population.

Demographic characteristics of studied population sample (260 subjects):

<table>
<thead>
<tr>
<th></th>
<th>Count</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>85</td>
<td>32.7%</td>
</tr>
<tr>
<td>Female</td>
<td>175</td>
<td>67.3%</td>
</tr>
<tr>
<td><strong>Age (Year)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16-20</td>
<td>31</td>
<td>11.9%</td>
</tr>
<tr>
<td>21-25</td>
<td>219</td>
<td>84.2%</td>
</tr>
<tr>
<td>26-30</td>
<td>10</td>
<td>3.8%</td>
</tr>
<tr>
<td><strong>Year of undergraduate study</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First year</td>
<td>7</td>
<td>2.7%</td>
</tr>
<tr>
<td>Second year</td>
<td>23</td>
<td>8.8%</td>
</tr>
<tr>
<td>Third year</td>
<td>25</td>
<td>9.6%</td>
</tr>
<tr>
<td>Fourth year</td>
<td>53</td>
<td>20.4%</td>
</tr>
<tr>
<td>Fifth year</td>
<td>152</td>
<td>58.5%</td>
</tr>
<tr>
<td><strong>Clinical orientation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>55</td>
<td>21.2%</td>
</tr>
<tr>
<td>Positive</td>
<td>205</td>
<td>78.8%</td>
</tr>
</tbody>
</table>

*Negative clinical orientation was considered for first, second and third stage students.
*Positive clinical orientation was considered for fourth and fifth stage students.

Knowledge, awareness and attitude responses according to gender:

**Knowledge:** The responses of the students concerning knowledge of epilepsy are given in Figure 1 and table 2, Overall knowledge about epilepsy was moderate (60.1±17.8), Majority of the students 75.4% answered that they know the cause of epilepsy. A higher percentage of respondents (82.3%) said that epilepsy is not a contagious disease, About (54.6%) of participants believed that epilepsy is inherited disease. Although (68.1%) of respondents think that epilepsy is not caused by evil spirits, but (58%) thought it is a form of mental illness, for this question we have significant relation between gender (male) and the base answer of this question, where the base answer of male students where significantly higher than those of female students (p-value =0.034).

![Figure 1: Knowledge response](image-url)
74.2% of respondents thought that epileptic patients could die from seizures; however, (45%) of the respondents thought that epilepsy is a curable disease. 53.5% of the students answered that they know how to perform first aid of epilepsy.

**Awareness:** The responses of students about awareness of epilepsy are presented in Figure 2 and table 2. The overall awareness response was poor (42.6±33.5). The main part of the participants (93.1%) said that they had heard or read about epilepsy, and (51.9%) had attended a lecture or seminar about it for this question we have a significant relation between gender (female) and attendance a lecture or seminar about epilepsy.

Although (86.5%) of the students said they had no epileptic patient in their family but (43.5%) said that they have seen a person having epileptic attack with significant relation between gender (male) and seeing a person having epileptic attack. About (10.8%) of study population had actually done first-aid seizure management.

![Figure 2: Awareness response](image)

**Attitude:** The responses on attitudes to epilepsy are given in figures 3 and table 2. The overall attitude was very good (83.3±13.1).

The main part of the students (92.3%) said epileptic patients could receive education and 89.6% of them said that epileptic patients could perform daily activities. Also 69.6% of them think that epileptic patients can participate in sports.

The main part of the students (96.2%) thought epileptic patients should not be isolated from the normal population. About (68.8%) of the respondents did not agree on dispensing of AEDs (Antiepileptic Drugs) by the pharmacist, with significant relation between gender(female) and the base answer of this question, where the female students were not agreed on dispensing AEDs by the pharmacist more than male students.
Figure 3: Attitude response

Knowledge, awareness and attitude responses according to gender:

<table>
<thead>
<tr>
<th>Base answer</th>
<th>Gender</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Do you know the cause of epilepsy</td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image.png" alt="Image" /> X²=2.3, P=0.167 NS</td>
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<td></td>
</tr>
<tr>
<td>Don’t know</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Yes</td>
<td>69 (81.2)</td>
<td>127 (72.6)</td>
</tr>
<tr>
<td>No</td>
<td>16 (18.8)</td>
<td>48 (27.4)</td>
</tr>
<tr>
<td>Do you think epilepsy is contagious</td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image.png" alt="Image" /> X²=3.1, P=0.213 NS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don’t know</td>
<td>10 (11.8)</td>
<td>21 (12.0)</td>
</tr>
<tr>
<td>Yes</td>
<td>8 (9.4)</td>
<td>7 (4.0)</td>
</tr>
<tr>
<td>No</td>
<td>67 (78.8)</td>
<td>147 (84.0)</td>
</tr>
<tr>
<td>Do you think epilepsy is hereditary</td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image.png" alt="Image" /> X²=4.1, P=0.127 NS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don’t know</td>
<td>10 (11.8)</td>
<td>34 (19.4)</td>
</tr>
<tr>
<td>Yes</td>
<td>45 (52.9)</td>
<td>97 (55.4)</td>
</tr>
<tr>
<td>No</td>
<td>30 (35.3)</td>
<td>44 (25.1)</td>
</tr>
<tr>
<td>Do you think epilepsy is a form mental illness</td>
<td></td>
<td></td>
</tr>
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<td></td>
</tr>
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<td>9 (10.6)</td>
<td>12 (6.9)</td>
</tr>
<tr>
<td>Yes</td>
<td>40 (47.1)</td>
<td>112 (64.0)</td>
</tr>
<tr>
<td>No</td>
<td>36 (42.4)</td>
<td>51 (29.1)</td>
</tr>
<tr>
<td>Do you think epilepsy is caused by evil spirits</td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image.png" alt="Image" /> X²=2.8, P=0.247 NS</td>
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<td>51 (29.1)</td>
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<td>Yes</td>
<td>6 (7.1)</td>
<td>5 (2.9)</td>
</tr>
<tr>
<td>No</td>
<td>58 (68.2)</td>
<td>119 (68.0)</td>
</tr>
<tr>
<td>Do you think people can die from seizures</td>
<td></td>
<td></td>
</tr>
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<td><img src="image.png" alt="Image" /> X²=2.8, P=0.241 NS</td>
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<td>6 (7.1)</td>
<td>22 (12.6)</td>
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<td>63 (74.1)</td>
<td>130 (74.3)</td>
</tr>
<tr>
<td>No</td>
<td>16 (18.8)</td>
<td>23 (13.1)</td>
</tr>
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</table>
### Base answer

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<thead>
<tr>
<th>Base answer</th>
<th>Gender</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Do you think epilepsy can be cured</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X²=0.9, P=0.625 NS</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Male 11 (12.9)</td>
<td>Female 30 (17.1)</td>
</tr>
<tr>
<td></td>
<td>Yes 41 (48.2)</td>
<td>76 (43.4)</td>
</tr>
<tr>
<td></td>
<td>No 33 (38.8)</td>
<td>69 (39.4)</td>
</tr>
<tr>
<td>Do you know how to perform first-aid epilepsy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X²=1.5, P=0.475 NS</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Male 12 (14.1)</td>
<td>Female 31 (17.7)</td>
</tr>
<tr>
<td></td>
<td>Yes 50 (58.8)</td>
<td>89 (50.9)</td>
</tr>
<tr>
<td></td>
<td>No 23 (27.1)</td>
<td>55 (31.4)</td>
</tr>
<tr>
<td>Awareness</td>
<td></td>
<td>42.6±33.5</td>
</tr>
<tr>
<td>Have you heard or read about epilepsy</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>X²=0.9, P=0.326 NS</td>
<td>Male 81 (95.3)</td>
<td>Female 161 (92.0)</td>
</tr>
<tr>
<td></td>
<td>4 (4.7)</td>
<td>14 (8.0)</td>
</tr>
<tr>
<td>Have you ever attended a lecture or seminar on epilepsy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X²=4.6, P=0.031 S</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male 36 (42.4)</td>
<td>Female 99 (56.6)</td>
</tr>
<tr>
<td></td>
<td>No 49 (57.6)</td>
<td>76 (43.4)</td>
</tr>
<tr>
<td>Anyone in your family that you know has epilepsy</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
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<td>Male 12 (14.1)</td>
<td>Female 23 (13.1)</td>
</tr>
<tr>
<td></td>
<td>No 73 (85.9)</td>
<td>152 (86.9)</td>
</tr>
<tr>
<td>Have you ever seen anyone having epileptic attack</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>X²=20.7, P=0.005 S</td>
<td>Male 54 (63.5)</td>
<td>Female 59 (33.7)</td>
</tr>
<tr>
<td></td>
<td>No 31 (36.5)</td>
<td>116 (66.3)</td>
</tr>
<tr>
<td>Have you ever done first-aid seizure management</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>X²=2.7, P=0.101 NS</td>
<td>Male 13 (15.3)</td>
<td>Female 15 (8.6)</td>
</tr>
<tr>
<td></td>
<td>No 72 (84.7)</td>
<td>160 (91.4)</td>
</tr>
<tr>
<td>Attitude</td>
<td></td>
<td>83.3±13.1</td>
</tr>
<tr>
<td>Do you think epileptics can receive education</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>X²=2.9, P=0.086 NS</td>
<td>Male 75 (88.2)</td>
<td>Female 165 (94.3)</td>
</tr>
<tr>
<td></td>
<td>No 10 (11.8)</td>
<td>10 (5.7)</td>
</tr>
<tr>
<td>Do you think epileptics can perform daily activities</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>X²=0.6, P=0.429 NS</td>
<td>Male 78 (91.8)</td>
<td>Female 155 (88.6)</td>
</tr>
<tr>
<td></td>
<td>No 7 (8.2)</td>
<td>20 (11.4)</td>
</tr>
<tr>
<td>Do you think epileptics should not participate in sports</td>
<td>Yes</td>
<td></td>
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<tr>
<td>X²=0.8, P=0.362 NS</td>
<td>Male 29 (34.1)</td>
<td>Female 50 (28.6)</td>
</tr>
<tr>
<td></td>
<td>No 56 (65.9)</td>
<td>125 (71.4)</td>
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<tr>
<td>Do you think epileptics should be isolated from normal population</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>X²=1.4, P=0.234 NS</td>
<td>Male 5 (5.9)</td>
<td>5 (2.9)</td>
</tr>
<tr>
<td></td>
<td>No 80 (94.1)</td>
<td>170 (97.1)</td>
</tr>
<tr>
<td>Do you think AEDs should be dispensed by pharmacist</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>X²=4.6, P=0.032 S</td>
<td>Male 34 (40.0)</td>
<td>Female 47 (26.9)</td>
</tr>
<tr>
<td></td>
<td>No 51 (60.0)</td>
<td>128 (73.1)</td>
</tr>
</tbody>
</table>

**Base answers (Yes/No) are in bold format showing mean±SD for Knowledge, awareness and attitude responses**

**NS: No significant relation to gender**

Significant relation using Chi-square test to gender were detected in Knowledge Q4 (P=0.034), Awareness Q2 (P=0.031) and Q4 (P=0.005), and Attitude Q5 (P=0.032).

**Knowledge, awareness and attitude responses according to clinical orientation:** Are presented in table 3, Negative clinical orientation was considered for first, second and third stage students. while Positive clinical orientation was considered for fourth and fifth stage students.

**Knowledge:** According to the question “Do you know the cause of epilepsy?” There was a significant relation between the clinical orientation (positive) and
the base answer of this question. There is no significant differences between positive and negative clinical orientation for all other questions.

**Awareness:** According to the question about the attendance a lecture or seminar on epilepsy, there was a significant relation between the clinical orientation (positive) and the base answer of this question.

**Knowledge, awareness and attitude responses according to clinical orientation:**

<table>
<thead>
<tr>
<th>Base answer</th>
<th>Clinical orientation</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Negative Count (%)</td>
<td>Positive Count (%)</td>
</tr>
<tr>
<td>Knowledge</td>
<td>60.1±17.8</td>
<td></td>
</tr>
<tr>
<td>Do you know the cause of epilepsy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$X^2=11.1$, $P=0.001$</td>
<td>Don’t know 0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Yes 32 (58.2)</td>
<td>164 (80.0)</td>
</tr>
<tr>
<td></td>
<td>No 23 (41.8)</td>
<td>41 (20.0)</td>
</tr>
<tr>
<td>Do you think epilepsy is contagious</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$X^2=0.33$, $P=0.846$</td>
<td>Don’t know 6</td>
<td>25 (12.2)</td>
</tr>
<tr>
<td></td>
<td>Yes 4 (7.3)</td>
<td>11 (5.4)</td>
</tr>
<tr>
<td></td>
<td>No 45 (81.8)</td>
<td>169 (82.4)</td>
</tr>
<tr>
<td>Do you think epilepsy is hereditary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$X^2=0.93$, $P=0.629$</td>
<td>Don’t know 11</td>
<td>33 (16.1)</td>
</tr>
<tr>
<td></td>
<td>Yes 27 (49.1)</td>
<td>115 (56.1)</td>
</tr>
<tr>
<td></td>
<td>No 17 (30.9)</td>
<td>57 (27.8)</td>
</tr>
<tr>
<td>Do you think epilepsy is a form mental illness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$X^2=3.3$, $P=0.194$</td>
<td>Don’t know 3</td>
<td>18 (8.8)</td>
</tr>
<tr>
<td></td>
<td>Yes 38 (69.1)</td>
<td>114 (55.6)</td>
</tr>
<tr>
<td></td>
<td>No 14 (25.5)</td>
<td>73 (35.6)</td>
</tr>
<tr>
<td>Do you think epilepsy is caused by evil spirits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$X^2=1.9$, $P=0.377$</td>
<td>Don’t know 13</td>
<td>59 (28.8)</td>
</tr>
<tr>
<td></td>
<td>Yes 4 (7.3)</td>
<td>7 (3.4)</td>
</tr>
<tr>
<td></td>
<td>No 38 (69.1)</td>
<td>139 (67.8)</td>
</tr>
<tr>
<td>Do you think people can die from seizures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$X^2=0.27$, $P=0.874$</td>
<td>Don’t know 5</td>
<td>23 (11.2)</td>
</tr>
<tr>
<td></td>
<td>Yes 41 (74.5)</td>
<td>152 (74.1)</td>
</tr>
<tr>
<td></td>
<td>No 9 (16.4)</td>
<td>30 (14.6)</td>
</tr>
<tr>
<td>Do you think epilepsy can be cured</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$X^2=0.41$, $P=0.816$</td>
<td>Don’t know 10</td>
<td>31 (15.1)</td>
</tr>
<tr>
<td></td>
<td>Yes 25 (45.5)</td>
<td>92 (44.9)</td>
</tr>
<tr>
<td></td>
<td>No 20 (36.4)</td>
<td>82 (40.0)</td>
</tr>
<tr>
<td>Do you know how to perform first-aid epilepsy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$X^2=1.7$, $P=0.429$</td>
<td>Don’t know 12</td>
<td>31 (15.1)</td>
</tr>
<tr>
<td></td>
<td>Yes 26 (47.3)</td>
<td>113 (55.1)</td>
</tr>
<tr>
<td></td>
<td>No 17 (30.9)</td>
<td>61 (29.8)</td>
</tr>
<tr>
<td>Awareness</td>
<td>42.6±33.5</td>
<td></td>
</tr>
<tr>
<td>Have you heard or read about epilepsy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$X^2=0.51$, $P=0.548$</td>
<td>Yes 50 (90.9)</td>
<td>192 (93.7)</td>
</tr>
<tr>
<td></td>
<td>No 5 (9.1)</td>
<td>13 (6.3)</td>
</tr>
<tr>
<td>Have you ever attended a lecture or seminar on</td>
<td></td>
<td></td>
</tr>
<tr>
<td>epilepsy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$X^2=22.4$, $P=0.005$</td>
<td>Yes 13 (23.6)</td>
<td>122 (59.5)</td>
</tr>
<tr>
<td></td>
<td>No 42 (76.4)</td>
<td>83 (40.5)</td>
</tr>
</tbody>
</table>

**Attitudes:** According to the question about the dispensing of AEDs by pharmacist there was a significant relation between the clinical orientation (positive) and the base answer of this question.
**Base answer**

<table>
<thead>
<tr>
<th>Clinical orientation</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count (%)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Anyone in your family that you know has epilepsy</td>
<td>Yes</td>
</tr>
<tr>
<td>X²=2.3, P=0.130 NS</td>
<td>No</td>
</tr>
<tr>
<td>Have you ever seen anyone having epileptic attack</td>
<td>Yes</td>
</tr>
<tr>
<td>X²=0.41, P=0.521 NS</td>
<td>No</td>
</tr>
<tr>
<td>Have you ever done first-aid seizure management</td>
<td>Yes</td>
</tr>
<tr>
<td>X²=0.001, P=0.970 NS</td>
<td>No</td>
</tr>
<tr>
<td>Attitude</td>
<td>83.3±13.1</td>
</tr>
<tr>
<td>Do you think epileptics can receive education</td>
<td>Yes</td>
</tr>
<tr>
<td>X²=1.01, P=0.313 NS</td>
<td>No</td>
</tr>
<tr>
<td>Do you think epileptics can perform daily activities</td>
<td>Yes</td>
</tr>
<tr>
<td>X²=1.3, P=0.255 NS</td>
<td>No</td>
</tr>
<tr>
<td>Do you think epileptics should not participate in sports</td>
<td>Yes</td>
</tr>
<tr>
<td>X²=0.80, P=0.371 NS</td>
<td>No</td>
</tr>
<tr>
<td>Do you think epileptics should be isolated from normal population</td>
<td>Yes</td>
</tr>
<tr>
<td>X²=2.2, P=0.137 NS</td>
<td>No</td>
</tr>
<tr>
<td>Do you think AEDs should be dispensed by pharmacist</td>
<td>Yes</td>
</tr>
<tr>
<td>X²=20.7, P=0.005 S</td>
<td>No</td>
</tr>
</tbody>
</table>

**Base answers (Yes/No)** are in **bold** format showing mean±SD for Knowledge, awareness and attitude responses

NS: No significant relation to gender

Significant relation using Chi-square test to clinical orientation were detected in Knowledge Q1 (P=0.001), Awareness Q2 (P=0.005), and Attitude Q5 (P=0.005).

**Discussion**

The present study was accomplished to evaluate knowledge, awareness and attitude towards epilepsy among undergraduate pharmacy students. Pharmacists have an executive obligation to give information, advice and direction to their patients \(^{(32)}\), including those using AEDs.

The female percentage participated in the present study was more than male percentage, which is attributed to the higher number of females than males in most of the Iraqi pharmacy colleges.

In the present study, the main part of the students (75.4%) said they knew the cause of epilepsy. This percentage is approximately more compared to study done on pharmacy students in University of Karachi, Pakistan (68.5%) \(^{(17)}\).

For the question “do you think epilepsy is contagious?” our results showed that 82.3% of the participants knew it is not contagious, while the percentage of participants who think the same in different universities in Pakistan for pharmacy students was 84.2% \(^{(25)}\). However, in a study done among school teachers in Bobo-Dioulasso the percentage was 73.8% \(^{(26)}\) and the percentage of other study done among students of other colleges in a Malaysian university was 84% \(^{(27)}\), while in Zimbabwe a study done on teachers show a percentage about 71.1% \(^{(28)}\). This result could be related to the fact that more knowledge about diseases is obtained throughout the study in pharmacy colleges than in other different colleges.
About 54.6% of the participants of the present study said epilepsy is hereditary. A study done among pharmacy students from Pakistan reported that 70% of the students know the hereditary nature of epilepsy, while other study done in the university of Mumbai showed that all the participants thought epilepsy is not hereditary (16,17). In a study done among public in Jordan, the percentage of people who think epilepsy is an inherited disease was 43.5% (29). These differences could have originated as there was conflicting evidence regarding hereditary nature of epilepsy, but the recent research improve this where the development in genetic technology has led to the identification of an increasing number of genes associated with epilepsy (30).

58% of the participants from the present study believed that epilepsy is a form of mental illness. This percentage is much lower than the study done in Mumbai-India (98%), and higher than that of students in a Malaysian university (39.7%) (16,27), so our result is confusing since pharmacy students should know that epilepsy is not a mental disease instead, rather it is neurological, for this question we show significant relation between gender (male) and the base answer of the question, where 42.2% of male students said that epilepsy is not a form of mental illness compared with 29.1% of female students of same answer, by comparing with the result of a study from Mumbai university that showed no significant difference between males and females about knowledge about epilepsy (16).

In the present study, only 139 out of 260 (53.5%) knew how to perform first-aid in epilepsy. A similar study done on pharmacy students from Karachi reported 33% of the participants knowing first aid in epilepsy, while in Mumbai study the percentage was only 0.98% (16,17), this considered a very good result for Iraqi pharmacy students.

The present study showed that about 93.1% of the students had heard or read about epilepsy. This was relatively higher compared to those reported among pharmacy students from Pakistan university (89.8%), but lower than those of pharmacy students in Mumbai university (96%) (16,17).

While in a study done among students in Malaysian university the percentage was 86.5% (27). Also the present study showed that 51.9% of the participants had attended a lecture or seminar on epilepsy, with significant relation with female than male students, where 56.6% of female attended a lecture or seminar on epilepsy compared with 42.4% of male students, by comparing with the results of Malaysian study that showed only 2.4% of the participants attended a lecture or seminar on epilepsy (27), while another study in Mumbai university showed that 97% of the participants attended a lecture or seminar on epilepsy with no significant differences between male and female students (16).

43.5% of the participants of the present study had seen someone having epileptic attack, with significant relation to male than female students, where the male percentage was 63.5% while female percentage was 33.7%, a study done in Pakistan showed that 54% of study population had seen an epileptic seizure (17).

31.2% of the participants believed that anti-epileptic drugs should be dispensed by pharmacist without a valid prescription. This was unexpected as pharmacy students study drug rules and they are expected to know that antiepileptic drugs in Iraq dispensed only after presenting valid physician prescription.

Knowledge, awareness and attitude responses according to clinical orientation: are presented in (table 3)

According to the question “Do you know the cause of epilepsy?” There was a significant relation between the clinical orientation (positive) and the base answer of this question (p-value 0.001), where 80% of the students of positive clinical orientation (4th and 5th stages) knew the cause of epilepsy comparing with 58.2% of the students of negative clinical orientation (1st, 2nd and 3rd), also we showed a significant difference between them (p-value 0.005) for attendance a lecture or seminar on epilepsy, where 59.5% of positive clinical students compared to only 23.6% of negative clinical students had attended a lecture or seminar on epilepsy.

Also 75.6% of positive clinical compared with 43.6% of those negative clinical students believed that anti-epileptic drugs should not be dispensed by pharmacist without a valid prescription (p-value 0.005), by comparing with saudi study that showed the same results where it showed that there was a greater level of knowledge and attitude toward epilepsy among clinical-year students compared to preclinical-year students (31), this could be related to the fact that more knowledge about epilepsy is obtained throughout the study in fourth and fifth stages where the curriculum in Iraqi pharmacy colleges involve clinical pharmacy and hospital training in those 2 stages compared to the first 3 stages.
Conclusion

The results of the present study identify the shortage of pharmacy students towards epilepsy knowledge and awareness. However, the majority of participants had positive attitudes towards it. Also, a lot of students thought epilepsy is a form of mental diseases which refers to lack of knowledge. In addition, some of the pharmacy students in this study believed in the necessity of dispensing antiepileptic drugs by pharmacist.

There is a need to improve certain aspects of knowledge and awareness, understanding of epilepsy among pharmacy students especially for those selecting their career as clinical pharmacist.

Ethical Clearance: All the students included in this study were of age 18 years and older, and they reveal voluntary permission to participation. There were no personal identifiers during the administration and collection of the questionnaire to rule out any personal identification.

Source of Funding: Self

Conflict of Interest: There is no conflict of interest

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Contemporary Evolution in CRISPR–CAS9 System Technology and their Uses in Treatment of Human Common Diseases: A Review

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Abstract

Gene therapy has proven its potential in treatment of several human diseases. Most recent method in a long line of the genome-editing-techniques is called “A Clustered-Regularly-Interspaced-Short-Palindromic-Repeat-associated-protein9” abbreviated as CRISPR-Cas9. The scientists and researcher have long sought to control, and modification the DNA that consider “the code of life”. The CRISPR-Cas9technology is offer very important improvements that differ about other gene-editing.technologies, it’s uncomplicated to apply & low-cost, also have comparatively high degree of the efficiency and precision . This technology uses a “.ribonucleic acid.(RNA)-guided. Deoxyribonucleic. acid-DNA-endonuclease.”, Cas9, which induces double-strand breaks (DSBs) in the target site, the DSBs was repaired by the use of a variety of cellular DNA-repair systems leading to changes in target sites, that technology have proven to be effective to investigation, prevention, and treatment of diseases.

This review summarizes contemporary evolution in CRISPR –Cas9 system technology and their uses in treatment of common diseases.

Keywords: Genome editing, CRISPR/Cas9 technology and Gene therapy.

Introduction

The Genome-editing-technologies is included mutations caused by UV radiation and chemicals, the zinc-finger-nucleases (ZFNs), the DNA-recombinase mediated gene replacement, and the “transcriptional-activator-like-effector-nuclease (TALEN)” mechanisms, it have contributed significantly to both basic and clinical developments in the biological research 1,2.

Scientists have reformed or change the genes by using radioactivity or chemical materials. These procedures of modifying produce random outcomes. The development of the technology of the recombinant-DNA in a year (1970s) permitted to the researchers with adding a new fragment of DNA addicted to genes structure, but introducing a precise gene or sequence within the genome persisted large theoretically inaccurate and challenging 3. Gene editing can be used to many process such as insert, eliminate, or transform DNA in a genome.

The CRISPR-Cas9 technology is one of the gene-editing-technology that longer provide the possibility of making significant improvements over other gene-editing-technologies4. That technology was described, easy to ably, efficacy, speed, also inexpensive5. the CRISPR-Cas9 technology have proven, it provide Revolutionary developments in the diagnosis, treatment and prevention of several diseases6.

Definition and description of CRISPR-Cas9 technology

The CRISPR-Cas9 technology is one of a gene editing-technologies, its uses mixture of the enzyme called “a nuclease-Cas9 enzyme “ to facilitate cuts DNA,
and (guide-RNA) a guide piece of the genetic material to indicate a position in the genome. Usually, the guide RNA has been target and bind to the special-DNA-sequence, while an attached-Cas9 enzyme works on cleave both DNA strands at that location, that slash could be used to inserts, removes, or edits the DNA-sequence. After that a slash is repaired and the changes have been integrated, (Show fig1). CRISPR/Cas9 technology is derived from the adaptive immunity of *Streptococcus pyogenes* bacterium, where Cas9-nuclease enzyme was mediated antiphage action recognition to its mixture with clustered frequently interspaced to CRISPR-loci that is a short palindromic repeats. That loci is short consist of 30–40 bp repetitive sequences and also intercalates with the spacing sequences match a virus genome. And a CRISPR-loci has been transcribed to the long RNA that consequently has been cleaved via “CRISPR-associated endo-ribonucleases” Known a Cas9 to liberate small CRISPR-RNAs (crRNAs). And the crRNAs after that in cooperation with tracrRNA form a Cas-RNA complex which recognize the target DNA and profits for cleaving it; in general, four strategies has been utilized for “double-strand break repair include geneknockout ordisruption, “gene deletion via NHEJ way”, “gene correction”, & “gene knock-in/insertion via HDR way”.

The initial appliance of the CRISPR-Cas9 coordination acts correspondingly to the immune systems in macroorganisms. After a bacterial or archaeal cell infected by virus, the fragment of the DNA viral categorization is incorporated into the CRISPR region in the bacteria. Immune response to CRISPR–Cas9 and the presence of preexisting antibodies against Cas9 (a protein) could be a significant hurdle especially for *in vivo* gene editing. It is highly desirable to exercise more rigorous assessment of possible immunological responses to the microbial origin of the system. However, delivery of RNP complexes and codon optimization may hold the key to overcome such hurdles. The CRISPR/Cas9 technology have been proven effective in establishing a gene KO or knockdout that known knockin in human cells and is predominantly valuable for editing stimulated pluripotent stem cells or (iPSCs). Despite that advances, several the ethical, technical & biological researches limiting about utilization that technology in analysis and treatment of common diseases.

![Fig. 1: “What Is CRISPR-Cas9?”](http://www.yourgenome.org/facts/what-is-crispr-cas9)
Compensations or Advantage of CRISPR Cas-9 technology: The genome editing system of CRISPR Cas-9 gives many benefits concluded the nuclease enzyme of zinc finger and transcription activator like effector nuclease in human iPSCs, and also stem cells of somatic origin.

Several synthesizing primers essential to be designated for expending this technique, since its specificity is associated only to ribo-nucleotide multifaceted development. Additional, these system is further economical, low cost for plasmid-mediated of that system. Another uses as the wildest presently obtain able technique of gene editing, it is using of these system can characteristically be achieved in present time. The CRISPR/Cas9 technology have been established to be valuable & effective for an editing various human cells. Recently, researchers have been reveal a higher editing capability of the transcription-activator-like-effector-nuclease in human stem cells is more efficiency about 79%, of using for editing human iPSCs. Furthermore, CRISPR/Cas9 also utilizing to monitor DNA noncoding sequences for recognizing regulatory elements to understand how a genetic variation were associated with cause the many of human diseases. In this context, Fulco et al. recognized nine distal enhancers, and their target-gene via CRISPRRi and Also the CRISPR/Cas9 have been utilize to set up DNA changes in the noncoding locations, and established a association between transcriptional function and intronic SNPs in PHACTR1 gene in that location. Where there is another concern was raise with CRISPR/Cas9 technology relates to editing efficiency sgRNAs. induce Cas9-mediated DSB. by the side of favorite target position, a DSB. induces “DNA-repair by HDR. way”, conversely, the alternative-”DNA-repair-mechanism-NHEJ.” be able to induce at low frequencies, giving rise to unpredictable events of diminutive insertions & deletions.

Application of CRISPR-Cas9 technology in treatment of the human common diseases: The previous scientists were able to create “alternative-cell-models” via induced pluripotent stem cell (iPSC), for monitoring the molecular mechanisms of several diseases including cardiovascular disease, in the context of CRISPR/Cas9 system has been provide a straight forward mechanism for elucidating how cells mishandled via allowing with reversing of a causal mutation to the disease. A Previous study of Wang et al. showed that persons with usually happening loss of the function mutation or what is called with “proprotein convertase subtilisin/kexin type 9” abbreviated as PCSK9., they had lower of serum LDLC concentration, and thus edition of the “PCSK9.gene via CRISPR/Cas9technology” was a hopefully therapeutic board to avoidance of the cardiovascular disorder. While the study of Xie, et al. indicated that utilized the CRISPR/Cas9technology in the postnatal mice to correct the mutation that cause to PRKAG2 cardiac syndrome, while the study of Ma et al. utilized a CRISPR/Cas9 technology for correction a pathogenic mutation, in the MYBPC3 gene that causes hypertrophic cardiomyopathy in human embryos.

1. The diabetes mellitus disease: The “California Institute for Regenerative Medicine (CIRM)” awarded a scholarship to the scientists. who work in the “Children’s Hospital Los Angeles”, they have been utilized the CRISPR-Cas9 technology for developing the modified approach to treat a genetic variations of the diabetic disease (for example Type I diabetes mellitus) via replacement the insulin producing cells in diabetic patients, and scientists suppose that the technique may also ultimately suggest treatment for non autoimmune diabetic disease (for example Type II diabetes mellitus)30,31. These study’s findings were indicated that utilization of the “patient’s own cells” reduced risks of the transplant rejection, also the patients wouldn’t be dependent on a limited availability of external donors.

2. The respiratory diseases: The DF508 mutation have been recognized in (CFTR) is one respiratory disease and its recognized in nineteen percent of patients with a cystic fibrosis, and previous study indicated that improvement of the DF508mutation in pluripotent stem cell (iPCS) by the use of “CRISPR/ Cas9-mediated HDR” way to treat CFTR disease. In same the context, The “Alpha-1 Antitrypsin Deficiency (AATD)” that cause a type of respiratory disorder that corrected by utilization of CRISPR/ Cas9technology by way of the NHEJ, mediated gene-disruption & the HDR. based precise gene-correction.

3. The hematologic diseases: Recently, the researchers have been utilized CRISPR/Cas9 technology to treatment the sickle cell disease (SCD) via two strategies: correction the mutation that cause sickle cell and stimulation the fetal hemoglobin (HbF) expression. In 2018 FDA established the submission of two bio-technology establishments—CRISPR
and Vertex for an investigational management with gene therapy for (SCD).

The new Method of treatment by using system of CRISPR-Cas9 for modification of stem cells that separated from blood of patients and then rein-fused for production of F Hb. The advanced intensities of F Hb are predictable to stabilize the pain that caused by the mutation of sickle cell. In the gene correction technique have been used the hematopoietic stem cells that derivative from the SCD patients & also corrected the Ex. Vivo. by the use of CRISPR/Cas9technology, after that transplanted into the SCD patients.

The study of Canver et al. indicated that the BCL11A” is a transcriptional controller which serve as a strong Hb F silencer & suppress to expression of cglobin, So this is suppression of BCL11A. could be utilized to treatment both beta-thalassemia & sickle cell anemia, while the study of Liu et al. indicated via utilization of the CRISPR/Cas9system, the beta-thalassemia causing mutation in patients derivative induced pluripotent stem cells (iPSCs) could be corrected & after that transplants a corrected iPSCs into that same patient . Also by the CRISPR/Cas9-mediated HDR have utilized to correction a mutation in patient with haemophilia-B. Majority a strict haemophilia-A were resulted via large-chromosomal inversions (600 or 140 kb) within coagulation Factor VIII (F8), & correction of those inversions in the patient-derived-iPSCs were created by the transfer of RNP-complex of Cas9, & a couple of sgRNAs for targeting two dissimilar locations for stimulating rein version of those mutations.

5. The severe combined immunodeficiency disease:
Currently, the study of Chang et al. indicated that using the “CRISPR/Cas9-mediated HDR approach” able to correction a point mutation at “the exon14 of JAK3gene” in patient-derived iPSC for treating severe combined immunodeficiency. Also the study of De Ravin et al. indicated Patient-derived iPSC of “the X-linked chronic granulomatous-disease-X-CGD- patients” that cause by a point mutation at the CYBB gene, could be corrected via “CRISPR/Cas9-mediated HDR approach” and after that, transplants into the same patient. The Knockout of miR-155 is imperative pro-inflammatory controller in the rheumatoid arthritis disease, via CRISPR/CAS9 technology have been revealed that the inhibition of pro-inflammatory-cytokine creation in “macrophage cell line” & presented a optimistic therapeutic strategy to treatment of arthritis disease.

6. The neurological diseases: This is a comparatively new and more advanced technology of gene editing but there are several setbacks: first being the host genome itself, and Targets to modify may have enough sequence resemblance (similarity) with other part of genome that leads to unintended cuts in host genome. Thus, undesired mutations are generated, which may affect overall health and even survival of host organism adversely. In vivo delivery is another limiting factor. Crossing blood–brain barrier is an utmost challenge for components of this gene-editing technology.

There is two strategies have been done designed for gene therapy to treat the progressive degenerative neurological disorder, include: “deletion of pathogenic mutations and targeted gene correction”. The CRISPR/Cas9technology could be ably for targeting deletion of the CAG repeats via the sgRNA/Cas9collection which flank this domain and creation a DSBs that consequently stimulate “non-homologous end joining (NHEJ) process” and also the “(deletion of open-reading-frame of HTT)” could reduced mutant-huntingtin-masses. Also the previous studies indicated that “Friedreich Ataxia and Amyotrophic lateral sclerosis (ALS)” were another disease which have targeted via CRISPR/Cas9technology.

The Malaria Disease: This is mosquito infected human and other animals, one of the greatest pervasive and mortal disease in the biosphere. Operative revision, decrease, or dismissal of the Anopheles mosquito is initial route for communication of the malaria can significantly condense expenditures also opened up original way for commercial occasions in domain’s unfortunate nations.

CRISPR-Cas-9 permitted attitudes that including use of driving genes in a improved gene being differently approved to children. This powerfulness proposal a incomes by which all Anopheles mosquitos might be prepared sterile. Also consequence in all young male. If effective, these methodologies will, considerably diminish or-even perhaps eliminate the populace being embattled. Additional method of CRISPR Cas-9 permitted attitude pursues for making the Anopheles mosquito impervious to the malaria.
7. **The Resistance for antibiotics:** Conferring to the center of disease control and prevention about two million of persons are infested yearly with microorganisms (bacteria) was appear resistance for antibiotics, also about thirty two thousands of individuals will decease or die every year and the consequence of such contaminations. The new system of CRISPR/Cas9 had been revealed to successfully board and reduce of bacteria with different types, as well as the strains of bacteria that have resistance to antibiotics from a public of microorganisms. This accurate training permits removal of injurious of bacteria, but circumvents positive of bacteria. Furthermore, unlike old-fashioned or customary of antibiotics will be challenging for the bacteria to progression their resistances to the CRISPR -based antimicrobials since such as the resistance will probable destroys defense of the bacteria, permit to reviewers and researchers of the major problem to improvement of CRISPR-based antimicrobials are categorizing an efficient provision way.

**Conclusion:**

1. Genome-editing-technology is very important technique that empowers productions of the genetically-modified-cells & organisms beings important to clarify gene role and human diseases mechanisms, And CRISPR/Cas9 system is one of Genome-editing-technology has been utilized for correcting DNA mutations that ranging from only single-base-pair into large deletion in the model systems of in vitro. & in vivo.

2. This “CRISPR–Cas9 technology” uses a “ribonucleic acid (RNA)-guided deoxyribonucleic acid (DNA) endonuclease”, Cas9, which induces “double-strand breaks (DSBs)” at target location, the DSBs. corrected by the use of a variety of cellular DNA-repair systems leading to changes in target sites, that technology have proven to be effective to investigation, prevention, and treatment of diseases.

3. The CRISPR-Cas9 technology has been quickly become a one of mainly important systems for genome-editing during essential biomedical investigate due to its adaptability & simplicity.

4. The CRISPR Cas-9 technology have been given several benefits that accomplished the “zinc finger enzyme nuclease & transcription activator-like effector nuclease in human pluripotent stem cells & stem cells of somatic origin”

5. Recently, researchers have been reveal a higher editing capability of the “transcription-activator-like-effector-nuclease” in human stem cells is more efficiency about 79%, of using for editing human iPSCs. Furthermore, CRISPR/Cas9 also utilized to monitor DNA noncoding sequences for recognizing the regulatory fundamentals to acknowledgment how the genetic variation were associated with cause the many of human diseases.

6. The CRISPR/Cas9 technology relates to editing efficiency “sgRNAs induce Cas9- mediated DSB” at favorite target position, “DSBs induces DNA-repair by HDRway”; conversely, an alternatives “DNA-repair mechanism NHEJ” be able to induce at low frequencies, giving rise to unpredictable events of diminutive insertions & deletions.

7. Several recent studies have made clear importance of the CRISPR-Cas9 technology for the diagnosis and treatment to the many common diseases.

**Acknowledgements:** Not applicable.

**Funding:** None, Self-financing source

**Availability of data and materials:** Not applicable.

**Ethics approval and consent to participate:** Not applicable.

**Patient consent for publication:** Not applicable.

**Competing Interests:** All the authors declare that they have no competing interests.

**References**


Purification and Characterization of Thermo Stable DNase of Staphylococcus Aureus Isolated from Different Clinical Source

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Abstract

Hundred samples were collected from different clinical source. Sixty isolates were identified as Staphylococcus aureus. The ability of S. aureus to produce DNase was examined phenotypically on DNase agar medium and also by quantitative assay that revealed only 37(66%) of S. aureus were able to produce the enzyme. DNase was extracted, the crude activity and specific activity was 38 (U/ml) and 253.3(U/mg) respectively. The enzyme purified by precipitating with ammonium sulphate at (65-85 %) saturation then by using ion exchange chromatography in CM cellulose and gel filtration by using Sephadex G150. Purified DNase activity and specific activity was 42 (U/ml) and 4200(U/mg) respectively. The optimum PH for DNase was found to be 8 while the enzyme was stable at wide range of pH (8, 9 and 10) with remaining activity 100%, 90%, 86% respectively. The optimum temperature for DNase was 37 ºC while the stability was also at 37 ºC. Results indicate that DNase activity increased when the enzyme was incubated with 10 mM of each MnCl₂, KCl, NaCl, MgCl₂, and CaCl₂. The molecular weight of DNase was done by gel filtration and found to be approximately 19KDa.

Keywords: Purification, thermo stable DNase, Staphylococcus aureus.

Introduction

Staphylococcus aureus is a Gram-positive bacterium living as a commensal on the skin, mouth and upper respiratory system, making it a risk factor for opportunistic and nosocomial infections (1). This group of microorganisms has various virulence factors subscribe to the ability of S. aureus to cause infection enzymes, cell-surface proteins, toxins, factors that assistance in avoiding the innate immune defense (2). One of the distinguishing characteristics of S. aureus is its ability to produce a wide variety of exoenzymes (3).

Among these exoenzymes, nuclease (EC 3.1.31.1) which was originally identified in 1956 by Cunningham and was named such as micrococcal nuclease, thermonuclease, deoxyribonuclease and DNase, and hereafter we will refer to the enzyme as DNase due to its ease of purification (4, 5).

Nucleases are very important enzymes belonging to the group of hydrolases that degrade nucleic acids (6). Staphylococcal nuclease catalyzes the hydrolysis of both DNA and RNA at the 5’ position of the phosphodiester bond yielding a free 5’-hydroxyl group and a 3’-phosphate monoester. The pH optimum is between 8.6 and 10.3 and varies inversely with Ca²⁺ concentration, but at any pH rather high levels of Ca, typically 1.1 M, are required for optimal activity (7).

A remarkable tolerance to prolonged heating and storage is exhibited by staphylococcal nuclease in foods and broth, and its presence is closely related with the occurrence of enterotoxins in food poisoning outbreaks(8). The gene encoding for staphylococcal nuclease (nuc) has also been widely used as a specific marker for the detection of S. aureus in various types of food and clinical samples (9, 10).

Materials and Method

Isolation of bacteria: From 100 samples of different clinical sources (60) isolates primary diagnosed as S. aureus depending on cultural morphological and biochemical test. These characteristics include; colonial morphology, size of colony, ability to ferment mannitol. Bacterial isolates were examined and identified by
microscopic, biochemical test and Vitek2 system characteristics (11).

**Phenotypic detection of thermo stable DNase:** Sixty isolates of *S. aureus* and were cultured by streaking on DNase agar and incubate at 35°C for 18-24 hr.(12, 13)

**The quantitative assay thermo stable DNase:** All *S. aureus* isolates were cultured in nutrient broth overnight in a concentration comparable to McFarland standard no. 0.5. Afterward, then centrifuged at 8000 ×g for 15 min. The supernatant was taken, boiled for 15 min and cooled down at 4 °C. Afterward, 50µl of supernatant was poured in wells punched in DNase agar and incubated overnight. A zone of pink or rose color around the well indicated a positive result; which were measured by an aid of metric ruler (14).

**Extraction thermo stable DNase:** The method described by Ohsaka et al. (15) was followed with some modifications for the purification of DNase. The isolate; which developed the largest zone of clearance on DNase agar, was cultured in 100 ml of nutrient broth at 32 °C for 24 hr. on a rotary shaker at 100 rpm. Subsequently, supernatant was obtained, heated in boiling water for 15 min then cooled.

**Purification of thermo stable DNase:** The crude DNase was subjected to different steps of purification including ammonium sulphate (NH₄)₂SO₄ precipitation, dialysis, CM- cellulose ion-exchange chromatography and gel filtration by using gradient elution buffer.

**Thermo stable DNase Assay:** *Pseudomonas aeruginosa* DNA was extracted by Presto™ Mini gDNA Bacteria Kit (Geneaid Corporation\ Korea). A volume of 2.5 µl of the sample was incubated with 7.5 µl E. coli DNA (1 mg/ml) and 40 µl DNase buffer (0.01 M CaCl₂, 0.1 M Tris HCl; pH 8) for 60 min at 37°C. The nuclease reaction was stopped with 12.5 µl of 0.33 M EDTA (pH 8.0). One unit of activity was expressed as change in absorbance at 260nm (15, 16).

**Characterization of thermo stable DNase**

**Determination of optimum pH for DNase activity and stability:** The effect of pH on the purified DNase activity was done by adding the enzyme solution (0.1 ml) to one ml of (0.1M) Tris-HCl buffer at different pH values (5 to 11) and the activity was determined by performing the standard assay procedure. While the pH effect on DNase stability was done using Equal volumes of purified enzyme solution was reacted with different pH buffers range from (5 to 11) was incubated at a room temperature for 30 min. The enzymatic activity for each one was measured (17).

**Determination of optimum temperature for DNase activity and stability:** The DNase activity was measured at different temperatures (20, 37, 40, 60, 80 and 100 °C). The remaining activity was plotted against the temperature. While for thermal stability, equal volumes of purified alkaline phosphatase was incubated in water bath at (30, 40, 50, 60, 70, 80, 90, and 100 °C) for 30min., and immediately transferred into an ice bath. Enzymatic activity was measured and the remaining activity (%) was plotted against the temperature (17).

**Determination of various metal ions effects on DNase activity:** The enzyme was incubated with an equal volume of different metal ions MnCl₂, KCl, NaCl MgCl₂ and CaCl₂, at a concentration of 10mM/mL at 37 °C for 30 minutes. The enzyme activity was assayed for each treatment. The control was the enzyme solution without any of these compounds. The remaining activity was assayed for each treatment.

**Molecular weight determination for DNase:** Molecular weight was determined by gel filtration technique using the column Sephadex G-150 with dimensions 1.5 × 80 cm. The column was calibrated with Lysozyme (14KDa), carbonic anhydrase (29,000), albumin (66 KDa) and alcohol dehydrogenase (150,000). Dextran blue (2,000,000) was used to determine the void volume (18).

**Results and Discussion**

**Isolation and Identification of taphylococcus aureus:** From 100 samples from different clinical sources 60 isolates were primary diagnosing as *S. aureus* depending on biochemical, morphological and cultural characteristics. These samples were collected from different sources such as wound, urine, burn, wound, blood, stool, and sputum and nose table 1. These samples were collected from many hospitals in Baghdad. All colonies from primary culture were purified by subculture on blood agar and then re inoculated on Mannitol Salt Agar at 37 °C for 24 hr (19).
Table 1: Percentage of Staph aureus with difference Source infection

<table>
<thead>
<tr>
<th>Sources of isolation</th>
<th>Number of samples</th>
<th>S.aureus Percentages %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urine</td>
<td>20</td>
<td>33</td>
</tr>
<tr>
<td>Burns</td>
<td>10</td>
<td>17</td>
</tr>
<tr>
<td>Wounds</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>Blood</td>
<td>8</td>
<td>13</td>
</tr>
<tr>
<td>Stool</td>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td>Sputum</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Nose</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>

Phenotypic detection of thermo stable DNase:
Sixty isolates of S. aureus isolates were cultured by streaking on DNase agar. Results showed that 56(93%) of S. aureus isolates gave positive result on DNase agar by changing the color from blue to pink or rose color while only 4 (7%) of S. aureus were non producer figure 1.

The quantitative assay thermo stable nuclease:
The quantitative assay was done for fifty six isolates of S. aureus. Result revealed that only 37(66%) of S. aureus were able to produce thermo stable nuclease while 19 (34%) were non producer. Staphylococcus aureus 43 was chosen for DNase extraction since that it accomplished the highest zone of clearance on DNase agar figure 1.

Extraction of the enzyme: Supernatant of this S. aureus 43 c was boiled to achieve the inhibition of other enzymes activities and remaining bacterial cell. Tang et al., (20) indicated that the nucleases secreted by strains still showed functional activity after 30 min at 121°C. The crude DNase activity and specific activity was 38 U/ml and 253.3 U/mg respectively.

Purification of the enzyme: After extraction, the supernatant was taken for (65-85%) ammonium sulphate precipitation. The DNase activity and specific activity was (31U/ml) and (606 U/mg) protein respectively. The sample was subjected to CM cellulose column by linear gradient of NaCl (0.1–1 M). The results showed four peaks in wash step, only the first peak of them showed DNase activity (29 U/ml) in fraction numbered 22 to 27 while the last three peaks had no DNase activity thus it was neglected. The fifth protein peak with 0.3M of NaCl at fraction numbered 71 to 78 showed the highest DNase activity reached to 49 U/ml figure 2. Ibraheem and Al-Mathkhury., (16) reported that the specific activity of DNase extracted from Staphylococcus aureus was 241.920 U/mg.

Further purification carried out by a gel filtration using Sephadex G150. Enzymic fractions from CM-cellulose were pooled and passed through gel filtration column. The fractionation yielded one protein peaks as absorbance reading at 280nm. DNase activity was (42U/ml), protein concentration (0.01mg/ml) with specific activity (4200U/mg) and the purification fold was (16.5) with yield of enzyme (46.4%) as mentioned in figure 2 and table 2.
Characterization of thermo stable DNase:

Determination of optimum pH for DNase activity and stability: The optimal pH for S. aureus DNase activity was found to be at pH= 8. However, DNase of S. aureus was still active over a wide range (6 to 9) of pH values. DNase activity decreased at pH (5, 11, and 12) figure 3 A. Abdel-Gany, (21) reported that the pH optima of DNase from human, pig, bovine, rabbit, rat and mouse were ranged from 6.5 to 7.0.

PH stability for DNase activity: The purified enzyme was incubated at different pH values for 30 min at 37 °C. DNase of S. aureus was stable in a wide range of pH (8, 9 and 10) with remaining activity 100%, 90%, 86% respectively figure 3 B.

Effect of temperature on DNase activity: The effect of temperature on DNase activity was examined by performing the enzyme assay at various temperature ranging from 20°C to 100, Purified DNase from S. aureus showed the highest activity at 37 °C with enzyme activity (42 U/ml figure 3 C. Each enzyme has an optimum pH at which the rate of the reaction that it catalyzes is at its maximum. Small deviations in pH from the optimum value lead to decreasing the activity due to changes in the ionization of groups at the active site of the enzyme, while larger deviations in pH lead to the denaturation of the enzyme protein itself due to interference with many weak non covalent bonds, maintaining its three dimensional structure (22).

Effect of temperature on DNase stability: Thermo stability of DNase was examined by pre incubation of pure enzyme in different temperatures (30–100°C) for 30mins and then the remaining activity was determined after assaying enzyme activity.

The maximum stability of DNase was observed to be at 37 with remaining activity 100% figure 3 D.
It has been reported that salt bridges play an important role in the high temperature tolerance of the protein. There are more salt bridges in thermophilic proteins (23).

**Effect of metal ions on DNase activity:** Results in table 3 illustrate that DNase activity increased when the enzyme was incubated with 10 mM of each MnCl₂, KCl, NaCl, MgCl₂, and CaCl₂, which gave a higher enzyme activity. DNase I activity is 100-fold lower in buffers that contain only one type of divalent cation compared to a Ca²⁺/Mg²⁺ reaction mixture, without any divalent cations, DNase I activity is almost negligible (24).

![Figure 3: A- Effect of PH on Enzyme Activity; B- Effect of PH on Enzyme stability; C- Effect of Temperature on Enzyme Activity; D- Effect of Temperature on Enzyme stability](image)

**Table 3: Metal ions effect on DNase activity**

<table>
<thead>
<tr>
<th>Metal ion</th>
<th>Remaining activity (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MnCl₂</td>
<td>107</td>
</tr>
<tr>
<td>KCl</td>
<td>112</td>
</tr>
<tr>
<td>NaCl</td>
<td>119</td>
</tr>
<tr>
<td>MgCl₂</td>
<td>126</td>
</tr>
<tr>
<td>CaCl₂</td>
<td>129</td>
</tr>
</tbody>
</table>

**Determination of molecular weight for DNase:**

The molecular weight was estimated by gel filtration according to the logarithm molecular weight and elution volume/void volume (Ve/Vo), the molecular weight for S. aureus DNase found to be 19 KDa. Ibraheem and Al-Mathkhury (16) stated that the molecular weight of purified DNase extracted from *Staphylococcus aureus* was 16.8 kDa by using SDS gel electrophoresis, while DNase purified from streptomycyes by gel filtration was 19.9 kDa (25).

**Ethic Statement:** The researchers already have ethical clearance from all required institution and laboratories.

**Source of Funding:** Self fund.

**Conflict of Interest:** No conflict of interest

**References**


Laparoscopic Sleeve Gastrectomy, with or without Staple Line Reinforcement

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Abstract

Background: Overweight and obesity are defined as abnormal or excessive fat accumulation that presents a risk to health. A crude population measure of obesity is the body mass index. The surgical treatment of morbid obesity is termed bariatric surgery, Laparoscopic sleeve gastrectomy first described by Gagner. Specific complications have been reported, including staple-line bleeding and staple-line leaks. Staple line reinforcement is extensively debated and highly recommended by most surgeons in an attempt to reduce postoperative complication.

Aim of the Study: To compare the early complication of sleeve gastrectomy with or without staple line reinforcement by over-sewing.

Patients and Method: Prospective study from 1st January 2013 to 31st January 2015, four or five ports used according to surgeon preference but all of them used graduated cartridge size, some of them used to re-inforce the staple line by Prolin or Vicryl and others did not. The patient was follow up for one month after surgery by direct contact with the surgical team.

Conclusion: there was no statistically difference in the incidence of leak or bleeding in cases of sleeve gastrectomy with or without staple–line reinforcement by over sewing.

Keyword: Laparoscopic sleeve gastrectomy; Leak; Bleeding; staple line reinforcement.

Introduction

Overweight and obesity are defined as abnormal or excessive fat accumulation that presents a risk to health. A crude population measure of obesity is the body mass index (BMI), a person’s weight (in kilograms) divided by the square of his or her height (in meters). A person with a BMI of 30 or more is generally considered obese. A person with a BMI equal to or more than 25 is considered overweight(1).

The overweight and obesity are major risk factors for a number of chronic diseases, including diabetes, cardiovascular diseases and cancer. Once considered a problem only in high income countries, overweight and obesity are now dramatically on the rise in low- and middle-income countries, particularly in urban settings(2).

The surgical treatment of morbid obesity is termed bariatric surgery. It had its origin in the 1950s, when mal-absorptive operation were first performed for sever hyperlipidemia syndromes (jejuno-ileal bypass), this operation, however produced unacceptable metabolic complication (3).

Table 1: The World Health Organization classification of obesity by body mass index as

<table>
<thead>
<tr>
<th>Classification</th>
<th>BM (Kg/m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal range</td>
<td>18.5-24.9</td>
</tr>
<tr>
<td>Pre-obese</td>
<td>25.0-29.9</td>
</tr>
<tr>
<td>Obese class I</td>
<td>30.0-34.9</td>
</tr>
<tr>
<td>Obese class II</td>
<td>35.0-39.9</td>
</tr>
<tr>
<td>Obese class III</td>
<td>=&gt; 40</td>
</tr>
</tbody>
</table>

Laparoscopic sleeve gastrectomy (LSG), first described by Gagner(4) in 2003, has become a well standardized therapeutic option for the surgical treatment
of different degrees of obesity\(^5\). Since its introduction, LSG has gained acceptance due to its technical simplicity and the convincing outcomes \(^6\). While specific complications have been reported, including staple-line bleeding and staple-line leaks are the most serious as they are associated with the greatest morbidity. The incidence of this type of leak after LSG varies in different series\(^4\) and its management has been attempted using several different therapeutic approaches\(^7\).

Gastric leaks can be due to mechanical or ischemic causes. According to Baker \textit{et al}\(^8\) a leak caused by stapler misfiring, usually appear within 2 day of surgery, compared to the “ischemic causes” that usually appear on day 5-6 post operatively and can be caused by improper vascularization due to an aggressive dissection especially of the posterior attachments of the upper sleeve, thermal injuries to the gastric tube by ultrasonic devices (harmonic),and Ligature can cause a leak which seen after the first week post-operative \(^9\).

A leak can be proximal at the gastro esophageal junction or distally at the lower end of the sleeve\(^10\).

Patients with distal stenosis are more likely to have proximal leaks, because of gastric emptying impairment leading to increased intraluminal pressure and decreased compliance of the gastric tube \(^11\).

Staple line reinforcement (SLR) is extensively debated and highly recommended by most surgeons in an attempt to reduce postoperative complication\(^12, 13, 14, 15\). Staple line reinforcement (SLR) is not well standardized and involves different options; over-sewing of the staple line\(^16\) application of buttressing biological material\(^17\).

To date, many studies have investigated the safety and efficacy of SLR. The results of these studies however remain inconsistent rather than conclusive \(^18\).

Since the subject has some debate, we plan to compare the early complication of sleeve gastrectomy with or without staple line reinforcement by over-sewing.

Patients and Method

Prospective study, conducted in Baghdad Teaching Hospital and Dijlah Private Hospital for the period from 1st January 2013 to 31st January 2015.

Patients with morbid obesity whom subjected to sleeve gastrectomy by different surgeon, four or five ports used according to surgeon preference but all of them used graduated cartridge size, the larger one used in the antrum of the stomach and the smaller size cartridge for the body and fundus. Some of them used to re-inforce the staple line by Prolin or Vicryl no. (2.0) and others did not. All of them used bougie size 36 Fr.

Patient who are smoker or diabetic or hypertensive were excluded, since diabetes mellitus and hypertension may interfere with wound healing and bleeding profile.

The patient was followed up for one month after surgery by direct contact with the surgical team. The early complication was recorded namely: the leak and bleeding. Patients with postoperative bleeding some of them manifested early as blood discharge via the drain and other presented later as hematoma demonstrated by imaging study.

Regarding postoperative leak most of them presented after one week with tachycardia, vomiting, tachypnea, shoulder pain and elevated WBC count. The presence of leak demonstrated by C.T scan with oral contrast. (one Patient with hematoma turned to be a leak in this study). The non-surgical complication (such as respiratory and cardiovascular, etc...) were excluded. The factors that may affect the rate of complications such as: age, gender, BMI and the reinforcement of stapler line also recorded.

The data were analyzed using the available software packages of Statistical Packages for Social Sciences-Version 22 (SPSS-22) and presented in simple measures of frequency, percentage, and range (minimum-maximum).

Chi-square test was used to calculate the significance of difference between proportions. P value of equal or less than 0.05 was considered as the level of statistical significance.

Results

During the three years of the study, 120 patients were included, 33 male and 87 female (male to female ratio 1:2.6). The ages of patients ranged from 18 to 50 years, 30.8% of the patients were older than 40 years (table 2).
The BMI of our patients ranged from 40 to 63 KG/m\(^2\), most of them (74 patients) with BMI less than 50 KG/m\(^2\) (table 3).

Regarding the complication rate, three patients out of 57 patients whom their gastric sleeve stapler line was reinforced by over sewing developed a leak proved by contrast study. While in patients without reinforcement, a leak was documented in two patients out of 63 there was no statistical significance difference between the two (table no 3). Regarding the bleeding rate one patient out of 57 patients with SLR and two patients out of 63 patients without SLR, there was no statistical significance difference between the two groups (table 4).

In attempt to further analyze the difference in complication rates between the subgroups of age, gender and BMI, the complications distributed according to these subgroups as shown in table 5 and table 6.

Regarding the leak in relation to age groups, we found leak in three patients with reinforcement all of them were above 40 years old, other two patients without reinforcement who were younger in age as shown in table 5, but because of the small number of complication, no statistical test could be applied in this subgroup.

Regarding the relation between the bleeding and the BMI of the patients, we found bleeding in two patients with BMI more than 55 KG/m\(^2\) and one bleeding with BMI less than 55 KG/m\(^2\) (table 6) but because of the small number of complication, no statistical test could be applied in this subgroup.
### Table 5: The leakage complication distribution of the studied sample by type of operation according to difference variables

<table>
<thead>
<tr>
<th>Age (Years)</th>
<th>Operation type</th>
<th>With reinforcement</th>
<th>Without</th>
<th>Leakage</th>
<th>No</th>
<th>Leakage</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Leakage</td>
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<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20</td>
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<td>4</td>
<td>-</td>
<td>3</td>
<td></td>
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<tr>
<td>20---24</td>
<td>-</td>
<td>10</td>
<td>-</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25---29</td>
<td>-</td>
<td>8</td>
<td>1</td>
<td>12</td>
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<td></td>
<td></td>
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<tr>
<td>30---34</td>
<td>-</td>
<td>8</td>
<td>1</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>35---39</td>
<td>-</td>
<td>8</td>
<td>-</td>
<td>7</td>
<td></td>
<td></td>
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<tr>
<td>=&gt;40</td>
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<td>16</td>
<td>-</td>
<td>18</td>
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</table>

**Gender**

<table>
<thead>
<tr>
<th>Gender</th>
<th>Operation type</th>
<th>With reinforcement</th>
<th>Without</th>
<th>Leakage</th>
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<tr>
<td>Male</td>
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<td>2</td>
<td>13</td>
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<td>Female</td>
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<td>37</td>
<td>-</td>
<td>48</td>
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</table>

**BMI (Kg/m²)**

<table>
<thead>
<tr>
<th>BMI (Kg/m²)</th>
<th>Operation type</th>
<th>With reinforcement</th>
<th>Without</th>
<th>Leakage</th>
<th>No</th>
<th>Leakage</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>40---44.9</td>
<td>-</td>
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<td>1</td>
<td>19</td>
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<tr>
<td>45---49.9</td>
<td>1</td>
<td>23</td>
<td>1</td>
<td>17</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>50---54.9</td>
<td>1</td>
<td>14</td>
<td>-</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>=&gt;55</td>
<td>1</td>
<td>5</td>
<td>-</td>
<td>12</td>
<td></td>
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</tr>
</tbody>
</table>

Due to small no of complication in the above subgroups there was no statistical method applicable to compare between them.

### Table 6: The bleeding complication distribution of the studied sample by type of operation according to difference variables

<table>
<thead>
<tr>
<th>Age (Years)</th>
<th>Operation type</th>
<th>With reinforcement</th>
<th>Without</th>
<th>Bleeding</th>
<th>No</th>
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</tr>
</thead>
<tbody>
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</tr>
<tr>
<td>&lt;20</td>
<td>-</td>
<td>4</td>
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<tr>
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<td>-</td>
<td>9</td>
<td></td>
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</tr>
<tr>
<td>25---29</td>
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<td>8</td>
<td>1</td>
<td>12</td>
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</tr>
<tr>
<td>30---34</td>
<td>-</td>
<td>8</td>
<td>-</td>
<td>13</td>
<td></td>
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<tr>
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<td>7</td>
<td>-</td>
<td>7</td>
<td></td>
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</tr>
<tr>
<td>=&gt;40</td>
<td>-</td>
<td>19</td>
<td>1</td>
<td>17</td>
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</table>

**Gender**

<table>
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<tr>
<th>Gender</th>
<th>Operation type</th>
<th>With reinforcement</th>
<th>Without</th>
<th>Bleeding</th>
<th>No</th>
<th>Bleeding</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>1</td>
<td>17</td>
<td>1</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Female</td>
<td>-</td>
<td>39</td>
<td>1</td>
<td>47</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**BMI (Kg/m²)**

<table>
<thead>
<tr>
<th>BMI (Kg/m²)</th>
<th>Operation type</th>
<th>With reinforcement</th>
<th>Without</th>
<th>Bleeding</th>
<th>No</th>
<th>Bleeding</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>40---44.9</td>
<td>-</td>
<td>12</td>
<td>-</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45---49.9</td>
<td>-</td>
<td>24</td>
<td>-</td>
<td>18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50---54.9</td>
<td>-</td>
<td>15</td>
<td>1</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>=&gt;55</td>
<td>1</td>
<td>5</td>
<td>1</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Due to small no of complication in the above subgroups there was no statistical method applicable to compare between them.

**Discussion**

Laparoscopic sleeve gastrectomy is increasingly applied as a promising stand-alone operation in bariatric surgery for its satisfactory effect on weight loss and decreased operative risk (19, 20). The most common and severe complications following LSG are staple line...
leak and bleeding that all surgeons want to avoid (20,21). Staple line reinforcement is strongly advocated to prevent these adverse events, although there’s no high-grade evidence in the literature for its need during LSG (22,23,24). According to the survey on LSG at the Fourth international consensus summit on Sleeve gastrectomy, 75% surgeons chooses to perform SLR (25). Among them, 57% of them use buttressing materials and 43% oversew the staple line.

In this study which included 120 patients (57 patients with SLR and 63 patients without) are compared to other studies, Stefano D’Ugo et al (26), Italy 1162 patients (973 patients with SLR and 189 patients without), Jean knapps et al (27), USA 4830 patients (3342 patients with reinforcement and 1488 patients without), Gill RS et al (28), Canada 116 patients all of them with SLR and Kasalicky M et al (29), Czech 61 patients all of them without SLR.

This study was conducted in two hospital involving four surgeons but Stefano D’Ugo et al and Jean Knapps et al studies were multicenter studies, while Gill et al and Kasalicky et al studies were isolated individually each of them in one center.

Regarding the age, the mean age in this study was more than 40 years that is comparable to Stefano D’Ugo et al (mean age = 43.7 years) and Gill Rs et al (mean age = 44 years) studies.

Regarding to the male to female ratio, in this study the ratio was (1:2.6) that is nearly comparable to the studies of Stefano D’Ugo et al (1:2.5) and Jean Knapps et al (1:3) and Kasalicky M et al (1:2.3) this reflect the fact that obesity are more common in female and the female are more interested about their body shape.

Regarding to BMI, in this study the majority of BMI (35%) was 45-49.9 kg/m2, that is comparable to Stefano D’Ugo et al (mean BMI = 48 kg/m2) and Gill Rs et al (mean BMI = 44.7 kg/m2).

Regarding the percentage of sleeve gastrectomy with or without SLR, in this study was 47.5% with SLR and 52.5% without, that’s different from other studies in which the percentage of sleeve gastrectomy with SLR more than without as in the study of Stefano D’Ugo et al (83.5% with SLR and 16.5% without) and the study of Jean Knapps et al (69% with SLR and 31% without).

Regarding to leak rate, in this study the leak was identified in three cases out of 57 patients with SLR (5.3%) and two cases out of 63 patients without (3.2%), while in the study of Stefano D’Ugo et al the overall rate of leak was 2.8% with SLR and 4.8% without, that’s versus result of this study in related to percentage but both of them statistically non significant among the difference between staple line with or without reinforcement, in the study of Jean Knapps et al the leak rate was 3.9% in SLR and 3.2% without reinforcement which comparable to this study, while in the study of Gill Rs et al there was no leak out of 116 patients all of them with SLR also in the study of Kasalicky M et al there was no leak out of 61 cases all of them without SLR, in all study above there are no statistically difference in both technique of gastric sleeve about the leak complication.

Regarding the post operative bleeding in this study one case out of 57 cases with SLR had bleeding (1.8%), while two cases out of 63 cases without SLR developed bleeding (3.2%) in compare to Stefano D’Ugo et al study the bleeding rate was 3%, with a higher frequency being observed without SLR which comparable to this study, while in the Gill Rs et al study bleeding occurred just in one case (0.9%) out of 116 cases all of them with SLR and his conclusive that SLR in sleeve gastrectomy limits postoperative bleeding in contrast to Kasalicky M et al study which show no case of bleeding out of 61 cases all of them without SLR, conclusively no significant difference between two technique.

We triad in this study to further evaluating the effect of Age and BMI on complication rate as shown in table (5,6) but Due to small no of complication in the subgroups there was no statistical method applicable to compare between them.

**Conclusion**

There was no statistically difference in the incidence of leak or bleeding in cases of laparoscopic sleeve gastrectomy with or without staple – line reinforcement by over sewing.

**Declarations:** Conflict of Interest the authors declare that there are no potential conflicts of interest related to the study.

**Source of Funding:** Nil

**Ethical Clearance:** This research has exemption as it a routine treatment (no new materials were used).
References


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Mood Disorders and How They are Related to Death Anxiety for Some Infirmaries in Baghdad

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Abstract

The subject of mood disorders and death anxiety in the elderly is considered one of the topics that have been addressed only slightly and in limited ways in relation to general trends and psychological research in other subjects in terms of quality and quantity. As well as if there is a statistically significant effect of sex variables, the sample of the study consisted of all the elderly who were able to respond to the researcher, which amounted to (110) elderly people, including (65) males and (45) females. We collected demographic information about the elderly, as well as translating the mood disorders scale, as well as the arithmetic averages, percentages, deviations and the Pearson correlation coefficient were used. To reach the results of the study, a number of results were reached. The suffering of elderly people living in nursing homes in the capital, Baghdad, from a high level of mood disorders. The suffering of the elderly residing in the nursing homes of the capital, Baghdad, from a moderate feeling in the level of death anxiety. There are statistically significant differences at the level of (0.05) between the elderly on the measures of mood disorders and death anxiety that are related to the gender variable and return to the benefit of females. There is no statistically significant relationship between mood disorders and death anxiety among the study sample.

Keywords: Death anxiety, Mood disorders, infirmaries, Baghdad.

Introduction

The subject of mood disorders and death anxiety in the elderly is considered one of the topics that have been addressed only sparingly - to the best of the researcher’s knowledge - and in limited ways, and it can be said since the late last century that the phenomenon of aging has become one of the essential axes within the field of modern psychological research and its topic has attracted greater attention among Researchers since ever since this stage carries the characteristics and components of the life stages that preceded it¹. It is not a coincidence that the issue of the elderly takes center stage in the interests of scholars, because each of us humans is getting old, and with age, changes in his daily life undergo changes, some of which are biological, some are social, and some are psychological, so the individual turns into a battlefield In it the different forces and he has to reconcile between them and the more he succeeds in that, his psychological life proceeds together and balanced, and the more the opposite is realized by despair and despair, and he develops a sense of dispersed self that prepares him for a life full of turmoil and the result of that is either mental or psychological disorder³. Among the stable facts is that mood disorders and the opposing symptoms that accompany them, such as depression or mania, or both, are considered among the common disorders of the age and perhaps more prevalent for the elderly, as the individual among them feels that he lives in an age that he does not understand and differs from the era in which he lived and that this feeling leads By his lack of adaptation to the new era, which may affect his outlook on life by changing his mood³. Mood disorders are disorders that result from failed attempts to resolve unconscious emotional crises, and that this failure to adapt leads to the accumulation of feelings of tension and anxiety in the individual, and we may find that these disorders are associated with anxiety disorder, which is a common symptom ⁴ of mental disorders and takes several types, including normal or objective anxiety, and anxiety Chronic acute and condition anxiety and trait anxiety ......... etc.

Among the types of anxiety that the elderly are
subjected to in their lives is the so-called death anxiety. This type of anxiety is a state of intellectual disturbance - mood in front of the imminent danger to the body and raises more questions and contradictory problems due to the privacy imposed on the human being required by the laws of nature, and the elderly by their nature live An unconscious state of dying phobia, which causes them to have tremendous anxiety and causes a paradoxical disturbance in their behavior. Despite the importance of this approach in diagnosis and treatment, it receives sufficient attention from Arab and Muslim researchers.

For this reason, many researchers have unanimously agreed that anxiety about death is the basis of psychological disorder, which is the origin of mental illness. Rather, some of them have argued that the situation differs in different moods, for example that the person with a bloody mood is longer than the bile and the phlegmatic than the melancholy and believes that many individuals Moody people have thoughts about death, which isn’t surprising as Beck thinks, because of their emotional state.

In light of the aforementioned, we can visualize a relationship between mood disorders and death anxiety as psychological ailments that the elderly suffer from, and with this we will be preparing for the beginning of the general basis on which this study will generally be conducted, which aims in general to know the level of these two disorders and ensure the existence of the relationship between them and the extent to which they are affected by the personal characteristics of the elderly. And, for that, we decided to conduct a field psychological study based on methodological foundations to investigate the truth about these two disorders among this segment of society and residents of some nursing homes for elderly people in Baghdad.

Problems of the study: Demographic statistics indicate, through the researcher’s briefing of studies and literature in the field of aging, that the current century will witness an increase in the number of elderly people in societies and nations as a result of the progress of human medicine and the improvement of living conditions. A hundred million people are believed to form (14%) of the world’s population.

The elderly, as a result of the sensitivity of the age stage in which they are going through, and the accompanying general psychological tension and mood disturbance due to physiological changes and deficiencies in mental functions, we find that they suffer from some psychological disorders.

Hence, we chose two types of these disorders, the first of which is mood disorders (affective), which affect the elderly in a large way. Death, the importance of which is evident in its effect on the individual’s psychological and physical health, it is expected that the older he approaches the end of life, he becomes more anxious about death.

It is worth noting that the researcher, through his review of the studies and literature of the subject of the research, found that most of them focused on studying one of the two variables without the other and neglected the connection between them, and this is what made us look to the problematic of our current study by examining the relationship between these two disorders.

Research Objectives:
1. Identifying mood disorders and death anxiety in some elderly homes in Baghdad.
2. Knowing the relationship between mood disorders and death anxiety in some elderly homes in Baghdad.
3. Detecting the level of mood disorders and death anxiety in the elderly, which are useful in judging whether was the level of these disorders moderate or did they reach a level that would pose a threat to the health of the elderly.

Hypothesis:
1. Most elderly people living in nursing homes have a high level of mood disorders
2. Most elderly people in nursing homes suffer from a high level of death anxiety
3. There is a significant relationship between mood disorders and death anxiety in the sample

1-5 Limits:
1. Human limits: the infirm and elderly in care homes
2. Place limits: the role of the elderly in Baghdad governorate

Terminology:

Mood disorders: This is a disorder that includes alternating symptoms of euphoria, euphoria and hyperactivity mental and physical illness, and darkness
and mental and physical dullness, and based on that the
definition the theoretical concept of mood disorders in
this study is a mental or sensory state experienced by
the individual in mood swings that oscillate between acute
euphoria (obsession) and severe sadness (depression).

**Death anxiety:** It is defined as a type of generalized
anxiety that is not worsening or free and that centers
around issues related to death and dying in a person or
his family.

**Section Three:**

**Research methodology and field procedures**

**Methodology**

The method used in this study is the descriptive
approach, since the majority of researchers are
unanimous in considering it an approach that aims to
describe the phenomenon under study, diagnose it, shed
light on its various aspects and collect the necessary data
on it with understanding and analysis in order to reach
the principles and laws related to the phenomena of life.

It also depends on the study of the phenomenon as
it is in reality as an accurate description and expresses it
in a qualitative and quantitative expression, and it is still
the most used in human studies so far.

In order to determine whether there is a relationship
between two or more quantifiable variables, expressed
by the correlation coefficient, the researcher will use
the descriptive-correlative approach to determine the
relationship between the study variables.

We can notice from the above table that the members
of the study sample are distributed as follows:

<table>
<thead>
<tr>
<th>Infirmary</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al- Sulaikh Infirmary</td>
<td>57</td>
<td>0</td>
<td>57</td>
</tr>
<tr>
<td>Al- Rashad Infirmary</td>
<td>0</td>
<td>42</td>
<td>42</td>
</tr>
<tr>
<td>Al- Kadhimyia Infirmary</td>
<td>8</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>65</strong></td>
<td><strong>45</strong></td>
<td><strong>110</strong></td>
</tr>
</tbody>
</table>

We can notice from the above table that the members
of the study sample are distributed as follows:

The number of elderly people in the Al-Sulaikh care
home reached (57) males, while the number of people
residing in the Rashad care home was (42) females,
while the Kadhimiya care home reached (11) individuals

**Research instruments:**

**Mood disorder scale test:** This scale consists of
(18) items distributed on two axes: mood rate, and this
axis includes the following items (2, 4, 6, 8, 10, 11, 13,
15, 16) and the intensity of the reaction towards postures
and includes the following items, 3, 5, 7, 9, 12, 14, 17, 18)
and this measure was applied.

- Validity of the scale
- Stability of scale

**Death anxiety scale:**

- Validity of the scale
- Stability of scale

**The statistical means used**

Frequency and percentages to describe the personal
characteristics of the study sample

- Calculating arithmetic averages to find out how
  similar the behavior of the sample members is, as
  well as calculating the standard deviation to know
  the nature of the sample members and their harmony.
- $\chi^2$ calculation for classification of mood disorders
  and death anxiety.
- Pearson correlation coefficient to study the
  relationship between mood disorders and death
  anxiety.

**Results Preview and Discussion**

This chapter aims to present the results as produced
by the statistical treatments of the data obtained after
applying the two measures to the studied sample, and
the main purpose of the study was to reveal the extent
of the relationship of mood disorders with death anxiety in the elderly in nursing homes for elderly people in the capital, Baghdad, with knowledge of their average levels and ended. The study is to discuss and try to answer the proposed hypotheses, which are as follows:

**Results of the first hypothesis:** The majority of elderly people residing in nursing homes suffer from a high level of mood disorders.

To answer this hypothesis, and after using some statistical method, the level of mood disorder among elderly sample members in elderly care homes in the capital Baghdad was determined, and the difference in levels was extracted by calculating:

\[
\chi^2 = (x^2 = 32.58) \text{ in a free degree (02) in the indication level of (0.01) and the following table clarify that.}
\]

<table>
<thead>
<tr>
<th>The scale</th>
<th>Repetition</th>
<th>Percentage</th>
<th>Term</th>
<th>Level</th>
<th>(\chi^2)</th>
<th>Free degree</th>
<th>Indication level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mood disorders</td>
<td>10</td>
<td>9.1%</td>
<td>18.48</td>
<td>Low</td>
<td>32.85</td>
<td>2</td>
<td>Indicates in level 0.01</td>
</tr>
<tr>
<td></td>
<td>42</td>
<td>38.2%</td>
<td>48.1_78</td>
<td>Medium</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>58</td>
<td>52.7%</td>
<td>78.1_108</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>110</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

It is evident from the above table that the majority of the sample members obtained a high level of mood disorder where the frequency of (58) members of the study sample (110 = N) was at this level, and depending on the criteria adopted in this study, their frequency falls within the range (87.1_108) Therefore, the level of mood disorders of the subjects of the study was classified as high and close to the average, and as the table shows, (52.7%) of the study sample individuals represented this level of mood disorders, while it had (38.2%) The sample members had a medium level of disorders, and only (9.1%) of them had a low level of mood disorders and at a level of significance (0.01).

**The second hypothesis results:**

Most of elderly who live in the infirmaries are suffering from death anxiety

The table shows the distribution of the sample members according to levels on the death anxiety scale.

<table>
<thead>
<tr>
<th>Scale</th>
<th>Repetition</th>
<th>Percentage</th>
<th>Term</th>
<th>Level</th>
<th>(\chi^2)</th>
<th>Free degree</th>
<th>Indication level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death anxiety</td>
<td>16</td>
<td>14.5%</td>
<td>0.6</td>
<td>Low</td>
<td>39.29</td>
<td>2</td>
<td>Not indicated</td>
</tr>
<tr>
<td></td>
<td>67</td>
<td>60.9%</td>
<td>7.14</td>
<td>Medium</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>27</td>
<td>24.5%</td>
<td>15.20</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>110</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The results of the current study do not support this hypothesis, when determining levels of death anxiety counts.

\[
\chi^2 = (39.29 \_2X) \text{ and the degree of freedom (02) at a level of significance (0.01) for the study sample. It appeared that the majority of the individuals suffer from a moderate level of death anxiety, and this means that the result did not obtain the statistical significance as it was the repeat of (67) individuals out of a total The sample members (N=110) have this level of anxiety and that this level falls within the range (7_14). Therefore, the level of death anxiety was classified on the anxiety scale as medium. Death anxiety while (24.5%) of them represented the high level of death anxiety and only (14.5%) of them had the low level of death anxiety.}

It is possible that the scale used in this study includes items with clear negativity, which made the respondents’ answers unrealistic, and also perhaps due to the fact that some elderly people lived through the death cases that occurred in recent days, which made them not care about death and are not afraid of it to a great extent. It remains for us to note that correlational relationships Between the total degree of death anxiety and the scores on the paths of death anxiety was a function of all domains,
and for both genders, the highest correlation was (0.64) between the total degree of death anxiety and the degree on the field of pain and suffering, and the relationship was significant at the level (0.01).

**Third Hypothesis Results:** There is a significant relationship between mood disorders and death anxiety among the sample of elderly people residing in hospice homes in the capital, Baghdad. This hypothesis was not supported, which is considered a major hypothesis in our current study. Mood and death anxiety are weak and the correlation value was (0.06) according to the following table for the value of the correlation coefficient.

<table>
<thead>
<tr>
<th>Mood disorders</th>
<th>Death anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mood disorders Pearson correlation Sig(2-tailed)</td>
<td>1.00</td>
</tr>
<tr>
<td>N</td>
<td>110</td>
</tr>
<tr>
<td>Death anxiety Pearson correlation Sig(2-tailed)</td>
<td>0.06</td>
</tr>
<tr>
<td>N</td>
<td>110</td>
</tr>
</tbody>
</table>

Explains the link between mood disorders and death anxiety and notes the relationship It is (0.06), and it is a non-statistically significant relationship

This result needs a lot of reflection in order to find an appropriate explanation for it, because the psychological heritage related to mood disorder contains important signals that push towards the expectation of a high rate of disturbance, and at the same time, some studies related to death anxiety showed that whatever increases the individual’s life, the fear of death becomes more. Urgent, comprehensive, and continuous, hence it was expected that the two variables correlation among the sample members would be statistically significant.

And if we try to explain the lack of the relationship, it may be due to a number of reasons, including the size of the studied sample, which was small in this study, which affected the lack of a statistically related relationship between these two variables, in addition to the inaccuracy in choosing the subjects who suffer from high psychological disorders because the choice came randomly.

**Conclusions and Recommendations**

1. The suffering of the elderly living in nursing homes in the capital, Baghdad, from a high level of mood disorders.
2. The suffering of the elderly residing in the nursing homes of the capital, Baghdad, from a moderate feeling of anxiety in death.
3. The results show that mood disorders and death anxiety were found in females and males.
4. The necessity of conducting new studies dealing with the variables of the current study, whether each of them is taken separately or with other variables, in order to make more sure of the results of this study.
5. It is better to use multiple method of measurement and not to be satisfied with one method for each variable. Perhaps it is possible to use more positive measurement method.
6. Developing programs to help workers in care homes understand psychological disorders and general anxiety, including in particular death anxiety.
7. The necessity for individuals to be educated to respect and appreciate the elderly as a humanitarian duty and imposed on us by our religious and Islamic human values.
8. Establishing a network of social contacts and emotional support for the elderly internally and externally, such as establishing and improving their relationships within the care homes themselves.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under The General Directorate of DhiQar Education and all experiments were carried out in accordance with approved guidelines.
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Emotional Intelligence among Undergraduate Medical Students at University of Baghdad

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Abstract

Objectives: The study aims to assess the level of emotional intelligence among undergraduate medical students and to identify the relationship between the level of emotional intelligence and some demographic variables of the students such as: academic year, gender, residency, and monthly income.

Methodology: A descriptive, cross-sectional design that is initiated for the period of January 1st to May 1st, 2018 on a sample consisted of (200) students which was selected by convenient sampling method from four medical colleges at University of Baghdad that are: College of medicine, college of dental medicine, college of pharmacy, and college of nursing. The used questionnaire is divided into two parts; one of them contains the demographic variable of the students and the other one deals with the Scale of Emotional Intelligence (EIS). The data have been collected through the utilization of the self-administrative report as a mean of data collection and analyzed by application of statistical package for social science IBM SPSS (v. 24).

Results: The result revealed that student are showing moderate level of emotional intelligence (63.5%). A relationship was detected between students’ gender and his emotional intelligence, while there are no significant relationships between emotional intelligence and academic year, residency, and monthly income.

Conclusions: The study concluded that students at medical colleges group are emotionally stable and emotionally intelligent. There is difference in gender of students with regard to emotional intelligence.

Recommendations: The study recommended for conducting future related studies with various variables and re-conducting the study on a large sample and different specialties is necessary.

Keywords: Emotional Intelligence, Medical Students.

Introduction

Emotional Intelligence (EI), also called as “Emotional Quotient (EQ)”, is one of the most important issues that psychology professionals are concerned with. EI is defined as “the person’s capability to make sense, control, and react according to their emotions”\(^{(1)}\). Originally, emotional intelligence was recognized as rooted in the concept of social intelligence\(^{(2,3,4)}\). More recent, studies provided evidence that the two concepts really defined interrelated components of the same construct\(^{(3)}\). Next, this wide construct was accurately referred to as “emotional-social intelligence”\(^{(5)}\). Emotional intelligence refers to the human ability of emotional functioning that includes: recognizing, remembering, describing, identifying learning, and feeling, using, communicating, managing, understanding and explaining emotions\(^{(6)}\). This emotional information guides in thinking and behavior\(^{(7)}\).

Emotional intelligence has an important role in individuals’ life and success which is considered as the ability of individuals to manage their emotions and feelings\(^{(8)}\). Recently, emotional intelligence has become wide spread and applied in various fields such as: career, education, and personal development\(^{(9,10)}\).

All over the world, individuals are experiencing various emotional experiences, some of them positive and the other negative such as: love, affection, spite and hatred, sadness and happiness, anger and fear, etc. all of these emotional experiences have important role in persons’ life because it affect the mental health. Emotional experiences that have been felt by persons...
are the outcomes of assessing the information which include cognitive or received information processing environment, body, memory, to be given for reacting to special practices and conceive action and result that could be received from emotional mode \(^{(11)}\).

The individuals that develop their emotional intelligence can become productive and successful at what they do, and they can help others to become more productive and successful also\(^{(12)}\).

It is helpful to evaluate emotional intelligence within organization\(^{(13)}\). It is expected that undergraduate medical students to be emotionally stable, empathetic to patients, good in advising and counselling the distressed relatives, and a good relations manager with leadership\(^{(14)}\).

Recently, the world emotional intelligence is started getting associated with medical profession \(^{(15)}\). Emotional intelligence is related to characteristics of the students and their performance at medical colleges, to that a little researches have been conducted. Precisely to state that emotional intelligence help the individual to use his/her capacities, or skills by which he/she can manage themselves, their life, works and other\(^{(16)}\).

Focusing on medical professions, especially nursing and medicine are related with a lot of social demands and stress. Hence, the students in these fields need to cope with various stressors of workload and burden from clinical practices during their education\(^{(17)}\). These coping abilities require a good mental health. Therefore, the researcher is focusing on the assessment of emotional intelligence as moderator for mental health and to provide a knowledge base for the future researches in this field.

**Objectives of the Study:** The present study aims to assess the level of emotional intelligence among undergraduate medical students as moderator to mental health and to identify the relationship between the level of emotional intelligence and some demographic variables of the students such as: academic year, gender, residency, and monthly income.

**Methodology**

A cross-sectional descriptive study which is started from the January 1\(^{st}\) to May 1\(^{st}\), 2018; an assessment approach was used to achieve the earlier stated objectives.

The ethical consideration was obtained from the Research Ethical Committee at College of Nursing in Baghdad University. In addition, informed written consent was took from the students for participation in research.

Another permission was asked from the Deanship of medical colleges involved in current study to facilitates the researcher task in meeting the students.

Four medical colleges at Baghdad university were included in the study which are: College of Medicine, College of Dentist Medicine, College of Pharmacy, and College of Nursing.

A 200 undergraduate medical students were chosen as (non-probability sample) who are studying at the medical colleges, i.e in this sampling method, the students were selected purposively. (50) students were selected for the sample representation from each college. According to Soper\(^{(18)}\), so that the anticipated effect size of 0.15 of the sample size, statistical power level of 0.80, and a probability level of 0.05; all were achieved the minimum required sample size would be 54.

The questionnaire study is designed by researcher and was divided into two parts; one part contains the demographic variable of the students whivh are: college, gender, residence, and monthly income; the other part is contains the Emotional Intelligence Scale (EIS).

EIS was adopted\(^{(19)}\) and used for the current study. EIS is consisted of (41) items that cover the emotional intelligence components which represented by four domains in the scale that are: empathy (represented by items 1 – 12), emotion regulation (represented by items 13 – 22), interpersonal relationship management (represented by items 23 – 33), and self-management (represented by items 34 – 41). Each item in the scale was rated into five Likert scale and scored as follow: always (5), almost (4), sometimes (3), rarely (2), Never (1), except the items numbered 16, 18, 20, 21, 22, 36, 37, 38, 40, and 41 that have reverse scores. The emotional intelligence level was calculated by estimating the cut off points of the total mean of scores & for the scale which is rated into three levels and scores as follow: low= 41 – 95, moderate= 96 – 150, and high= 151 – 205.

The original validity for EIS was estimated by content validity method through seven experts in educational psychology which met the acceptance degree of (80%) for the scale items. The original reliability of EIS was achieved by application of Alpha Correlation...
Coefficient and through method of internal consistency, the reliability results were accepted for all domains of the scale (r= 0.79, 0.82, 0.70, and 0.74). (19)

The self-administrative report was used for data collection. The questionnaire was distributed after taking the permission from the participants.

Results

Table 1: Distribution of Sample according to their Demographic Characteristics

<table>
<thead>
<tr>
<th>No.</th>
<th>Characteristics</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Academic year:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>First</td>
<td>16</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>42</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Third</td>
<td>53</td>
<td>26.5</td>
</tr>
<tr>
<td></td>
<td>Fourth</td>
<td>89</td>
<td>44.5</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>Gender:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>61</td>
<td>30.5</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>139</td>
<td>69.5</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>Residency:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Upper class neighborhood</td>
<td>107</td>
<td>53.5</td>
</tr>
<tr>
<td></td>
<td>Low class neighborhood</td>
<td>93</td>
<td>46.5</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>Monthly income:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Insufficient</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Barely sufficient</td>
<td>48</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Sufficient</td>
<td>146</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>200</td>
<td>100</td>
</tr>
</tbody>
</table>

No: Number, f: Frequency, %” Percentage

The analysis of the above table is the following: (44.5%) of the students are from fourth academic years, who are female students (69.5%). Regarding residence variable, the finding shows that more than half of the students are resident in upper class neighborhood (53.5%). The monthly income variable indicates that more of the students report sufficient monthly income (73%).

Table 2: Emotional Intelligence levels among the Students (N=200)

<table>
<thead>
<tr>
<th>Emotional Intelligence</th>
<th>Levels</th>
<th>f</th>
<th>%</th>
<th>M.S</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empathy*</td>
<td>Low</td>
<td>4</td>
<td>2</td>
<td>2.80</td>
<td>.448</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>32</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>164</td>
<td>82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotion Regulation**</td>
<td>Low</td>
<td>71</td>
<td>35.5</td>
<td>1.73</td>
<td>.607</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>112</td>
<td>56</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>17</td>
<td>8.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The above table shows that the students have moderate level of emotional intelligence (overall: moderate=63.5%). Regarding the domains of emotional intelligence, they show high empathy (82%), moderate emotional regulation (56%), high interpersonal relationship management (81%), and moderate self-management (85%).

Table 3: Significant Difference is noticed between Emotional Intelligence of the students and Academic Year (N=200).

<table>
<thead>
<tr>
<th>Academic year</th>
<th>Low</th>
<th>Moderate</th>
<th>High</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>0</td>
<td>10</td>
<td>6</td>
<td>16</td>
</tr>
<tr>
<td>Second</td>
<td>0</td>
<td>29</td>
<td>13</td>
<td>42</td>
</tr>
<tr>
<td>Third</td>
<td>0</td>
<td>33</td>
<td>20</td>
<td>53</td>
</tr>
<tr>
<td>Fourth</td>
<td>0</td>
<td>55</td>
<td>34</td>
<td>89</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>127</td>
<td>73</td>
<td>200</td>
</tr>
</tbody>
</table>

χ²obs. = 2.753 df = 5 χ²crit. = 3.453 P = 0.738

df: Degree of freedom, P: Probability level (P-value ≤ 0.05)
χ²obs.: Calculated Chi-square, χ²crit.: Tabulated Chi-square

The above table shows that there is no significant relationship between emotional intelligence among students and their academic year at p-value ≤ 0.05.

Table 4: Significant Difference between Emotional Intelligence and Students’ Gender (N=200)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Low</th>
<th>Moderate</th>
<th>High</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>0</td>
<td>45</td>
<td>16</td>
<td>61</td>
</tr>
<tr>
<td>Female</td>
<td>0</td>
<td>82</td>
<td>57</td>
<td>139</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>127</td>
<td>73</td>
<td>200</td>
</tr>
</tbody>
</table>

χ²obs. = 3.994 df = 1 χ²crit. = 3.82 P = 0.046

df: Degree of freedom, P: (P-value ≤ 0.05)
χ²obs.: Chi-square(Calculated), χ²crit.: Chi-square (Tabulated)
The above table demonstrates that there is significant relationship between emotional intelligence among students with their gender at p-value ≤ 0.05.

**Table 5: Significant Difference is noticed between Emotional Intelligence and Residency of the Students (N=200)**

<table>
<thead>
<tr>
<th>Residency</th>
<th>Emotional intelligence</th>
<th>Low</th>
<th>Moderate</th>
<th>High</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper class neighborhood</td>
<td></td>
<td>0</td>
<td>64</td>
<td>43</td>
<td>107</td>
</tr>
<tr>
<td>Low class neighborhood</td>
<td></td>
<td>0</td>
<td>63</td>
<td>30</td>
<td>93</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>0</td>
<td>127</td>
<td>73</td>
<td>200</td>
</tr>
</tbody>
</table>

χ²obs. = 1.350 df = 1 χ²crit. = 1.029 P = 0.245

df: Degree of freedom, P: (P-value ≤ 0.05)
χ²obs. : Chi-square (Calculated), χ²crit.: Chi-square (Tabulated)

The above table indicates that there is no significant relationship between emotional intelligence among students with their residence at p-value ≤ 0.05.

**Table 6: Significant Difference between Emotional Intelligence and Monthly Income of the Students (N=200)**

<table>
<thead>
<tr>
<th>Income</th>
<th>Emotional intelligence</th>
<th>Low</th>
<th>Moderate</th>
<th>High</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insufficient</td>
<td></td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Barely sufficient</td>
<td></td>
<td>0</td>
<td>33</td>
<td>15</td>
<td>48</td>
</tr>
<tr>
<td>Sufficient</td>
<td></td>
<td>0</td>
<td>92</td>
<td>54</td>
<td>146</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>0</td>
<td>127</td>
<td>73</td>
<td>200</td>
</tr>
</tbody>
</table>

χ²obs. = 2.942 df = 4 χ²crit. = 2.840 P = 0.230

df: Degree of freedom, P: Probability level (P-value ≤ 0.05)
χ²obs. : Chi-square (Calculated), χ²crit.: Chi-square (Tabulated)

The above table shows that there is no significant relationship between emotional intelligence among students with their monthly income at p-value ≤ 0.05.

**Discussion**

The analysis of findings in table (1) presented that students were females in fourth academic year who resident in upper class neighborhood with sufficient monthly income. The finding related to academic year may refer that the students in other classes are busy in the schedule of practical training. So, most of their presence is in the areas of clinical training which contribute that more of the sample is in the fourth academic year. The gender-related finding which indicates that most of the students are females may be attributed to the large number of females that registered in medical colleges in which the last statistics about University of Baghdad for the years (2017) and (2018) refers that the number of females students are exceeds the number of male students (20). Regarding residency and monthly income results, the researcher sees that high income families often have better chances for obtaining good education for their sons and daughters, considering that medical colleges group is the highest among other colleges in Iraq. On the other hand, the registration in these colleges requires more costs to meet the requirement of the study. A study found close finding for this study that medical students are associated with average socio-economic status (21).

It has been known out of table (2) that students showing moderate level of emotional intelligence as indicated by the overall score; the emotional intelligence sub-domains refer that the students are highly empathetic and management for interpersonal relationship, while they showing moderate emotional regulation and self-management. The finding of emotional intelligence may
indicate that students have an emotional maturity and stability that enable them to manage their relationship, evaluate and regulate their emotions. Such finding is depict with the researcher’s hypothesis that students at medical colleges having good emotional intelligence. The researcher believes that this emotional maturity is developed among students based on many factors, one of the more important is the nature of the study in these colleges that characterized by their scientific and qualitative content of curriculum that include submission of the students to training and educational programs which requires the student to have personality traits enable him to deal with faculties, other students, and even patients in the clinical area. A study found supportive evidence for this study that found Ozlu et al. who reports that students are showing moderate level of emotional intelligence (22). Many studies also revealed that students who are studying at colleges of health care specialties are showing high scores of emotional intelligence than others (23 and 24).

Table (3) indicated that the relationship between emotional intelligence and academic year among the students is not significant. This finding may reveal that students among all classes of academic years have the same emotional stability and the emotional intelligence has not influenced by students’ age group which may be closed with no apparent differences. The current study finding was controversy to many study results such a study that found emotional intelligence is related to academic year and professional success (25).

The finding in table (4) revealed that there is significant relationship between gender and emotional intelligence. Many studies have shown differences in the emotional intelligence between males and females, in which more of these studies reported that females have high emotional intelligence scores (26, 27, and 28).

In table (5 and 6), no significant relationship have been reported between emotional intelligence with regard to residency and monthly income. Such finding may indicate that most of the students are living in upper class neighborhood and associated with sufficient monthly income. A study found supportive evidence that found those who associated with high socio-economic status having more emotional intelligence (29).

**Conclusions**

1. Students at medical colleges group are emotionally stable evidenced by moderate level of emotional intelligence that they show.
2. There is significant relationship between emotional intelligence and gender of students; females are showing high emotional intelligence than males.

**Recommendations:**

1. Conducting future related studies with various variables such as academic performance, mental health, and social skills.
2. Re-conducting the study on a large sample and different specialties is necessary.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Ministry of Health and all experiments were carried out in accordance with approved guidelines.

**References**

University of Tankabon, Iran. 2009.


Effects of Bullying on Pupil’s Self Esteem in Al-Basra Primary Schools

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Abstract

Background: Bullying is a worldwide issue that can be seen in any school; it is not limited to one type of public, private, primary or secondary, urban or rural institution and, as a result, brings anxiety, decreased school absenteeism, academic school performance, and can even contribute to the suicide of bullying victims.

Aim: To examine Effects of Bullying on Pupil’s Self Esteem in Al-Basra primary schools.

Methodology: Non-probability (purpose) sample of 300 primary school students Systemic randomly selected from a total of 400 schools in Basra Governorate in Al Basra City Center was diagnosed as victims by administrators and teachers from a sample of 40 primary schools.

Results: The findings indicate that the level of bullying towards primary school students was high and the level of self-esteem was low. There is a negative statistically association between bullying and self-esteem, which means that self-esteem has declined as bullying has increased.

Conclusion: There is a negative association between self-esteem and bullying. A highly statistically significant relationship exists between the self-esteem of the students and their gender and grade. A non-significant relationship exists between the self-esteem of the learners and their age.

Keywords: Bullying, Self Esteem, Pupil’s, primary schools.

Introduction

Bullying refers to the use of force, coercion, or danger to intimidate, abuse, or aggressively control others. Usually, the conduct is repetitive and habitual. Bullying is one of the prevalent phenomena among children and can manifest itself in different ways, such as rejection, pushing, calling for names, hitting, or chattering. The presence of children as either victims or bullies in the act of bullying has a significant impact on their wellbeing. (1) Bullying in schools is also a concern that is still attracting support from academics, teachers, parents, and students. Despite the widespread belief that bullying is a natural part of adolescence and includes mild teasing and abuse, scientists are increasingly finding that bullying is an issue that can affect the well-being of students. (2) Victims are at greater risk, like, depression, anxiety disorders, and psychotic symptoms, of potential poor physical health, low self-esteem, and psychological issues. Bullies later in life have more behavioral problems and weaker emotional adjustment. Besides, children who are not interested in bullying appear to be fewer effective in school than bullies, and victims appear. (3) A universal concern is an aggressiveness in classrooms. (4) During childhood and adolescence, bullying and victimization reflect various forms of participation in violent circumstances. Bullying is a form of reinforcement of interpersonal dominance by violence. Victimization implies violent actions carried out by a more powerful person against a less powerful individual. Bullying and victimization may have adverse consequences on all affected people in the short and long term: aggressors, victims, and observers. (5) Greater levels of anxiety, fear, depression, physical, isolation, and mental symptoms, and low self-esteem are presented by those who are victims of bullying, and male students who have bullied exhibit depressive personality.
traits and physical weakness\(^6\). There are biological variances in boys and girls, some investigators have indicated, in that girls are biologically predisposed to value friendships; thus, that is the arena in which they can express their emotions \(^7\).

**Objectives:**

1. To measure the level of violence against pupils in primary school.
2. To determine the level of self-esteem of bullying students among victims.
3. To investigate the effects of bullying on the victim’s pupils’ self-esteem.
4. To evaluate the relationship between the students ‘self-esteem of victims and their socio-demographic characteristics of age, gender, level of parent education, occupation of parents.

**Methodology**

**Design:** A descriptive design cross-sectional study was carried out at the Al- Basra Primary Schools from the period of the 29th November 2019 to the 1st July 2020.

**Setting:** The study was carried out at Al- Basra Governorate; Al Basra City Center, whereas, the researcher selected 40 primary schools randomly from a total 400 schools.

**Sample of the Study:** Non-probability purposive sample of 300 students in primary schools Precisely 5th and 6th grade both gender diagnosed as victims by the administers and teachers.

**Study Instrument:** After intensive analysis of available literature and related research, the questionnaire was designed. The instrument of analysis consists of three parts.

The first section covers the demographic characteristics of age; gender; grade level; family type; family arrangement of students; educational level of father and mother; occupation of father and mother.

The second section relates to the victim bullying scale, consisting of 21 items with either yes or no responses.

The third element consists of 14 things with a response (agree, not insure and disagree) relevant to the self-esteem scale; it is adapted from the scale of the World Health Organization to assess self-esteem.

**Statistical Data Analysis:** The results of the study were analyzed and assessed using the “Statistical Package for Social Sciences program” (SPSS, Version 23). The researcher used descriptive statistics tools such as frequency, percentage, mean of score and used in inferential statistics such as Chi-Square.

**Results**

**Table 1:** The overall level of bullying among students who have been victims

<table>
<thead>
<tr>
<th>Bullying</th>
<th>Freq.</th>
<th>Percent.</th>
<th>“M.S”</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weak</td>
<td>77</td>
<td>25.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strong</td>
<td>223</td>
<td>74.3%</td>
<td>0.61</td>
<td>S</td>
</tr>
<tr>
<td>Total</td>
<td>300</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The results show that the overall level of bullying among students who have been victims is strong, at mean of score more than 0.5

**Table 2:** The Level of Self- Esteem Among the Victim Students

<table>
<thead>
<tr>
<th>Self-esteem</th>
<th>f</th>
<th>%</th>
<th>M.S</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>186</td>
<td>62%</td>
<td>1.62</td>
<td>L</td>
</tr>
<tr>
<td>Moderate</td>
<td>114</td>
<td>38%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>300</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The results indicate that the study subjects’ self-esteem is low level.

**Table 3:** Show Effect of Bullying Upon Self Esteem

<table>
<thead>
<tr>
<th>Items</th>
<th>R</th>
<th>R^2</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self esteem</td>
<td>_0.415</td>
<td>0.17</td>
<td>0.012</td>
</tr>
<tr>
<td>Bullying</td>
<td>-</td>
<td>0.17</td>
<td>0.012</td>
</tr>
</tbody>
</table>

(p-value ≥ 0.05)

The study results indicate that “there is a negative regression between the bullying and self-esteem”, this indicate that, when the bullying increased the self-esteem decreased.
Table 4: The Relationship Between Students’ Self-Esteem and Their Demographic Characteristics

<table>
<thead>
<tr>
<th>Demographic Data</th>
<th>Self-Esteem</th>
<th>Chi-Sq.</th>
<th>D. F</th>
<th>Level of Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rating</td>
<td>Low</td>
<td>Moderate</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>0</td>
<td>1</td>
<td></td>
<td>15.035</td>
</tr>
<tr>
<td>10</td>
<td>22</td>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>79</td>
<td>29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>57</td>
<td>45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>16</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>10</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>2</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>107</td>
<td>42</td>
<td></td>
<td>11.478</td>
</tr>
<tr>
<td>Female</td>
<td>80</td>
<td>72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fifth Primary</td>
<td>120</td>
<td>50</td>
<td></td>
<td>12.282</td>
</tr>
<tr>
<td>Sixth Primary</td>
<td>66</td>
<td>64</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This table shows that there is a “non-significant relationship between the students’ self-esteem and their age. While, there is a high significant relationship between the students’ self-esteem and their gender”, grade at p-value ≤ 0.05.

**Discussion**

In terms of the degree of bullying, the findings of the study indicate that the rate of bullying was high for most victims. This result is consistent with a study conducted in Qatar, which found that the rate of bullying among victims was the highest (8). As for the level of self-esteem, the results of the hand-held research indicate that the level of self-esteem was low among most subjects in the study.

These results were inconsistent with studies conducted in Iraq that suggest that the study subjects’ self-esteem is moderate (9). Regarding the effect of bullying on self-esteem, the findings indicate that there is an adverse regression among self-esteem and bullying, suggesting that when bullying increased self-esteem decreased, this result indicates that there is a substantial correlation between bullying and self-esteem at p-value 0.05 in the same line with research in Iraq (9). Their findings also suggest that there is a reverberated or negative regression between bullying and self-esteem, suggesting that, due to the reverberated scoring between these two realms, self-esteem decreased as bullying increased. Another research also indicates that the two variables of self-esteem and bullying exist in a shared mutual relationship in that little self-esteem is linked to high self-esteem and greater bullying experiences is linked to low bullying experiences. (10)

Concerning the relationship between the self-esteem of students and their demographic characteristics, the findings in the present study suggest that there is a highly significant relationship between the self-esteem of students and their gender, grade, this may be because the boys are more violent and their toys are more serious and stronger than the girls. These findings were also consistent with studies that showed that male students faced more bullying and low self-esteem, and continuity with the findings of Spade suggests that grade 5 students had slightly lower levels of self-esteem than grade 3 and 4 students. (10). Another research also found that there was a substantial gap in bullying conduct between boys and girls. (11)

**Conclusions**

The researcher concludes based on the results of the present study that there is a high level of bullying towards primary school students. There is a low level of self-esteem between primary school pupils. There is an adverse relationship between self-esteem and bullying, which suggests that self-esteem decreased when bullying increased. There is a highly significant statistical relationship between the self-esteem of students and their gender and degree. A non-significant statistical relationship exists between the self-esteem of students and their age.
**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Nursing and all experiments were carried out in accordance with approved guidelines.

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Study of the Relationship between Vitamin D Level and the Increase in the Severity of Covid-19 Infection in Kirkuk City

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Abstract

The study aimed to find the relation between Covid-19 infection and reduction in vitamin-D levels and with development of severe infection. The study was conducted in Kirkuk city during July 2020, included 120 COVID-19 patients who diagnosed by collecting of naso/oropharyngeal swabs and the virus RNA was qualitatively detected by real-Time PCR in Public Health Laboratory according manufacture instruction and WHO protocol. The study also included 30 healthy persons as control group. The study included the collection of blood samples for determination of vitamin-D level (I-chroma, Korea) by direct immunofluorescence technique and according to manufacture instruction. The study also included collection of associated information like age, sex, residence, BMI and by contacting with all patients daily until the 10th day of infection to know their status after treatment. The study showed that, majority of patients were aged from 22 to 41 years of old (P. value <0.001). The study showed that 62.5% of COVID-19 patients were males compared with 37.5% females (P<0.05). The study showed that were asymptomatic, 44.17% of cases of COVID-19 patients were with mild infection and 10% were with severe infection (P<0.001). The study showed a significant relation between Covid-19 infection status with age as the highest mean of age of Covid-19 infected patients was recorded in those who with severe infection.

The study showed that the lowest mean of serum Vitamin was found in COVID-19 patients comparing with healthy control (12.8±3.6 v.s. 29.3±3.1 ng/ml) (P: <0.001). The study also demonstrated that the level of vit. D was significantly reduced in severe infected COVID-19 patients followed by patients with moderate infection and the highest mean was in patients with asymptomatic infection (P<0.001).

Keywords: Covid-19; Severe infection; PCR; Kirkuk; Vitamin D.

Introduction

The Covid-19 virus is one of the modern viruses that have spread in our societies since the beginning of 2020 and up to this point (¹). The spread of this virus in the community is considered one of the most dangerous viruses on the soul of humans, especially in later ages, and for people with chronic diseases, diabetes, hypertension, acute pneumonia, cancer, and chronic kidney inflammation (²). This virus has spread to all countries of the world, including the Middle East, the Republic of Iraq, especially in the city of Kirkuk and Baghdad, and from the south and the cities of Iraqi Kurdistan (³). Among the most common elements and causes of the spread of this disease is the failure to respond to the laws of the World Health Organization and the Ministry of Health in terms of social distancing, wearing masks, sterilizing feet, surfaces and floors, and avoiding touching, kissing and shaking hands ⁴. Epidemiological studies investigating links between circulating levels of 25-hydroxyvitamin D (25[OH] D; the biomarker of vitamin D status) and incidence and severity of COVID-19 are currently limited in number. Two ecological studies have reported inverse correlations between national estimates of vitamin D status and COVID-19 incidence and mortality in European countries. Lower circulating 25(OH)D concentrations have also been reported to associate with susceptibility to SARS-CoV-2 infection and COVID-19 severity⁵. Recently, we have shown that airway diseases are associated with dysregulated vitamin D metabolism raising the possibility that vitamin D deficiency might

DOI Number: 10.37506/mlu.v21i2.2884
arise as a consequence of pulmonary inflammation. Prospective studies can provide insights into the potential for reverse causality, but results from those published to date are conflicting: one retrospective longitudinal study from Israel reported independent associations between low pre-pandemic 25(OH)D levels and subsequent incidence and severity of COVID-19 (6-10). The study aimed to find the relation between Covid-19 infection and reduction in vitamin-D levels and with development of severe infection

**Materials and Method**

The study was conducted in Kirkuk city during July 2020, included 120 COVID-19 patients who diagnosed by collecting of naso/oropharyngeal swabs and the virus RNA was qualitatively detected by real-Time PCR in Public Health Laboratory (Sacace Biotechnology, Italy) according manufacture instruction and WHO protocol. The study also included 30 healthy persons as control group. The study included the collection of blood samples for determination of vitamin-D level (I-chroma, Korea) by direct immunofluorescence technique and according to manufacture instruction. The study also included collection of associated information like age, sex, residence, BMI and by contacting with all patients daily until the 10th day of infection to know their status after treatment.

**Results**

The study showed that, majority of patients were aged from 22 to 41 years of old (P. value <0.001), Table 1.

**Table 1: Distribution of studied patients according to characteristics of menstrual cycle**

<table>
<thead>
<tr>
<th>Age (Year)</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-21</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>22-31</td>
<td>28</td>
<td>23.33</td>
</tr>
<tr>
<td>32-41</td>
<td>40</td>
<td>33.33</td>
</tr>
<tr>
<td>42-51</td>
<td>20</td>
<td>16.67</td>
</tr>
<tr>
<td>52-61</td>
<td>11</td>
<td>9.17</td>
</tr>
<tr>
<td>62-71</td>
<td>9</td>
<td>7.5</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>100</td>
</tr>
</tbody>
</table>

P. value <0.001

The study showed that 62.5% of COVID-19 patients were males compared with 37.5% females (P<0.05), Table 2.

**Table 2: Distribution of Covid-19 according to sex**

<table>
<thead>
<tr>
<th>P.value</th>
<th>Positive</th>
<th>Sex</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>No.</td>
<td></td>
</tr>
<tr>
<td>0.026</td>
<td>62.5</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>37.5</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>120</td>
</tr>
</tbody>
</table>

The study showed that were asymptomatic, 44.17% of cases of COVID-19 patients were with mild infection and 10% were with severe infection (P<0.001), Table 3.

**Table 3: Distribution of Covid-19 according to type of infection**

<table>
<thead>
<tr>
<th>Covid-19 cases</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asymptomatic</td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>Mild</td>
<td>53</td>
<td>44.17</td>
</tr>
<tr>
<td>Moderate</td>
<td>25</td>
<td>20.83</td>
</tr>
<tr>
<td>Severe</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>100</td>
</tr>
</tbody>
</table>

P. value <0.001

The study showed a significant relation between Covid-19 infection status with age as the highest mean of age of Covid-19 infected patients was recorded in those who with severe infection

**Table 4: Relation of Covid-19 infection status with age**

<table>
<thead>
<tr>
<th>Covid-19 cases</th>
<th>Mean±SD</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asymptomatic</td>
<td>30.55±4.5</td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td>32.17±4.7</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>40.15±4.9</td>
<td></td>
</tr>
<tr>
<td>Severe</td>
<td>58.5±5.4</td>
<td></td>
</tr>
</tbody>
</table>

P<0.001

The study showed that the lowest mean of serum Vitamin was found in COVID-19 patients comparing with healthy control (12.8±3.6 v.s. 29.3±3.1 ng/ml) (P: <0.001).

**Table 5: Levels of vitamin D in COVID-19 patients and the control group**

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean (ng/ml)</th>
<th>SD</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>COVID-19 patients</td>
<td>12.8</td>
<td>3.6</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Healthy group</td>
<td>29.3</td>
<td>3.1</td>
<td></td>
</tr>
</tbody>
</table>
The study also demonstrated that the level of vit. D was significantly reduced in severe infected COVID-19 patients followed by patients with moderate infection and the highest mean was in patients with asymptomatic infection (P<0.001), Figure 1.

![Figure 1: relation of Vit. D and severity of Covid-19 infection](image)

**Discussion**

Numerous studies have found that the Covid-19 virus is spreading highly in eastern and Middle Eastern countries in Saudi Arabia, Iraq, Iran, Turkey and the Arab Gulf. Covid-19 and those with symptoms similar to those of Covid-19 were actually infected with the virus in this study 9. And as our study found, the most people infected with the Covid-19 virus are among the people who spend cities, and as such, numerous studies were conducted at the beginning of this year and to the end of this day, as studies indicated that those who say cities are the most vulnerable to infection with covid 19, and there is no doubt 7-10. Many studies conducted previously that young people are the most vulnerable to infection due to their frequent interaction with infected people, caring for the sick and suffering from health personnel or Of the people who provide services to the community, all the restaurants, clothes, shops, laboratories, and factories, all of them are young cadres who may be exposed to people infected with covid-19 and they do not know, then they may be infected, then they go to health centers, and then it is discovered that they are infected with Covid-19 11,12. Our findings about the increased risk of testing positive for COVID-19 with likely deficient vitamin D status compared with likely sufficient vitamin D status contrasts with the findings of a recent study by Xu et al 13. Since vitamin D deficiency may be increased by many factors that could be associated with COVID-19 risk, including age, obesity, diabetes, and chronic illness more generally, observed associations of vitamin D with outcomes in almost any observational study may fail to accurately reflect any potential causal effects of vitamin D on outcomes. Some clinical and epidemiological studies support to outline the hypothesis regarding COVID-19 and its relationship with vitamin D status. Recent studies indicated that COVID-19 is associated with low vit D level 11,14. In other studies, serum concentrations of 25(OH)D were inversely associated with pro-inflammatory cytokines, IL-6, increased CRP, and increased risk of pneumonia, ARDS, diabetes and heart failure. In randomized control trials, vitamin D supplementation has been shown to reduce the risk of respiratory diseases 15,16. A placebo-controlled trial with 5660 subjects showed that vitamin D supplementation significantly reduces the risk of respiratory tract infections 17. A review included five clinical studies reported that respiratory tract infections were significantly lower in the vitamin D supplementation group than the control group 18. Another study included 25 randomized controlled trials, with 10,933 participants in total from 14 different countries indicated the beneficial effects of vitamin D
supplementation in reducing the risk of at least one acute respiratory tract infection\(^9\).

**Conclusions**

There was a significant relation between vitamin-D reduced levels and severity of Covid-19 infection

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Kirkuk Health Directorate and all experiments were carried out in accordance with approved guidelines.

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Purification of Gamma Glytamyl Transferase and Study Some Biochemical Variables in Sera Patients with Hepatitis B and C in Kirkuk City

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²Prof. Dr. Biochemistry. College of Science, Kirkuk University, Iraq

Abstract

Hepatitis B and C are the most frequent causes of chronic hepatitis diseases in the world. A cross sectional study was carried out in Kirkuk city from 17th of November 2019 to 25th of February 2020. The number of hepatitis patients under study was 80 hepatitis patients, 44 with hepatitis B (14 acute and 30 chronic) and 36 with hepatitis C (11 acute and 25 chronic). Their ages were between 20-70 years old. These patients admitted to Hepatology and Gastroenterology Center of Azadi Teaching Hospital and Kirkuk General Hospital and the control group matched the patients group included 30 individuals who were apparently healthy who were conducted in this study to determine the level of activity of the enzyme (GGT) as well as to determine the level of a number of biochemical variables (ALT, AST, ALP, TSB, CRP, AFP) in both healthy subjects and patient group with acute and chronic viral hepatitis B and C. The results showed that there was significant increase in the activity of the GGT enzyme in patients with P-value (p ≤ 0.01) compared to control group. The present study showed that there was significant increase in the levels of (ALT, AST, ALP, TSB) in the blood sera of patients with acute hepatitis B and C compared to chronic and the healthy group. The present study also included the purification and partial isolation of the enzyme (GGT) and find the approximate molecular weight for it, that was purified from the blood serum of patients with hepatitis B and C. The high single peak were used to determine the approximate molecular weight of the enzyme, and using the gel filtration technique. The approximate molecular weight of the enzyme (GGT) was up to (371,000-346,000-316,000) Dalton for healthy and hepatitis C and B patients, respectively. In acute and chronic viral hepatitis B and C, there was a positive correlation between the efficacy of (GGT) and the efficacy of GPT, CRP and AFP. The study showed that there was significant increase in the activity of the ALT enzyme in patients compared to control group. After performing the process of separating and purifying the GGT enzyme from the serum of patients with viral hepatitis B and C, using 40-60% of ammonium sulfate and after obtaining the required purity separating it from the rest of the components of the blood serum, the activity of the GGT enzyme was measured and it was found to have overall effectiveness in patients with hepatitis Liver C was (0.282) and the number of purification times was (1.63) times and the specific effectiveness was (1843). Hepatitis B was (3.5) times, and the results from the dialysis process of the precipitate resulting from the saline precipitation process showed an increase in the specific activity of the enzyme GGT, so it was (3.4) for healthy people, (3.5) for patients with HCV and (4.3) HBsAg. Then he used gel filtration chromatography using the gel (Sephadex G-150), the results showed that a single protein beam appeared, which is highly effective and has a degree of purification reaching (30.2) And (31.2) and (27) times for GGT enzyme separated by gel filtration technique when the protein solution obtained from the blood serum of healthy subjects and patients with viral hepatitis is passed from the separation column containing gel (G-150).

Keywords: Gamma Glytamyl Transferase; HCV; HBV; Kirkuk; Liver enzymes.
Introduction

Several enzymes act as catalysts in a specific biochemical reaction that leads to the normal state and the maintenance of regular balance in the body. Any changes in the enzyme level in the body could indicate a specific abnormality in the body. The enzyme Gamma Glutamyl Transferase (GGT) is a hepatic and biliary enzyme with a molecular weight of (68000) Dalton that is synthesized by hepatocytes as well as by the epithelial cells of the bile ducts, and it is a two-molecular glycoprotein, the large secondary unit and the small secondary unit are associated with a non-covalent bond. The GGT enzyme (EC2.3.2.2) is one of the main antioxidants in many of the body’s defense mechanisms. It plays a key role in the metabolism and metabolism of glutathione, it is classified within the enzymes that transport the peptide (Transpeptidase), as it stimulates the process of transferring the Gamma Glutamyl group of peptides and compounds that contain this group to some receptors that form the main substance Substrate or some amino acids or peptides or even water. A simple decomposition process takes place.

\[
\text{Gamma-glutamyl-X + acceptor Gamma-glutamyl-acceptor + X}
\]

It also has an important role in the liver, and it has other functions in the body as a transporter molecule, helping to transport other molecules around the body, such as glutathione, to a receptor that may be an amino acid, peptide, or water. The GGT enzyme is present in the cell membranes of many tissues and is located on the outer surface of the plasma in almost all cells, but it is mainly involved in the epithelial tissues with their secretory and absorptive functions, and includes the kidneys, bile duct, pancreas, gallbladder, spleen, heart, brain, and seminal vesicles. In adult liver, the enzyme (GGT) is found in the bile duct from hepatocytes and in gallbladder cells and is responsible for secreting bile into the bile duct. Glutathione is the basis for the physiological enzyme (GGT) in mammals and The relationship between glutathione and GGT is presumed to be a means of supplying the liver with cysteine and Glycin.

Materials and Method

Thirty samples were collected from the blood of healthy people of varying ages from (20-50) years. These samples were collected by blood donors. (80) samples were collected from the blood of patients infected with viral hepatitis (B, C) after they were diagnosed by specialized doctors in the lobbies of the digestive system and the public health laboratory in Kirkuk. The hepatitis patients under study was 44 with hepatitis B (14 acute and 30 chronic) and 36 with hepatitis C (11 acute and 25 chronic) Their ages were between 20-70 years old, The samples collection period is from 11/17/2019 to 2/25/2020.

Estimation of GGT Activity in Serum: The basic principle of this method is known as Szasz, A kinetic chromatometric method for determining GGT activity. The interaction can be explained as follows: This process liberates the compound (5-amino-2-nitrobenzoate, which can be measured at 405 nm). The increase in absorption of this compound at this wavelength is directly related to the increase in GGT activity. Where 1000 μmol of puffer is mixed with 100 μmol of serum and incubated at a temperature of 37 for a minute, then (250 μmol) of the base material is added to the mixture and incubated for a minute, then the absorbance is recorded at (405 nm) within 3 minutes.

Separation and purification of Gamma-Glutamyl Transferase (GGT): Ammonium sulfate is the first stage in the purification process during which the proteins present in the serum are deposited, depending on the degree of saturation of the serum with ammonium sulfate. Where (1.88 gm) of ammonium sulfate was added slowly with constant stirring to (4.7 ml) of serum over a period of 60 minutes at low temperatures in order to obtain a saturation rate of (40%). The filtrate was collected and placed in a centrifuge cooled at a temperature of (4° C) and for a period of (20 minutes) the filtrate was taken and an ammonium sulfate (2.4 gm) was added to obtain a saturation rate of (60%), then It was centrifuged at (14600 xg) for (20 minutes) to obtain the precipitate, the precipitate dissolved in (mL) of (0.125M) Tris-HCl with a pH of (8.3). Then it is placed in a centrifuge at a speed (14600 xg) for a period of (20 minutes) at (4° C), after which the total protein concentration is measured. The dissolved protein is placed in the hemodialysis bag membrane after measuring GGT activity and protein concentration, and the pouch is immersed in buffer solution (HCl-Tris 0.125 M).) From a pH of 8.3. The solution is changed from time to time for an entire night. This step is performed at (4° C) to maintain GGT activity.
Gel filtration is also used as a method for estimating the approximate molecular weight of protein substances. The Laemmli method was used to prepare electrolyte separation gel with modifications using 10% acrylamide gel and Coomassie bright blue.

**Results**

The study showed that there was significant increase in the activity of the GGT enzyme in patients compared to control group.

<table>
<thead>
<tr>
<th>Studied groups</th>
<th>N</th>
<th>GGT (U/L)</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients with acute hepatitis C</td>
<td>10</td>
<td>202.4±52.0</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Patients with chronic hepatitis C</td>
<td>25</td>
<td>76.68±10.53</td>
<td></td>
</tr>
<tr>
<td>Patients with acute hepatitis B</td>
<td>14</td>
<td>192.07±26.04</td>
<td></td>
</tr>
<tr>
<td>Patients with chronic hepatitis B</td>
<td>30</td>
<td>63.47±15.64</td>
<td></td>
</tr>
<tr>
<td>Control group</td>
<td>30</td>
<td>40.43±15.29</td>
<td></td>
</tr>
</tbody>
</table>

The results showed in Table 3 that there was significant increase in the activity of the ALT enzyme in patients compared to control group, Table 2.

<table>
<thead>
<tr>
<th>Studied groups</th>
<th>N</th>
<th>ALT (U/L)</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients with acute hepatitis C</td>
<td>10</td>
<td>671.3±164.1</td>
<td>P&lt;0.01</td>
</tr>
<tr>
<td>Patients with chronic hepatitis C</td>
<td>25</td>
<td>34.04±8.18</td>
<td></td>
</tr>
<tr>
<td>Patients with acute hepatitis B</td>
<td>14</td>
<td>606.0±151.6</td>
<td></td>
</tr>
<tr>
<td>Patients with chronic hepatitis B</td>
<td>30</td>
<td>27.00±7.05</td>
<td></td>
</tr>
<tr>
<td>Control group</td>
<td>30</td>
<td>14.96±6.91</td>
<td></td>
</tr>
</tbody>
</table>

Proteins were precipitated from their protein solution by removing the solvent to make them insoluble. After performing the process of separating and purifying the GGT enzyme from the serum of patients with viral hepatitis B and C, using 40-60% of ammonium sulfate and after obtaining the required purity separating it from the rest of the components of the blood serum, the activity of the GGT enzyme was measured and it was found to have overall effectiveness in patients with hepatitis Liver C was (0.282) and the number of purification times was (1.63) times and the specific effectiveness was (1.843) as shown in the table (3-6). In hepatitis B patients, the overall effectiveness of GGT enzyme was found (0.27), the number of purification times (1.63), and the specific effectiveness (2.077), as shown in Table (3-7). The enzyme was concentrated and a degree of purity was obtained and the salts were eliminated during the separation process by membrane sorting by Tris-HCl with an acidic function of PH (8.3). Hepatitis B was (3.5) times, and the results from the dialysis process of the precipitate resulting from the saline precipitation process showed an increase in the specific activity of the enzyme GGT, so it was (3.4) for healthy people, (3.521) for patients with HCV and (4.3) HBsAg. Then he used gel filtration chromatography using the gel (Sephadex G-150), the results showed that a single protein beam appeared as shown in Figures (3-3), (3-4) and (3-5), which is highly effective and has a degree of purification reaching (30.2) And (31.2) and (27) times for GGT enzyme separated by gel filtration technique when the protein solution obtained from the blood serum of healthy subjects and patients with viral hepatitis is passed from the separation column containing gel (G-150).
Figure 1: The profile shows the demonstration of the highly effective GGT protein packet from the gel filtrate column of the healthy blood serum.

Figure 2: The profile Rogan shows the high-potency GGT protein packet from the gel-filtration column of the serum of patients with viral hepatitis C.

Figure 3: The profile shows the Rogan of the high-activity GGT protein packet from the gel filtrate column of the serum of patients with hepatitis B.
Table 5: Steps of GGT enzyme purification from blood serum of healthy subjects

<table>
<thead>
<tr>
<th>Purification Step</th>
<th>Volume (L)</th>
<th>Protein Conc (g/L)</th>
<th>Total Protein (g)</th>
<th>Enzyme Activity (U/L)</th>
<th>Total Activity U</th>
<th>Specific Activity (U/mg)</th>
<th>Fold of Purification</th>
<th>Yield 100 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum</td>
<td>0.005</td>
<td>61.2</td>
<td>0.306</td>
<td>51</td>
<td>0.25</td>
<td>0.817</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>Precipitation by Ammonium sulphate 60%</td>
<td>0.0048</td>
<td>24.1</td>
<td>0.115</td>
<td>40</td>
<td>0.192</td>
<td>1.67</td>
<td>2</td>
<td>76.8</td>
</tr>
<tr>
<td>Dialysis</td>
<td>0.0032</td>
<td>12.2</td>
<td>0.039</td>
<td>42</td>
<td>0.134</td>
<td>3.4</td>
<td>4.16</td>
<td>53.6</td>
</tr>
<tr>
<td>Gel Filtration Sephadex G-150</td>
<td>0.0027</td>
<td>1.9</td>
<td>0.005</td>
<td>45</td>
<td>0.121</td>
<td>24.2</td>
<td>30.2</td>
<td>48</td>
</tr>
</tbody>
</table>

The approximate molecular weight of the protein bundle produced when the serum resulting from the dialysis step was passed into the separation column that contains the gel of the type sephadex G-150 and the molecular weight was approximately (371000) Dalton. For healthy subjects, also for patients with HCV the approximate molecular weight of the enzyme was about (346000) Dalton approximately as well as for patients with HBsAg, the approximate molecular weight of the enzyme was approximately (316000) Dalton. These values were taken from the Figures 4, 5, 6.

Table 6: Steps for GGT enzyme purification from blood serum for people with viral hepatitis C.

<table>
<thead>
<tr>
<th>Purification Step</th>
<th>Volume (L)</th>
<th>Protein Conc (g/L)</th>
<th>Total Protein (g)</th>
<th>Enzyme Activity (U/L)</th>
<th>Total Activity U</th>
<th>Specific Activity (U/mg)</th>
<th>Fold of Purification</th>
<th>Yield 100 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum</td>
<td>0.0051</td>
<td>68.4</td>
<td>0.348</td>
<td>77</td>
<td>0.392</td>
<td>1.126</td>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>Precipitation by Ammonium sulphate 60%</td>
<td>0.0047</td>
<td>32.6</td>
<td>0.153</td>
<td>60</td>
<td>0.282</td>
<td>1.843</td>
<td>1.63</td>
<td>71.9</td>
</tr>
<tr>
<td>Dialysis</td>
<td>0.0038</td>
<td>18.2</td>
<td>0.069</td>
<td>64</td>
<td>0.243</td>
<td>3.521</td>
<td>3.1</td>
<td>61.9</td>
</tr>
<tr>
<td>Gel Filtration Sephadex G-150</td>
<td>0.0032</td>
<td>2.1</td>
<td>0.006</td>
<td>66</td>
<td>0.211</td>
<td>35.166</td>
<td>31.2</td>
<td>53.8</td>
</tr>
</tbody>
</table>

Figure 4: Standard curve for estimating the approximate molecular weight of the GGT enzyme using a sephadex G-150 gel-containing separator column for healthy subjects.
The molecular weight of the GGT enzyme was determined by the method of electrophoresis in the presence of sodium dodecyl sulfate (SDS-PAGE). This method is widely used and is used in the process of separating large biomolecules such as enzymes, proteins and nucleic acids, where the enzyme is treated with sodium dodecyl sulfate, which works to break down the protein giving chains of different sizes surrounded by particles of negatively charged sodium dodecyl sulfate, which removes the original charge of the protein, so these chains migrate to the positive electrode as the movement of the protein in the gel depends on the charge it carries mainly and then depends on the size and shape of the protein. Figure 7 shows the shape of the GGT enzyme bundle when migrated with standard solutions of known molecular weight \(^{16,17}\), and in comparison between...
the GGT enzyme package and the standard compound packages, it was found that the molecular weight of the purified GGT enzyme from the sera of HCV patients and HBsAg is (68 K.D), and this is consistent with the findings of previous research\textsuperscript{18-21}.

![Figure 3-9: Electrophoresis of purified GGT enzyme to find approximate molecular weight compared to standard solutions. (1 : Healthy, 2 : HCV, 3 : HBV, M : protein marker)](image)

**Discussion**

The increase in the GGT rate in hepatitis B and C patients compared to the control group indicates a difference, and this gives evidence of the importance of GGT activity as a reliable marker for long-term (HCV, HBV) infection. It is considered as an independent indicator for both viral response and clinical outcome among patients with advanced liver disease due to hepatitis C and B. These general results in this research are consistent with previous work and are supported by many studies. Increased GGT activity is observed in all forms of liver disease especially in blockage of bills within or after the liver \textsuperscript{22}. In addition to increasing the level of the enzyme in cases of high triglycerides and liver disease. The factor of excessive alcohol consumption \textsuperscript{23}. Previous studies \textsuperscript{24-27} showed an increase in the level of GGT activity in all patients with viral hepatitis B and C and most importantly, all of them showed a chronic increase in GGT, so it remained elevated repeatedly for a long time after the ALT level had returned to normal, as it is a closely related marker for predicting severity and GGT has been shown to have greater predictive significance than ALT or AST. Therefore, the association of GGT to any clinical point of treatment or liver disease in patients with viral hepatitis and liver cancer over relatively longer periods. And among (RuidanZheng et al) and (Rui Huang) \textsuperscript{28,29}, the levels of ALT, AST, and GGT were significantly higher in patients with hepatitis B virus type, the GGT levels reached about 8 times higher than the limit. Normal highest and a significant positive association was found between serum GGT levels and serum ALT levels in chronic hepatitis B patients. Previous studies \textsuperscript{30-36} showed that the level of ALT, AST, and ALP in acute infection was higher than that in patients with chronic hepatitis. Previous literature indicated that GGT was purified from Helicobacter pylori from the gastric mucosa\textsuperscript{37}, Bacillus subtilis SK11.004 \textsuperscript{38}, human kidney \textsuperscript{39} and human liver\textsuperscript{40}, and with However, there is no evidence to suggest iso-GGT enzyme purification in the serum of patients with hepatitis B and C. The molecular weight of 68 KDa found in this study is consistent with previous research\textsuperscript{41-44}. All enzymes operate at an ideal pH that results in a change in the hydrogen ion concentration\textsuperscript{45}. Any change in H + reduces the activity of the enzymes\textsuperscript{46}. The pH can affect the activity of the enzyme due to the difference in its nature and chemical structure in addition to the presence of different ionic groups carried by the enzyme\textsuperscript{47}. as the enzyme has a complex three-dimensional configuration that plays a role in the creation and functioning of the enzyme’s active site\textsuperscript{48}.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the Kirkuk University and all experiments were carried out in accordance with approved guidelines.

**References**

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Assessment of Nurses Knowledge Who Working in Premature Section about Ideal Nursing Care at Kerbala Pediatric Teaching Hospital, Iraq, 2020

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BSN, Maternal and Neonatal, College of Nursing, University of Kerbala, Kerbala City, Iraq

Abstract

Objectives: To determine assessing the nurse knowledge towards ideal nursing care for premature baby.

Methodology: A descriptive quantitative study was carried out in order to achieve the early stated objectives. The study was initiated from 10th February, 2019; to 10th July, 2019. The study was conducted at Kerbala pediatric teaching hospital. A non-probability (purposive sample) of 41 nurses, who work in premature care unit at Kerbala pediatric teaching hospital.

Result: The study show high percentage 61% related to item (21-30) years. Regarding years of experience was 53.7%. Regarding educational level was 70.7% for junior nursing. Regarding complication of premature baby the high percentage was 97.33% related to item “fingernails and toenails are abnormally delicate and short”. Regarding nursing care high percentage was 98.33 for item “the mother must breast feed her baby to avoid jaundice”.

Conclusion: According to the present study findings, the researchers enabled to make the following conclusions: most of the nurses participated in the study were female, within age group less than 30 years old. The majority of nurses that participated in this study have a secondary school of qualification in nursing, the majority of the nurses who is working in premature department within less than five years of experience in premature unit. The study revealed high percentage regarding nursing care of premature baby.

Conclusions and Recommendations: According to the present study findings, the researchers enabled to make the following conclusions: Most of the nurses participated in the study were female, within age group less than 30 years old. The majority of nurses that participated in this study have a secondary school of qualification in nursing. Most of nurse working in premature department, and the majority of them within less than five years of experience in premature unit. Most of nurses participated in training sessions regarding management of premature. The study revealed high nurse’s knowledge regarding caring of premature baby. According to the results of the study the researcher recommended that: Emphasis on the survival of nurses working in the department where they work and not to change their section of work in order to allow time to gain more experience in the section increase information. Emphasize the establishment of scientific courses for the nurses who work in the department so that they can gain more experience. Provision of scientific booklet about standard management with clear language. College graduated nurses should be encouraged to working in premature department.

Keywords: Nurses knowledge, premature, ideal nursing care.

Introduction

The birth of a baby is a wonderful yet very complex process. Many physical and emotional changes occur for mother and baby. A baby must make many physical adjustment to life outside the mother’s body (Narinder, 2004). Leaving the uterus means that a baby
can no longer depend on the mother’s circulation and placenta for important physiologic functions. Such as (breathing, eating, elimination of waste, and immunologic protection) (Narinder, 2004). Suraj C (2010) mention that a baby when enters the world, many body systems change dramatically from the way they functioned during fetal life e.g. (The lungs must breathe air, The cardiac and pulmonary circulation changes. The digestive system must begin working to balance fluids and chemicals in the body and excrete waste, The liver and immunologic systems must begin functioning independently. The baby’s body systems must work together in a new way. Sometimes, a baby has difficulty making the transition to the world. Being born prematurely, having a difficult delivery or birth defects can make these changes more challenging. Fortunately for these babies, special newborn care is necessary so he needed the incubator. Incubator is an apparatus for maintaining an newborn (especially premature infant) in an environment of controlling temperature, humidity, and oxygen concentration so it’s provides a clean environment and help to protect the baby from noise, infection, and excessive handling so the nurse should be careful handling with infant and incubator to promote infant health (Suraj G., 2010).

Preterm infants are at great risk for medical complications and future developmental disabilities. They can develop a range of problems, their organs are not mature and an unfavorable environment in the neonatal intensive care unit, may compound this morbidity. It has been recognized that for many years the environment of neonatal intensive care unit can have an important influence on the development of premature infants (Aita & Sinder, 2003).

**Methodology**

A descriptive quantitative study was carried out in order to achieve the early stated objectives. The study was initiated from 10th February, 2019; to 10th July, 2019. The study was conducted at Kerbala Pediatric Teaching Hospital.

The Sample of the Study was non-probability (purposive sample) of 41 nurses, whose work in premature care unit at Kerbala Pediatric Teaching Hospital. The data were collected through the utilization of the structured questionnaire and by means of interviewing technique with the subjects who were individually interviewed in the premature child at hospital teaching kerbala by the using the Arabic version of the questionnaire, and they were interviewed in a similar way, in the same place. After reviewing the related literatures and relevant studies, a draft instrument was developed by the researchers. A structured questionnaires consisting of closed ended questions were distributed to nurses at time of data collection. It consist from two main part as follow: Part one of study instrument represent the socio-demographic data, that consist of (9) items, which include age, gender, marital status, qualification, working setting (premature child unit) total years of experience, years of experience in premature child unit. The second part of the questionnaire was consist from three section; section one consist from (20) items that are related to nurses knowledge regarding pediatric child unit and its risk factors; section two consist from (15) items regarding to nurses knowledge regarding signs and symptoms and diagnostic procedures of premature child unit. The items have been rated and scored according to the following patterns:

1. Three point likert scale was used to test the respondent knowledge of each question that was scored with (3) for agree, (2) for uncertain, and (1) for disagree.

2. The higher grade scoring of the questionnaire (MS), (RS) the greater level of knowledge regarding caring of premature child.

3. Each question consists of (3) alternative responses, and only one of these alternative responses was considered a correct response. To achieve the purpose of the present study, the responses of knowledge questionnaires were scored as (3) for agree, (2) for uncertain and (1) for disagree. The cut of point was (2) and the low limit for acceptance nurses knowledge was (66.6), the relative sufficiency (RS) for acceptance of nurses knowledge score was calculated according to the following formula: (Cut of point) x100/(No. of scale).

   Low = (less than 66.6), Moderate = (66.6-83.3), High = (83.3-100), these calculated according to the following formula (100-66.6)/2 =16.7, then this score was added to (66.6+ 16.7=83.3) moderate level, (83.3+16.7=100) high (AL-Maliky, 2010).

In addition to the experts’ responses, their suggestions were taken into consideration. So far, modifications are employed and the final copy of the constructed instrument is completed to be an appropriate...
tool for conducting the study. The pilot study was conducted from 12 – 13 Jou 2019. Reliability of the studied questionnaire was (0.85) by using Cronbach Alpha test. All data was analyzed using the statistical package for social science (SPSS) for Windows version 20. The statistical procedures, which are applied for the data analysis and assessment of the results, included the following:

(a) Statistical tables includes Frequencies (F), Percentages (%), cumulative percents, mean of score (M.S), were used to summarize the data.
(b) Relative sufficiency (R.S): was assess for level of knowledge by three grades (Low, Moderate, and High).

Results

Table (1) Participants nursing care (n=41).

<table>
<thead>
<tr>
<th>No</th>
<th>Item</th>
<th>Response Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>F</td>
</tr>
<tr>
<td>1</td>
<td>the temperature of the incubator must ranging between (20,30) and</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td>the perfect humidity ranging for (40%,50%)</td>
<td>Uncertain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agree</td>
</tr>
<tr>
<td>2</td>
<td>the mother must breast feed her baby to avoid jaundice</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Uncertain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agree</td>
</tr>
<tr>
<td>3</td>
<td>vitamins must be given to the premature baby</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Uncertain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agree</td>
</tr>
<tr>
<td>4</td>
<td>breast-feeding begins immediately from birth to avoid hypoglycemia or</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td>high bilirubin</td>
<td>Uncertain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agree</td>
</tr>
<tr>
<td>5</td>
<td>breast-feeding protects the child from gastroenteritis</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Uncertain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agree</td>
</tr>
<tr>
<td>6</td>
<td>sweeping child’s body by alcohol help reduce the baby’s temperature</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Uncertain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agree</td>
</tr>
<tr>
<td>7</td>
<td>the best time for newborn baby shower when the child’s temperature</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td>is stable</td>
<td>Uncertain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agree</td>
</tr>
<tr>
<td>8</td>
<td>if the incubator is not available the heat can be provided by rolling</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td>the child and placing a warm water by around him or shedding light</td>
<td>Uncertain</td>
</tr>
<tr>
<td></td>
<td>near him</td>
<td>Agree</td>
</tr>
<tr>
<td>9</td>
<td>put a blank made of fiber under the premature baby during the (</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td>phototherapy</td>
<td>Uncertain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agree</td>
</tr>
<tr>
<td>No</td>
<td>Item</td>
<td>Response Answer</td>
</tr>
<tr>
<td>----</td>
<td>----------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F</td>
</tr>
<tr>
<td>10</td>
<td>the eyes &amp; genitals must be covered when the premature baby is placed under the phototherapy</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Uncertain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agree</td>
</tr>
<tr>
<td>11</td>
<td>hand hygiene is very important when a premature baby care,because the immune system in preterm infants immature so they are exposed to infection.</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Uncertain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agree</td>
</tr>
<tr>
<td>12</td>
<td>fluid balance (homeostasis) must be carefully monitored for the premature baby</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Uncertain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agree</td>
</tr>
<tr>
<td>13</td>
<td>it’s necessary to wake the premature child every (2-3)hours in the cause of breast –feeding and every 3-4 hours in the case of bottle feeding</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Uncertain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agree</td>
</tr>
<tr>
<td>14</td>
<td>the nurse should involve parents and teach them how to care for premature child and emphazier on the need for skin adhesion between the infant and the mother .</td>
<td>Disagree</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Uncertain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agree</td>
</tr>
<tr>
<td>15</td>
<td>premature baby’s temperature must be measured every 3-4 hours</td>
<td>Disagree</td>
</tr>
</tbody>
</table>

m.s= mean of score; r.s= relative sufficiency; l= low level of knowledge (r.s= ≤ 66.6); m= moderate level of knowledge (r.s= > 66.6- ≤ 83.3); h=high level of knowledge (r.s=>83.3).

**Discussion**

This chapter presents a systematically organized, interpretation of available related studies. Premature is a live born infant delivered before 37 weeks from the first day of last menstrual period. It accounts for the largest number of admissions to neonatal intensive care unit (NICU). Premature infants can develop a range of problems because their organs are not mature enough.

The present study shows regarding the following:-

The result study show that (61%) of nurses who are at premature baby section were within the age group of (21-30)years and (24.4%) were within the age group of (31-40)years old, (73.2%) of them were female(53.7%) were 3 years or less, (19.5%) were (9-13) years, (17.1%) were (4-8) years and (9.8%) were (14-18) years.

Concerning to level of education of the study sample, the results demonstrate that’s most of them (4.9%), (22%) and (70.7%) were having bachelor of nursing, nursing diploma and junior (preparatory) nursing respectively. Also regard to current place of work, in hospital of the nurses were (87.8%) and (12.2%) working in neonatal and RCU respectively. Abohmied, Z, 2015 reported that the majority of 60% of nurse’s age between 25-30 years followed by 26% there age from 31-35 years and the gender where almost 86% of nurses were female. Concerning years of experience where this study was observe that 66% of nurses had bachelor degree 22% of sample were post graduate level and 12% were diploma level and concerning education level where showed that 34%of nurses between 6-10 years followed by 32% were 1-5 years,16% more than 10 years and 18% less than 1year. Concerning to nursing care, the result shown that nurses have had high level of knowledge in all items. The result was agrees with (Abohmied, Z,2015) in some of items. Where agree in no.10 show that 94% of nurses covered eye and genital while phototherapy, in no.11 showed that 68% of nurses perform hand hygiene, in no.12 that 94% of nurses monitor infant balance carefully, but disagrees in no.15 show that 50% of nurses check temperature for baby every hour.

**Conclusions**

According to the present study findings, the researchers enabled to make the following conclusions:
Most of the nurses participated in the study were female, within age group less than 30 years old. The majority of nurses that participated in this study have a secondary school of qualification in nursing. The experience of majority of nurse who had work at premature department were less than five years. The study revealed high nurse’s knowledge regarding complication and ideal caring of premature baby.

**Recommendations:** According to the results of the study the researcher recommended that: Emphasis on the survival of nurses working in the department where he works and not to change his place of work in order to allow time to gain more experience in the section in which he works and increase information. Emphasize the establishment of scientific courses for the nurses of the department in which he works so that he can gain more experience. Provision of scientific booklet about standard management with clear language. College graduated nurses should be encouraged to working in prem nursing staff must at bachelore degree education level.

**Financial Disclosure:** There is no financial disclosure.

**Conflict of Interest:** None to declare.

**Ethical Clearance:** All experimental protocols were approved under the College of Nursing and all experiments were carried out in accordance with approved guidelines.

**References**


The Role of Serum Level of Indoleamine 2,3–dioxygenase 1 (IDO1) in Patients with Prostate Cancer

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Abstract

Prostate cancer or carcinoma of prostate is the development of cancer in the prostate a gland in the male reproductive system. This is a cross sectional, hospital based study. This study was carried out at the Oncology Center in Kirkuk City- Iraq from the 1st of February 2020 to the end of June 2020. A verbal consent was taken from each Men included in this study whether considered as a case or control. Sixty Seven men with prostatic cancer were screened to participate in the present study. Men with prostatic cancer attended to Oncology Center were enrolled in this study. The diagnosis of prostate cancer was made by the patient’s file contain information about his state after take agreement from each Men included in this study, that is mean that the diagnosis of prostate cancer was according to discussion of the oncologist. Men ages were between 52 to 89 years, and they were from the center and periphery of Kirkuk City. Forty-Seven Men with prostatic cancer were considered as a study group, three Men did not meeting the inclusion criteria and 17 Men refuse to participate in this study due to the personal reasons. Forty apparently healthy Men without prostatic cancer and with negative family history were considered as a control group. Each Men with benign tumor, benign prostatic hyperplasia or prostatitis diseases were excluded from this study. By using a sterile disposable syringe, 5 ml of venous blood sample was drawn from the vein of each Men at morning and was kept into disposable gel tube and allowed to clot for(2hour) at room temperature, then each sample was centrifuged at 6000 rpm for 10 minutes to obtain serum. The serum was aspirated by mechanical micropipette and transferred into clean Eppendorf tubes which labeled with number, then put this Eppendorf tubes in urine cups for safety and addition more information like name, date, number and stored at - 20°C until the time of estimation. Serum of the patients and controls had assay for: Human IDO1 (Indoleamine 2,3-dioxygenase 1) and Human acid phosphatase/prostate by ELISA. The study demonstrated that, the rate of prostate cancer occurrence was increased with age and majority of patients were belonged to the age group (70-79 years). The study also showed non-significant difference between patients and control regarding their BMI mean (27.36±5.16 vs. 27.24±3.34kg/m²) respectively. The study showed that, serum level of IDO1 enzyme was elevated significantly (P<0.01) in prostate cancer patients (11.74±0.28 pg/ml) as compared with healthy control group (4.78±0.15 pg/ml). The study showed that, the highest mean of PAP enzyme was recorded in prostate cancer patients (0.111±0.075 pg/ml) as compared with healthy control group (0.069±0.024 pg/ml). The difference was highly significant (P<0.01), Table 3. The study showed positive correlation between PAP enzyme and stage of prostate cancer (r: 0.34). The study showed positive correlation between IDO1 level and stage of prostate cancer (r: 0.62). The study showed negative correlation between IDO1 level and PAP level in prostate cancer patients (r: -0.22).

Keywords: Indoleamine 2,3–dioxygenase 1; Prostate cancer; PAP; Kirkuk.

Introduction

Prostate cancer (PCa) or carcinoma of prostate is the development of cancer in the prostate a gland in the male reproductive system(1). PC is a significant public health burden and a major cause of morbidity and mortality among men worldwide(2). Prostatic intraepithelial neoplasia (PIN) is the possible precursor of prostatic carcinoma. It is responsible for the abnormal growth of epithelial cells that line the prostate gland. PCa is the most common cancer in men, with approximately one
in nine men developing the disease in their lifetime\(^{(3)}\). Informed decision making is recommended when it comes to screening among those 55 to 69 years old \(^{(4)}\). PCa is one of the heritable malignancies and (10 \%-20 \%) of PCa patients have a family history of cancer that is associated with elevated risk of lethal disease \(^{(5)}\). The IDO1 is an intracellular enzyme that catalyzes the first, rate –limiting step in the kynurenine pathway of tryptophan catabolism \(^{(6)}\). The ability of IDO1 to modulate the immune response was first discovered in 1998, and most commonly studied in the context of immune regulation and as a host response to infection\(^{(7)}\). Is widely expressed in the body tissue and cell type either constitutively or upon stimulation by relevant inflammatory and immune stimuli. IDO1 has been described as a novel therapeutic immune target in recent years\(^{(8)}\). The aim of this study was to evaluate the levels of IDO1 (Indoleamine2,3 dioxygenase 1) in the sera of patients with prostate cancer in different stages.

**Materials and Method**

This is a cross sectional, hospital based study. This study was carried out at the Oncology Center in Kirkuk City- Iraq from the 1\(^{st}\) of February 2020 to the end of June 2020. A verbal consent was taken from each Men included in this study whether considered as a case or control. Sixty Seven men with prostatic cancer were screened to participate in the present study. Men with prostatic cancer attended to Oncology Center were enrolled in this study. The diagnosis of prostate cancer was made by the patient’s file contain information about his state after take agreement from each Men included in this study, that is mean that the diagnosis of prostate cancer was according to discussion of the oncologist . Men ages were between 52 to 89 years, and they were from the center and periphery of Kirkuk City. Forty-Seven Men with prostatic cancer were considered as a study group, three Men did not meeting the inclusion criteria and 17 Men refuse to participate in this study due to the personal reasons. Forty apparently healthy Men without prostatic cancer and with negative family history. Each Men with benign tumor, benign prostatic hyperplasia or prostatitis diseases were excluded from this study.

By using a sterile disposable syringe, 5 ml of venous blood sample was drawn from the vein of each Men at morning and was kept into disposable gel tube and allowed to clot for (2 hour) at room temperature, then each sample was centrifuged at 6000 rpm for 10 minutes to obtain serum. The serum was aspirated by mechanical micropipette and transferred into clean Eppendorf tubes which labeled with number, then put this Eppendorf tubes in urine cups for safety and addition more information like name, date, number and stored at - 20 \(^{0}\)C until the time of estimation. Serum of the patients and controls had assay for: Human IDO1 (Indoleamine 2,3-dioxygenase 1) and Human acid phosphatase/prostate by ELISA.

**Statistical Analysis:** Computerized statistically analysis was performed using Minitab version 23 statistic program. Comparison was carried out using Chi-square (\(X^2\)) and T-Test probability. The P value>0.05 was considered statistically significant, while for those which its P value was greater than 0.05 considered non-significant statistically.

**Results**

The study demonstrated that, the rate of prostate cancer occurrence was increased with age and majority of patients were belonged to the age group (70-79 years). The study also showed non-significant difference between patients and control regarding their BMI mean (27.36±5.16 vs. 27.24±3.34kg/m\(^2\)) respectively, Table 1.

<table>
<thead>
<tr>
<th>Age groups</th>
<th>Patients with prostate cancer</th>
<th>Control group</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>50-59</td>
<td>11</td>
<td>23.40</td>
<td>19</td>
</tr>
<tr>
<td>60-69</td>
<td>12</td>
<td>25.53</td>
<td>13</td>
</tr>
<tr>
<td>70-79</td>
<td>18</td>
<td>38.30</td>
<td>8</td>
</tr>
<tr>
<td>&gt;79</td>
<td>6</td>
<td>12.77</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>47</td>
<td>100</td>
<td>40</td>
</tr>
<tr>
<td>Mean±SD</td>
<td>68.32±8.89</td>
<td>60.81±7.81</td>
<td>0.001</td>
</tr>
<tr>
<td>BMI(kg/m(^2))</td>
<td>27.36±5.16</td>
<td>27.24±3.34</td>
<td>0.91</td>
</tr>
</tbody>
</table>

P<0.01: Highly Significant, P. value >0.05 : Non-significant (NS)
The study showed that, serum level of IDO1 enzyme was elevated significantly (P<0.01) in prostate cancer patients (11.74±0.28 pg/ml) as compared with healthy control group (4.78±0.15 pg/ml), Table 2.

Table 2: Relation of Indoleamine 2,3-dioxygenase 1 (IDO1) with prostate cancer.

<table>
<thead>
<tr>
<th>IDO1 (ng/ml)</th>
<th>Patients with prostate cancer (n:47)</th>
<th>Control group (n:40)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean±SD</td>
<td>11.74±0.28</td>
<td>4.78±0.15</td>
</tr>
<tr>
<td>Minimum</td>
<td>5.34</td>
<td>5.39</td>
</tr>
<tr>
<td>Maximum</td>
<td>30.1</td>
<td>9.85</td>
</tr>
</tbody>
</table>

T. Test: 2.18 P. value: 0.001

P<0.05: Significant

The study showed that, the highest mean of PAP enzyme was recorded in prostate cancer patients (0.111±0.075 pg/ml) as compared with healthy control group (0.069±0.024 pg/ml). The difference was highly significant (P<0.01), Table 3.

Table 3: Relation of Prostate acid phosphatase (PAP) with prostate cancer.

<table>
<thead>
<tr>
<th>PAP enzyme (pg/ml)</th>
<th>Patients with prostate cancer (n:47)</th>
<th>Control group (n:40)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean±SD</td>
<td>0.111±0.075</td>
<td>0.069±0.024</td>
</tr>
<tr>
<td>Minimum</td>
<td>0.056</td>
<td>0.045</td>
</tr>
<tr>
<td>Maximum</td>
<td>0.33</td>
<td>0.15</td>
</tr>
</tbody>
</table>

T. Test: 3.62 P. value: 0.001

The study showed positive correlation between PAP enzyme and stage of prostate cancer (r: 0.34), Figure 1.

Figure 2: Correlation of PAP enzyme level with stage of prostate cancer

The study showed positive correlation between IDO1 level and stage of prostate cancer (r: 0.62), Figure 3.
The study showed negative correlation between IDO1 level and PAP level in prostate cancer patients (r: -0.22), Figure 4.

**Discussion**

The study demonstrated that, the rate of prostate cancer occurrence was increased with age and majority of patients were belonged to the age group (70-79 years). The study also showed non-significant difference between patients and control regarding their BMI mean.
(27.36±5.16 vs. 27.24±3.34kg/m²) respectively. In agreement with these finding, Al-Tmemi (9) reported that, the number of prostate cancer patients was maximally recorded in age group (60-69) years (43.75%), and followed age group (≥ 70) years. this gives clear idea that there are a relationship between the disease and age, This confirmed by present study and by other previous studies of several authors; Ke Zhou et al(2), who found that in united states more than (65%) of all prostate cancer are diagnosed in age men over the age of 65 and the average age diagnosis of prostate cancer is 69 years, after that age, the chance of developing prostate cancer becomes more common than any other cancer in men. The result of the current study was in agreement with Ferreira et al(10) study, who found a significant elevation in IDO1 levels in prostate cancer patients as compared with healthy control group. Banzola et al(11) found that IDO1 was elevated significantly (P<0.01) in prostate cancer patients. Moreover, IDO1 was also expressed in tumor cells as well as in various non-tumor cells in the tumor microenvironment, such as fibroblasts, endothelial cells, eosinophils, dendritic cells, and macrophages (12,13). In addition, the expression of IDO by tumor cells can result in a decrease in the number of tumor-infiltrating lymphocytes in various tumors (14,15).

The study also in agreement with that found by Junk Quiroz-Munoz et al(16) who found that increasing of serum PAP enzyme were positively correlated with stage of prostate cancer. Previous studies have shown that PAP can serve as a prostate cancer marker by proportionally increasing secretory PAP expression as prostate cancer progresses (17,18). High levels of PAP expression were detected by Jia et al(19) in patients with prostate cancers at advanced stage, as determined by immunohistochemistry . Van Der Toom et al(20) also reported that, PAP enzyme levels has significantly higher correlation with prostate cancer progression . Banzola et al(11) study, showed that, when PAP concentration is correlated positively with the progression of prostate cancer. PAP appears to be particularly valuable in predicting distant failure in higher-risk patients for whom high levels of local control are achieved with aggressive initial local treatment. Many studies subsequently demonstrated that the expression of IDO1 in tumors was associated with patients’ clinical outcome (21,22). Several other studies indicated that, IDO1 predicted a poor clinical outcome in many tumors, such as ovarian adenocarcinomas, colorectal adenocarcinomas, and endometrial and esophageal cancer(23,24).

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Kirkuk Health Directorate and all experiments were carried out in accordance with approved guidelines.

References
10. Ferreira JM, Dellê H, Camacho CP, Almeida RJ,


Prevalence Rate and Clinical Features of Fissure-in-Ano in a Private Surgical Clinic in Al-Diwaniyah Province, Iraq

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Abstract

Background: One of the most frequent causes of anal discomfort and pain is fissure in ano in which there is a linear tear in the squamous epithelium that lines the anal canal at location distal to dentate line. The disease is encountered in both male and female gender and no age is immune particularly middle age and young age. Little is known about the prevalence rate and clinical presentation in our community of Al-Diwaniyah Province, Iraq.

Aim of the Study: The current study was aiming at identifying the prevalence and clinical Presentation of Fissure-in-Ano in a Private Surgical Clinic in Al-Diwaniyah Province, Iraq.

Patients and Method: The current cross sectional study was carried out at a private surgical clinic in Al-Diwaniyah Province, Iraq. The study duration extended from January the 2nd 2019 to December the 31st 2019. During this period patients with an age between 20-60 years were enrolled based on their clinical presentation of an anorectal problem. Any patient with previous anal surgery, with malignant disorder, pregnancy or lactation was excluded from the study. All enrolled patients were examined by digital rectal examination and proctoscopic examination. Sigmoidoscopy and colonoscopy were done as required.

Result: The study included a total of 314 patients with anorectal complaint of whom 78 patients had fissure in ano making the prevalence rate as 24.8 %. Those patients with anal fissure were categorized into 57 (73.1%) males and 21 (26.9%) females. Most patients were between 31-40 years of age and the mean age of all patients was 34.98±7.81 years and the range was 20-60 years. Most of fissures were located in the posterior midline location and the minority of them was seen in an anterior midline location. The majority of patients had acute disease and the minority of them had chronic disease with some having sentinel pile.

Conclusion: It has been shown therefore, that anal fissure is a common problem in our community and that young age and middle age men are the target of majority of cases. The clinical features vary according to age and gender

Keywords: Fissure-in-Ano, Al-Diwaniyah Province, Iraq.

Introduction

One of the most frequent causes of anal discomfort and pain is fissure in ano in which there is a linear tear in the squamous epithelium that lines the anal canal at location distal to dentate line ¹.². The disease is encountered in both male and female gender and no age is immune particularly middle age and young age (3-5). The usual site of occurrence is the posterior or the anterior midline, and it extends from the dentate line toward the anal verge²,⁶,⁷. The pathogenesis and exact etiology of the disease are not well recognizes; however, the increase in the local tone of internal anal sphincter and the presence of local ischemia have been reported to be associated with increased incidence of the disease²,⁶,⁸,⁹. Constipation and passage of hard stool has been proposed
as an important initial event in the pathology of anal fissure. Anal fissure acquisition has been also linked to low fiber diet. Other associated factors have been previously reported such as childbirth in women, spicy food and poor anal cleaning.

The disease is associated with poor quality of life because of severe pain that may lead to delay of defecation and exacerbation of pathology due to chronic constipation, in addition to bleeding per-rectum and spasm of anal sphincter.

There has been a tradition to classify the disease into acute and chronic typed based on duration from onset of symptoms. Those who present within 3 to 4 weeks of onset are categorized as having acute disease with self-limiting course and well response to conservative measures such as stool softeners and high fiber diet. The other type is the chronic one, in which the clinical features are present for more than 6 weeks and it usually fails to heal spontaneously or to respond to conventional treatment and surgical intervention is often required.

Another suggested classification is based on etiology into idiopathic one with no obvious cause and secondary one in which there is some predisposing pathology such as malignant neoplasm, tuberculosis and inflammatory bowel disease.

The current study was aiming at identifying the prevalence and clinical presentation of Fissure-in-Ano in a Private Surgical Clinic in Al-Diwaniyah Province, Iraq.

Patients and Method

The current cross sectional study was carried out at a private surgical clinic in Al-Diwaniyah Province, Iraq. The study duration extended from January the 2nd 2019 to December the 31st 2019. During this period patients with an age between 20-60 years were enrolled based on their clinical presentation of an anorectal problem. Any patient with previous anal surgery, with malignant disorder, pregnancy or lactation was excluded from the study. All enrolled patients were examined by digital rectal examination and proctoscopic examination. Sigmoidoscopy and colonoscopy were done as required.

The study was approved based on ethical approval issued by ethical approval committee of the directorate of health in the province and college of medicine and a verbal consent was obtained from every participant.

Data were collected and transformed into a spread sheet of an SPSS (statistical package for social sciences) software (Chicago, IBM, USA, version 23.0) for purpose of statistical description and analysis.

Results

The study included a total of 314 patients with anorectal complaint of whom 78 patients had fissure in ano making the prevalence rate as 24.8 % (Figure 1). Those patients with anal fissure were categorized into 57 (73.1 %) males and 21 (26.9 %) females (Table 1). Most patients were between 31-40 years of age and the mean age of all patients was 34.98 ±7.81 years and the range was 20-60 years (table 1).

The most common clinical features were pain during defecation, constipation, bleeding per rectum, pruritus and discharge (table 2). Both pain during defecation and constipation were common in men, whereas, women were complaining of bleeding per-rectum, pruritus and discharge (table 2). According to age, young patients (20-30 years) were complaining mostly of bleeding per-rectum, middle age patients (31-40) were complaining mostly of pain and constipation and old patients were complaining predominantly of pruritus and discharge (table 3). Most of fissures were located in the posterior midline location and the minority of them was seen in an anterior midline location. The majority of patients had acute disease and the minority of them had chronic disease with some having sentinel pile.
Figure 1: Pie chart showing the prevalence rate of fissure in ano out of all cases with anorectal conditions

Table 1: Frequency distribution of patients according to age and gender

<table>
<thead>
<tr>
<th>Age (Years)</th>
<th>Total n (%)</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>20-30</td>
<td>10 (12.8 %)</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>31-40</td>
<td>41 (52.6 %)</td>
<td>31</td>
<td>10</td>
</tr>
<tr>
<td>41-50</td>
<td>21 (26.9 %)</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>51-60</td>
<td>6 (7.7 %)</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>78 (100.0 %)</td>
<td>57</td>
<td>21</td>
</tr>
<tr>
<td>Mean age ± SD</td>
<td>34.98 ± 7.81</td>
<td>34.91 ± 8.07</td>
<td>35.19 ± 6.84</td>
</tr>
<tr>
<td>Range</td>
<td>20-60</td>
<td>20-60</td>
<td>21-60</td>
</tr>
</tbody>
</table>

SD: standard deviation

Table 2: Clinical features in association with anal fissure according to gender

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Total n (%)</th>
<th>Male n (%)</th>
<th>Female n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain during defection</td>
<td>63 (80.8 %)</td>
<td>49 (86.0 %)</td>
<td>14 (66.7 %)</td>
</tr>
<tr>
<td>Constipation</td>
<td>48 (61.5 %)</td>
<td>37 (64.9 %)</td>
<td>11 (52.4 %)</td>
</tr>
<tr>
<td>Bleeding per rectum</td>
<td>24 (30.8 %)</td>
<td>15 (26.3 %)</td>
<td>9 (42.9 %)</td>
</tr>
<tr>
<td>Pruritus</td>
<td>9 (11.5 %)</td>
<td>3 (5.3 %)</td>
<td>6 (28.6 %)</td>
</tr>
<tr>
<td>Discharge</td>
<td>6 (7.7 %)</td>
<td>3 (5.3 %)</td>
<td>3 (14.3 %)</td>
</tr>
</tbody>
</table>

Table 3: Clinical features in association with anal fissure according to age

<table>
<thead>
<tr>
<th>Symptom</th>
<th>20-30</th>
<th>31-40</th>
<th>41-50</th>
<th>51-60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain during defection</td>
<td>6</td>
<td>37</td>
<td>17</td>
<td>3</td>
</tr>
<tr>
<td>Constipation</td>
<td>5</td>
<td>27</td>
<td>14</td>
<td>1</td>
</tr>
<tr>
<td>Bleeding per rectum</td>
<td>7</td>
<td>10</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Pruritus</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Discharge</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>
Discussion

The prevalence rate of fissure in ano in this study was 24.8% out of all anorectal conditions. This figure is somewhat less than that reported by a previous Indian report of 30.7%\textsuperscript{21}. It has been shown that the disease is far more common in men than in women and this finding is consistent with previous reports\textsuperscript{21}. Indeed, the high prevalence rate of disease in men in the current study may not reflect the true status of the disease and may be based on some cultural aspects in that men often seek medical advice for such conditions, whereas, females are hesitant in seeking medical advice for anorectal conditions because in our culture it is a usual tradition that women avoid being examined by a male doctor when having medical troubles in such embarrassing location\textsuperscript{22}.

In the current study, the main clinical features were pain during defecation, constipation and bleeding per-rectum (in that order); whereas, in previous reports bleeding was more common than constipation, but, the symptom of pain was also predominant\textsuperscript{21}. Our study has shown that men have symptoms that are different from that of women in term of frequency, pain and constipation being highly frequent in men, whereas, bleeding and pruritus being more frequent in women, in accordance with previous reports\textsuperscript{21}.

The most common age group affected in our study were patients with an age range of 31-40 (middle age), in accordance with previous observation\textsuperscript{21}. There was also substantial variation in clinical presentation with respect to age in the current study in such a way that young patients mainly had bleeding, middle age group mainly had pain and older age group mainly had pruritus and discharge. In previous reports, young patients have been shown to complain of pain and bleeding\textsuperscript{21}. Regarding the location of anal fissure, it has been shown that posterior midline site is by far the most prevalent and this is in consistence with previous reports\textsuperscript{21}.

Conclusion

It has been shown therefore, that anal fissure is a common problem in our community and that young age and middle age men are the target of majority of cases. The clinical features vary according to age and gender.

Acknowledgement: Deep thanks are to be expressed to all patients participated in this study for their kind acceptance to be enrolled and their generous cooperation.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Al-Diwaniyah Burn Specialized Center and all experiments were carried out in accordance with approved guidelines.

References


The Value of Early Pregnancy Ultrasound Parameters in Prediction of First-Trimester Outcome

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²Assist. Prof., Obstetrics & Gynecology. College of Medicine- Tikrit University, Iraq

Abstract

Background: In early pregnancy, it is essential to emphasize viability, and gestational age precisely. Researchers have tried to discover some useful sonographic indicators in early pregnancy so as to expect the outcome of the ongoing pregnancy. The aim of this study is to assess first-trimester ultrasound measurements for the prediction of early pregnancy loss.

Subjects and Method: A prospective observational cohort study done in Tikrit city in outpatient clinic of obstetrics and gynecology department in Salah Al-Deen General Hospital from 1st February-31st August 2020. A random sample of 78 pregnant women selected, 8 were lost to follow up. The data collection done through a designed questionnaire, physical examination and transvaginal sonography assessment. Sonography assessment of the crown rump length (CRL), yolk sac (YS) and gestational sac (GS) diameters, & fetal heart rate (FHR) are recording.

Results: Seventy pregnant women examined by using transvaginal ultrasonography at 6th, 9th and 12th week of gestation. The readings at 6th week of gestation for the (GSD, YSD, CRL, and FHR) were (14.5±1.3), (3.2±1.8), (3.1±0.8), & (105±10.6) respectively, lower among those with first trimester loss than those continue pregnancy (26.1±5.2), (3.9±0.3), (5.1±0.5), and (119±3). The readings at 12th week of gestation for the (GSD, YSD, CRL, and FHR) were as follows; [(25.1±3.5), (3.6±0.3), (13± 2.1). & (165± 1)] were lower among with first trimester loss group than those continue pregnancy [(59.2±4.1), (4.5±0.7), (50.7±5.7) & (171±5)].

Conclusions: The current study found that lower GSD, YSD, CRL, and FHR may indicate early pregnancy loss.

Keywords: Early pregnancy loss, crown rump length, yolk sac, gestational sac diameters, fetal heart rate.

Introduction

Spontaneous abortion is specified to end a pregnancy without medical or mechanical means before a fetus is sufficiently established to be able to survive. In other words, its fetus loss before the twenty week of gestation. [¹] spontaneous miscarriage may be the outcome in 15% of confirmed pregnancies. The recurrent loss is confirmed if loss occur in ≥3 pregnancies, with prevalence of 2% of pregnancies.[²] Ultrasonography has an important function in defining the proceeding of pregnancy and foreseeing outcome. 1st trimester of pregnancy is known as twelve weeks next to the last menstrual period is now a method of predicting an abnormal fetal outcome in both cases where a live embryo is present and even before visualization of the embryo itself. [³] With continuous technological achievements; high-frequency transvaginal scanning, have permitted the resolution of ultrasound imaging in the 1st trimester to develop to a level at which early fetal development can be estimated and watched in detail. [⁴] Ultrasonography is a safe method because it does use too low power levels and not use ionizing radiation, so not cause adverse heating or pressure effects in tissue. Generally Ultrasonography advantages to patients outweigh the risks.[⁵] Researchers have tried to discover some useful sonographic indicators in early pregnancy so as to expect the outcome of the
ongoing pregnancy. These are as follows; gestational sac diameter (GSD), yolk sac diameter (YSD), crown-rump length (CRL), and fetal heart rate (FHR).\(^6\) CRL gives a more precise assessment of gestational age because GSD shows higher variability of prediction of age.\(^7\) In early pregnancy, it is essential to emphasize viability, set up gestational age precisely, and define the number of fetuses and, in the case of multiple pregnancies, estimate amnionicity & chorionicity.\(^4\) This study was conducted to assess first-trimester ultrasound measurements role for the prediction of early pregnancy loss.

**Subjects and Method**

This is a prospective observational cohort study done in Tikrit city in outpatient clinic of obstetrics and gynecology department of Salah Al-Deen General Hospital from 1\(^{st}\) February-31\(^{st}\) August 2020. Study carried out on a convenient, randomly selected sample of 78 pregnant women who were attendants this hospital. Inclusion Criteria include mothers at any age, any parity, singleton pregnancy, 1st trimester pregnancy (6-8 weeks) with a reliable date. The mothers with chronic medical disorders (heart disease, DM, chronic hypertension, renal diseases, etc.), multiple pregnancies, smokers, and drug abusers, known uterine abnormalities, uncertain gestational age, and extra uterine pregnancy were excluded from the study. The data collection tools included designed closed and open-ended questionnaire, by using direct interviewing, physical examination by the researcher and transvaginal sonography assessment. The information collected through the questionnaire related to: Demographic questions, (e.g. age, sex, residence), and questions related to obstetrical and gynecological history, previous medical history. Physical Examination was done for the mothers in order to assess the general condition, abdominal and local examinations, and gestational age calculation according to modified Naegle’s rule. Routine investigations (CBC, ABO and Rh typing, urine analysis, RBS also was done for each mother. Sonography assessment using 2 Dimensions transvaginal ultrasound imaging, the crown rump length (CRL), yolk sac (YS) and gestational sac (GS) diameters, & fetal heart rate (FHR) are recording. Then follow up them at 9 and 12 weeks gestational age to record the result of pregnancy.

**Results**

This study was carried out on 78 pregnant women examined by using transvaginal ultrasonography starting early in the first trimester with a first scan between 6 - 8 weeks. A follow up scan was conducted at 9 weeks and at 12 weeks. During follow up 8 was lost due to the condition of COVID19 pandemic, therefore outcome of first trimester of the 70 pregnancies were recorded. For the 70 pregnant women followed 6(9%) had early pregnancy loss, and 64(91%) continue pregnancy after 12 weeks.

**Table 1. The General Characteristics of the Patient in Study**

<table>
<thead>
<tr>
<th>Age</th>
<th>No.</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤20</td>
<td>13</td>
<td>16.7</td>
</tr>
<tr>
<td>21-35</td>
<td>59</td>
<td>75.6</td>
</tr>
<tr>
<td>&gt;35</td>
<td>6</td>
<td>7.7</td>
</tr>
<tr>
<td>Total</td>
<td>78</td>
<td>100.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BMI</th>
<th>27.5±4.2</th>
<th>BMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>HB</td>
<td>11.5±2.3</td>
<td>HB</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gravida</th>
<th>Age</th>
<th>No.</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14</td>
<td>17.9</td>
<td></td>
</tr>
<tr>
<td>2_3</td>
<td>45</td>
<td>57.7</td>
<td></td>
</tr>
<tr>
<td>&gt;3</td>
<td>19</td>
<td>24.4</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>78</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

The gestational sac diameter at 6 wk of gestation (14.5±1.3) was lower among with first trimester loss group than those continue pregnancy (26.1±5.2), this relation was statistically significant, as shown in table 2. The gestational sac diameter at 9 wk of gestation (28.1±3.3) was lower among with first trimester loss group than those continue pregnancy (37.8±2.5), this relation was statistically significant, as shown in table 2. The gestational sac diameter at 12 wk of gestation (25.1±3.5) was lower among with first trimester loss group than those continue pregnancy (59.2±4.1), this relation was statistically significant, as shown in table 2.
Table 2: Relation between Gestational Sac Diameter at Different Gestational Age Period and Pregnancy Outcome

<table>
<thead>
<tr>
<th>Gestational sac diameter (mm)</th>
<th>First trimester loss</th>
<th>Continuing pregnancy</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean±SD</td>
<td>Rang</td>
<td>Mean±SD</td>
</tr>
<tr>
<td>6 wk</td>
<td>14.5±1.3</td>
<td>12-23</td>
<td>26.1±5.2</td>
</tr>
<tr>
<td>9 wk</td>
<td>28.1±3.3</td>
<td>21-33</td>
<td>37.8±2.5</td>
</tr>
<tr>
<td>12 wk</td>
<td>25.1±3.5</td>
<td>21-27</td>
<td>59.2±4.1</td>
</tr>
</tbody>
</table>

The Yolk sac diameter at 6 wk of gestation was lower among with first trimester loss group (3.2±1.8) than those continue pregnancy (3.9±0.3), this relation was statistically not significant, as shown in table 3. The Yolk sac diameter at 9 wk of gestation was lower among with first trimester loss group (5.3±0.9) than those continue pregnancy (5.8±0.6), this relation was statistically significant, as shown in table 3. The Yolk sac diameter at 12 wk of gestation was lower among with first trimester loss group (3.6±0.3) than those continue pregnancy (4.5±0.7), this relation was statistically not significant. There were lower steady increase in yolk sac diameter then decrease after 9 wk of gestation among the group with early pregnancy loss than the continuing pregnancy group, as shown in table 3.

Table 3: Relation between Yolk Sac at Different Gestational Age Period and Pregnancy Outcome

<table>
<thead>
<tr>
<th>Yolk sac diameter (mm)</th>
<th>First trimester loss</th>
<th>Continuing pregnancy</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean±SD</td>
<td>Rang</td>
<td>Mean±SD</td>
</tr>
<tr>
<td>6 wk</td>
<td>3.2±1.8</td>
<td>2.5-7</td>
<td>3.9±0.3</td>
</tr>
<tr>
<td>9 wk</td>
<td>5.3±0.9</td>
<td>4.6-7.1</td>
<td>5.8±0.6</td>
</tr>
<tr>
<td>12 wk</td>
<td>3.6±0.3</td>
<td>3.2-4.1</td>
<td>4.5±0.7</td>
</tr>
</tbody>
</table>

The crown–rump length (CRL) at 6 wk of gestation was lower among with first trimester loss group (3.1±0.8) than those continue pregnancy (5.1±0.5), this relation was statistically not significant, as shown in table 4. The CRL at 9 wk of gestation was lower among with first trimester loss group (17.5±6.7) than those continue pregnancy (27.8±3.6), this relation was statistically significant, as shown in table 4. The CRL at 12 wk of gestation was lower among with first trimester loss group (13±2.1) than those continue pregnancy (50.7±5.7), this relation was statistically not significant, as shown in table 4.

Table 4: Relation between Gestational Crown–Rump Length (CRL) At Different Gestational Age Period and Pregnancy Outcome

<table>
<thead>
<tr>
<th>Crown–rump length (CRL) mm</th>
<th>First trimester loss</th>
<th>Continuing pregnancy</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean±SD</td>
<td>Rang</td>
<td>Mean±SD</td>
</tr>
<tr>
<td>6 wk</td>
<td>3.1±0.8</td>
<td>2.3-4.2</td>
<td>5.1±0.5</td>
</tr>
<tr>
<td>9 wk</td>
<td>17.5±6.7</td>
<td>10-23</td>
<td>27.8±3.6</td>
</tr>
<tr>
<td>12 wk</td>
<td>13±2.1</td>
<td>29-35</td>
<td>50.7±5.7</td>
</tr>
</tbody>
</table>
The Fetal heart rate (FHR) at 6 wk of gestation was lower among with first trimester loss group (105±10.6) than those continue pregnancy (119±3), this relation was statistically significant, as shown in table 5. The FHR at 9 wk of gestation was lower among with first trimester loss group (162±9) than those continue pregnancy (119±3), this relation was statistically not significant, as shown in table 5. The FHR at 12 wk of gestation was lower among with first trimester loss group (165±1) than those continue pregnancy (171±5), this relation was statistically significant, as shown in table 5.

Table 5: Relation between Gestational Fetal Heart Rate (FHR) At Different Gestational Age and Pregnancy Outcome

<table>
<thead>
<tr>
<th>FHR (BPM)</th>
<th>First trimester loss</th>
<th>Continuing pregnancy</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean±SD</td>
<td>Rang</td>
<td>Mean±SD</td>
</tr>
<tr>
<td>6 wk</td>
<td>105±10.6</td>
<td>98-126</td>
<td>119±3</td>
</tr>
<tr>
<td>9 wk</td>
<td>162±9</td>
<td>159-170</td>
<td>170±4</td>
</tr>
<tr>
<td>12 wk</td>
<td>165±1</td>
<td>165-166</td>
<td>171±5</td>
</tr>
</tbody>
</table>

Discussion

The early identification of pregnancies at increased risk for early loss is important issue for health personnel and for the mother herself. The current study revealed that readings of GSD at 6th week of gestation (14.5±1.3) was lower among with first trimester loss group than those continue pregnancy (26.1±5.2) GSD at 9th week of (28.1±3.3) was lower among with first trimester loss group than those continue pregnancy (37.8±2.5) GSD at 12th week of gestation (25.1±3.5) was lower among with first trimester loss group than those continue pregnancy (59.2±4.1). This agrees with Al Darwish AG et al who found that GSD below normal (< 10th percentile) was associated significantly with PTL (preterm Labor), 1st & 2nd mid-trimester abortions.[8] This agrees with Al Darwish AG et al who found that abnormal CRL (< 10th percentile), > 90th percentile) was associated significantly with 1st trimester abortion and intrauterine fetal death (IUFD). [8] This agrees with Al Darwish AG et al who found that abnormal YS less than normal (< 10th percentile) was associated significantly with PROM and 1st trimester abortion. [8] This agrees with Al Darwish AG et al who found that abnormal GS measurements significantly related to abortion, CRL is considered an important predictor for 1st & 2nd trimester abortion and intrauterine fetal death IUFD, abnormal YSD strongly related to 1st trimester abortion, PROM and APH. [8] The current study results were in agreement with Christiansen et al., 2017 [9] they found that pregnancies that will end in abortion after 6 weeks’ gestation may be predicted by the measures of YS and GS. Additionally, they determined that abortion is predicted at least 7-days prior to occurrence. The other parameters also became abnormal prior to spontaneous abortion, but at a later time in pregnancy and closer to the event. [9] Also similar to the current study results, Odeh et al, 2009 compare gestational sac volume (GSV) between normal pregnancies, missed abortion and anembryonic pregnancies they found that GSV in missed abortion and anembryonic pregnancies are considerably smaller than normal pregnancies, starting at 7-weeks of gestational age. [10] Also results of Batmaz et al, 2016 in their research agreed with the current study, they found that GS readings can help to distinguish between normal and abnormal pregnancies. [11] Also Jauniaux et al 2005 proved that in pregnancies with a live fetus at 6-10-weeks’ gestation the rate of subsequent fetal loss is associated to maternal age, and the ultrasound findings of small GSD and fetal bradycardia (FHR bradycardia), relative to CRL. [12] Also, the current research is in accordance with many other researches as Balsane et al.[13] 2017, Agarwal et al.[14] 2017 and Abu Elghar et al.[15] 2013, S Abdulkadhim et al,[16] 2017found that with majority of patients with embryonic heart rate <100 BPM ended up with poor outcome. Regarding the FHR, Most of the patients who had poor first trimester outcome had EHR below 100 BPM. This finding came in agreement with those of Doubilet et al 1995 [17] who found that an FER below 90 beats per minute at 6-8 weeks of gestation have been found to be related with a high probability of subsequent 1st trimester demise. Another similar research by Benson et al 2013 [18] identify the survival rate according to the FHR in 6.3-7 gestational weeks to
be nearly 52% when the FHR between 100-119 bpm and
drop to 0% when the heart rate drop to less than
100 bpm. The current study revealed that YSD at 6th
week of gestation was lower among with first trimester
loss group (3.2±1.8) than those continue pregnancy
(3.9±0.3), YSD at 9th week of gestation was lower
among with first trimester loss group (5.3±0.9) than
those continue pregnancy (5.8±0.6), and YSD at 12th
week of gestation was lower among with first trimester
loss group (3.6±0.3) than those continue pregnancy
(4.5±0.7). This result disagrees with a research by Cho
FN et al 2006 [19] shown that the largest acceptable size
of yolk sac was 8.1mm, and that the quality of the yolk
sac is also an important predictor of the outcome of
pregnancy. The poor quality and early regression of a
yolk sac are more specific than the large size of a yolk sac
in predicting pregnancy loss. According to SinanTan et
al [20] 2012, evaluation of yolk sac should be part of a full
1st trimester sonographic examination as an abnormality
in the sonographic appearance of a yolk sac can predict
subsequent embryonic death. Another study made by
Asim K et al, [21] gave the criteria of subsequent first
trimester demise depending on the quality of the yolk
sac as 1-Absence of the yolk sac, 2-Too large yolk sac
more than 6mm (sensitivity 16%, specificity 97 %),and
3-Too small yolk sac less than 3mm (sensitivity 15%,
specificity 95%). In the current study the 3rd point was
found to have bad impact on the pregnancy outcome.

Conclusions

The readings at 6th, 9th and 12th week of gestation
for the (GSD, YSD, CRL, and FHR) were lower among
with first trimester loss group than those continue
pregnancy. The current study found that that those
with early pregnancy loss the mean GSD, YSD, CRL,
and FHR were lower than the value among those
continue pregnancy. This study proves the function of
early ultrasound in predicting abnormal outcomes of
pregnancy it could be useful to obstetricians to anticipate
adverse outcomes and being warned to manage prenatal
care and delivery more accurately. Early fetal ultrasound
should be used as a tool to predict pregnancy outcome so
as to manage prenatal care and delivery more efficiently.

Financial Disclosure: There is no financial
disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols
were approved under the Salahadeen Health Directorate
and all experiments were carried out in accordance with
approved guidelines.

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Health and Culture:  
A Basis for Development of Extension Health Service Programs

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Abstract

Health is a priority need where related services should be extended to people and empower them on aspects that is beneficial to their wellbeing. However, approaches toward health intervened by the culture outgrown by the people in a society that oftentimes influence beliefs about the origins and nature of illness and how it will be managed. Therefore, understanding individual and cultural beliefs about health and illness is essential. This is vital in developing effective approaches on how to improve health of the people though, everyone’s experience with illness is unique and personalized. Community’s health development through empowerment of people on services that will benefit them was the ultimate goal of this project at which participatory assessment was the initial step to identify what particular health needs to be addressed. At which, sequential explanatory strategy of mixed method research design was used where survey on holistic health indices followed by key informant interviews and observations particularly on their health-related practices, traditions were the means of data collection applied. All gathered data on health and health related problems has inference to their culture. It was also noted that culture has implication to the health status of the community. Therefore, it is highly suggested to develop extension services on promotive and preventive health programs that is more intensive particularly on healthy lifestyle, prevention and control of communicable and non-communicable diseases, family planning, environmental safety and sanitation, personal hygiene and community-based health projects based on their beliefs and practices. Moreover, clear and simple dissemination of result prior to planning should be given an emphasis to avoid conflict and to gain full participation of the community.

Keywords: Health, culture, community, illness, health service programs.

Introduction

Cultural perspectives show limitations that control people because of beliefs and traditions transferred through generations that are sometimes advantageous for it inculcates discipline to youth. However, these often delimits how people think and react to certain scenarios especially towards health and illnesses where cultural dimensions are essential to physiological and psychological health. The Center for Advanced Research in Language Acquisition (CARLA) defined culture as the shared patterns of behaviors and interactions, cognitive constructs, and affective understanding that are learned through a process of socialization. Further, Brives & Le Marcis described culture as a set of distinctive spiritual, material, intellectual and emotional features of society or a social group … [which] encompasses, in addition to art and literature, lifestyles, ways of living together, value systems, traditions and beliefs.¹ At this point, health should be examined from the viewpoint of culture and health point of view because a culture of health is one in which good health and wellbeing flourish across geographic, demographic, and social sectors; fostering healthy equitable communities guides public and private decision making; and everyone has the opportunity to make choices that lead to healthy lifestyles(Evidence for Action, n.d.). Hence, connection of health and culture

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appears from the professional world of healthcare and positive impact of culture on health that is considered an essential focus on culture reflected in two strategic frameworks that underpin a project on cultural contexts of health and wellbeing in the European policy framework Health 2020\(^2\) and the 2030 Agenda for Sustainable Development.\(^3\) Moreover, it has always been the focus of the World Health Organization (WHO) to look on awareness of cultural contexts of health program implementation and/or understanding community resilience and wellbeing in the face of poor health and economic hardship. The Cultural contexts of health which was rationalized by 2014 Lancet Commission on Culture and Health contended that the systematic neglect of culture in health and health care is the single biggest barrier to the advancement of the highest standard of health worldwide.\(^4\)

On the other hand, health is a priority need where related services should be extended to people and empower them on aspects that is beneficial to their wellbeing. However, approaches toward health intervened by the culture outgrown by the people in a society that oftentimes influence beliefs about the origins and nature of illness and how it will be managed. Therefore, understanding individual and cultural beliefs about health and illness is essential. In fact, Napier, Ancarano, Butler, Calabrese, et al.\(^5\) claimed that the worldwide equality can only be achieved by recognizing cultural systems of value and countering the idea that local cultures are obstacles to worldwide equality. Indeed, a failure to acknowledge culture leaves its negative effects unaddressed and its positive potential for providing new models of thinking unrealized. Thus, ignoring culture prevents each individual the sense of belonging in a local moral world.

The argument ascertained that culture and health are related at which health beliefs and practices is vital and should be included during participatory community health assessment as basis for developing health service programs.

**Methodology**

The sequential explanatory strategy of mixed method was utilized in this endeavor. It emerged from the paradigm wars between qualitative and quantitative research approaches that is widely used as a mode of inquiry.\(^6\) In this study, collection and analysis of quantitative data comes firsts followed by qualitative data collection and analysis to substantiate the findings of the quantitative data. Moreover, purposive-convenience sampling was utilized because the selection of participants is criterion-based and this study relied on available household members of Betwagan, Sadanga, Mountain Province, Philippines during the survey.

In the quantitative part of this study, a self-made family health assessment tool was utilized after reliability testing making use of Kuder-Richardson 20 (KR20) coefficient which was declared valid for the coefficients of reliability is 0.99 and the descriptive equivalent is “very reliable”. Furthermore, frequency count and percentage were used to reflect findings of the survey for it can be easily recognize which among the findings should be the priority. Furthermore, a semi-structured interview guide was used for the qualitative part of the research guided by\(^7\) framework of themes to be explored. Meanwhile, key informant interview was conducted purposely to discover informants’ feelings, perceptions and thoughts that focused on the past, present and, the essential experiences of the participants.\(^8\) The theme of the interview was on the health beliefs and practices of households who voluntarily agreed to participate. Descriptive analysis of qualitative data was used as it can simply connect the meaning of responses during interviews supported by the observation.

Before data collection, ethical considerations were given priority until the final stage of this study. Since participation of human persons was involved, the researchers ensured that human rights are fulfilled through the process of ongoing informed consent, continual assessment of risk versus benefit for research participants, and the prevention of harm; and conduct research that is relevant to communities of interest, are guided by participation of these communities in identifying research problems, and strive to benefit patients, society, and professional practice.\(^9\)

**Results and Discussions**

Data on health and culture of the people in Betwagan, Sadanga, Mountain Province, Philippines was taken through community health participatory assessment. This is a methodological process which is focused on the local health indices of community for diagnosis, planning or development of strategies that will address the identified health needs and its implementation. Due to wider coverage of gathered information, this study regrouped the collected data into three clusters. These
are: (1) Community vital statistics particularly on age and gender of the people in the community; (2) Community health statistics which include the diseases or health conditions of the community; and the (3) Community demographics particularly on (a) socioeconomic indicators such as occupation, employment status and place of work, (b) sociocultural indices such as educational attainment, religious affiliation and housing, and (c) environmental health markers particularly on water supply, human waste and garbage disposal.

Community Vital Statistics: Table 1 presented the distribution of population according to year and gender. As shown, majority of the population belongs to the age group 21-40 years old which was almost equal in number. This stage is also called early adulthood at which, individual of this age is typically vibrant, active, healthy, and are focused on intimate relationship, romance, child bearing and careers. Physical abilities are at its peak, including muscle strength, reaction time, sensory abilities and cardiac functioning. Taking into consideration the ranks, it was noticed that it projects a direction that is conducive for a sustainable healthy community.

Table 1. Distribution of population according to gender and age group

<table>
<thead>
<tr>
<th>Age Group (Year)</th>
<th>Male</th>
<th></th>
<th>Female</th>
<th></th>
<th>Overall</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>Rank</td>
<td>f</td>
<td>%</td>
<td>Rank</td>
</tr>
<tr>
<td>&gt;60</td>
<td>114</td>
<td>10.04</td>
<td>4</td>
<td>90</td>
<td>7.41</td>
<td>6</td>
</tr>
<tr>
<td>41-60</td>
<td>187</td>
<td>16.46</td>
<td>2</td>
<td>193</td>
<td>15.90</td>
<td>2</td>
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<tr>
<td>21-40</td>
<td>355</td>
<td>31.25</td>
<td>1</td>
<td>354</td>
<td>29.16</td>
<td>1</td>
</tr>
<tr>
<td>18-20</td>
<td>62</td>
<td>5.46</td>
<td>7</td>
<td>86</td>
<td>7.08</td>
<td>7</td>
</tr>
<tr>
<td>15-17</td>
<td>78</td>
<td>6.78</td>
<td>6</td>
<td>103</td>
<td>8.48</td>
<td>5</td>
</tr>
<tr>
<td>13-14</td>
<td>95</td>
<td>8.36</td>
<td>5</td>
<td>121</td>
<td>9.97</td>
<td>4</td>
</tr>
<tr>
<td>7-12</td>
<td>123</td>
<td>10.83</td>
<td>3</td>
<td>151</td>
<td>12.44</td>
<td>3</td>
</tr>
<tr>
<td>4-6</td>
<td>40</td>
<td>3.52</td>
<td>9</td>
<td>48</td>
<td>3.95</td>
<td>9</td>
</tr>
<tr>
<td>1-3</td>
<td>53</td>
<td>4.67</td>
<td>8</td>
<td>55</td>
<td>4.53</td>
<td>8</td>
</tr>
<tr>
<td>0-11 Month</td>
<td>29</td>
<td>2.55</td>
<td>10</td>
<td>13</td>
<td>1.07</td>
<td>10</td>
</tr>
<tr>
<td>Overall</td>
<td>1136</td>
<td>100.00</td>
<td></td>
<td>1214</td>
<td>100.00</td>
<td></td>
</tr>
</tbody>
</table>

However, it was observed that 0 – 6 years old found at the last three among the groups while the first and second populated age group are from 21 –60 who are in the reproductive age or childbearing period. Yet, they are not family planning acceptor. Follow up were done where most of them are married at their thirties and some are still single. On the other hand, more than 60 years old was found at the 5th rank. Individuals in this stage are vulnerable to non-communicable and chronic diseases which is more on lifestyle related illnesses. Lastly, the data reflected that there was near to perfect distribution of males and females. This indicated a successful and healthy community environment as it depicts equality in terms of communication, interest and motivation. One thing, having the same number of sexes working together means more sustainable, successful work environment.

Community Health Demographics: This cluster has three focuses which are socioeconomic status, sociocultural indices and environmental health markers. Table 2 revealed the socioeconomic status of the community. Its emphases are on occupation, employment status and place of work. As gleaned from the table, most of the people in the community are farmers. The community has wide-range area for farming vegetables, rice, and sugarcane. This made people considered themselves as self-employed that is an advantage to their health because the distance of their residence to the farms are minutes to an hour which served as their daily warm up exercise. The most alarming issue is the unemployed citizens. Among them should have to become productive as what was concluded by the researchers. This should be one from the prioritized focus of developing the
community to avoid these people into not good source of income. Moreover, most of the people works within the community which means that there are tendencies of economic stagnation. An alarming increasing number of unemployed individuals sometimes an advantage for some help in terms of health-related emergencies considering the distance of the community to the main road as an access to health care facilities. However, being a stand byer due to unemployment results to bad habits like smoking and drinking as it is their common practice to gather in one area or a small convenient store if they do nothing at home or elsewhere. Good thing for people has a practice on simple investment and budgeting that made them always within the level threshold which is beneficial in the sustainability of their essential needs every day. Moreover, food is their priority for they have granaries (arang or agamang) for their stocks. With the simplicity of their life, they even save money for the education of their children.

### Table 2: Socioeconomic status of the community

<table>
<thead>
<tr>
<th>Indices</th>
<th>f</th>
<th>%</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farmer</td>
<td>996</td>
<td>62.3</td>
<td>1</td>
</tr>
<tr>
<td>Laborer</td>
<td>193</td>
<td>32.38</td>
<td>2</td>
</tr>
<tr>
<td>Miner</td>
<td>26</td>
<td>4.36</td>
<td>3</td>
</tr>
<tr>
<td>Army</td>
<td>15</td>
<td>2.52</td>
<td>4</td>
</tr>
<tr>
<td>Employment status</td>
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<td></td>
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</tr>
<tr>
<td>Employed</td>
<td>234</td>
<td>9.98</td>
<td>3</td>
</tr>
<tr>
<td>Unemployed</td>
<td>211</td>
<td>16.71</td>
<td>2</td>
</tr>
<tr>
<td>Self-employed</td>
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<td>73.32</td>
<td>1</td>
</tr>
<tr>
<td>Place of work</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inside the community</td>
<td>968</td>
<td>67.18</td>
<td>1</td>
</tr>
<tr>
<td>Outside the community</td>
<td>473</td>
<td>32.82</td>
<td>2</td>
</tr>
</tbody>
</table>

On the other hand, Table 3 illustrated the sociocultural status of the community. Most of the residents are elementary level. However, second most numbered residence of the community was college graduate which has narrow difference that neutralizes the finding. This was validated by the result of interview that education was the second priority of the people in the community. The direction of educational attainment is good but the 7th in rank is too alarming. Still many from them have no formal education. On follow-up, it was found that residents who had no formal education are mostly the elderly. Reasons which arose for the inability to attend schooling were: (a) they cannot afford a very expensive education; (b) they work in the farm to support their parents and sibling; and (c) there were no schools back in the old times. On the other hand, Roman Catholic is the most dominant religious affiliation despite of other sectarian group existence. Though there are varieties of religious affiliations, they have still commonalities in terms of their cultural beliefs and practices.

### Table 3. Sociocultural status of the community

<table>
<thead>
<tr>
<th>Indices</th>
<th>f</th>
<th>%</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational attainment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary Level</td>
<td>396</td>
<td>18.75</td>
<td>1</td>
</tr>
<tr>
<td>Elementary Graduate</td>
<td>253</td>
<td>11.98</td>
<td>6</td>
</tr>
<tr>
<td>High School Level</td>
<td>348</td>
<td>16.48</td>
<td>3.5</td>
</tr>
<tr>
<td>High School Graduate</td>
<td>348</td>
<td>16.48</td>
<td>3.5</td>
</tr>
<tr>
<td>College Level</td>
<td>318</td>
<td>15.06</td>
<td>5</td>
</tr>
<tr>
<td>College Graduate</td>
<td>359</td>
<td>17.00</td>
<td>2</td>
</tr>
<tr>
<td>No Formal Education</td>
<td>90</td>
<td>4.26</td>
<td>7</td>
</tr>
</tbody>
</table>
Furthermore, land ownership enhances personal freedom. The freedom can maximize owners to utilize their land with no hindrances. Most families who reside in the community have their own land and house they can stay. Moreover, majority of the families live in a house made up of light material which is wood. Some are old houses that are built years ago and are just being maintained by the family who inherited these from their folks. Some are mixed which are made up of wood and cements and it is seldom to see houses made by strong materials. As to lighting facility, electricity had reached the community where most are utilizing and minimal are still using other means. There were no street lights seen in this community that people can use during night emergencies and is considered hazardous for anybody is vulnerable to accident. One thing, pathways have no siderails for the safety of people passing considering the terrain of the community.

On the other hand, environment health markers were shown in table 4. Water is a necessity resource that every family need in the farm, family survival and other environmental activities. It was noted that most of residences shared water resources. However, each has own connection from the main line for household consumption. Shared water supply is purposely for laundry and agriculture as their main source of living.

<table>
<thead>
<tr>
<th>Table 4. Environmental health markers of the community</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indices</td>
</tr>
<tr>
<td>Water supply</td>
</tr>
<tr>
<td>Shared</td>
</tr>
<tr>
<td>Owned</td>
</tr>
<tr>
<td>Human waste disposal</td>
</tr>
<tr>
<td>Flush</td>
</tr>
<tr>
<td>Pit privy/latrine</td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td>Under construction</td>
</tr>
<tr>
<td>Shared</td>
</tr>
<tr>
<td>Garbage disposal</td>
</tr>
<tr>
<td>Collected</td>
</tr>
<tr>
<td>Waste segregation</td>
</tr>
<tr>
<td>Feed to animals</td>
</tr>
<tr>
<td>Burning</td>
</tr>
<tr>
<td>Burying</td>
</tr>
<tr>
<td>Open pit dumping</td>
</tr>
<tr>
<td>Dispose along the river</td>
</tr>
<tr>
<td>Others</td>
</tr>
</tbody>
</table>
Further, most of them have their own flush type for human waste disposal which is an advantage due to abundancy of water. However, sanitary considerations should be strictly observed for this method considering that toilets are normally the place where waterborne diseases in the gastrointestinal and urinary started. Moreover, families who don’t have toilets land at the second on rank. This means that they are utilizing other means of disposing. Nice to know that pit privy or latrine is sufficient enough within the community as the shared human waste disposal for those who don’t have toilets while other families have their own.

The community was observed on its stage of development for some families are still on the process of constructing their own toilets. Further, burning was their most preferred garbage disposal. It’s nice to know that segregation of waste was done before burning because burning of other materials like plastic may intoxicate people as well as the environment leading to vulnerability to illnesses. Others was the third choice which either be combination to any of those because they scored the indicator without specifying if how. The last two choice is somewhat alarming because the way they dispose their garbage is not the proper way that may result to other health problems.

Community Health Statistics: This describes the health behaviors, diseases, and injuries of people in the community and its comparison to the national targets. In this community, it is their common belief that being healthy is when anybody can be able to do their functions, work well and are productive. Further, the community has health center with trained volunteers called barangay health workers (BHW) and a midwife. BHWs are the one conducting home visits to gather health related information and disseminate health programs of the government. There were times that public health nurse (PHN) does visits in the community if necessary same as with the municipal health officer. At this point, midwife assigned in their locality was the most preferred health worker for consultation followed by BHWs. The distance between the community to nearest hospital or the main health center is far enough for a regular travel related to health consultation. Alburaryo or quack doctor were the least they visit in terms of health problems that has implication to their culture.

Breastfeeding and immunization were highly recommended and always reminded by health workers to each family of its advantages at which, mothers claimed that they practice breastfeeding until their child do not like to do. The advantages as what claimed by mothers are: free, no special preparation, accessible all the time and tends they knew the difference of breast milk and formula milk because they even claimed that breast milk is more nutritious and less allergens than the formula milk. As to immunization, there’s a need for further education of what benefits a child can avail from the expanded program on immunization by the government. Records at the health center reported minimal numbers of children who are fully immunized that was confirmed by mothers during interview. Same as to the importance of the tetanus toxoid immunization of mothers. It seems they need to know more about the benefits of the said preventive regimen due to minimal number of reported mothers who underwent the vaccination. The community dominantly took medications as prescribed. They sometimes used alternatives like calamansi juice for cough and boiled guava leaves for diarrhea. Moreover, there is a government pharmacy called “botika” for them to buy medicine at affordable price where the one in-charge explains how it can be taken, its duration and alike.

On the other hand, table 5 revealed top 10 diseases and injuries encountered by the people in the community. These problems were classified under health deficit, health threat and foreseeable crisis where data needed were taken through survey, interviews, observations, and records from the health center.

As revealed, hypertension was on the top list. Food preference was one of the suspected reasons of its existence. The residents are fond of preparing cured meat they called it as “etag” followed by diarrhea which is related to personal hygiene and environmental sanitation. Pneumonia is a highly contagious disease at which suppressed immune system was one of the reasons of its occurrence. Hygiene also add on it cause. Moreover, arthritis was one of those that is related to their daily activities and diet. Farmers are hard workers while dried beans and internal organs are example of foods, they usually eat that increases uric acid. Fall was one of the reported cases related to lack of street lights and siderails of pathways for the people to pass. Heart Failure is related to hypertension and tuberculosis correlates to pneumonia. Moreover, anemia and goiter are related to the foods they are eating. Lastly, UTI (Urinary Tract Infection) is more on personal hygiene. One practice which is related to hygiene and infection is that, carrying a naked cadaver from one person to
another which are also naked which they believe that more blessing if any secretion coming from the dead body drops to the carrier.

**Table 5: 10 leading diseases and injuries**

<table>
<thead>
<tr>
<th>Indices</th>
<th>f</th>
<th>%</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anemia</td>
<td>5</td>
<td>3.97</td>
<td>8</td>
</tr>
<tr>
<td>Arthritis</td>
<td>14</td>
<td>11.11</td>
<td>4</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>20</td>
<td>15.87</td>
<td>2</td>
</tr>
<tr>
<td>Fall</td>
<td>8</td>
<td>6.35</td>
<td>5</td>
</tr>
<tr>
<td>Goiter</td>
<td>3</td>
<td>2.38</td>
<td>9.5</td>
</tr>
<tr>
<td>Heart Failure</td>
<td>7</td>
<td>5.56</td>
<td>6.5</td>
</tr>
<tr>
<td>Hypertension</td>
<td>46</td>
<td>36.51</td>
<td>1</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>13</td>
<td>10.32</td>
<td>3</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>7</td>
<td>5.56</td>
<td>6.5</td>
</tr>
<tr>
<td>UTI (Urinary Tract Infection)</td>
<td>3</td>
<td>2.38</td>
<td>9.5</td>
</tr>
</tbody>
</table>

**Conclusions and Recommendations**

All gathered data on health and health related problems has inference to their culture. It was also noted that culture has implication to the health status of the community. Therefore, it is highly suggested to develop extension services on promotive and preventive health programs that is more intensive particularly on healthy lifestyle, prevention and control of communicable and non-communicable diseases, family planning, environmental safety and sanitation, personal hygiene and community-based health projects based on their available resources, beliefs and practices. Moreover, clear and simple dissemination of result prior to planning should be given an emphasis to avoid conflict and to gain full participation of the community.

**Conflict of Interest:** There is no professional, personal, or family allegiance, bias, inclination, obligation or loyalty which may in any way affects the objectivity, independence or impartiality in the accomplishment of this study.

**Funding:** This research did not receive any specific grant from funding agencies in the public, commercial, or non-for-profit sectors.

**Ethical Clearance:** Guidelines for the protection of human rights outlined in the American Nurses Association\(^\text{10}\) was observed.

**References**

Evaluation of Ischemia Modified Albumin IMA as New Predictor in Patients with Newly Thyroid Dysfunction in Type 2 Diabetes Mellitus

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2Asst. Prof., F.R.C.(u.k), C.A.B.M, National Diabetes Center/Mustansiriyah University/Iraq

Abstract
In the general population Thyroid dysfunctions are common after DM as the most well-known situation to influence the endocrine system. Diabetic patients are at increased danger of thyroid sickness, particularly persons with poor glycaemic control. Ischemia Modified Albumin IMAis novel marker of oxidative stress and tissue ischemia . The pathophysiological occasions of ischemia, including free oxygen radicals and hypoxia, bring about a conformational change of albumin in the N-terminus. The study included 120 subjects, divided into four groups; the first group included 30 patients type2 diabetes mellitus T2DM with newly diagnosed hyperthyroidism HprT, the second group includes 30 patients T2DM with newly diagnosed hypothyroidism HpoT, the third group included 30 patients diagnosed with T2DM, and the fourth group included 30 healthy control subjects. The concentration of (fasting blood glucose FBG, Glycated hemoglobin HbA1c, Total cholesterol TC, Triglyceride TG, high density lipoprotein HDL, Free Triiodothyronin FT3, Free Thyroxin FT4 and thyroid-stimulating hormone TSH). The results show high significant differences in level of IMA between all studied groups that including diabetic patient with newly diagnosed thyroid disorders, [(2.60±1.11), (2.41±1.23), (2.57±5.50), (2.10±0.61)] respectively.

Conclusion: Biomarkers IMA could be helpful early diagnosis in monitoring T2DM with newly diagnosed thyroid disorders.

Keywords: Type2 DM, thyroid dysfunction, ischemia modified albumin.

Introduction
Diabetes mellitus DM is a chronic endocrine issue described by hyperglycemia, which happens because of inadequacy secretion of insulin from pancreas or insulin sensitivity in the body or both of them(1). The thyroid gland is the first endocrine gland to develop in humans(2). Thyroid keep released growth hormone, skeletal development, and heart rate. It advances central nervous system development and invigorates synthesis of numerous enzymes, Thyroid is essential for muscle tone and life. Furthermore, metabolism is managed by the thyroxine hormone, which can be made by the thyroid if enough organic iodine is accessible(3). Diabetic patients are at increased danger of thyroid sickness, particularly persons with poor glycaemic control(4).

In the mid-1990s, it was first found that presentation to ischemic tissue changes the N-terminus of the albumin serum, diminishing its coupling limit with regards to metals, (for example, cobalt, nickel, and copper) and bringing about the development of IMA(5). Many studies used the new biochemical indicator IMA for the finding and evaluation of myocardial ischemia. In DM, both of oxidative stress and hyperglycemia will promote chronic ischemia which may lead to necrosis of several tissues and lead to different diabetic complications(6).

Material and Method
The study included 120 subjects, divided into four groups; the first group included 30 patients with T2DM with newly diagnosed of hyperthyroidism HprT, the second group includes 30 patients T2DM with newly diagnosed hypothyroidism HpoT, the third group include 30 patients diagnosed with T2DM, and the fourth group included 30 healthy control subjects. The concentration of (fasting blood glucose FBG, Glycated hemoglobin HbA1c, Total cholesterol TC, Triglyceride TG, high density lipoprotein HDL, Free Triiodothyronin FT3, Free Thyroxin FT4 and thyroid-stimulating hormone TSH). The results show high significant differences in level of IMA between all studied groups that including diabetic patient with newly diagnosed thyroid disorders, [(2.60±1.11), (2.41±1.23), (2.57±5.50), (2.10±0.61)] respectively.
diagnosed of hypothyroidism HpoT, the third group included 30 patients diagnosed with T2DM, and the fourth group included 30 healthy control subjects. The study was approved by the scientific and ethics committee in the national diabetes center/Al-mustansiryah University was enrolled in the study which was conducted from January 2020 to July 2020. Blood sample was divided into two parts, the first one (1ml) was transferred into tube containing (EDTA), to estimate HbA1C. While the second one (9ml) was transferred into a gel tube. Then centrifugation at (3000rpm) for 15 minutes to separate the serum. 1 ml of serum was used to determine FBG and lipid profile and 1.5 ml of serum used for further investigation thyroid function test (FT3, FT4 and TSH). The remained was transferred to the eppendorf tube and stored in a deep freezer (-20ºC) to be used for IMA. All biochemistry measurement were done using kenza 240TX (Biolabo) instrument and (Biolabo) kit (FBG, TC,TG, HDL) .HbA1c were measured using the Tosoh automated glycohemoglobin analyzer HLC-723GX. The HLC-723GX was based on the high-performance liquid chromatography HPLC. The Thyroid hormones assay(TSH,FT4 and FT3) were performed using Vidas Instruments and Biomerieux kit. The concentration of IMA determined using ELISA kit (Al-Shkairate establishments, Jordan).

Result and Discussion

As shown in table (1), the mean duration increase in diabetic with newly diagnosed hypothyroidism group HpoT and in diabetic with newlydiagnosed hyperthyroidism group HprT, as compared to the patient with DM only. But that increase was not significant. The result in the study showed the female number increase in diabetic with newly diagnosed hypothyroidism group HpoT (27 (90%)) more than males 3 (10%), but in diabetic with newly diagnosed hyperthyroidism group HprT, the female were 20(66.7%) and male were 10 (33.3%).

The level of FBG showed a highly significant (p<0.001) increase in diabetic with newly diagnosed hyperthyroidism group, DM only group, diabetic with newly diagnosed hypothyroidism group,and control group. The level of HbA1c showed a highly significant (p<0.001) increase in diabetic with newly diagnosed hyperthyroidism group,diabetic with newly diagnosed hypothyroidism group, DM only group,and control group.

Table 1: Assessment of demographic data

<table>
<thead>
<tr>
<th>Variables</th>
<th>HprT</th>
<th>HpoT</th>
<th>Control</th>
<th>DM only</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>-</td>
</tr>
<tr>
<td>Age years</td>
<td>52.9±6.0</td>
<td>55.7±7.0</td>
<td>49.2±7.4</td>
<td>53.5±7.9</td>
<td>0.006 [S]</td>
</tr>
<tr>
<td>Duration Years</td>
<td>6.0±4.8</td>
<td>6.9±5.2</td>
<td>5.7±4.4</td>
<td>-</td>
<td>0.621</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>20 (66.7%)</td>
<td>27 (90%)</td>
<td>27 (90%)</td>
<td>26 (86.7%)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>10 (33.3%)</td>
<td>3 (10%)</td>
<td>3 (10%)</td>
<td>4 (13.3%)</td>
<td></td>
</tr>
<tr>
<td>FBS mg/dl</td>
<td>220.3±75.5</td>
<td>187.3±77.1</td>
<td>85.7±6.8</td>
<td>196.3±102.9</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>HbA1c %</td>
<td>8.8±0.7</td>
<td>8.5±0.8</td>
<td>4.8±0.4</td>
<td>8.3±0.8</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Diabetes with newly hypothyroidism HpoT: Diabetes with newly diagnosed hypothyroidism HprT: Diabetes with newly diagnosedhyperthyroidism p-value<0.05 is significant

Advanced age considered a well-known risk factor for hypothyroidism, coupled with female gender, and autoimmune disease(7). Because of the insidious and silent nature of the disease “The American Thyroid Association” had recommended to start the screening at the age above 35 years, to be performed periodically every 5 years, for early detection of HpoT(8). Other epidemiological study indicated that older populations are at increased risk (9). Diabetes duration has been found to be a significant risk factor in this study sample for more than 6 years, which is not the case in studies of various ethnic groups such as the Saudi diabetic patients
were 10 years, for Chinese 8.3 years and for Spanish population was 9.6 years\(^{(10)}\).

In the current research, the incidence of thyroid conditions was higher in females than in males. These findings are in agreement with studies of Papazafiropoulou A.et al. and Aljabri KS.et al.,\(^{(11,12)}\), founds female gender is affected by the prevalence of thyroid abnormalities in diabetic patients. In hyperthyroid with diabetes patient group, the increase level of FBG may be due to increased metabolic rate. And in hypothyroid with diabetes patient group, low FBG may be attributed to decrease metabolic rate\(^{(13)}\). There is a decline in insulin secretion by beta cells caused low glucose in hypothyroidism, and the reaction of beta cells to glucose is increased in hyperthyroidism due to increased beta cell mass.\(^{(14)}\).

The result of the present study as shown in figure (1) and (2), demonstrated a highly significant increase in the TC and TG in diabetic with newly diagnosed hypothyroidism group, and DM only group. Whereas, there is lower level of TC and TG in diabetic with newly diagnosed hyperthyroidism group, and control group. While there is a highly significant increase in the HDL in control group. And lower in diabetic with newly diagnosed hyperthyroidism group, in diabetic with newly diagnosed hypothyroidism group, and DM only group as shown in figure (3).

The results of the present study were close to the Kumar, et al.\(^{(15)}\), study found that the mean TC and LDL cholesterol levels were elevated in hypothyroidism compared to the controls. Thyroid dysfunction was highly common in patients with impaired glycemic regulation, a longer duration of diabetes, and was associated with substantially higher serum cholesterol and triglyceride levels\(^{(16)}\).
Table (2), demonstrated a highly significant (p<0.001) increase in the means of FT3 and FT4 in diabetic with newly diagnosed hyperthyroidism group. Whereas, there were lower indiabetic with newly diagnosed hypothyroidism group, DM only group, and control group. The level of TSH is highly significant (p<0.001) increase in diabetic with newly diagnosed hypothyroidism group. Whereas, it is lower indiabetic with newly diagnosed hyperthyroidism group, DM only group, and control group. The results also showed a high significant differences in the level of IMA between all studied groups including diabetic patient newly diagnosed hyperthyroidism, diabetic patient newly diagnosed hypothyroidism, DM only, and control group as shown in table (2), and figure (4).

Table 2: Assessment of thyroid function parameters

<table>
<thead>
<tr>
<th>Variables</th>
<th>HprT</th>
<th>HpoT</th>
<th>Control</th>
<th>DM only</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>fT3 Pmol/l</td>
<td>11.3±3.9</td>
<td>4.0±8.7</td>
<td>5.3±0.7</td>
<td>4.9±0.7</td>
<td>&lt;0.001 [S]</td>
</tr>
<tr>
<td>fT4 Pmol/l</td>
<td>25.1±7.2</td>
<td>7.8±1.7</td>
<td>11.3±2.7</td>
<td>10.7±1.6</td>
<td>&lt;0.001 [S]</td>
</tr>
<tr>
<td>TSH µmol/l</td>
<td>0.1±0.001</td>
<td>20.1±19.3</td>
<td>1.5±0.6</td>
<td>2.1±0.9</td>
<td>&lt;0.001 [S]</td>
</tr>
<tr>
<td>Ischemia Modified Albumin ng/ml</td>
<td>2.60±1.11</td>
<td>2.41±1.23</td>
<td>2.10±0.61</td>
<td>2.57±5.50</td>
<td>&lt;0.001 [S]</td>
</tr>
</tbody>
</table>

p-value<0.05 is significant
Insulin, an anabolic hormone, is believed to increase FT4 levels while suppressing T3 levels by inhibiting T4-T3 conversion in liver. In diabetes mellitus, thyrotropin releasing hormone production declines and there is also a depletion of the nocturnal TSH peak that is responsible for the incidence of low thyroid hormone levels in certain diabetics(17). Oxidative stress (OXS) and free radicals is associated with diabetes and that leads to the onset and progression of the diabetes mellitus and occurrence of complications(18). Many studies describe the function of IMA as a marker for ischemia induc and inflammation cascade of proinflammatory reactions that result in reactive oxygen species ROS being produced(19). It was understood that thyroid hormones control oxidative metabolis and mitochondrial respiration, and may therefore play an important role in controlling the production of free radicals and OXS. Therefore, any changes in the status of thyroid hormones can be contributed to a potential change in the status of OXS(20). This study is agreed with Ma, SG, et al, and Oncel, M.et al.(21,22), showing a significant positive associations between ischemia modified albumin and thyroid hormones.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** None

**Funding:** Self-funding

**Reference**


20. Ersoy K, Anaforoğlu İ, Algün E. Serum ischemic modified albumin levels might not be a marker of oxidative stress in patients with hypothyroidism. Endocrine. 2013 Apr 1;43(2):430-3.


The Effect of Face-Conclude-Answer Strategy in the Achievement of Fourth Grade Students in Chemistry

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Abstract

The aim of the research is to find out the effect of the (face-conclude-answer) strategy on the achievement of fourth-grade students in chemistry and branched thinking. Research sample was 53 students divided into two groups: A group was 27 students as experimental group and B group was 26 students as control then equalized in the following variables: academic achievement of the chemistry subject for the third intermediate grade, previous scientific knowledge of their information, intelligence test, chronological age and branched thinking test. The test was 35 items, where 26 was multiple choices question and 9 are article paragraphs. The validity was verified after the experiment in the academic year 2019-2020 by the researcher on the two research groups and according to the teaching plans that were prepared for them and applied the achievement test and the results showed the superiority of the experimental group that was studied according to the strategy (faced -conclude- answer) on the group that studied according to the usual method in a variable Academic achievement.

Keywords: Strategy (face - conclude - answer), achievement, science fourth graders, chemistry, branched thinking.

Introduction

Human instinct is the essence of life and the basis for practice in it, and it is the true entrance to the human being who is the basic nucleus of society. He always needs to keep pace with the renewal of life and achieve the integration of development for his personality. This integration can only be achieved by education, so education is an active organizational process for the system of participation and interaction, and the compatibility of individual activity(1). The specialists in scientific education confirm that teaching in general and teaching chemistry in particular is not just a transfer of knowledge to students. Rather than it is a process that helps in building their knowledge and develop their understanding and thinking about the natural world and are interested and their integration and development of all aspects of their personalities(2). Education can achieve its desired goals in order to highlight the energies of the learner and reveal his capabilities and reach him to the maximum possible learning, thinking and application. Studying chemistry helps the student to understand and think in the era of science and technology that has become difficult for a student to live in the twenty-first century without an understanding of the nature of science. Also, it gives familiarity with basic chemical information, the use of branched thinking to solve life problems, and make sound decisions in light of scientific and technological developments(3). So the best way to improve chemistry teaching can only be done through the use of a scientific method based on research and experimentation. The use of reason and thinking in problem solving is a missing factor in traditional education. Some of the criticisms and shortcomings faced the educational philosophy in the past twenty years, especially the teaching method that led to a kind of change and development, whether in form or content (4). The way to improve the level of students in the learning process is to develop their abilities to choose appropriate strategies for learning is how to activate their previous knowledge and employ them in current learning situations(5). As for the subject of chemistry, problem-solving strategies can be adopted to help students understand the proposed solution to the problem. This seeks other solutions, in addition to controlling and students will improve their understanding and comprehension, planning, management and problem-solving (6). Teaching strategy is extremely
important in three basic aspects (the teacher, the learner, and the educational subject). For the teacher, to reach his goals clearly and in a logical sequence and the learner has ability to follow the educational subject in a comfortable gradient as it provides. These strategies and models that will work is the strategy (faced - concluded - solve) as it is seen as one of the problem-solving strategies. This strategy activates are the previous information that students know and activates their ability to find solutions to the problem at hand, as well as combining the correct and wrong ideas and reaching the right ideas themselves. Especially in chemistry, as it is no longer hidden from anyone, that the extremely important role is chemistry plays as one of the main areas of technical development in other theoretical sciences, such as physics, mathematics, geology, and applied sciences such as medicine, engineering, and agriculture. It can be said that the areas of its spread are very wide (8). This achievement influences this comprehensive development outcome for students, so its effectiveness is positive and its educational importance in the student’s behavior towards the best and helps them to interact with their environment (10). The branched thinking: thinking makes the learner move in his thinking to unspecified horizons and unconventional pathways. This helps him come up with new ideas, especially when he is asked for evidence or reasons about a phenomenon. It also includes a solution to a problem in a unique and expert way producing new solutions to the problem and thus reflected on the scientific level and school performance(11). Also branched thinking skills are among the most important goals that educational institutions seek to achieve(12).

A strategy (face - conclude - answer) is an teaching strategy of problem-solving strategies followed by the teacher (the researcher) with students as the researcher divides the subject of the lesson into axes and then identifies a problem for each of them and takes into account that the problem is solvable in more than one way, then the teacher presents the problem for learners in the form of a question that students try to reach a solution. Their knowledge and previous experience then choose the teacher with the help of the educated answer will reach the most accurate and correct solution to the problem (13).

Because there are no studies that dealt with a strategy faced - concluded - answer, so the researcher turned to studies that dealt with the problem-solving method considering that this strategy is derived from the problem-solving method. From these studies is the effect of using a problem-solving method on the achievement of middle school students in geography (14).

Experimental: The researchers follow the experimental method to achieve the two goals of the research and the experimental design was the partial accurate in one description for the equal groups as shown in table 1.

<table>
<thead>
<tr>
<th>Group</th>
<th>Independent variable</th>
<th>Dependent variable</th>
<th>Research tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>Face - conclude – answer strategy</td>
<td>The achievement of branched thinking</td>
<td>Post test achievement Branched thinking test</td>
</tr>
<tr>
<td>Control</td>
<td>Regular method</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The community under study the students of science fourth grade in the governmental day school that belong to the general directorate of education in Holly Karbala at 2019-2020. The researcher chose Almakasib preparatory school randomly which included three groups of science fourth grade (A, B, and C). Group A was chosen randomly to be experimental group which consist of 27 students. This group would be taught by face-conclude-answer strategy. In the same procedure, the researchers chosen group B to be control, which is consist of 26 students.

Equivalent of The Groups Research: the two groups were equalized according to academic achievement of the chemistry subject for the third intermediate grade, previous scientific knowledge of their information, intelligence test, chronological age and branched thinking test as in table 2.
Control of foreign variables: Exotic variables: are types of independent variables that must be controlled or prevented from affecting the study by following a specific method of controlling the variables. The control of exotic variables is one of the important procedures in experimental research in order to provide the internal honesty of the experimental design and for the researcher to attribute most of the variation in the dependent variable to the independent variable and not to other variables. Accordingly, the researchers tried to control the foreign variables that he saw that might affect the integrity of the research as follows:

Accidents accompanying the experiment: During the period of application of the experiment demonstrations were witnessed (October 25 Revolution), which led to a break in full-time work in most of the provinces of Iraq, and after that, the working hours returned to normal on 27/11/2019.

Experimental extinction: There were no breakdowns, transfers, or absences except for some individual cases throughout the experiment.

Sample selection: The two research groups were randomly chosen and the two groups were equal in number of variables. This enables the researcher to avoid the effect of individual differences between the two research group, which may affect the results of the research.

Growth factor: Given that the trial period is uniform for the two research groups and the students `ages are close to the two groups, so what happens will be equal to the growth of the two groups, so this factor did not affect the research.

Measurement tools: The researcher used the same measuring tools for the two research groups: (achievement test, branched thinking test). The effect of experimental procedures: The researcher worked to limit the impact of the experimental procedures that could affect the dependent variable during the course of the experiment, and here is a presentation of these procedures whose impact has been determined.

Research confidentiality: The researcher was keen on confidentiality of the research, in agreement with the school administration and the teacher of the article not to inform the students of the nature of the research and the application of the experiment, as they were told that the researcher is a new teacher in the school so that their activities do not change or deal with the researcher.

Duration of the experiment: The duration of the experiment was equal for the two research groups (10 weeks), as it started on (Tuesday) corresponding to (10/8/2019) and ended on (Tuesday) corresponding to (16/2/2020).

Academic Subject: The two research groups were studied in the same subject, which are the three chapters (1-3 chapters) of the book of chemistry (2019, 10th edition), to be taught for the fourth scientific grade by the Iraqi Ministry of Education for the academic year (2019-2020).

Teacher: The researcher studied the two research groups himself throughout the experiment, which gives the results of the experiment accuracy and objectivity, because the difference of teachers may affect the results of the experiment and hide the effect of the independent variable.

Place: The experiment was applied in the same school, and it is a prep course.
Distribution of lessons: It was agreed with the headmaster and the teacher of the subject on equal distribution of lessons between the two research groups at three classes per week for each group, provided that one lesson for each group is on the same day.

Search requirements:

The search application requests the configuration of the following supplies:

Course Identification: The course material is determined by the three (first, second, and fifth) chapters of the Chemistry Book (2019, 10th edition) scheduled for teaching for the fourth academic year of the year by the Iraqi Ministry of Education (2019-2020).

Formulating behavioral goals: After defining the academic subject, the researcher formulated (191) behavioral goals according to Bloom’s classification distributed on (Remembering, understanding, applying, analyzing, synthesizing, evaluating), and these goals were presented to a group of experts and specialists in the field of education, psychology, teaching method, chemistry teachers and supervisors, to express their opinions and observations, and the percentage and value of Kay square for each of the goals was calculated Behavior and compare it with the tabular value of (51) with a degree of freedom (2) and at the level of significance (0.05) and the results showed the validity of all behavioral goals, a set of teaching plans were prepared for the two research groups according to the content of the book of chemistry (2019, 10th edition) to be taught to students of the fourth scientific grade for the academic year (2019-2020m) goals and tuberculosis Cauterizing, where it was set up (40) teaching plan by (20) plan teaching experimental group according (strategy faced - concluded - duty) and (20) teaching plan for the control group according to the regular method.

Search tool

The steps of the research tools (achievement test) were prepared as follows:

Determining the purpose of the achievement test: One of the requirements for applying the current research is preparing an achievement test that is used to measure the academic achievement of the research sample in chemistry for the three semesters to be taught in the first semester, so the researcher has prepared an achievement test related to the course that was taught and behavioral purposes related to it. It matches the level of the research sample.

Determine the goal of the test: The aim of the test is to measure the achievement of fourth-grade students (the research sample) in chapters (first, second, and fifth) of the textbook of chemistry after teaching it. Determining the number of test items: The researcher determined the number of items that make up the achievement test, as the number of test items reached (35) test items, including (26) objective paragraphs and (9) article paragraphs.

Preparing the specifications table: The specifications table was prepared according to its basic steps where he determined the relative importance of the three chapters: (basic concepts in chemistry, gases, nuclear chemistry), and he also determined the relative weights for each level of the cognitive field in the light of the number of pages of the book chapters, and after Defining test items with (35) items. The number of questions for each cell in the specifications table was calculated.

Drafting test instructions:

A. Answer Instructions: After verifying the validity of the test items, instructions for the test are given, giving an illustrative example of how to answer.

B. Correction Instructions:

1. Objective Paragraph: For the purpose of correcting students’ answers, the researcher prepared a key for correction, and gave (one score) for the correct answer and a score (zero) for the wrong or abandoned answer or in the case of choosing more than one answer, and thus the total score for the objective test becomes (26) degrees.

2. The essay paragraph: The researcher prepared a test for correction and was presented to some experts and arbitrators, where he gave (two grades) for the complete correct answer, (one degree) for the incomplete answer and the degree (zero) for the abandoned or incorrect answer, thus the total score for the fried test becomes (18) Degree.

Sincerity of the test: The test truthfully means that the test measures what was set to measure it, that is, the honest test measures the function for which it was designed and does not measure anything else. To verify the validity of the test, the researcher adopted two types of honesty:

The first exploratory application: The
achievement test was applied in its first exploratory stage to a group of fourth-grade students without scientific research, and the number of students was (40) students, the purpose of which is to know the clarity of the test instructions and instructions and the extent of understanding and clarity of the test items for students and calculating the necessary time period For the test, as the researcher recorded the exit time for each student, and by calculating the mathematical mean of time, he found that the time needed to answer all the test items is (40) minutes.

**The second exploratory application:** The test was applied to a sample consisting of (100) students in the fourth grade of science without the research sample, and its purpose is to analyze the statistical test achievement paragraphs represented by the difficulty of the paragraph, distinguishing the paragraph, and the effectiveness of wrong alternatives.

**Statistical analysis of achievement test items:** The achievement test items were analyzed as follows:

**Paragraph difficulty:** By performing the statistical analysis of the achievement test items, it was found that the difficulty factor of its paragraphs ranges from (0.46-0.65). Thus, the achievement test paragraphs are all good and their difficulty is appropriate.

- Paragraph discrimination: One of the important characteristics that should be provided in the test items is the distinguishing feature, which means the possibility of items or paragraphs to examine the individual differences of students. The test items are valid as the items discrimination factor is (20.0) and above, and the value of the discrimination factor of achievement test items Between (0.31 - 0.74), and thus the achievement test items are considered to be a good and suitable discrimination factor.

- Effectiveness of wrong alternatives: The researcher performed a statistical analysis of the test items and it became clear from that the alternatives to the achievement test items are all effective and thus all of them are considered appropriate.

**Stability of the test:** The stability test of the test depends on the relationship between each of the other or all of the test items, and this is evident through the stability of its scores and the consistency of its paragraphs. Paragraphs of the test have a clear meaning that must be honest and steady at the same time.

**Method of finding test reliability:** Midway segmentation method: This method is one of the most used method, due to the fact that it avoids the disadvantages of some other method. Pearson correlation between the degrees of the odd and even paragraphs of paragraphs, the coefficient of stability and its value (0.88) was obtained, and since the coefficient of the half-fragmentation stability of the test did not measure the overall homogeneity of the test (because it is only half stability), therefore the correction was made using the Spearman-Brown factor, as it reached (0. 94) It is a good stability coefficient from the expert’s point of view.

**The application of the research tool:** The experimental and control research groups were notified of the date of applying the achievement test a week before it was conducted and it was applied after the completion of teaching the specific subject for the two research groups at one time, and the researcher supervised the process of applying the test.

**Statistical means:** The researcher used the t-test equation for two independent samples to conduct equivalence between the experimental and control groups, and the Pearson correlation equation, as the researcher used the equation to correct the correlation coefficient between the two test parts (degrees of individual and even paragraphs) after being extracted by the Pearson correlation coefficient and the bag Statistical SPSS, and Excel.

**Results and Discussion**

The experimental group students who studied according to the strategy (face - deduce the duty) surpassed the students of the control group who studied according to the usual method in the achievement test, and this is consistent with studies that confirmed the superiority of the experimental group that was studied according to the strategy (face - conclude - Answer) the control group that was studied according to the usual method as shown in table 3.
Conclusions

The strategy of face-conclude-answer is a good tool for rise of students’ level in thinking to be very creative and compatible with chemistry lessons. According the statistical study, we found there is significance relationship between the experimental and control groups. The average of students’ marks in chemistry was developed after using face-conclude-answer strategy, which will be a good recommendation for chemistry teaching.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

Conflict of Interest: None

Funding: Self-funding

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Spectrophotometric Determination of Drugs with MBTH as Oxidative Coupler Reaction: A Review

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Abstract

A widespread range of oxidative coupler reactions have been approved for drugs. Majority of these reactions are color producing reactions.

Generally, spectrophotometric procedures are easy to achieve, little-cost, sensitive and selective, however each spectrophotometric way has its advantages and weaknesses, which are an essential feature when choosing the technique for estimation of drugs.

So, the purpose of objective in this paper is to review numerous present techniques for spectrophotometric estimation of drugs with MBTH and to compare the modern spectrophotometric ways and to summarize their advantages and weaknesses.

Keywords: Spectrophotometric determination, Drug, 3-Methyl-2-Benzothiazolinone Hydrazine, Oxidative coupler reaction.

Introduction

Oxidative Coupler Reaction: Oxidative coupler reaction includes combination of two organic materials or further in existence of suitable oxidizing agent and satisfactory reaction circumstances. After the oxidation process of these ingredients occurs, leading to the creation of intermediary compounds which rejoin with each other to provided dyed product that can be measured spectrally, and therefore can advantage from these interactions for the aims of quantification of a number of compounds (1).

The oxidative coupler reaction first detected by Berthelot in 1859 (2), which was known as by his name also called indophenol reaction. The blue color of indophenol created by phenol and hypochlorite in the existence of ammonia provided the maximum absorbance at 630 nm (3). The mechanization of reaction shown below (4):

Spectrophotometric analysis for the determination of drugs: Absorption spectrophotometry is one of greatest beneficial tools obtainable to the chemist for quantitative analysis. This is for the reason that it has wide-ranging applicability, great sensitivity and modest to high selectivity, perfect accuracy and simplicity as well as suitability.

Colorimetric techniques can selectively convert a drug, its impurity, or metabolite so that the spectrum is moved to the visible region and away from interfering affected via additional drug, formation constituents, or biological materials, thus talking a more degree of specificity. Furthermore, a drug with slight or no beneficial absorption can be extra sensitivity estimated by adjusting it to further high absorptive chromophore (5).

3-Methyl-2-Benzothiazolinone Hydrazine (MBTH) (Besthorn’s reagent or Sawicki’s reagent) (6): 3-Methyl-2-Benzothiazolinone Hydrazine was initially produced by Besthron in 1910. Huning and Fritsch have designated the oxidative coupler of this reagent with aromatic amines, heterocyclic bases, phenols, and compounds containing active methylene group to produce extremely dyed yields in 1957. In 1961 Sawicki et al. introduced MBTH in analytical chemistry as a sensible reagent for the estimation of carbonyl compounds. It can be also utilized for the revealing and estimation of phenols, polyhydroxy compounds, aldehydes, aromatic amines and amino hetro aromatic compounds including indoles, carbazoles and phenothiazines. The chemical construction of MBTH is shown in Figure 2.
\[
\text{NH}_3 + \text{OCl}^{-} \rightarrow \text{H}_2\text{NCl} + \text{OH}^-
\]
Ammonia Hypochlorite ion Chloramine hydroxide ion

\[
\text{H}_2\text{NCl} + \begin{array}{c}
\text{Phenol} \\
\text{Chloramine}
\end{array} \rightarrow \begin{array}{c}
\text{Cl} = \text{N} - \text{O} \\
\text{Quinone Chloramine}
\end{array}
\]

\[
\begin{array}{c}
\text{O} = \text{N} - \text{N} - \text{OH} \\
\text{Indophenol blue dye}
\end{array}
\]

Figure (1): The mechanization of indophenol formation.

![Figure 2](https://example.com/figure2.png)

**Figure 2:** The chemical construction of (MBTH).

**General mechanism for the reaction of MBTH**(6): MBTH misses two electrons and one proton on oxidation, under reaction conditions, creating an electrophilic intermediate, which is assumed to be the active coupler species. The intermediary rejoins with amine (or) phenol by electrophilic attack on the mainly nucleophilic place up in the aromatic ring of amine or phenol (i.e., para or ortho position) and the intermediary is oxidized in the existence of oxidant to get the dyed components. Figure 3 shows the general reaction with MBTH.

![Figure 3](https://example.com/figure3.png)

**Figure 3:** General reaction with MBTH
Spectrophotometric analysis for the determination of drugs with (MBTH) as oxidative coupling reagent: (MBTH) initially presented as a reagent for aldehydes. Subsequent MBTH use was comprehensive to different organic compounds (example: phenols, aryl amines and different N- and S- heterocyclic compound)\(^6\). In latest years, the utilize of spectrophotometric method were useful in the analysis of drugs with MBTH as oxidant reagent. A survey of the literature mentioned numerous spectrophotometric techniques for analysis of drugs using MBTH as oxidative coupling reagent.

### Table (1): Some spectrophotometric determination of drugs with (MBTH).

<table>
<thead>
<tr>
<th>No.</th>
<th>Drug compounds (Trade name)</th>
<th>(\lambda_{\text{max}}) (nm)</th>
<th>Linear range (µg.ml(^{-1}))</th>
<th>Molar absorptivity (L.mol(^{-1}).cm(^{-1}))</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(Nifedipine)</td>
<td>685</td>
<td>1-19</td>
<td>2.77\times10^4</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>(Tenofovir disoproxil fumarate)</td>
<td>626.5</td>
<td>50-250</td>
<td>1.65\times10^4</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>(Fenofibrate)</td>
<td>596</td>
<td>2-5</td>
<td>1.91\times10^4</td>
<td>9</td>
</tr>
<tr>
<td>4</td>
<td>(Chloramphenicol)</td>
<td>620</td>
<td>10-60</td>
<td>1.00\times10^4</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>(Nitrofurantoin)</td>
<td>610</td>
<td>0.5-30</td>
<td>6.59\times10^3</td>
<td>11</td>
</tr>
<tr>
<td>6</td>
<td>(Selegiline Hydrochloride)</td>
<td>629</td>
<td>10-85</td>
<td>0.98\times10^4</td>
<td>12</td>
</tr>
<tr>
<td>7</td>
<td>(Meloxicam) and (Tenoxicam)</td>
<td>619, 619</td>
<td>0.2-10, 0.1-5</td>
<td>15.82\times10^4, 16.61\times10^4</td>
<td>13</td>
</tr>
<tr>
<td>8</td>
<td>(Iornoxicam)</td>
<td>620</td>
<td>0.008-0.04</td>
<td>1.39\times10^4</td>
<td>14</td>
</tr>
<tr>
<td>9</td>
<td>(Pregabalin)</td>
<td>668</td>
<td>50-350</td>
<td>4.202\times10^4</td>
<td>15</td>
</tr>
<tr>
<td>10</td>
<td>(Prulifloxacin)</td>
<td>580</td>
<td>1-5</td>
<td>1.34\times10^4</td>
<td>16</td>
</tr>
<tr>
<td>11</td>
<td>(Atorvastatin)</td>
<td>566</td>
<td>2-20</td>
<td>3.36\times10^4</td>
<td>17</td>
</tr>
<tr>
<td>12</td>
<td>(Bicalutamide)</td>
<td>630</td>
<td>10-60</td>
<td>0.35\times10^4</td>
<td>18</td>
</tr>
<tr>
<td>13</td>
<td>(Lamivudine)</td>
<td>659</td>
<td>1-8</td>
<td>0.28\times10^3</td>
<td>19</td>
</tr>
<tr>
<td>14</td>
<td>(Aceclofenac)</td>
<td>592</td>
<td>1-100</td>
<td>1.00\times10^4</td>
<td>20</td>
</tr>
</tbody>
</table>

### Conclusion

The techniques described for spectrophotometric estimation of drugs alongside with MBTH display perfect analytical possibility. So these techniques can be suggested for the repetitive analysis of these drugs in quality controller laboratories and they may be successfully used for the estimation of drugs in pharmaceutical preparations.

### Acknowledgement:

Thanks for everyone who helped me accomplish this research.

### Ethical Clearance:

The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

### Conflict of Interest:

None

### Funding:

Self-funding

### References


The Effect of Aerobic Exercise and Ginseng Extract on Developing the Special Endurance of Young Football Players

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Abstract

The researchers touched on the importance of aerobic and anaerobic exercises and ginseng extract in developing special endurance and some basic football skills, as ginseng stimulates and stimulates the nervous system, as ginseng is one of the medicinal plants that have a great effect for the athlete in terms of physical and physiological that works to provide a suitable physical fitness and it increases the activity and vitality of the body and helps the body to resist nervous fatigue.

The researchers put forward the following hypotheses:

1. The use of aerobic exercise and taking ginseng extract had a positive effect on developing the special endurance of young football players.
2. There is a preference for using aerobic exercise and taking ginseng extract in developing the special endurance of young soccer players.

Completing the process of testing and measuring the research variable. The results were extracted after statistical treatment, from which the researchers reached several conclusions, namely:

1. Adopting aerobic exercises and taking ginseng capsules in approved doses and proportions in preparing programs to develop special endurance capabilities for football players for youth under (19) years old.
2. Conducting experimental research to find out the effect of taking ginseng extract for young soccer players in particular on developing physical capabilities that were not covered by the current study.

Keywords: Aerobic exercise, ginseng and endurance.

Introduction

The game of football is one of the sports that is characterized by physical exertion and a relatively long period, during which the player’s body loses a lot of materials and physical components to be able to continue to perform at a high level, as this causes an increased feeling of fatigue, so the standardized and purposeful sports training helps players to delay fatigue for a longer period. Possible.

The player must be distinguished by football and possess high levels of physical abilities, especially the special endurance and energy production systems of the antenna, meaning that special training is required to bring them to a state of physiological adaptation to the vital organs and withstand effort during the match to achieve the best possible achievement. The ginseng plant is a useful nutritional supplement for athletes to increase activity and vitality and resist fatigue during exercise and sports competitions, and it does not contain any substance mentioned in the list of substances banned by the International Olympic Committee.¹ Powder of ginseng root extract in capsules in pharmacies as a pharmaceutical preparation to increase the efficiency, vitality and spirits of the person, and the plant ginseng is one of the most important that the pharmacy offers to a person to increase his vitality and sexual and mental

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efficiency of its superiority over chemical drugs and it is free from harmful side effects and its importance for athletes lies in stimulating the nervous system and increasing His efficiency, especially in learning and mastering the basic skills that are essential to the technical performance of football players.²

Therefore, the importance of research lies in identifying the importance and effect of aerobic exercise with eating ginseng on developing the special endurance of young football players.

Research Methodology

The researchers used the experimental approach with the experimental design of two experimental groups (equivalent groups) with pre and posttest and because it is the appropriate way to solve the problem and to prove his hypothesis as a dependent and controlled change of the specific conditions for an event, and to note the changes resulting in the event itself and its interpretation.

Community and sample research: The research sample consisting of (18) players representing the players of the Specialized School of Football in the two governorates of Babylon (under 19 years), the youth group, was selected from a total of (25) players representing the community of origin, and the individuals of the research sample were randomly selected, then the sample was divided by lottery into (6 players for the first group, (6 players) for the second group, and (6 players) for the third group, which is the control group, and the percentage (72%) was from the original research community.³

Means, devices and tools used in the research:

1. Observation.
2. Personal interviews.
3. Tests and measurements
4. Data registration forms
5. Training curriculum
6. Exploratory experiments
7. Auxiliary work team
8. Arab and foreign sources and references
9. A whistle (2), a type of Canadian-made Fox.
10. HP laptop (no laptop), count (1) Korean made.
11. Hand-held electronic calculator (CASIO), count (1).
12. Plastic cones of different sizes.

Field research procedures

Determine the doses of ginseng intake for the first experimental group

1. The effective doses for adults should range between (45-70) grams and with the ratio of ginsides (2-8) grams for a period limited to (8-12) weeks as a maximum.
2. American ginseng should be taken every 12 hours, twice a day.
3. It is preferable to take American ginseng before eating to increase the speed of absorption of nutrients and to make more use of them.

The use of American ginseng should not exceed 3 months, because it leads to a deficiency of vitamin B6 in the body, which leads to feelings of lethargy and depression.⁴ The researcher will give the plant potions to the players according to regular fines and times. The use of American ginseng should not exceed 3 months, because it leads to a deficiency of vitamin B6 in the body, which leads to feelings of lethargy and depression.⁵

Define the search tests

Physical tests: The researcher used the tests after the researcher reviewed the specialized sources, the opinion of the supervisor, and the scientific committee’s support for approving the research project on the validity of these research tests.

Speed endurance test:

• Name of the test: Running the ball for a distance of (5* 30) meter without stopping.⁶
• Objective of the test: To measure the soccer velocity tolerance.

Performance Test⁷

• Name of the test: He ran sloping with the ball and ended with scoring (twice from left and right to the side of the court)
• Objective of the test: to measure the performance tolerance.

Pilot study: The pilot study was conducted on 11/30/2019 corresponding to Thursday at 4 pm on a sample consisting of (6) players representing the team of
the Specialized School of Football in Babil Governorate for the youth group (under 19 years) who were selected from outside the research sample, and the purpose of the experiment was to get to know:

1. The validity of some of the exercises used in terms of practical application.
2. The validity of the tools used in the exercises.
3. The time spent performing the exercises.
4. Identify the efficiency of the assistant staff in implementing the training curriculum.
5. Identify the negatives that may appear when performing tests in order to pass them.

**Pre-test:** The pre-tests for the research sample were conducted on 3-4/12/2019 on Tuesday and Wednesday, respectively, at four o’clock in the evening for the physical tests, and on Wednesday 4/12/2019 at the same time for the skill tests of the three groups, and the tests were conducted on the playground of the Specialized School in the football.

**The main experience of the search:** The implementation of the main experiment began on Sunday (12/8/2019) and ended on Friday (1/17/2020).

**Aerobic exercise:** The researcher prepared regular aerobic exercises for the players of the Specialized School in Babylon, youth category (under 19 years). Sportsman.

**Post tests:** The post tests were conducted on Sunday and Monday (19-20/1/2020) respectively, at four o’clock in the evening on Sunday 19/1 for the physical tests and on Monday 20/1 for the skill tests and for the three groups, and the conditions for the pre-tests themselves were fulfilled, as much as possible.

---

### Results and Discussions

**Table 1. Shows the values of the median, the quartile deviation, Wilcoxon value in the pre and posttest of the research variables for the first experimental group**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Units</th>
<th>Tests</th>
<th>Median</th>
<th>SD</th>
<th>Wilcoxon</th>
<th>Significance value</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed endurance</td>
<td>Second</td>
<td>Pre</td>
<td>42.075</td>
<td>1.00621</td>
<td>2.33</td>
<td>0.011</td>
<td>Sig.</td>
</tr>
<tr>
<td>Strength endurance</td>
<td>Numb.</td>
<td>Pre</td>
<td>31</td>
<td>3.464102</td>
<td>2.163</td>
<td>0.0288</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Numb.</td>
<td>Post</td>
<td>34</td>
<td>2.0328</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance endurance</td>
<td>Second</td>
<td>Pre</td>
<td>31</td>
<td>2.16795</td>
<td>2.449</td>
<td>0.014</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>Post</td>
<td>30</td>
<td>2.20795</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 2. Shows the values of the median, the quartile deviation, Wilcoxon in the pre and posttest of the research variables for the second experimental group**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Units</th>
<th>Tests</th>
<th>Median</th>
<th>SD</th>
<th>Wilcoxon</th>
<th>Significance value</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed endurance</td>
<td>Second</td>
<td>Pre</td>
<td>41.675</td>
<td>0.6316248</td>
<td>2.21</td>
<td>0.022</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>Post</td>
<td>40.57</td>
<td>0.80991</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strength endurance</td>
<td>Numb.</td>
<td>Pre</td>
<td>28</td>
<td>4.4158804</td>
<td>1.054</td>
<td>0.034</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Numb.</td>
<td>Post</td>
<td>31</td>
<td>1.16905</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance endurance</td>
<td>Second</td>
<td>Pre</td>
<td>31</td>
<td>1.54919</td>
<td>2.232</td>
<td>0.026</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>Post</td>
<td>30</td>
<td>1.91919</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 3. Shows the values of the median, the spring deviation, and the Wilcoxon value for the three search groups in the pre and post tests of the strength endurance test

<table>
<thead>
<tr>
<th>Groups</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Wilcoxon</th>
<th>Significance value</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Median</td>
<td>SD</td>
<td>Median</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>42.17</td>
<td>0.9359843</td>
<td>41.09</td>
<td>1.01614</td>
<td>2.201</td>
</tr>
<tr>
<td>First experimental</td>
<td>42.075</td>
<td>1.0062090</td>
<td>39.605</td>
<td>0.80991</td>
<td>2.33</td>
</tr>
<tr>
<td>Second experimental</td>
<td>41.675</td>
<td>0.6316248</td>
<td>31</td>
<td>0.80991</td>
<td>2.21</td>
</tr>
</tbody>
</table>

Which confirms the presence of a significant difference in favor of the post-test of the first experimental group, and the researcher concludes from this that the speed tolerance characteristic of the experimental group members has developed significantly due to the effectiveness of using aerobic exercises with the intake of ginseng capsules with a multifaceted effect by taking into account the use of exercises Speed in different forms and for various distances as this helped improve the physiological ability of the players and improve the general compatibility and help in the process of adaptation to high physical requirements,9 as well as through the exercises used by the researcher, which aims to codify the components of the training load in terms of intensity, repetition and comfort to the extent that it works on The development of speed tolerance, in addition to aerobic exercises, led to the development of the level of agility among the members of the experimental group, which had the effect of reducing the recoil time (changing direction) while running This test as one of the factors of speed and balance during change of direction and rapid responses to changing situations.10 On the other hand, we notice that there has been progress, but it is not prominent in the post-test of the control group in the same test, as the value of (Wilcoxon) is (2.201).

As for the level of significance (0.028), despite the presence of statistically significant differences, the development of the level of speed tolerance among members of this group did not rise to the level of development of members of the first experimental group.11 The researcher believes, through his follow-up of the training units, that the little development that occurred at the level of the control group members balanced with the development of the members of the first experimental group was the result of interest in developing the qualities of speed and endurance separately and not focusing on the compound characteristic of these two characteristics (endurance speed) while the exercises that were He applied it and used the extract of the ginseng herb on the members of the first experimental group, aiming to develop endurance and speed as well as the mutual relationship between them (endurance speed).12

Table 4. Shows the values of the median, the spring deviation, and the Wilcoxon value for the three search groups in the pre and post tests of the strength endurance test

<table>
<thead>
<tr>
<th>Groups</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Wilcoxon</th>
<th>Significance value</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Median</td>
<td>SD</td>
<td>Median</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>25</td>
<td>3.48807492</td>
<td>26.5</td>
<td>1.31661</td>
<td>1.511</td>
</tr>
<tr>
<td>First experimental</td>
<td>31</td>
<td>3.464101615</td>
<td>34</td>
<td>2.03280</td>
<td>2.163</td>
</tr>
<tr>
<td>Second experimental</td>
<td>28</td>
<td>4.4158804</td>
<td>31</td>
<td>1.16905</td>
<td>1.054</td>
</tr>
</tbody>
</table>

By looking at Table (4), we notice that there is a significant difference between the median for the two measurements before and after the first experimental group in the sitting test - jumping to the top to measure strength tolerance, and this difference was very clear as the value of (Wilcoxon) for the first experimental group was (2.163) Comparison of the Wilcoxon value for the control group and the second experimental group, where the results were (Wilcoxon for the control group 1.511) (the value of Wilcoxon for the second experimental group was 1.054) and the level of significance was less than (0.05). Ginseng works to develop the level of strength endurance by raising the efficiency of the nervous system and thus an evolution occurs in the
amount of nerve signals emanating from the brain and into the working muscles, and also the ginseng extract works to prevent lactic acid from accumulating in the muscles,\textsuperscript{13} and also through the training method used and changing its percentage and types according to the goal of training And the solution to the main duty is to reach a high level of endurance of strength as one of the main components of special endurance, which made the development of the level of members of this group The first experimental test results were quick and effective in this test, which is a prominent indicator of strength tolerance growth.\textsuperscript{14}

Table 5. Shows the values of the median, the quartile deviation, and the (Wilcoxon) value for the three research groups in the pre and posttests to test endurance performance

<table>
<thead>
<tr>
<th>Groups</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Wilcoxon</th>
<th>Significance value</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Median</td>
<td>SD</td>
<td>Median</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>30</td>
<td>0.470196014</td>
<td>30</td>
<td>1.11196</td>
<td>2</td>
</tr>
<tr>
<td>First experimental</td>
<td>31</td>
<td>2.167948339</td>
<td>30</td>
<td>2.20795</td>
<td>2.449</td>
</tr>
<tr>
<td>Second experimental</td>
<td>31</td>
<td>1.549193338</td>
<td>30</td>
<td>1.91919</td>
<td>2.232</td>
</tr>
</tbody>
</table>

The exercises were also characterized by comprehensiveness as the use of various and different training method, method and means effectively gave various results and different and multi-faceted effects, which was reflected in the development of various physical characteristics in addition to the focus that the researcher adopted in giving exercises to focus on developing the components of special endurance (speed endurance, Endurance, strength, endurance performance) as well as the development that took place in technique as a result of repeated performance of exercises for developing skills in addition to agility, which led to the improvement of the results of this test among the members of the experimental group as a result of the correlation of the attribute of endurance skills performance with agility.\textsuperscript{15}

Although there was progress in the telemetry of the control group and that this progress was statistically significant because the value of (Wilcoxon) was (2.000) and in statistical significance (0.046), but the researcher attributes this progress to that the traditional approach that was applied to the members of this group was It contains many exercises that work to develop skills, especially the skills of rolling and scoring, in addition to general endurance exercises and strength exercises as well as speed as the high level of general physical characteristics is reflected in the high status of athletic achievement.\textsuperscript{15}

Conclusions

1. Adopting aerobic exercises and taking ginseng capsules in approved doses and proportions in preparing programs to develop special endurance capabilities for football players for youth under (19) years.

2. Conducting experimental research to find out the effect of taking ginseng extract for young soccer players in particular on developing physical capabilities that were not covered by the current study.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

Conflict of Interest: None

Funding: Self-funding

References

5. Athab, N. A., Hussein, W. R., & Ali, A. A. M.


Saw Palmetto Therapy for Lower Urinary Tract Symptoms Associated with Benign Prostatic Hyperplasia Assessment in Iraq

Mazin Abdulridha Ateyah¹, Manal Khalid Abdulridha², Munaim Jumaa Alkabee³

¹Pharmacist, Clinical Pharmacist, Baghdad, Iraq, ²Assist. Prof., Department of Clinical Pharmacy/College of Pharmacy/Mustansiriyah University, Iraq, ³Consultant Urosurgeon, Alshahed Alsader Hospital-MOH, Iraq

Abstract

Background: The current study was designed to explore the effectiveness of Saw Palmetto as monotherapy or supplementation with tamsulosin in the treatment of patients with lower urinary tract symptoms consistent with benign prostatic hyperplasia.

Method: The present study is diagnosed patient with moderate to severe symptomatic BPH. (60) Patients were divided into 3 groups; Group (1) treated with Saw Palmetto cap (320 mg); Group (2) treated with Saw Palmetto cap (320 mg) and tamsulosin (0.4mg); Group (3) treated with tamsulosin (0.4mg), daily for 3 months. The assessment is done based on the change in urological IPSS, urodynamic activity, urine flow, voiding quantity measures, and prostate volume. Also, some measurement such as erection function, urinary incontinence, sleep quality, and quality of life.

Results: Saw Palmetto supplementation with tamsulosin revealed a significant decrease in the IPSS score (P<0.01), a significant increase in the urine flow rate and the voided volume, a significant decrease in the post-void residual volume and prostate volume (P<0.01), and decrease in serum PSA level (P<0.01). Additionally, improved erection function decreased urinary incontinence score, improvement in sleep quality, and improvement in the quality of life score among the Saw Palmetto supplementation group was noticed (P<0.01).

Conclusion: The phytotherapy with saw palmetto alone or as supplement collectively produced marked improvement in objective and subjective measurements in men with lower urinary tract symptoms consistent with BPH:

Keywords: Benign prostatic hyperplasia, LUTS, Saw palmetto.

Introduction

Lower urinary tract symptoms LUTS are prevalent in adult men and are often associated with the presence of BPH, which is a troublesome condition that can have a significant negative impact on patients’ QoL [1]. The extraction of the Saw Palmetto plant is used most commonly for the treatment of many diseases. In Germany and France, the plant extracts have more than 50% of all drugs used for BPH therapy. These agents are common used in the United States. Both Boyle in 2004 and Maccagnano in 2006 claimed the efficacy of Permixon® by its comparative effectiveness to α-blockers and 5α-reductase inhibitors[2].

Still controversy in the therapeutic benefit of combining Saw Palmetto plant extract with the conventional therapy of BPH. The review included 32 randomized controlled trials involving 5666 men, compared with placebo, Serenoa repens at double and triple the usual dose, provides no improvement for nocturia, Qmax, and symptom scores for men with benign prostatic hyperplasia[3]. Inversely, another systematic review of 18 randomized controlled trials involving 2939 men with BPH showed significant improvement in urinary tract symptoms and peak urine flow following supplementation with Saw Palmetto plant extract. The update of Cochrane Complementary Medicine stated that Serenoa repens provides mild
to moderate improvements in urinary symptoms and urinary flowrate[4].

Consumption of herbal drug products by Iraqi patients is quite high. Considering the magnitude of the popularity of these products among the consumers, it is necessary to evaluate the safety, efficacy, and quality of these products which may involve clinical trial studies[5]. To the best knowledge, no available data highlight the substantial benefit of Saw Palmetto supplementation as monotherapy or as an adjuvant to other medication therapy, besides the lack of awareness by most urologist about the impact of dietary supplements to provide some evidence-based findings.

**Patients and Method**

**Patients:** The study is used data of patient who attended the private clinic neurosurgeon diagnosed with benign prostatic hyperplasia. Out of 155 patients, only 60 patients completed the study intervention all ≥45 years of age [6].

The patients were divided into three groups; Group (1) included 20 patients treated with Saw palmetto (320 mg *Serenoarepenes*) to be given once daily for 12 weeks; Group (2) included 20 patients treated with Saw palmetto (320 mg *Serenoarepenes*) and tamsulosine (0.4) mg to be given once daily for 12 weeks; Group (3) included 20 patients treated with tamsulosin (0.4) mg to be given once daily for 3 months.

**Method**

American Urological Association Symptom Score questionnaire have seven questions intended to classify the severity of enlarged prostate symptoms that were carried out at baseline, after 4 weeks, after 8 weeks, and after 12 weeks[13]. All other objective measurements were (voided volume, post-void residual volume, prostate volume, and prostate-specific antigen) carried out at baseline and after 12 weeks.

All subjective questionnaires were carried out at baseline, after 1 month, after 2 months, and after 3 months. Erection function assessed using International Index of Erectile Functions (ILEF) questions (1, 2, 3, 4, 5, and 15) Patients with ILEF scores (<14 out of 30) in Domain A (Erectile Function) considered low. The Urinary Incontinence assessed by 0-24 incontinence symptoms subscale (IS) from International Consultation on Incontinence Questionnaire Male Lower Urinary Tract Symptoms. The four-item Jenkins Sleep scale was used to assess and evaluate the urinary function for patients at different levels. The questionnaire evaluated the frequency and intensity of certain sleep difficulties in respondents the value of the Jenkins Sleep scale Questionnaire is (0-20)[16].

**Results**

**Patient demographic and disease characteristics:** The patient demographic of a total of 60 patients included in the present study is shown in table (1). There was no statistically significant difference between study groups concerning age, BMI, and duration of symptoms, (P≥0.05).

<table>
<thead>
<tr>
<th>Table (1): Disease characteristics with patients demographic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Study Groups</strong></td>
</tr>
<tr>
<td><strong>Study variable</strong></td>
</tr>
<tr>
<td><strong>Age (Year)</strong></td>
</tr>
<tr>
<td>&lt;55</td>
</tr>
<tr>
<td>55-64</td>
</tr>
<tr>
<td>64&gt;</td>
</tr>
<tr>
<td><strong>BMI (kg/m&lt;sup&gt;2&lt;/sup&gt;)</strong></td>
</tr>
<tr>
<td><strong>Duration of symptoms (Months)</strong></td>
</tr>
</tbody>
</table>

Data expressed as mean±SD, Percentage (%), Number of patients (n), Chi-square is used for statistical analysis. NS: No significant differences (P≥0.05).
Effect of study intervention on objective parameters: There are no significant differences (P≥0.05) in the urine flow rate between study groups pre and post-treatment, Table (2). Within each study group, there was a highly significant increase (P<0.01) in the urine flow rate at the end of the study, with a high percentage of change, noticed among group 2 patients (52.25 %). Significant differences (P<0.01) in voided volume were revealed between the study group post-treatment only. Also, there was a highly significant increase (P<0.01) in the voided volume after three months, mainly among group 3 patients (82.61 %). The present study showed highly significant differences (P<0.01) in post-void residual volume between study groups post-treatment only, and the significant decrease (P<0.01) in the post-void residual volume was noticed among group 2 patients (59.36 %) after three months of treatment. Moreover, results showed no significant differences (P≥0.05) in prostate volume between study groups pre and post-treatment. Nevertheless, there was a highly significant decrease (P<0.01) within each study group in the prostate volume after three months, particularly, among group 2 patients high percent of change was noticed(3.38 %). The changes in serum PSA level revealed a significant difference between groups 1and 2 at the end of treatment (P<0.05). Patients in group 2 presented with a high percentage of change in the serum PSA level (-10.59 %) compared to other study groups after treatment (P<0.01).

Table (2): Effect of study intervention on objective parameters pre and post-treatment

<table>
<thead>
<tr>
<th>Study variables</th>
<th>Study groups</th>
<th>Pb value</th>
<th>P value a</th>
<th>P value b</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Group 1</td>
<td>Group 2</td>
<td>Group 3</td>
<td></td>
</tr>
<tr>
<td>Urine flow rate (ml/s)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre- treatment</td>
<td>8.18±2.21</td>
<td>7.98±2.32</td>
<td>7.40±1.90</td>
<td>0.50 NS</td>
</tr>
<tr>
<td>Post- treatment</td>
<td>11.58±3.68</td>
<td>12.15±4.00</td>
<td>10.79±3.75</td>
<td>0.53 NS</td>
</tr>
<tr>
<td>Pa value</td>
<td>0.001**</td>
<td>0.001**</td>
<td>0.001**</td>
<td></td>
</tr>
<tr>
<td>Change (%)</td>
<td>41.56 %</td>
<td>52.25 %</td>
<td>45.81 %</td>
<td></td>
</tr>
<tr>
<td>Voided Volume (ml)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-treatment</td>
<td>152.75±15.93</td>
<td>164.00±37.16</td>
<td>151.00±14.29</td>
<td>0.206 NS</td>
</tr>
<tr>
<td>Post-treatment</td>
<td>249.75±42.93</td>
<td>295.50±31.07</td>
<td>275.75±40.56</td>
<td>0.002**</td>
</tr>
<tr>
<td>Pa value</td>
<td>0.001**</td>
<td>0.001**</td>
<td>0.001**</td>
<td></td>
</tr>
<tr>
<td>Change (%)</td>
<td>63.50 %</td>
<td>80.18 %</td>
<td>82.61 %</td>
<td></td>
</tr>
<tr>
<td>Post Void Residual Volume (ml)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre- treatment</td>
<td>216.25±39.23</td>
<td>220.25±48.00</td>
<td>219.50±40.23</td>
<td>0.95 NS</td>
</tr>
<tr>
<td>Post- treatment</td>
<td>120.25±40.44</td>
<td>89.50±26.45</td>
<td>109.25±36.75</td>
<td>0.02*</td>
</tr>
<tr>
<td>Pa value</td>
<td>0.001**</td>
<td>0.001**</td>
<td>0.001**</td>
<td></td>
</tr>
<tr>
<td>Change (%)</td>
<td>-44.39 %</td>
<td>-59.36 %</td>
<td>-50.22 %</td>
<td></td>
</tr>
<tr>
<td>Prostate Volume (cm³)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre- treatment</td>
<td>46.10±6.71</td>
<td>44.35±5.60</td>
<td>46.70±6.62</td>
<td>0.48 NS</td>
</tr>
<tr>
<td>Post- treatment</td>
<td>45.45±6.95</td>
<td>42.85±4.96</td>
<td>45.70±6.36</td>
<td>0.27 NS</td>
</tr>
<tr>
<td>Pa value</td>
<td>0.004**</td>
<td>0.001**</td>
<td>0.001**</td>
<td></td>
</tr>
<tr>
<td>Change (%)</td>
<td>-1.40 %</td>
<td>-3.38 %</td>
<td>-2.14 %</td>
<td></td>
</tr>
<tr>
<td>PSA (ng/ml)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre- treatment</td>
<td>2.92±2.52</td>
<td>1.51±1.45</td>
<td>1.76±1.51</td>
<td>0.050*</td>
</tr>
<tr>
<td>Post- treatment</td>
<td>2.83±2.40</td>
<td>1.35±1.31</td>
<td>1.61±1.25</td>
<td>0.019*</td>
</tr>
<tr>
<td>Pa value</td>
<td>0.001**</td>
<td>0.001**</td>
<td>0.031*</td>
<td></td>
</tr>
<tr>
<td>Change (%)</td>
<td>-3.08 %</td>
<td>-10.59 %</td>
<td>-8.52 %</td>
<td></td>
</tr>
</tbody>
</table>

Data expressed as mean±SD, percentage of change (%). Number of patients (n). NS: No significant differences (P≥0.05). **(P<0.01) is highly significant. (a): Paired t-test is used to compare pre- and post-treatment results in the same group. (b): ANOVA (one way) is used to compare study intervals among group 1 group 2, and group 3 patients.
Effect of study intervention on subjective parameters: There were highly significant differences in the (IPSS/AUA) mean index score among the study groups at baseline, 4 weeks, 8 weeks, and 12 weeks study intervals ($P<0.01$). Also, the AUA mean score showed a highly significant decrease within each study group at the end of the study ($P<0.01$), with a high percentage of change noticed with group 2 patients (-81.68%), Table (3). No significant differences in the erection function (of the IIEF Questionnaire) mean score was produced among the study groups at baseline, 4, 8; 12 weeks study intervals ($P\geq0.05$). Also the erection function means score showed highly significant improvement within each study group at the end of the study ($P<0.01$), with a high percentage of change noticed among group 2 patients (108.03%). There were highly significant differences in the urinary incontinence mean score among the study groups at baseline, 4 weeks, 8 weeks, and 12 weeks study intervals ($P<0.01$) as in Table (3-5) and Figure (3-4). Also the urinary incontinence mean score showed highly significant decrease within each study group at the end of the study ($P<0.01$), with a high percentage of change noticed with group 2 patients (-70.92%). There were highly significant differences in the quality of sleep mean score among the study groups at baseline, 4 weeks, 8 weeks, and 12 weeks of study intervals ($P<0.01$). The score quality of sleep showed a highly significant decrease within each study group at the end of the study ($P<0.01$), with a high percentage of change noticed with group 2 patients (-82.90%). There were highly significant differences in the quality of life mean score among the study groups at baseline 4, 8, 12 weeks of study intervals ($P<0.01$).

Table (3): Effect of study intervention on subjective parameters

<table>
<thead>
<tr>
<th>The variables</th>
<th>The groups</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(IPSS) score</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>21.0±2.88</td>
<td>20.2±3.4</td>
</tr>
<tr>
<td>4 weeks</td>
<td>17.9±2.39</td>
<td>10.9±3.0</td>
</tr>
<tr>
<td>8 weeks</td>
<td>13.1±3.14</td>
<td>6.3±2.7</td>
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<tr>
<td>12 weeks</td>
<td>8.8±3.81</td>
<td>3.7±1.4</td>
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<tr>
<td>P value</td>
<td>0.001**</td>
<td>0.001**</td>
</tr>
<tr>
<td>Change (%)</td>
<td>-58.09 %</td>
<td>-81.68 %</td>
</tr>
<tr>
<td>(IIEF) score</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>7.05±2.67</td>
<td>5.60±2.60</td>
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<tr>
<td>4 weeks</td>
<td>8.30±3.63</td>
<td>7.40±3.62</td>
</tr>
<tr>
<td>8 weeks</td>
<td>10.15±4.60</td>
<td>9.85±4.58</td>
</tr>
<tr>
<td>12 week</td>
<td>11.55±5.53</td>
<td>11.65±5.61</td>
</tr>
<tr>
<td>Pa value</td>
<td>0.001**</td>
<td>0.001**</td>
</tr>
<tr>
<td>Change (%)</td>
<td>63.82%</td>
<td>108.03%</td>
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<tr>
<td>(UIQ) score</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>10.90±1.86</td>
<td>11.35±2.08</td>
</tr>
<tr>
<td>4 weeks</td>
<td>9.15±1.79</td>
<td>6.15±1.81</td>
</tr>
<tr>
<td>8 weeks</td>
<td>7.15±1.73</td>
<td>4.45±1.88</td>
</tr>
<tr>
<td>12 weeks</td>
<td>5.90±1.59</td>
<td>3.30±1.56</td>
</tr>
<tr>
<td>Pa value</td>
<td>0.001**</td>
<td>0.001**</td>
</tr>
<tr>
<td>Percentage of change (%)</td>
<td>-46.11 %</td>
<td>-70.92 %</td>
</tr>
</tbody>
</table>
The variables | The groups | Group 1 | Group 2 | Group 3 | P value
--- | --- | --- | --- | --- | ---
**The (JENKINS) Sleep score**<br>Baseline | 15.80±2.91 | 13.75±2.83 | 15.55±1.28 | 0.021**
4 weeks | 14.05±2.95 | 7.15±2.18 | 9.00±2.08 | 0.001**
8 weeks | 10.60±3.53 | 4.20±1.40 | 5.65±1.87 | 0.001**
12 weeks | 7.40±3.59 | 2.35±1.04 | 3.40±1.19 | 0.001**
Pa value | 0.001** | 0.001** | 0.001**
Change (%) | -53.16 % | -82.90 % | -78.13 % |
**The (QoL) score**<br>Baseline | 4.90±0.31 | 4.75±0.44 | 4.70±0.47 | 0.290 NS
4 weeks | 4.15±0.59 | 3.10±0.45 | 3.35±0.49 | 0.001**
8 weeks | 3.70±0.57 | 2.45±0.76 | 2.70±0.57 | 0.001**
12 weeks | 2.50±0.61 | 1.40±0.99 | 1.70±0.47 | 0.001**
P a-value | 0.001** | 0.001** | 0.001**
Change (%) | -48.97 % | -70.52 % | -63.82 % |

Data expressed as mean±SD, percentage of change (%), Number of patients (n), NS: No significant differences (P≥0.05), **(P<0.01) is highly significant. (a): ANOVA is used to compare among study intervals (4, 8, 12 weeks) treatment results in the same group.(b): ANOVA test is used to compare study intervals among group 1 group 2, and group 3 patients.

**Discussion**

As mentioned earlier, the AUA 2010 guideline update lowered the age of the Index Patient from age 50 years or older to age 45 years or older\(^7\), which applies to the age group of the current study where half of them less than 65 year old, (20%) of patients were less than 54 year old, (28.3%) were 55-65 year old, and (51.7%) were older than 64 year old. Postmortem research has seen an 8 percent, 50 percent, and 80 percent incidence respectively for the fourth, sixth, and ninth decades of life\(^10\).

Most of the enrolled patients in the current study were diagnosed with moderate to severe symptomatic BPH and were mostly overweight. The reports showed that obesity has related to BPH, the recent one in 2019 revealed a marked association between the risk of larger PV and BMI, and suggested considering Concomitant diseases like Obesity and diabetes may influence the risk of BPH and LUTS in older men\(^11\).

AUA Score, Prostate Volume, Urine Flow Rate, Voided Volume, Post-Void Residual Volume:

The effect of Saw Palmetto alone or as a supplement with Tamsulosin on objective measures for LUTS/BPH was reported by many review articles and worldwide studies, but no data available from the Iraqi population yet to the best search. Controversy data obtained from several previous reviews, data from early review stated that Saw Palmetto extract (\textit{Serenoa repens}) alone, at double and triple doses, did not significantly decrease nightly urination on the AUA, peak urine flow, or prostate size in men with lower urinary tract symptoms consistent with BPH\(^3\). A study involving more than one thousand patients (55-80) years old with IPSS ≥ 7, to compare Saw Palmetto extract with tamsulosin in BPH therapy after at six month, also, \textit{Serenoa repens} used for the same purpose due to it has the same effect in BPH therapy in terms of IPSS (\(p = 0.20\)), QoL (\(p = 0.33\)), Qmax (\(p = 0.21\)), PVR (\(p = 0.65\)), and PSA (\(p = 0.08\))\(^12\).

In a similar 3 groups treatment comparative study, no difference was found in the sense of a change between baseline and final evaluation in total IPSS score, however, during the treatment period 20 (23%) of the patients managed with tamsulosin and 17 (21%) with tamsulosin plus Saw palmetto had a drug-treated with related adverse reactions\(^13\). The more recent study reported that the long-term prediction of 7 initial criteria (predictors): IPSS; (Qmax); average urine flow rate;
urination volume, urination time, residual urine volume, prostate volume, used to assess the treatment outcome with a lipidosterolic extract of *Serenoa repens* (320 mg. Permixon (capsules) per day for two years in LUTS/BPH patients aged (52 to 87 years) with symptomatic benign prostatic hypertrophy[14]. The prostate size increases with age. The prostate are growth with age with four stages with the second stage (50-90) years and the prostate increase (0.5–1.2) gram yearly[15][16].

Several other studies tested the effect of with Saw Palmetto as a monotherapy, a study extended to 12 months in patients with BPH aged (53.3) years. The results showed a simple reduction of prostate size and volume from baseline (26.1 ±1.7) vs (24.8±1.7) respectively. Others reported prostate size decreased after administration of Saw Palmetto (from 51.1±20.1 to 43.3±15.9). Additionally, in younger men aged (35.06±5.85) years on 320 mg Saw Palmetto as a monotherapy showed (15%), decrease in prostate size[16].And that is agreement with our study.

Most of the clinical trials use this cut off value as inclusion criteria[17].Several previous comparative studies reported equipotent effect of Saw Palmetto and tamsulosin that matched the current study findings, one of them recorded that the increasing in Qmax was similar in both over 3-12 months period. Another matched findings to the current study, the efficacy of both the Saw Palmetto and tamsulosin groups from day 0 to 6th month of treatment produced similar the mean changes Qmax in both, and the decreased prostate volume and the improvement in PVR was noticed in the Saw Palmetto group the most.Additionally, in his review Giacomo N. reported superiority issue of the combination of Permixon and tamsulosin for relieving LUTS (p < 0.01) but not in reducing the number of nocturnal voids and increasing Qmax which was explored more in Permixon alone[37]. Inversely, prospective open-label, 12-month study stated no differences in maximal urinary flow rate, PVR, prostate-specific antigen, and prostate volume between a combination of (Saw Palmetto with bovine colostrums)[19].

**Erection Function, Urinary Incontinence, Sleep Quality, and Quality of Life:** Numerous clinical studies with thousands of men have documented that the benefits of saw palmetto can build over time. Compare this to the common drug finasteride (Proscar) which causes erectile dysfunction for about (5%) of users, a study found that sexual function was significantly improved during the second year of two years taking saw palmetto. A previous review published in The Journal of Urology analyzed (30) *in vivo* and *in vitro* laboratory studies, noted that the frequency of use of Saw Palmetto globally for medical treatment of men’s disorders, BPH matches the use of conventional drugs, and the studies confirm that Saw Palmetto has a wide spectrum of activity via numerous mechanisms such as subduing excess testosterone and DHT, and a known anti-inflammatory action.[20] In agreement with previous studies.

An enlarged prostate can cause frustrating and uncomfortable symptoms, urinary difficulties, urinary hesitancy, weak stream, and nocturia are the most commonly reported LUTS, it is estimated that 90% of men between 45 - 80 years of age suffer some types of LUTS. After 3-month treatment protocols in the current study revealed a marked decrease in urinary incontinence mean score up to (-70.92 %) downscale (p<0.01), particularly among patients received combination therapy, besides saw palmetto or tamsulosin also produced a significant decrease in urinary function in a significant difference between the groups(p<0.01)[21].

The four-item Jenkins Sleep scale Questionnaire in the current study showed a marked decrease within each study group after 12 weeks (P<0.01), particular change was noticed among group 2 patients received combination therapy (-82.90%). Both Saw Palmetto and tamsulosin also produced significant decrease as well. The reason is perhaps due to the effects of those treatments on the GABA neurotransmitter that acts on increasing the capacity of the urinary bladder which decreases the frequent times of waking up during night sleep[22].

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of bothMOH and MOHSER in Iraq.

**Conflict of Interest:** None

**Funding:** Self-funding

**References:**

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19. Di Maida F.a · Mari A.a · RubinoR.b · MinerviniA.a · Carini M.a · Siena G.aA, Prospective, Open-Label Comparison of Tamsulosin plus Serenoarepens and Bovine Colostrum versus Tamsulosin Alone in the Treatment of Benign Prostatic Hyperplasia


Evaluation the Role of Micro-RNAs During Stages of Breast Cancer: A Review

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Abstract
Breast cancer is one of the most deadly cancers threatening life and is the most prevalent among women worldwide and in general is the second most common type of cancer. The aim of this study was to identify the expression of microRNAs and biomarkers for early detection of breast cancer. MicroRNAs have become a hot subject in cancer research today because of their important role not only in cancer progression, But also suppress genes related to cancer. With advanced techniques, these microRNAs can be easily detected from biopsy samples and blood for early diagnosis, diagnosis and treatment. Due to the increase in the demand for research in the exploration of the microRNAs profile in relation to different subtypes of breast cancer, the role of microRNA microRNA as an oncomir or oncosupressor, and discovery of microRNAs and miRNAs potentials for the treatment of breast cancer. MiR is involved in a variety of natural physiological processes, specifically identifying and identifying cell type. It has become clear that they are also major factors in cancer. Here we discuss what is known about miR biology in natural breast, and the emerging roles in breast cancer.

Keywords: Breast Cancer, miRNAs, Target prediction, Gene expression profile.

Introduction
Breast cancer remains as one of the deadliest disease worldwide (¹) . High throughput studies highlighted the role of different sets of miRNAs in the control of gene expression during and after initiation stages of breast cancer as well as metastasizes stage (²). However, a comprehensive overview and classification of the most important miRNAs at different stages of this type of cancer still remains to be elucidated. Here, using different tools and web resources we have listed the most important miRNAs that appear to be involved during different stages of breast cancer (¹, ⁴) . Besides, we have predicted the most probable target genes for the proposed miRNAs and assessed the gene expression status of those targets in this type of cancer. Then we have profiled the gene expression patterns for these miRNAs and their target to gain an overview of the biological significance of these miRNAs in onset and progression of breast cancer. The results indicate usefulness of our approach in identifying novel miRNAs candidates related to breast cancer for possible lab work experiments.

Breast cancer is one of the most common malignancies in women, and represents the second leading to death after heart failure worldwide (⁵) . In fact, Iraq breast cancer positions the first amongst the communal malignancies amongst all the people and accounts for roughly one- third of the registered female cancer (⁶), which highlights the importance of early detection. The finding of breast cancer in women represents the major problems for early detection, accurate staging and checking of breast cancer (⁷) . Thus, there is still need to develop a cost-effective and accurate screening method for this cancer and discover new biomarkers to improve diagnosis, prognosis and prediction (⁸),(⁹). As mentioned in American Cancer Society (¹⁰) the objective of screening for early breast cancer discovery is to find the cancer before it starts to
cause symptoms. Screening used to find a disease, such as cancer, in people who do not have any symptoms. Early discovery means consuming an approach that lets breast cancer get diagnosed earlier than otherwise might have happened.

Breast cancer can be detected by watchful physical examination, mammography, ultrasound (U/S), and magnetic resonance imaging (MRI) and breast biopsy(11). With recent technological improvements, gene expression profiling is used also to detect early breast cancer and predict their prognostic results(12).

MicroRNAs, which are novel class of naturally occurring, evolutionarily conserved, small RNA ranged in size 19-23 nucleotides, non-coding RNA molecules and are important in gene regulation and expression either by inhibition of translation or degradation of mRNA(13,14).

Breast cancer currently is the public female malignancy in practically all of Asia, Europe and North America(15) recommended being the first reason of death from cancers in women in Europe. Each year more than 1.3 million women were identified with breast cancer worldwide and about 465,000 die from the disease (16). Although the fact that breast cancer is highly curable if diagnosed and preserved applicably at an early stage (17). The increasing incidence of breast cancer results in a critical need to identify and develop more special means of diagnosing and treating the disease.

**Aim of the Study:** The overarching aims of this study were to first investigate the factors impacting the potential of circulating miRNAs as biomarkers for breast cancer.

**MicroRNA and Cancer:** The first studies about miRNA expression in human cancer examined a recurring deletion at chromosome 13q14 to search for tumor suppressor genes involved in chronic lymphatic leukemia (CLL) (18). The result shows that this region at the chromosome was encoded two miRNAs; miR-15a and miR-16-1, and the scientists then confirmed that these two miRNAs have a role in CLL pathogenesis (19) found that genes for miRNA were positioned at fragile sites in the genes that are frequently deleted or amplified in human cancer. The data of the study provide a catalogue of miRNA genes that may have roles in cancer and argue that the full complement of miRNA in the genome may be involved in cancer.

Any altered expressions in levels of miRNA have been correlated in different studies with cancer type, tumor stage and response to treatment. These studies confirm that miRNA represents a new class of biomarker as a diagnostic and prognostic and cancer therapy(20). miRNA-196 and miRNA-10a were shown to be located in home box clusters, which is identified to be convoluted in carcinogenesis and it is attendant with the malignant of cancer cell (21). Each miRNA is thought to target multiple genes this will affect cellular process and may induce carcinogenesis. Up and down regulation of miRNA expression were observed in tumor compared to normal tissues, this indicate that microRNA play as either oncomiRs or tumor suppressors (22). Usually, encoding miRNAs genes were positioned on chromosomal regions that are overexpressed or amplified in cancer and function as oncogenes, while those are deleted or less expressed in cancer act as tumors suppressor miRNAs(23). Over expression of miR-21 were observed in all cancers, which support the evidence of the role of this miR in malignancies and its oncomiR activity. And there are numbers of tumor suppressor genes were targeted by this oncomiR like PTEN (24).

**MicroRNA and Breast Cancer:** The first studies that determine the global miRNA expression profiles in breast cancer used 76 breast tumors and 34 normal(25). The result of the study showed that there are many miRNA which down-regulated in these breast tumors like; miR-10b, miR-125b and miR-145 while others were shown to be up-regulated like; miR-21 and miR-155. Another finding from this study, it can differentiate between normal and cancer breast tissues. One of the most studied microRNA is miR-21 which was found play role as an oncogene in different cancers and in breast cancer especially (26). Knockdown of miR-21 in MCF7 breast cancer cell lines was shown to reduce the growth and reduce tumour growth in mouse xenograft(27). While miR-21 overexpression was correlated with disease aggressiveness and tumour grade(28). By comparing the differentiation levels of miRNA expression in tumour cells, it could be expected that their levels were affected by methylation and demethylation of miRNA promoter regions during the development of cancer. However, miRNA may mutate in breast cancer, which may affect the detection of its expression. So, the study of Wang and Wei (29), declared that genomic instability, epigenetic changes and mutation of miRNA cause miRNA deregulated in breast cancer. The function of miRNA in cancer invasion and metastasis were found the role
of two miRNAs, miR-373 and miR-520c, in promoting invasion and metastasis of MCF7 cell lines. On the other hand, miRNA levels and expression were measured in serum of breast cancer patients and used to differentiate between healthy and cancer individual; and concluded from this study that serum microRNA could be used as a biomarker in early stage breast cancer. In a study of Schrader and his group, they used microRNA microarray technology to investigate miRNA expression in whole blood of early-stage breast cancer patients. The result indicated that miRNA need a diagnostic and prognostic possible in those patients compared to normal.

The stability of microRNAs, tissue-specific expression profiles and the easy to be quantified, suggest that these molecules represent an ideal biomarker for cancer. Elevated level expression of miR-195 with let7a and miR-155 in the blood of breast cancer patients increase the specificity and sensitivity of the test. The result at the end concluded the potential utility of microRNA as unique and noninvasiveness breast cancer markers. The research to identify more efficient miRNA biomarkers in blood is a nonstop process. The latest publications suggest that miR-92a in the circulation of serum breast cancer patient was elevated and correlates with tumour size and lymph node metastases. The study gave some clues for improving diagnosis, prognosis and therapeutic strategy for the future of cancer. Another novel microRNA, miR-155 was shown important in serum of breast cancer. This study analyzed miR-155 in the serum of breast cancer patients and showed that it was up regulated and this elevation was correlated with clinical stage and p53 status.

**Character of breast cancer miRNA:** Though widespread study mechanisms of molecular complicated in breast cancer are completed over the periods, experiments quiet triumph in the early identification and management patients of breast cancer, such as random response and improvement resistance to adjuvant therapies. miRNAs, as mRNA regulators, might help as original investigative and prognostic applicants, and therapeutic targets potent. Since 2005, the deregulation of miRNA in breast cancer was first described. Also there are numerous studies on various miRNAs expression and its function in breast cancer as summarized in Table 1.

**Table (1): miRNAs purpose as tumor suppressors or oncogenes in breast cancer.**

<table>
<thead>
<tr>
<th>miRNAs</th>
<th>Targets</th>
<th>Functional pathways</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tumor suppressor miRNAs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>miR-206</td>
<td>ESR1</td>
<td>ER signaling</td>
</tr>
<tr>
<td>miR-17-5p</td>
<td>ALK, CCND1, E2F1</td>
<td>Proliferation</td>
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<tr>
<td>miR-125a,b</td>
<td>HER2, HER3</td>
<td>Anchorage-dependent growth</td>
</tr>
<tr>
<td>miR-200c</td>
<td>BM1, ZEB1, ZEB2</td>
<td>TGF-beta signaling</td>
</tr>
<tr>
<td>let-7</td>
<td>F-BAD, HMG12, LIN28, FEB1</td>
<td>Proliferation/differentiation</td>
</tr>
<tr>
<td>miR-34a</td>
<td>CCND1, CDK6, E2F3, MYC</td>
<td>DNA damage, proliferation</td>
</tr>
<tr>
<td>miR-31</td>
<td>FZD5, ITGA5, MIPF1, ERBB2, RHOA</td>
<td>Metastasis</td>
</tr>
<tr>
<td>miR-335</td>
<td>SOX4, PTEN, MYLK, PDCP2</td>
<td>Metastasis</td>
</tr>
<tr>
<td>miR-27a,b</td>
<td>CYPIB1</td>
<td>Modulation of the response of tumor to anti-cancer drugs</td>
</tr>
<tr>
<td>miR-126</td>
<td>IRS1</td>
<td>Cell cycle progression from G1/G0 to S</td>
</tr>
<tr>
<td>miR-101</td>
<td>E2F2</td>
<td>Oncogenic and metastatic activity</td>
</tr>
<tr>
<td>miR-145</td>
<td>miR-145 in p53-mediated repression of c-Myc</td>
<td>Suppresses Cell Invasion and Metastasis</td>
</tr>
<tr>
<td>miR-146a/b</td>
<td>NF-kB</td>
<td>Negatively regulate factor-xB and impaired invasion and migration capacity</td>
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<tr>
<td>miR-205</td>
<td>ErbB3 and VEGF-A expression</td>
<td>Inhibits tumor cell growth and cell invasion</td>
</tr>
<tr>
<td>Oncogenic miRNAs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>miR-21</td>
<td>BCL2, TPM1, PDCD4, PTEN, MAF5P</td>
<td>Apoptosis</td>
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<td>miR-195</td>
<td>RHOA</td>
<td>IGF-beta signaling</td>
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<td>miR-10b</td>
<td>HOXD10</td>
<td>Metastasis</td>
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<td>miR-873/920c</td>
<td>CD44</td>
<td>Metastasis</td>
</tr>
<tr>
<td>miR-27a</td>
<td>Zinc finger ZBTB10, MYC</td>
<td>Cell cycle progression G2-M checkpoint regulation</td>
</tr>
<tr>
<td>miR211/221</td>
<td>p27kip1</td>
<td>Tamoxifen resistance</td>
</tr>
</tbody>
</table>
Computational Method

In order to find miRNAs differentially expressed in breast cancer, we have analyzed two breast cancer-related data contains gene expression values (GSE57297, GSE10797). The fold change values were then filtered based on the two-fold threshold. Then all differentially expressed miRNAs were extracted from the list and considered to be important in cancer. For enriching the results, KEGG database was also scanned to find cancer-related miRNAs. Among the list of all important miRNAs, those related to breast cancer at different stages were extracted and considered to be important. A comparison between these two sets of findings identify the most significant miRNAs involved in different stages of breast cancer development. Table 2 and table 3 shows the results of KEGG and Microarray data analysis for breast cancer. The results indicated that although some miRNAs including miR7 and let7 are shared among these two sets of analysis, many miRNAs are found in only one of dataset. It could be due to variation between samples and the stages that samples were collected.

<table>
<thead>
<tr>
<th>Study</th>
<th>miRNAsUP</th>
<th>miRNAsDown</th>
</tr>
</thead>
<tbody>
<tr>
<td>KEG Initiation</td>
<td>miR-181,miR-155</td>
<td>miR-200,miR-30e,LET-7</td>
</tr>
<tr>
<td>Metastasis</td>
<td>miR-10b,miR-373,miR-520,miR-103,miR-107, miR21,miR-31,miR-193b,miR-221,miR-222,miR-125B</td>
<td>miR-335,miR-335,miR-126,miR-200,miR-206,LET-7</td>
</tr>
<tr>
<td>Therapyresistance</td>
<td>miR-451,miR-345,miR-7</td>
<td></td>
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</tbody>
</table>

Table (2) Documentation of miRNAs involved in breast cancer using KEGG

<table>
<thead>
<tr>
<th>Dataset</th>
<th>miRNA Up-regulated</th>
<th>miRNA Down-regulated</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCBI(gse57297)</td>
<td>miR-7-3p,miR-7-5p,miR-155,miR-155</td>
<td>miR-100,miR-100-LTE-7a-2, dusterhostgene,miR-143,miR-143hostgene,miR-100,miR-143,miR-205,miR-204,miR-8071-1, miR-6743R,</td>
</tr>
<tr>
<td>NCBI(gse10797)</td>
<td>miR-6132,miR-7703,miR-3656,miR-4640,miR-4738,miR-3636, miR6734,miR-3636R,miR-3620R,miR-</td>
<td>miR-8071-2R,miR-8071,miR6743R,miR-6878,miR637R,miR-4746R,miR-742,miR3917,miR-600R-miR-600,</td>
</tr>
</tbody>
</table>

Table (2) Identification of miRNAs involved in breast cancer revealed by gene expression data analysis

Conclusion

The present research was demonstrated the impact that different method of analysis have on circulating miRNAs. There is a need for standardization in approaches taken to analyses circulating miRNAs. Researchers need to be transparent in reporting of findings to allow for comparison of results and improved reproducibility.

This study has abridged the function of miRNAs in cancer biology, through a particular focus on breast cancer. Sympathetic the molecular mechanisms convoluted in miRNA expression and secretion and expression of miRNA in body fluids and different tissues, were significant subjects in both basic and clinical research. Overall results, highlighted the role of miRNAs during different stages of breast cancer development. The precise role of each miRNA remains to be further investigated. It is also difficult to determine if the differentially expressed miRNAs are cause or effects of breast cancer.
**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq

**Conflict of Interest:** None

**Funding:** Self-funding

**References**

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Serum Podocalyxin Levels as High Risk Markers for CVDs of Complication of Diabetes

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Abstract

Diabetes mellitus is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of various organs, especially the eyes, kidneys, nerves, heart, and blood vessels; Podocalyxin is the major sialoprotein in the glycocalyx of glomerular podocytes, podocalyxin was found in the blood vessels of several organs.

Objective: The aim of the present study was to elevate serum podocalyxin and some biochemical parameters in diabetic patients compare with healthy group.

Method: The present case-control study included 90 participants divided into two groups: 60 patients with diabetes mellitus (40 males and 20 females; aged 49.87 ±8.089 yr.) study group and 30 (20 males and 10 females; aged 48.27±6.335 yr.) a healthy group (control group). Podocalyxin (PODXL) and insulin measured using the ELISA kit. Anthropometric were measured fasting serum glucose levels and lipid profile were determined by photometric method.

Result: The mean serum podocalyxin levels was significantly increase in patients with diabetes mellitus Vs. healthy control group (26.24±2.11ng/ml Vs. 17.45±1.57ng/ml respectively, p<0.001), BMI was significantly increased in patients diabetes mellitus Vs. healthy control group (29.766±3.225 Vs. 23.756±0.77 respectively, p<0.001) also the mean fasting insulin level was higher in patients with diabetes mellitus than the healthy control group (7.23±1.26 Vs. 5.05±1.14 respectively, p<0.001), HOMA-IR significantly increased in patients with diabetes mellitus Vs. healthy control group (2.65±0.77 Vs. 1.16±0.25 respectively, p<0.001) but the mean of HOMA-β in patients with diabetes mellitus was significantly lower than the healthy control group (35.30±13.83 Vs. 61.91±19.87 respectively, p<0.001), lipid profile include TG, TC, LDL-C, VLDL-C significant increased in patients with diabetes mellitus compared with healthy control group (211.50±88.02 Vs. 116.87±38.43, p<001), (240.13±56.20 Vs. 141.43±33.34, p<0.001), (161.87±56.39 Vs. 65.82±30.97, p<0.001), (42.30±17.60 Vs. 23.37±7.68, p<0.001) respectively except HDL-C were significantly decreased in patients with diabetes mellitus than the healthy control group (33.83±9.02 Vs. 52.23±7.08 respectively, p<0.001), Patients with diabetic mellitus have significantly higher serum podocalyxin levels than the controls. Podocalyxin levels positively significantly correlated with BMI, FSG, Insulin, HbA1c and HOMA-IR levels while HOMO-β significant negative correlation respectively with podocalyxin levels. podocalyxin may be a promising biomarker in patients with diabetes mellitus.

Conclusion: Podocalyxin may be a promising biomarker in patients with diabetes mellitus and can be used as a high risk markers for CVDs in DM patients.

Keywords: Diabetes mellitus, glycaemiaindices, insulinresistance, podocalyxin.

Introduction

Diabetes mellitus (DM) is a hyperglycemic, multifactor metabolic disease characterized by insulin secretion deficiencies, insulin activity, or both. Chronic hyperglycemia is one of the long-term, widespread diseases worldwide. This is linked with long-term microvascular and macrovascular diseases(1). In addition to these serious medical conditions, however, other
co-morbidities, such as retinopathy, nephropathy and cardiovascular disease also arise in patients with T2D over time(2). Symptoms of diabetes are normal in patients with Type 1 and type 2 diabetes, though at the same time causing substantial morbidity. The recurrent diabetes risks are primarily classified into microvascular and macrovascular, the former being far more common than the latter(3). Neuropathy, nephropathy and retinopathy are the microvascular complications, while coronary and peripheral artery disorders have macrovascular complications(3).

Podocalyxin is the major sialoprotein in the glycocalyx of glomerular podocytes, podocalyxin, was found in the blood vessels of several organs (lung, heart, kidney, small intestine, brain, pancreas, aorta, the periporal blood vessels in the liver, and the central arteries of follicles of the spleen, but not in the endothelial that line the sinusoids of the latter organs)(4). Podocalyxin (Podxl) is a sialomucin CD34 that is a major cell surface component that is expressed within the epithelial cells (podocyte) of the kidney glomerulus as a glycocalyx and was for- merly known as sialylated protein(5). Podxl maintains the slit diaphragm and podocytes’ shape(6). When podocytes are injured, Podxl is released from the vesicle-like structures or microvilli and excreted in urine(7,8). Renal Podxl is used as an early marker for diabetic nephropathy and is considered a biomarker for glomerular disease(9,10). Podxl also has a wide expression on endothelial cell surface all over the body(11). Podxl is expressed within neurons(13) mesothelial cells that line organs, hematopoietic stem cells,(14) megakaryocytes, and vascular endothelial cells.(12) A recent study showed that serum Podxl (s-Podxl) levels were correlated with carotid intimal medial thickness(15).

Materials and Method

Subject: In this case-control study (90) participated were recruited from AL-Najaf province- Iraq where divided into two groups: 60 patients with diabetes mellitus (40 males and 20 females) (study group) and 30 healthy control group (20 males and 10 females) the visited patient DM at Diabetes and Endocrine Center Al-Sadr Medical City from 2019 December to February 2020. All of the 37-65 yr. without another chronic disease for example, immune system, Cardiovascular, thyroid, smoking, pregnant, patients with acute condition or complications including renal, hepatic, neurologic and pulmonary disease were excluded.

Blood Sample Collection: Five milliliters of venous blood were drawn from each the patients and control groups by medical syringes, and 2ml was but into EDTA tubes in order to used for HbA1C and the remaining the blood were placed in gel tubes and then left at room temperature for a period of ten minutes to fifteen minutes for coagulation, then centrifuged (at 3000 X g) for 10 minutes for serum delivery. The sera were separated into four Eppendorf tubes and stored at (-20ºC) until time of biochemical estimation.

Anthropometric and Biochemical study: Demographic characteristic were measured and included waist, hip, height (cm), utilizing a standardized measuring tape in cm, weight (Kg) and BMI (calculated a Kg/m²)

Fasting analysis serum glucose, lipid profile level were measured by enzymatic method. The concentration of fasting insulin and podocalyxin were determined by ELISA kits (MLSIN kit, china), (MLSIN kit, china) respectively HbA1c (the CLOVER A1c Self analyzer is an IVD (In Vitro Diagnostic Device), insulin resistance index (Homeostatic model assessment–insulin resistance). HOMA-IR = [glucose (mg/dl) X Insulin (μU/ml)]/405 cutoff value of HOMA-IR is > 2.5(16), HOMA-β%=360x Insulin/(Glucose - 63)(17).

The body mass index (BMI) was calculated at the ratio of weight in (Kg) to the height squared (m²)(18).

Statistical Method: Statistical evaluation was done by SPSS version 22 (IBM, Inc) and included a univariate and multivariate, multinominal, linear, and logistic regression analysis, Wallis test, chi-square test, and independent-sample Student t-test as appropriate. The data was shown as the mean±standard deviation or as a number with a percentage for categorical variables. A change in β of >10% was used to identify confounding in multivariate analysis.

Result and Discussion

As shown table (1) was illustrated the general characteristics of the study this includes data of patients with diabetes and a healthy group.

The level of fasting serum glucose, HbA1C, insulin, HOMA-IR were significantly higher (p<0.001) compared to the healthy group while the data of HOMA-β decreased in patients DM group.
Podocalyxin level was significant (p<0.001) higher in patient with DM group (26.24±2.11ng/ml) and healthy group (17.45±1.57ng/ml).

The present results shown in table (2) the correlation between levels of podocalyxin and the biochemical studied in patients with diabetes mellitus.

HDL-C have a non-significant negative correlations, (-0.095), respectively with podocalyxin levels.

Table (1): Characteristics and differences between DM patients group and healthy group.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>DM Patients group Mean±SD</th>
<th>Healthy group Mean±SD</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex. (M:F)</td>
<td>60(40:20)</td>
<td>30(20:10)</td>
<td>-</td>
</tr>
<tr>
<td>Age (Years)</td>
<td>49.87±8.08</td>
<td>48.27±6.33</td>
<td>0.437 NS</td>
</tr>
<tr>
<td>BMI (Kg/m²)</td>
<td>29.76±3.22</td>
<td>23.75±0.77</td>
<td>≤0.001</td>
</tr>
<tr>
<td>WC (cm)</td>
<td>109.66±10.84</td>
<td>98.86±10.82</td>
<td>≤0.001</td>
</tr>
<tr>
<td>Hip (cm)</td>
<td>110.70±16.37</td>
<td>99.23±11.46</td>
<td>≤0.001</td>
</tr>
<tr>
<td>WHR</td>
<td>1.00±0.14</td>
<td>0.99±0.03</td>
<td>0.237NS</td>
</tr>
<tr>
<td>FSG (mg/dL)</td>
<td>147.27±31.52</td>
<td>94.13±8.26</td>
<td>≤0.001</td>
</tr>
<tr>
<td>Insulin (µUI/mL)</td>
<td>7.23±1.26</td>
<td>5.05±1.14</td>
<td>≤0.001</td>
</tr>
<tr>
<td>HbA1C%</td>
<td>7.73%±1.68%</td>
<td>4.02%±0.52%</td>
<td>≤0.001</td>
</tr>
<tr>
<td>HOMA-IR</td>
<td>2.65±0.77</td>
<td>1.16±0.25</td>
<td>≤0.001</td>
</tr>
<tr>
<td>HOMA-β</td>
<td>35.30±13.83</td>
<td>61.91±19.87</td>
<td>≤0.001</td>
</tr>
<tr>
<td>TG (mg/dL)</td>
<td>211.50±88.02</td>
<td>116.87±38.43</td>
<td>≤0.001</td>
</tr>
<tr>
<td>TC (mg/dL)</td>
<td>240.13±56.20</td>
<td>141.43±33.34</td>
<td>≤0.001</td>
</tr>
<tr>
<td>LDL-C (mg/dL)</td>
<td>161.87±56.39</td>
<td>65.82±30.97</td>
<td>≤0.001</td>
</tr>
<tr>
<td>VLDL-C (mg/dL)</td>
<td>42.30±17.60</td>
<td>23.37±7.68</td>
<td>≤0.001</td>
</tr>
<tr>
<td>HDL-C (mg/dL)</td>
<td>33.83±9.02</td>
<td>52.23±7.08</td>
<td>≤0.001</td>
</tr>
<tr>
<td>Podocalyxin (ng/mL)</td>
<td>26.24±2.11</td>
<td>17.45±1.57</td>
<td>≤0.001</td>
</tr>
</tbody>
</table>

Data presented as Mean±SD, standard deviation, BMI: body mass index, WHR: ratio of waist to hip, WC: waist circumference, FSG: Fasting serum glucose, HbA1C: Glycated hemoglobin, SD: Standard deviation, significant difference at (p<0.05), TC: Total cholesterol, HDL-C: High density lipoprotein- Cholesterol, LDL-C: Low density lipoprotein- Cholesterol, VLDL-C: Very low density lipoprotein-Cholesterol, TG: Triglycerides, significant at (P<0.01).
Figure (1): Comparison of mean podocalyxin level between control and patients group.

Table (2): Correlation between level of podocalyxin and studied parameters in DM patients group

<table>
<thead>
<tr>
<th>Parameters</th>
<th>r</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>0.209-</td>
<td>0.26</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>0.353</td>
<td>0.05*</td>
</tr>
<tr>
<td>WC (cm)</td>
<td>0.119</td>
<td>0.05*</td>
</tr>
<tr>
<td>Hip (cm)</td>
<td>0.135-</td>
<td>0.47</td>
</tr>
<tr>
<td>WHR</td>
<td>0.223</td>
<td>0.02*</td>
</tr>
<tr>
<td>FSG (mg/dL)</td>
<td>0.186</td>
<td>0.03*</td>
</tr>
<tr>
<td>Insulin (μU/mL)</td>
<td>0.136</td>
<td>0.04*</td>
</tr>
<tr>
<td>HbA1C%</td>
<td>0.022-</td>
<td>0.059*</td>
</tr>
<tr>
<td>HOMA-IR</td>
<td>0.242</td>
<td>0.01*</td>
</tr>
<tr>
<td>HOMA-β</td>
<td>-0.122-</td>
<td>0.03*</td>
</tr>
<tr>
<td>HDL-C (mg/dL)</td>
<td>-0.095</td>
<td>0.61</td>
</tr>
<tr>
<td>TG-C (mg/dL)</td>
<td>0.044</td>
<td>0.81</td>
</tr>
<tr>
<td>TC (mg/dL)</td>
<td>0.112</td>
<td>0.058</td>
</tr>
<tr>
<td>LDL-C (mg/dL)</td>
<td>0.254</td>
<td>0.175</td>
</tr>
<tr>
<td>VLDL-C (mg/dL)</td>
<td>0.044</td>
<td>0.818</td>
</tr>
</tbody>
</table>

BMI: body mass index, FSG: fasting serum glucose HOMA-IR: hemostasis model assessment-insulin resistance assessment- HOMA-β%: hemostasis model assessment-beta cell percentage. TG: triglyceride, HDL-C: High-density lipoprotein-cholesterol, LDL-C: low density lipoprotein-cholesterol. Data represented as Mean ±SD: standard deviation, NS= non- significant differences at (P>0.05). *=significant differences at (P ≤ 0.05), **=significant differences at (P ≤ 0.01)

Insulin resistance and T2DM are characterized by dyslipidemia one major risk factor for cardiovascular disease(19) comprise with hypertriglyceridemia, low levels of high-density lipoprotein cholesterol (HDL-C) and the appearance of small, dense, LDL (sLDL) - and caused excessive postprandial lipemia(20) Diabetic dyslipidemia caused from the disturbance of lipid metabolism, an early event cardiovascular complications development and was preceded in T2DM patients by several years.(21) Lipid abnormalities in patients with diabetes often termed “diabetic dyslipidemia”, are typically characterized by high total cholesterol
(T-Chol), high triglycerides (TG), low high-density lipoprotein cholesterol (HDL-C) and increased levels of small dense (LDL-C) particles. Low-density lipoprotein cholesterol (LDL-C) levels may be moderately increased or normal\(^{(22)}\). Podocalyxin is strongly represented by glomerular podocytes, endothelial vascular and hematopoietic cells\(^{(10)}\). Showed that s-Podxl levels were significantly higher in patients with diabetic patients compared with healthy group. A recent study reported an association between s-Podxl concentrations and markers of CVD. Shoji et.al claimed that s-Podxl levels were significantly associated with cIMT and this association remained significant even after controlling the common CVD risk factors such as diabetes, dyslipidemia, hypertension, sex, age and current smoker\(^{(23)}\). In other study illustrated, the number of cases with diabetic and CHD increased with increasing tertiles of s-Podxl from 11(15%) in the 1st tertile, over 22 (30%) in the 2nd tertile, to 25 (33%) in the 3rd tertile\(^{(24)}\).

Previous study showed that the release of Podxl from injured podocytes occurs as vesicle-like structures and/or as a result of shedding microvilli\(^{(25)}\). Various types of cells and tissues express Podxl including neurons, lungs, platelets and vascular endothelial cells\(^{(26)}\). Our results of high s-Podxl levels in patients with DM might be due to its release from injured endothelium through amechanism, which may be similar to that of podxl release from injured podocytes. Previous studies have shown the role of Podxl in endothelial function and vascular inflammation\(^{(27)}\). Another study showed that, there was an increase in non-specific inflammatory infiltrates within the vessels and CRP level in murine endothelial cells after conditional knock out of the Podxl gene\(^{(28)}\). In our study, we found higher levels of s-Podxl in patients with DM compared with healthy group that s-Podxl might be associated with CVD independently of diabetes\(^{(29)}\).

**Conclusion**

Podocalyxin levels positively correlated with BMI, FSG, insulin, and HOMA-IR levels while HOMA-β significantly negative correlation respectively with podocalyxin levels. Podocalyxin may be a promising biomarker in patients with diabetes mellitus. Podxl can be used either alone or with other markers for cardiovascular disease to determine diabetic patients with high risk of complication diabetes.

**Acknowledgements:** I would like to present special thanks to my supervisor prof. Dr. Hanaa Addai Ali for her, suggested this research continuous advice, guidance and encouragement. The authors also would like to thank the volunteers from the Diabetes and Endocrine Centre in Al-Sadr Medical City AL-Najaf province for the recruitment of subjects.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** None

**Funding:** Self-funding

**Reference**


Conicity Index as an Anthropometric Index of Central Obesity in the Prediction of Adult Bronchial Asthma; Correlation with Fractional Exhaled Nitrous Oxide Tests

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¹Ass. Prof., Hammurabi College of Medicine, University of Babylon/Iraq,
²Ass. Prof., College of Pharmacy, University of Babylon/Iraq

Abstract
Obesity and bronchial asthma (BA) are two major health concerns. These entities have been further established by several meta-analyses. Still, these analyses denote to “general-obesity”, that classically measured via body mass index (BMI), which is a broad measure unable to distinguish between lean muscle-bulk and body fats. Thus, other indices, should applied like waist perimeter, waist/hip ratio, and conicity index (CI), which are also reasonable, and normalized easily. Sufficient studies on the BA association with CI are lacking up till now. Our work was designed based on the theory that obesity worsens BA symptoms, aiming to evaluate the asthma relationships and CI.

Methodology: This is an observational-study conducted on 410 asthmatics consulting outpatient-respiratory-clinic. They were diagnosed by pulmonologists, then referred for spirometric pulmonary functions (SPF) and fractional exhaled nitric oxide (FENO) tests. Patients’ weight, height and BMI were measured and accordingly divided into two-classes “nonobese and obese”. The \( \chi^2 \)-test was applied to analyze the associations among qualitative parameters. Level of significant acceptance was 5%, and the analyses had completed by using the SPSS package.

Results: Mean±SD of weight, height, and BMI were 80.9±15.4, 1.64±1.6, and 30.8±5.4, respectively. AOb-indices were 96.2±14.3, 107.1±10.6, 0.98±0.9 and 1.25±0.1 for waist, hip, W/HR, and CI respectively. The mean FENO-measures were 43.8 ppb. There was a significant variation in the means of PEF and FEV1/FVC only, although the FENO-tests were equivalent between the sexes. There was a strong association between CI with increasing age. The CI had a weak non-significant association with increasing FENO-results.

Conclusion: The conicity index as an anthropometric index of central obesity is not associated with the FENO test among adult asthmatic patients. There was non-significant variation between obese and nonobese groups. The CI is not useful in the prediction of adult BA.

Keywords: Asthma, obesity, conicity index, fractional exhaled nitric oxide test.

Introduction
Obesity and bronchial asthma (BA) are two major health-concerns, that accumulating evidences emphasizes the incidence of obese-asthma phenotype associated with refractory symptoms, poor control, reduced response to inhaled steroids, and inferior life quality specially in women¹. It is anticipated that by 2025, the number of asthmatics will reach up to 400million globally². Notably, these two entities have been further established by numerous meta-analysis³. Still, these analyses, denotes “general-obesity”, that is classically measured via body mass index (BMI), which is a broad measure. BMI applied clinically since it is cheap and informal,
but not allows the body fat distribution to be inspected. Specifically, BMI unable to distinguish lean muscle bulk from body fats. Consequently, anthropometry other indices applied, including waist-perimeter, waist/height ratio and conicity-index (CI), which are reasonable, and normalized easily. Currently, abdominal obesity (AOb), progressively concerned, as a state-of-art for having an extra-abdominal fat. Whether AOb also plays a dynamic role in BA is still debatable, because of the limits inherent in the methodologies used in these studies. Meanwhile, studies on the AOb association with BA are lacking hitherto. Given the above, our work designed based on the theory that obesity worsens BA symptoms, aiming to evaluate relationships between CI and BA.

Methodology and Sampling

This is an observational-study conducted on 410 asthmatic patients (212 males) attending outpatient-respiratory-clinic. The patients diagnosed by pneumologists based on a history besides either reversible airflow restriction (FEV1<70% predicted or preceding best, that improved by >15% post 200μg β-agonist inhaler) and being at stage-5 of the ‘‘BTS/SIGN-asthma-management-guidelines’’8. Then, referred for private-clinics to read their spirometric pulmonary functions (SPF) and fractional exhaled nitric oxide (FENO) test (medisoft®, Belgium) for the severity of BA9. FENO-values were classified to ‘‘low (<25ppb) and intermediate/high (≥25ppb)’’ compatible to the ATS references10,11. Two measures were taken for each patient simultaneously and the mean was recorded. The study excluded patients with respiratory infection, chronic renal/cardiac illnesses, neurophysical-debility, any edematous condition, chest-deformity that would influence SPFs. Patients were divided according to their treatment history into treated and untreated group. Treatment history includes all anti-asthma medications: oral, systemic, inhaled, and injectable. Those on irregular therapies (poorly complaints) regarded as untreated. Patients further subdivided into two-classes ‘‘nonobese and obese’’ demarcated as BMI≤25 and ≥30kg/m², individually. The anthropometrics (weight, circumferences, and length) were obtained by standardized procedures with calibrated stadiometer and ground scale, assuming a maximum difference of 1.0 cm or 100 g between the replicated measures. For waist/hip circumferences (WC/HC), and waist-to-hip ratio (W/HR), an elastic-tape was used; and for WC the tape placed at the least-circumference in between iliac crest and last ribcage. All measurements were repeated and their means was depended finally. BMI Measures were obtained while the applicant wearing least cloths and barefooted. The applicants were barefooted also during tallness measurement. Valdez scientific-equivalence for CI calculation was applied13:

\[
\text{Conicity index} = \frac{\text{Waist Circumference (m)}}{0.109 \frac{\text{weight (kg)}}{\sqrt{\text{height (m)}}}}
\]

The study protocol was permitted by the Ethical-Committee of the hospital and Babylon-health-directorate. All the results were expressed as mean and either standard errors or standard deviations. The \( \chi^2 \)-test was applied to analyze the association among qualitative parameters. The level of significant acceptance was 5%, and the analyses were completed using SPSS-software.

It is worth attention; our work had conducted during the era of two major-events on national and international levels. On national level: protests and riots, while on international levels COVID19-pandemic. Both were associated with transportation and internet-network difficulties, curfews, and road-barricades. These problems rendering many participants unable to complete their SPFs examination in the private-clinic, therefore, not all study parameters for all patients were completed.

Results

The main characteristics of the study had been expressed by table-1, which exposed mean age of 33.4±13 with mean duration of BA of 8.02 year. The mean±SD weight, height and BMI were 80.9±15.4, 1.64±1.6 and 30.8±5.4 respectively. Indices of AOb were 96.2±14.3, 107.1±10.6, 0.98±0.9 and 1.25±0.1 for waist, hip, W/HR, and CI one-to-one. The mean FENO were 43.8 ppb.
Table-1: Mean, standard deviation, minimum and maximum measures of study parameters

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>Duration</th>
<th>Weight</th>
<th>Height</th>
<th>BMI</th>
<th>Waist</th>
<th>Hip</th>
<th>W/H</th>
<th>Conicity Index</th>
<th>FENO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>33.4</td>
<td>8.02</td>
<td>80.9</td>
<td>1.64</td>
<td>30.8</td>
<td>96.2</td>
<td>107.1</td>
<td>0.89</td>
<td>1.25</td>
<td>43.8</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>13</td>
<td>8.2</td>
<td>15.4</td>
<td>1.63</td>
<td>5.4</td>
<td>14.3</td>
<td>10.6</td>
<td>0.9</td>
<td>0.1</td>
<td>28.2</td>
</tr>
<tr>
<td>Minimum</td>
<td>10</td>
<td>1</td>
<td>49</td>
<td>1.5</td>
<td>20</td>
<td>64</td>
<td>86</td>
<td>0.74</td>
<td>0.96</td>
<td>8</td>
</tr>
<tr>
<td>Maximum</td>
<td>68</td>
<td>38</td>
<td>119</td>
<td>1.9</td>
<td>43</td>
<td>128</td>
<td>135</td>
<td>1.08</td>
<td>1.47</td>
<td>148</td>
</tr>
</tbody>
</table>

Table-2 exposed the impact of gender-variation among the variables. The age, duration was comparable between sexes, while all anthropometric parameters were significantly higher in males except BMI and HC. There was a significant variation in the PEF and FEV1/FVC only, although the FENO tests were equivalent between sexes.

Table-2: Gender distribution of study anthropometric and spirometric parameters and their significance

| FENO FEV1/FVC | FVC PEF FEV1% W/H Ratio Hip Waist Conicity Index BMI Height Weight Duration Age No Gender |
|--------------|---------|--------|------|--------|------|-------|-------|-----|----------------|-------|
| 46.1±5.8 | 78.9±1.1 | 1.1±0.02 | 82.6±2.30 | 88.7±1.8 | 0.94±0.01 | 108.6±1.7 | 13.0±0.01 | 30.3±0.9 | 1.7±0.01 | 88.2±2.9 | 8.7±1.3 | 32.9±1.7 | 212 | Male (Mean±SE) |
| 41.9±3.7 | 75.3±1.2 | 1.1±0.03 | 712±23.5 | 84.9±2.7 | 0.89±0.01 | 105.7±1.6 | 12.0±0.02 | 30.9±0.8 | 1.6±0.01 | 76.7±2.3 | 7.6±1.0 | 33.7±1.6 | 198 | Female (Mean±SE) |
| >0.05 | 0.05 | 0.05 | 0.001 | >0.05 | 0.001 | >0.05 | 0.001 | >0.05 | 0.001 | >0.05 | 0.001 | >0.05 | >0.05 | P-Value |

Table-3 revealed significant influence of the asthma treatment on FENO-readings. Those with no treatment history had about three-times chances to get severe asthma in terms of poor FENO results [P=0.034, 95%CI: 1.06-8.27].

Table-3: Variation in the Measurements of FENO According to the History of Treatment in Asthmatic Patients

<table>
<thead>
<tr>
<th>Categories of FENO tests</th>
<th>OR</th>
<th>Significance</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;25ppb</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;25ppb</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>History of treatment</td>
<td>14.8±5.3</td>
<td>43.2±17.6</td>
<td>2.96</td>
</tr>
<tr>
<td>No history of treatment</td>
<td>18.7±3.6</td>
<td>59.3±29.5</td>
<td></td>
</tr>
</tbody>
</table>

Both FENO and FVC measures exceptionally, revealed non-significant differences among obese-groups, otherwise other SPF-indices significantly differed (table-4).

Table-4: Differences of spirometric pulmonary functions and FENO tests among study participants according to their obesity status

| FENO FEV1/FVC | FVC PEF FEV1% |
|--------------|--------------|--------------|----------------|--------------|
| 31.8±5.2 | 73.5±1.6 | 1.1±0.05 | 66.7±2.2 | 78.3±2.1 | Non-obese (Mean±SE) |
| 24.7±4.5 | 77.1±4.4 | 1.2±0.03 | 78.9±2.8 | 88.7±2.5 | Overweight (Mean±SE) |
| 29±3.3 | 72±1.2 | 1.2±0.02 | 81.5±3 | 289.1± | Obese (Mean±SE) |
| >0.05 | 0.019 | >0.05 | 0.003 | 0.007 | Significance |

There was a positive-association between CI and participants’ ages; were CI increased with increasing ages (figure-1B).Meantime, the CI had a weak non-significant association with increasing FENO-results (figure- 1A).

Discussion

To our knowledge, this is the first study inspecting AOb-indicators with adult asthma according to FENO (a marker of a topic inflammatory airways) in Babylon. The correlation of AOb with FENO-tests in the adult BA-prediction lies at the heart of the discussion on this article. Asthma/airways-hyper responsiveness associated with obesity are matters of congoing-studies. However, the pathophysiological bases and causal/
effect factors are partly-understood. Our hypothesis is that the AOb (defined as CI) is associated with the SPF and FENO-measures. Contrary to our hypothesis, data disclosed that FENO-values had non-significant variations between obese and nonobese groups, although, significant differences of SPFs-indices excluding FVC besides a high overall mean FENO-measures among the asthmatics (43.8ppb). Additionally, nonsignificant association between FENO-tests and CI was reported.

Our results are consistent to Flashner et al. findings, who showed both high and low BMI were related with lower FENO-values in his cohort14. Lang et al., stated that obesity (BMI>95th centile) had slight effect on symptoms, risk of acute attack or airway-markers among poorly-controlled asthmatic children1. The severity of disease was not significantly correlated with relative body-weight in a study involved children and adolescents in Poland15. Contrariwise, it might be argued that in obesity, higher mass of the abdominothoracic wall decreases “functional-residual-capacity” causing shortened smooth muscle of the air-passages. Likewise, obesity assume a breathing pattern of high-frequency and reduced flow-volume, which disposes them to higher airway-responsiveness. Appleton et al., from Australia, revealed that AOb increased the risk of developing adults asthma16.

In this section, the discussion will point to several probable elucidations of nonsignificant association of FENO-results with AOb among asthmatic adults.

First, in obese, higher levels of asymmetric-dimethyl-arginine (ADM) compared to L-arginine (LA), might cause reduced FENO-measures. Late-onset asthmatic-adult revealed are verse relationship between BMI and LA/ADM ratio17. This correlation was lost after adjustment for LA/ADM indicating possible arbitration of the association with FENO by LA/ADM. Both ADM/LA can inhibit nitrous oxide (NO)18. Obesity has been publicized to be allied with elevated ADM level. Consequently, obese people may show low LA/ADM, and therefore lower FENO14.

Second, the males showed higher obesity parameters and worse FENO-values compared to females in this study. The studies displayed a larger influence of obesity on nonatopic BA specifically in females that may explain the stronger obesity-asthma link seen in females compared with males19. Additionally, lack of association between obesity and adults allergy is also demonstrated by other scholars16.

One more explanation for the detected results of CI and FENO includes the effects of body size on pulmonary dynamics. It was found that a negative-association of FENO with BMI clarified partially by more narrow air-passages detected among obese-patients20. If the exhalation-rate at the mouth is kept constant, as in FENO-collection, those with narrow airways may have a higher airflow-velocity, decreasing transit time of alveolar gas in the airway, and reducing amount of NO exhaled21. Malnourished-asthmatics could have low-arginine measures, which is essential for NO-synthesis. Furthermore, those peoples may have low-thiamine levels that can disturb NO-synthesis by its effect on NO-synthase22. Moreover, it is possibly that effects of AOb result in the pulmonary-vascular-tree variations that lower FENO14. NO has vasodilatory activities by stimulation of Ca-dependent endothelial NO-synthase that cause vasodilatation23.

Lastly, I’m not alone in my view that obesity is a state of chronic inflammation, which is characterized by high levels inflammatory biomarkers like interleukin-6, and transforming growth factor-beta (TGF-β)24. TGF-β is a polypeptide-cytokine of multicellular activities, formed by respiratory epithelium and stimulates fibroblasts-multiplication which may cause significant lung-fibrosis27. Previous studies demonstrated an increased TGF-β1 in obstructive pulmonary disease28. Macrophages and fibroblasts are vital in fibrogenesis and remodeling of respiratory-passages with uncertain pathway29. Hung, C. et al. reported an abnormal differentiation of monocytes into ‘PM-2K’ macrophage-like cell subclasses and fibrocytes’ along with high monocyte-derived TGF-β1; characterized severe BA (i.e. poor SPFs).3

All anthropometric parameters were significantly higher in males apart from BMI and HC, although significant variations in SPFs in terms of the means of PEF and FEV1/FVC but not FENO, were noticed. These outcomes are contradicting recent findings. Umlawska W. revealed nonsignificant association between the asthma-severity and relative body weight regardless the age, with non-significant changes in SPFs between the two sexes although the girls had a significantly higher AOb15. Several revisions exposed a robust obesity correlation with asthma risk in women compared to men31,32,33. Obese women show reduced progesterone levels that may reduce β2-receptor activity, thereby reduce bronchodilation and worsen asthma symptoms. Weight reduction may upsurges progesterone and β2-receptor density34.
In this article, there was a significant CI increase with increasing ages correlated with nonsignificant association of FENO-tests with increasing age. Obesity can aggravate both age-linked physical deterioration and complications of other illnesses. The incidence of several health complications, like DM, hypertension, arthropathies, and vascular diseases connected with obesity in increasing age\textsuperscript{35}. The effect of age and duration of BA on asthma exacerbation is highest with increasing age; but the age has a more impact than duration on severity of BA\textsuperscript{36}. Notable, aging is linked with raised stiffness of the thoracic-wall, reduced pulmonary elastic-recoil, and weakened respiratory muscles\textsuperscript{37}.

Conclusions

Conicity index as an anthropometric index of central obesity is not associated with FENO-test among asthmatic adults. Conicity index is not useful in the prediction of adult BA.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

Conflict of Interest: None

Funding: Self-funding

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Distribution of Patients Microbial Infections with Cancer Disease of Women

Abdullah Hassan Jassim Abdullah¹, Kawther Mohammed Ali Hasan², Hawraa Wahab Al-Kaim³

¹Post Graduate, ²Prof., ³Assit. Prof. College of Science for Women, University of Babylon, Iraq

Abstract
Cancer disease is a variety of diseases that are uncontrolled development, and non-natural cell disturbance. This can lead to death if the disturbance is not controlled. The results indicate the dangerous role of fungi and bacteria associated with cancer patients. They were both Staphylococcus aureus, Str. mitis, Str. mutans and Escherichia coli are the most common isolates associated with cancer patients. Candida albicans, C. krusei, and C. glabrata are a high frequency yeast and its association with clinical infections indicates the pathogenic role of these yeasts, and the proportions and diversity of fungi were higher in cancer patients compared with healthy ones.

Keywords: Fungal infections, Cancer disease, Bloodstream infections.

Introduction
For most human cancers, it is not possible to determine literally how many individual events are required to bring about all the changes that lead to cancer. It is clear, though, that events, including both mutational changes and promotion, can be caused either by internal or external mechanisms or external events (1).

Breast cancer is the most common malignancy among women, accounting for 29% of women diagnosed cancer cases. An estimated 2.5 million cases of breast cancer have been recorded in 2016 (2). Consequently, the etiology of breast cancer remains elusive; the likelihood of cancer development, therapeutic outcomes and survival remain not reliably predictable (3).

Uterus cancer is a malignant tumor that develops from the inner lining of the uterine cavity and is called endometrial cancer. It is the second most common form of cancer among women worldwide, with 170,000 new cases annually being the most prevalent gynecological cancer in developed countries. There are 320,000 new cases worldwide per annum (4).

The risk of infection in patients with cancer is a function of a balance between the integrity of host defense mechanisms and the intensity of potentially pathogenic exposure to potentially pathogenic microorganisms in the host’s environment (5). Whereas alcohol intake, high glycemic diet, higher body mass index, family history of breast cancer, menopause age, and menopausal hormone therapy were risk factors for breast cancer reported (6, 7).

The initiation and development of microbiota and chronic inflammation with human ovarian cancer has received little attention (8). Bacteria can have an oncogenic effect on the human cells in three ways: causing chronic inflammation, acting as an anti-apoptotic and producing cancerous substances (9). Many fungal infections are caused by Candida spp and Aspergillus spp, and Cryptococcus neoformans, widely known opportunistic fungi, and other fungi of emerging significance have, emerged as major causes of infection in this patient population (10, 11, 12).

The aim of our study that evaluated the risk factors and their relation to breast and uterus cancer patients, As well as, isolation and identification of pathogenic bacteria and fungi from blood and mouth of women.
**Materials and Method**

**Patients:** Two hundred samples are collected from 85 women cancer patients (55 breast cancer patients and 30 uterus cancer patients) and 15 control persons attending to Marjan teaching hospital from November 2019 to January 2020. The samples included one hundred blood samples and one hundred swab samples.

**Sample collection:** This study included collection clinical specimens based on standard method (13, 14). The samples collected one hundred samples collected from the oral cavity by swabs with transport media of cancer patients and one hundred samples collected from venous blood stream of cancer patients. As well as control group included 15 blood samples and 15 oral swabs taken from healthy peoples. **Cultivation of specimens:** For blood specimens tow milliliters of blood were collected from each patient, blood injected directly in glass plain tube which contain 20 ml of BHI (Brain heart Infusion) broth (14), for the purpose of being transferred from the hospital to the laboratory was used cold box to transfer samples. Then incubated blood cultures at 28°C for 7days. Growth sub-cultured on SDA (Sabouraud’s dextrose agar) by streaking and incubate at 28-30°C for 24-48h to yeast isolation and 7 days to mold isolates, and cultured on Nutrient agar,Blood Agar base,Salmonella–Shigella agar, mannitol agar and MacConkey agars for bacteria and incubated at 37°C for 24-48h.

While for oral cavity specimens were grow pouring and streaking method to get single colonies for fungi cultured on the SDA medium, the Petri dishes were incubated at 28-30°C for 48-72 hour. After the incubation interval, loop full of single colony growth on SDA and then streaking on CHROMagar and incubated for 24-48 h at 37°C. The isolated colony on CHROMagar have several colors (green, dark pink, pink, white and purple)(15).

**Results and Discussion**

**Patients and collection of specimens:** The results of history and clinical characteristics of cancer patients according to the bacterial and fungal culture results are shown in table (1). The results are shown percentage rate of positive culture in female 70 (82.35%), while negative culture was 41 (16.47%). Although the highest incidence of cancer patients was the age group 41-55 years was 38 cases, also, the highest rate of positive culture in same age group was 32 (37.64%). When compared between breast and uterus cancer patients according to the culture results, the highest rate of positive culture was in breast cancer cases (84.28%). Since only one case was associated with not taking chemotherapy and had a positive result with bacterial infection, while 84 cases were associated with taking chemotherapy, including 70 (82.35%) cases as a result of positive culture. In breast and uterus cancer patients were 28 cases with chronic diseases, of which 27 (31.76%), compared to 57 cases without chronic diseases, of which 44 (51.76%). The results of the present study revealed that most of cancer patient duration of incidence for less than 5 years was (42 cases), followed by 5-10 years of duration to incidence was (40 cases), while there is not difference of positive culture products between them was 34 (40.0%).

<table>
<thead>
<tr>
<th>History of patients N= 100</th>
<th>Positive culture n= 71</th>
<th>Negative culture (% n= 14)</th>
<th>Total no.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1</td>
<td>/</td>
<td>1</td>
</tr>
<tr>
<td>Female</td>
<td>38</td>
<td>7</td>
<td>25</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26-40</td>
<td>9</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>41-55</td>
<td>16</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>56-70</td>
<td>11</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>71-90</td>
<td>3</td>
<td>/</td>
<td>5</td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breast</td>
<td>28</td>
<td>6</td>
<td>19</td>
</tr>
<tr>
<td>Uterus</td>
<td>11</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td><strong>Chemoth.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>38</td>
<td>7</td>
<td>25</td>
</tr>
<tr>
<td>No</td>
<td>1</td>
<td>/</td>
<td>1</td>
</tr>
</tbody>
</table>
Several risk factors cause microbial infection in cancer patients and because of the compromised immune system and many other factors these bacterial species cause multiple opportunistic infections in cancer patients (16). Another study by Koll, (17) fungal infections in cancer patients have been a leading cause of morbidity and mortality. One specific challenge with treating such infections is that it is difficult to detect early, so care can be delayed, which also leads to poor clinical outcome. Diverse microbiota is connected to many areas of the human body, such as the gastrointestinal tract, head, and face. The existence of this microbiota, however, is mainly bacteria, fungi, viruses, and there are also Protozoans and Candida spp. they are commensal to safe people and are found the oral mucosa is frequently colonized yeast -caused fungal infection of the genus Candida, oral fungal is the most common humans infected (18).

**Isolation and identification:**

**Bacterial isolation:** In this study, out of total 200 clinical blood samples and oral cavity swabs were isolated from patients with breast cancer and uterine cancer these samples were distributed to control (30), blood (85) and oral cavity swabs (85). From all these samples, 64% were a negative for bacterial growth appeared, while 36% were positive for bacterial growth appeared. As for the samples taken from blood cancer patients, the percentage of bacterial appearance was 17 (8.5%), while no growth appeared in blood control samples for bacterial culture. In oral cavity swabs was 51(25.5%) for bacterial growth appeared, while in oral cavity control samples was (2%). As shown in Table (2) and the Figure (1).

In this study conducted by Nada,,(19) reported 107 samples remained from National Cancer Institute (NCI) in Egypt, Seventy two positive cases for bacterial infection are acknowledged. Circulation infection initiated by bacterial pathogens remains a fundamental source of infection and death of cancer patients (20). In a similar study, Twenty patients with the diagnosis of uterine endometrial cancer and 20 patients without complications were enrolled in the study Enterobacteriaceae, Streptococcus agalactiae and anaerobic bacteria were mainly detected(21).

### Table (2): Distribution of specimens type according to bacterial culture results.

<table>
<thead>
<tr>
<th>Specimens type</th>
<th>Positive culture (%)</th>
<th>Negative culture (%)</th>
<th>Total no. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood specimens</td>
<td>17 (8.5)</td>
<td>68 (34.0)</td>
<td>85 (42.5)</td>
</tr>
<tr>
<td>Oral swabs specimens</td>
<td>51 (25.5)</td>
<td>34 (17.0)</td>
<td>85 (42.5)</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blood s.</td>
<td>/</td>
<td>15 (7.5)</td>
<td>15 (7.5)</td>
</tr>
<tr>
<td>Oral s.</td>
<td>4 (2.0)</td>
<td>11 (5.5)</td>
<td>15 (7.5)</td>
</tr>
<tr>
<td>Total no.</td>
<td>72 (36.0)</td>
<td>128 (64.0)</td>
<td>200 (100)</td>
</tr>
</tbody>
</table>
A total number of bacteria colonies is 93 isolated from 200 clinical blood and oral swabs samples taken from breast and uterus cancer patients and healthy controls, the number and percentage of fungi species isolated from clinical samples were summarized in table (3). Seven genera of bacteria are isolated and diagnosed from blood and oral swabs for breast and uterus cancer patients and control individuals. The total number of frequency percentage for bacteria species is 18 (19.4%) isolated from blood samples, while the total number of frequency percentage for oral swabs samples is 67 (72.0%), compared with total number of frequency percentage for bacteria species isolated from oral swabs control is 8 (8.6%).

During this study, it was isolated many bacterial species from both cancer and control samples were Included: the high frequency rate is *Staphylococcus* species(45.1%)suchas*S. aureus*(20.4%),*S. haemolyticus* (8.6%), *S. hominis* (5.3%), *S. hyicus* (4.3%), *S. lentus* (4.3%) and *S. equorum* (2.2%). The second frequency rate is *Streptococcus* species (29%) such as *S. mitis* (11.8%), *S. mutans* (10.8%) and *S. agalactiae* (6.4%), followed by *Escherichia coli* (10.8%), *Klebsiella* spp (6.5%), *Psudomonas aeruginosa* (4.3%), *Enterococcus* spp (3.2%), and *Proteus mirabilis* (1.1%), as shown in Table (3).

### Table (3): Distribution of Bacteria species in clinical blood and oral samples of cancer patients and control.

<table>
<thead>
<tr>
<th>Fungi species</th>
<th>No. of colonies (%)</th>
<th>Total no. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Blood samples</td>
<td>Oral samples</td>
</tr>
<tr>
<td><em>Enterococcus</em> spp</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td><em>Klebsiella</em> spp</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Proteus mirabilis</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Psuedomonas aeruginosa</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td><em>Staphylococcus</em> aureus</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>Sta. equorum</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Sta. haemolyticus</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>
Nowadays cancer is the second main cause of death in the world. Some specific species have been identified that correlate strongly with cancer, such as *Streptococcus* sp., *Peptostreptococcus* sp., *Prevotella* sp., *Porphyromonas gingivalis*, and *Capnocytophaga gingivalis*. Various bacteria present in various types of cancer patients especially in lung, liver, blood, skin, breast and gastric cancer and different other complication are *H. pylori*, *Mycobacterium tuberculosis*, *E. coli*, *S. pyogene*, *Streptococcus mutant*, *Staphylococcus aureus* (22). Study conducted by Meo, (16) isolated bacteria from various varieties of cancer e.g. *E. coli* (14%), *H. pylori* (10%), *M. tuberculosis* (08%), *Listeria* (07%), *S. pyogene* (05%) and *S. aureus* (05%). These bacterial species cause different opportunistic infections in cancer patients due to the compromised immune system and many other reasons.

In another study approach to the current study Rolston, (23) investigated gram-positive bacteria isolated from the bloodstream of patients with hematological malignancies were coagulase-negative *Staphylococci* (33%), *Staph aureus* (15%), viridans group *streptococci* (10%), and the *enterococci* (8%). Velasco, (24) studied that mostly Gram-positive microbes isolated from the circulation of patient with diverse blood cancers such as leukaemia existed coagulase-negative *Staphylococci* (33%), the *Enterococci* (8%), and viridans group *Streptococci* (10%) and *Staph aureus* (15%).

While the researcher Iqbal, (25) conducted a study included Clinical blood samples (200) were together from hospitalized cancer and non-cancer patients different bacterial pathogens were identified. Among the isolates *E. coli* were (13.33%), *S. aureus* (11.66%), *P. aeruginosa* (11.66%), *salmonella* (10%), *bacillus spps* (9.16%), *Enterobacter spps* (8.13%), *S. Pyogene* (7.5%), *Klebsiella spps* (5.83%), *S. epidermidis* (4.16%) and *Shigella* were (4.16%). It has long been known that oral bacteria preferentially colonize different surfaces in the oral cavity as a result of specific adhesions on the bacterial surface binding to complementary specific receptors on a given oral surface (26).

Close to the current study results, Prakash, (27) found Bloodstream Bacterial Pathogens 57.8% were gram-positive and 42.2% were gram-negative bacteria. Among the bacterial pathogens, the most common 10 bacterial isolates were: *Streptococcus* species 76 (21.1%), coagulase-negative *Staphylococci* 75 (20.8%), *Escherichia coli* (*E. coli*) 43 (11.9%) *Staphylococcus aureus* (*S. aureus*) 41 (11.4%), *Klebsiella* spp. 19 (5.3%), *Streptococcus pneumoniae* (*S. pneumoniae*) 16 (4.4%), *Pseudomonas aerginosa* (*P. aerginosa*) and *Proteus* spp. 11 (3.1%) each, *Salmonella* spp. 10 (2.8%) and *Klebsiella pneumoniae* (*K. pneumoniae*) 9 (2.5%).

**Fungal isolation:** The results of fungal cultures are summarized in table (4), with 160 specimens from patients with breast and uterus cancer as 85 specimens of blood and 85 specimens of oral swabs as well as 30 specimens from control persons (15 of blood and 15 of oral swabs). The results of cultures in blood specimens are show 13 (6.6%) in breast and uterus cancer patients have positive culture with fungal infections, whereas in control subjects, the positive culture is zero. In oral swabs samples are show 32 (16.0%) in breast and uterus cancer patients have positive culture with fungal infections, whereas in control subjects, the positive culture is 7 (3.5%). Significant improvements in the treatment of anticancer have led to increased incidence of serious fungal infections in neoplastic disease patients.

Neutropenia remains one of the most significant predisposing factors associated with the malignancy or its treatment. Some fungal infections are caused

<table>
<thead>
<tr>
<th><strong>Fungi species</strong></th>
<th><strong>No. of colonies (%)</strong></th>
<th><strong>Total no. (%)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Blood samples</td>
<td>Oral samples</td>
</tr>
<tr>
<td>Sta. hominis</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>Sta. hyicus</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Sta. lentus</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td><em>Streptococcus agalactiae</em></td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>Str. mitis</td>
<td>-</td>
<td>8</td>
</tr>
<tr>
<td>Str. mutans</td>
<td>-</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total no. (%)</strong></td>
<td>18 (19.4)</td>
<td>67 (72.0)</td>
</tr>
</tbody>
</table>
by Candida spp and Aspergillus spp, widely known opportunistic fungi, and Cryptococcus neoformans, Histoplasma capsulatum, Coccidioides immitis, and less frequently by Blastomyces dermatitidis. Newer pathogens such as Phaeohyphomycetes, Hyalohyphomycetes, Zygomycetes and other emerging essential fungi such as Torulopsis glabrata, Trichosporon beigelii,” (28).

Cancer patients usually have neutropenia, cellular immune defects and residential catheters which make them an ideal target for fungal infections. Several in recent years, there has been an rise in cancer centers incidence of difficult infections- to counter opportunistic molds like Fusarium, Zygomycetes, and Scedosporium Species and yeasts for example Trichosporon Species” (29).

Table (4): Distribution of specimens type according to fungal culture results.

<table>
<thead>
<tr>
<th>Specimens type</th>
<th>Positive culture (%)</th>
<th>Negative culture (%)</th>
<th>Total no. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood specimens</td>
<td>13 (6.6)</td>
<td>72 (36.0)</td>
<td>85 (42.5)</td>
</tr>
<tr>
<td>Oral swabs specimens</td>
<td>32 (16.0)</td>
<td>53 (26.5)</td>
<td>85 (42.5)</td>
</tr>
<tr>
<td>Blood s.</td>
<td>/</td>
<td>15 (7.5)</td>
<td>15 (7.5)</td>
</tr>
<tr>
<td>Oral s.</td>
<td>7 (3.5)</td>
<td>8 (4.0)</td>
<td>15 (7.5)</td>
</tr>
<tr>
<td>Total no.</td>
<td>52 (26.0)</td>
<td>148 (74.0)</td>
<td>200 (100)</td>
</tr>
</tbody>
</table>

A total number of fungi colonies is 124 isolated from 200 clinical blood and oral swabs samples taken from breast and uterus cancer patients and healthy controls, the number and percentage of fungi species isolated from clinical samples were summarized in table (5). Eight species of molds and four species of yeasts are isolated and diagnosed from blood and oral swabs for breast and uterus cancer patients and control individuals. The total number of frequency percentage for fungi species is 41 (33.06%) isolated from blood samples, while the total number of frequency percentage for oral swabs samples is 65 (52.41%), compared with total number of frequency percentage for fungi species isolated from oral swabs control is 18 (14.51%).

During this study, it was isolated many bacterial species from both cancer and control samples were included: the high frequency rate is Candida spp. (41.92%), such as Candida albicans (18.54%), C. krusei (12.09%) and C. glabrata (11.29%). The second frequency rate is Cladosporium spp. (28.22%) such as C. sphaerosporum (16.93%) and C. herbarum (11.29%), followed by Aspergillus spp. (20.95%), Rhodotorula sp. (3.22%), Penicillium sp. (2.41%) and Alternaria sp (0.80%).

Table (5): Distribution of Fungi species in clinical blood and oral samples of cancer patients and control.

<table>
<thead>
<tr>
<th>Fungi species</th>
<th>No. of colonies (%)</th>
<th>Blood samples</th>
<th>Oral samples</th>
<th>Oral control</th>
<th>Total no. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternaria sp.</td>
<td>1</td>
<td>/</td>
<td>/</td>
<td>1 (0.80)</td>
<td></td>
</tr>
<tr>
<td>Aspergillus candidus</td>
<td>1</td>
<td>3</td>
<td>/</td>
<td>4 (3.22)</td>
<td></td>
</tr>
<tr>
<td>A. flavus</td>
<td>5</td>
<td>7</td>
<td>1</td>
<td>13 (10.48)</td>
<td></td>
</tr>
<tr>
<td>Fungi species</td>
<td>No. of colonies (%)</td>
<td>Total no. (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------</td>
<td>---------------------</td>
<td>---------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Blood samples</td>
<td>Oral samples</td>
<td>Oral control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. niger</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>7 (5.64)</td>
<td></td>
</tr>
<tr>
<td>A. terreus /</td>
<td>/</td>
<td>2</td>
<td>/</td>
<td>2 (1.61)</td>
<td></td>
</tr>
<tr>
<td>Cladosporium herbarum</td>
<td>5</td>
<td>7</td>
<td>2</td>
<td>14 (11.29)</td>
<td></td>
</tr>
<tr>
<td>C. sphaerospermum</td>
<td>7</td>
<td>10</td>
<td>4</td>
<td>21 (16.93)</td>
<td></td>
</tr>
<tr>
<td>Penicillium sp.</td>
<td>/</td>
<td>3</td>
<td>/</td>
<td>3 (2.41)</td>
<td></td>
</tr>
<tr>
<td>White mycelia</td>
<td>1</td>
<td>2</td>
<td>/</td>
<td>3 (2.41)</td>
<td></td>
</tr>
<tr>
<td>Candida albicanes</td>
<td>6</td>
<td>12</td>
<td>5</td>
<td>23 (18.54)</td>
<td></td>
</tr>
<tr>
<td>C. glabrata</td>
<td>5</td>
<td>7</td>
<td>2</td>
<td>14 (11.29)</td>
<td></td>
</tr>
<tr>
<td>C. krusei</td>
<td>5</td>
<td>8</td>
<td>2</td>
<td>15 (12.09)</td>
<td></td>
</tr>
<tr>
<td>Rhodotorula sp.</td>
<td>3</td>
<td>1</td>
<td>/</td>
<td>4 (3.22)</td>
<td></td>
</tr>
<tr>
<td>Total no.</td>
<td>41 (33.06)</td>
<td>65 (52.41)</td>
<td>18 (14.51)</td>
<td>124 (100)</td>
<td></td>
</tr>
</tbody>
</table>

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

**Conflict of Interest:** None

**Funding:** Self-funding

**References**


The Degree of Knowledge of Sports Games During their Practice

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Abstract

The importance of conducting this research is that it seeks to obtain information and knowledge of the information and knowledge of the employees of the Directorate of Physical Training and Police Games in the Babil Police Command, because this is an urgent necessity to evaluate these outcomes in order to work on improving this important aspect, which may contribute to improving their level. In the sciences related to the field of sports (football, basketball, volleyball, and handball), it is also considered to provide a new measurement method based on scientific foundations through which the knowledge aspect of these games can be evaluated in order to identify weaknesses and deficiencies in knowledge and theoretical and practical information that includes legal aspects. And technical, and this test may contribute to classifying them at different levels according to their scientific knowledge, whether on the theoretical or practical side, and this test can also be used in the tests of new affiliates. And after the data obtained from the research sample were subjected to statistical treatment after they were subjected to the scientific foundations, and through the results obtained by the researcher from the study sample, the researcher concluded that the majority of the sample members are prevented from sport knowledge regarding football, basketball, volleyball and handball in terms of acquiring the skill and how to learn and mastering the required movements and exercises, especially the training method and method and legal positions.

Keywords: Knowledge, sports, Health attitude; games and practice.

Introduction

There is no doubt that we are now living in an era that is changing by all standards from past eras, which is called the information age, and this means that the real power now is for those who possess information and can use it in the best way and apply it in practice in proportion to the needs of this age, which is characterized by speed in everything and from here we notice that In the speed of change and development in all fields, especially the sports field, as this field has become fast, successive and intense, and this is not a coincidence, but rather a result of the use of modern method based on scientific development and progress for accurate scientific research in solving problems that may face the athlete and a shift between him and the achievement of sport achievement. The higher education institution relies on all sciences in order to achieve the desired goal.

Psychology is one of the important sciences as it is concerned with researching life issues, including those related to sports activity in its various fields and levels. It also researches the psychological characteristics and features of the personality that form the subjective basis of sports activity in order to develop this type of activity and try to find scientific solutions to its various applied problems. The sports that the athletes own as it enriches the individual with all the information about the performance and is capable of providing the necessary support to initiate the correct performance and avoid the problems facing the athlete.¹ The knowledge field represents one of the important pillars for the development of physical education and sports programs, as it expresses a distinct cultural and civilizational aspect that the modern person must be familiar with, as
knowledge plays an important role and requirement for its transmission through cultural communication processes with its mechanisms, so knowledge is not inherited but rather is acquired through education, education and education. So that the individual practitioner or observer must understand, know and assimilate a measure of sports knowledge about the type of sports activity practiced first and then practiced secondly, so that sport knowledge is no longer just a by-product of the physical education curriculum, but has become a basic education.

The importance of conducting this research is that it seeks to obtain information and knowledge of the information and knowledge of the employees of the Directorate of Physical Training and Police Games in the Babylon Police Command, because this is an urgent necessity to evaluate these outcomes in order to work on improving this important aspect, which may contribute to improving their level. In the sciences related to the field of sports (football, basketball, volleyball, and handball), it is also considered to provide a new measurement method based on scientific foundations through which the knowledge aspect of these games can be evaluated in order to identify weaknesses and deficiencies in knowledge and theoretical and practical information including legal aspects. And technical, and this test may contribute to classifying them at different levels according to their scientific knowledge, whether on the theoretical or practical side, and this test can also be used in the tests of new associates.

The measurement of sports knowledge is one of the various and objective methods that must be used alongside the tests that measure the physical, skill and mental aspects, which have an effective role in raising the level of performance in addition to acquiring the scientific foundations that support performance and through the work of the researcher as an affiliate in the Ministry of Interior, and according to his specialization in physical education, he decided to study scientific and practical knowledge and in view of the effectiveness of the role that employees of the Directorate of Training and Police Games play in achieving advanced results and achievements through capabilities and theoretical capabilities in sports games (soccer, basketball, volleyball, and handball) that they acquire without knowledge, so the researcher saw the need to study this problem to identify sports knowledge in sports (football, basketball, volleyball, and handball) for employees of the Physical Training Directorate, and police games in Babylon Police Command.

**Research Objective:** Identifying the reality of sports knowledge among the employees of the Directorate of Physical Training and Police Games in Babylon.

**Research Methodology**

The nature of the phenomenon and the goals set impose on the researcher to choose the appropriate approach because “the art of correct organization of a series of many ideas in order to reveal the truth when we are ignorant of it or prove it to others when we are familiar with it,” the researcher used the descriptive approach due to its suitability and the nature of the current study.

**Research community and its samples:** The research community is defined as the group of elements or individuals who have been addressed by the study related to the problem that has been identified. Determining the community is usually linked to the goals set by the researcher and the condition for selecting the sample from that community is that it be truly representative of the original community so that this sample fulfills a major condition which is the possibility of generalizing its results on the group from which it was taken. What is meant by the sample (is the private part taken from the original community through which the actual data necessary for the experiment can be obtained).

On this basis, the research community included (60) affiliates of the Directorate of Physical Training and Police Games in Babylon, while the research sample included (20) affiliates.

**Tools, means and devices used in the research:**

- One computer (Pentium 4).
- Electronic calculator type Casio, count (2).
- One stopwatch.
- Stationery and stationery (papers and pens).
- Arabic and foreign sources and references.
- Personal interviews.
- Questionnaire.
- Tests and measures.

**Field research procedures:**

**Measure preparation procedures:** The two researchers chose the scale prepared by (Ali Ibrahim Malik) to describe sport knowledge.
1. Determining the validity of the psychological scale: The validity of the scale paragraphs was determined in accordance with the sample of the study by presenting them to a number of (4) experts in the field of the four games to indicate their validity in measuring the goal for which they were set, as they obtained a 100% agreement through the use of the Ka2 test. Where the calculated value reached (6), which is greater than the tabular value of (3.84) at the degree of freedom (1) and the level of significance (0.05). Based on these results, the scale was adopted for application to the research sample.

2. The exploratory experience: The two researchers conducted their exploratory experiment that lasted for 10 days in order to take data on the tests and measures and also calculate the scientific basis for the tests and scale and were performed on players (8) of its affiliates, and the main objectives of the exploratory experiment were the following:

- Ensuring the validity of the psychological tests and scale to demonstrate their suitability to the nature of the current work.
- Knowing the time required to conduct the tests and apply the scale.
- Calculating the practical principles (truthfulness, consistency, and objectivity).
- The ability of the work team if it was able and interactive with the current research and its procedures.

The scientific foundations of the scale: After the scale applied sport knowledge to the exploratory research sample (8), data were taken to calculate the scientific basis.

First, the validity of the scale: The opinions of experts were approved in the calculation of honesty after it was presented to a group of the four sports experts to demonstrate its suitability to the nature of the current work. Their number was (5) experts, and the results were positive.

Second, Stability of scale: Stability is nothing but “a test that gives results of an approach or the same results if applied more than once in similar circumstances.” When re-applying the scale on the experimental experiment sample and using a coefficient between the testers’ scores on the scale, it is found that the value of the Pearson correlation coefficient has reached 0.85, which is a high value indicating that the scale is fixed.

Scale Correction: The scale consists of a group of phrases for the four sports (football, represented by (24) phrases and basketball, represented by (38) phrases, and volleyball, represented by (30) phrases, and handball, represented by (19) phrases) and the alternatives were the answer from the multiple, where The answer is chosen only one, in addition to that the scale of basketball contains another type of wording of the phrase (true and false), and thus the answer alternatives for the scale are formed (zero, one).

Statistical Means: The two researchers used the statistical bag for social sciences (SPSS) in order to reach the results.

Results and Discussions

Table 1. Show the values of the mean, the hypothetical mean, the standard deviation, the t-value and its significance for the fields of sport knowledge

<table>
<thead>
<tr>
<th>Fields</th>
<th>Mean</th>
<th>SD</th>
<th>Center-premise</th>
<th>(t) Value</th>
<th>Moral value</th>
<th>Type of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Football game</td>
<td>20.03</td>
<td>3.86</td>
<td>12</td>
<td>11.387</td>
<td>0.000</td>
<td>Sig.</td>
</tr>
<tr>
<td>Basketball game</td>
<td>29.87</td>
<td>6.36</td>
<td>19</td>
<td>9.357</td>
<td>0.000</td>
<td>Sig.</td>
</tr>
<tr>
<td>Volleyball game</td>
<td>20.77</td>
<td>4.67</td>
<td>15</td>
<td>6.769</td>
<td>0.000</td>
<td>Sig.</td>
</tr>
<tr>
<td>Handball game</td>
<td>15.80</td>
<td>3.92</td>
<td>12</td>
<td>5.314</td>
<td>0.000</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

Table (1) and Figure (1) show the results of the research for sport knowledge after analyzing the data, as the results of the football field appeared with an mean (20.03) and a standard deviation (3.86) and by comparing the mean with the hypothetical mean of (12) degrees, from which there are apparent differences Therefore,
it was tested with a t-test to find out the statistical significance of these differences, and that the calculated value of (t) reached (11.387), which is greater than the value of (Sig) amounting to (0.000), which means that the difference is significant.

![Figure 1. Show the values of the mean, standard deviation, and hypothetical mean of sport knowledge domains](image)

As for the results of the basketball field data with an mean (29.87) and a standard deviation (6.36), and by comparing the mean with the hypothetical mean of (19) degrees, it was found that there are visible differences. The calculated value of (t) reached (9.357), which is greater than the value of (Sig) amounting to (0.000), which means that the difference is significant. As for the results of the volleyball field data with an mean (20.77) and a standard deviation (4.540), and by comparing the mean with the hypothetical mean of (15) degrees, it was found that there are apparent differences, so they were tested with a t-test to identify the statistical significance of these differences and that the calculated value of (t) reached (6.769), which is greater than the value of (Sig) amounting to (0.000). This means that the difference is significant.

As for the results of the handball field data with an mean (15.80) and a standard deviation (3.92) and by comparing the mean with the hypothetical mean of (12) degrees, it was found that there are apparent differences, so they were tested by the t-test to find out the statistical significance of these differences and that the calculated value of (t) was (5.314), which is greater than the value of (Sig) amounting to (0.000), which means that the difference is significant.

It is evident from the results shown in Table (1) that the sample answers to the test were of an outstanding level, and thus the test became a scientific method that can be relied upon to measure the cognitive aspect and evaluate the knowledge and information possessed by the employees of the Directorate of Physical Training and Police Games in the Babil Police Command.9

The greater the mastery of theoretical knowledge and the method of its application, as well as the basic information of the individual sport, the more capable it is to develop and develop his level to the fullest extent, and it is imperative that the athletic individual is fully familiar with the theoretical and scientific foundations of the science of training and possesses the information related to the foundations of skill development. The mobility is not satisfied with what he has achieved in terms of qualification,10 but he works on increasing and getting acquainted with all the knowledge that will be found.11 Importance of sports knowledge and its topics is not limited to the athlete or athlete only. They seek - or should - seek to acquire this knowledge or employ it appropriately.12

**Conclusions**

1. The effectiveness of the Games’ Sport Knowledge
Scale in measuring the capabilities of individuals in sports knowledge

2. The majority of the sample is denied sport knowledge regarding football, basketball, volleyball and handball in terms of acquiring skill, how to learn, and mastering the required movements and exercises, especially training method and method and legal positions.

Ethical Clearance: The Research Ethical Committee at scientific research by ethical approval of both MOH and MOHSER in Iraq.

Conflict of Interest: None

Funding: Self-funding

References

The Effect of Giving Massage, Physiotherapy and Nutritional Needs Based on RDA Numbers Against Increased Endurance of the Legs and Heart Muscles of the Road Racetour De Singkarak Bicycle Racing Athletes

Deri Putra¹, Nurlan Kusmaedi², Amung Mamun³, Syafrudin⁴, Firman Suryadi Rahman⁵

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Abstract

This study aims to determine the effect of giving massage, physiotherapy and nutritional needs based on nutritional adequacy rates to increase endurance of leg and heart muscles in the Road Racetour De Singkarak Bicycle Racing Athlete. The sample in this study uses a total sample technique that is all athletes Pelatnas Road Racetour De Singkarak athletes, amounting to 10 people. The findings of this study include, 1) There is an effect of giving massage to increase leg and heart muscle power, with the average rating of the experimental group using the Strocking Effleurage method, traction (traction) and Effleurage more dominant than the average value of the control group. 2) There is an influence of giving physiotherapy to increase leg and heart muscle power, and the administration of control group physiotherapy with Exercise therapy technique is more dominant than the administration of Thermotherapy (Heat therapy/Heat Therapy). 3) There is an influence of nutritional needs based on the nutritional adequacy rate on the increase in leg and heart muscle power of the Road Racetour De Singkarak Road Race, with the average experimental group being more dominant than the control group.

Keywords: Massage, Physiotherapy, Nutritional, Bicycle Racing Athletes.

Introduction

Cycling can make the body become healthier and fitter. As stated by Giam & Teh¹ that bicycle sport is one of the branches of aerobic exercise which during its implementation requires oxygen consumption. Therefore, cycling is very beneficial for maintaining and improving the fitness of the heart, lungs, blood circulation, muscles, bones and joints. But in practice, cycling also has risks, both by external factors such as accidents during a race and internal factors in the form of fatigue overuse or posture errors that do not match the shape of the bicycle.

The sport of bicycle has different characteristics from other sports. In the sport of bicycle, athletes are required to be able to pedal a bicycle as fast as possible with a predetermined distance and mastery of good techniques to get through obstacles in order to create maximum acceleration. Therefore Harsono² emphasized in the physical component table some of the body parts needed in the sport of bicycles, namely: (a) back muscle strength, (b) muscle strength and strength of arm muscles, (c) muscle strength, muscle strength, agility, flexibility, heart muscle strength and leg power.

Physical exercise such as cycling will cause strength and strength of respiratory muscles to increase, so that the ability of the lungs to expand will increase. In addition, physical exercise will result in an increase in the ability of the respiratory muscles to overcome the resistance of respiratory air flow. Indicators of muscle endurance can be measured by facilities, tools, and implementation.
processes. For this reason, the researcher considers that paying attention to athletes physically before and after a bicycle race, such as massage, doing physiotherapy and the nutritional needs of athletes are important things to do.3

The problem that always occurs in the world of sports is injuries that often occur due to incorrect techniques and fatigue. Back pain problems are often experienced by bicycle racers. Viewed from several aspects, giving massage, nutrition, or physiotherapy is the first aid for athletes to maintain the physical fitness of athletes to stay fit and the adequacy of good nutrition is believed to improve the athlete’s condition during the race.

Based on the background presented above, the researchers are interested in examining the extent of the effect of massage, how much physiotherapy results are, and the extent of the effect of nutritional requirements based on the Nutrition Adequacy Rate (RDA) on increasing endurance of leg and heart muscles in Road Bike Racing Athletes Racetour De Singkarak which will be held in April 2020.

Methods

Research Design: This study is an experimental study using a Quasy-experiment design defined as an experiment that has treatments, impact measurements, experimental units but does not use random assignments to create comparisons in order to conclude changes caused by treatment with the Pre-test and Post-test non-equivalent control group designs, where the treatment given can make a change or not make a change

The treatment given in this study is the provision of massage, physiotherapy, and nutritional needs based on nutritional adequacy rates to increase endurance of leg and heart muscles during control class meetings and experimental athletes of the Pelatnas bicycle racers, Road Racetour De Singkarak Road Bike Athletes.

Location and Time of the Research: This research was conducted at the training center of the PGN bicycle team which will become the Road Racetour De Singkarak Bicycle Race Athlete during preparation for the race. The training place for the PGN bicycle team is located at Jl. Kaliurang, Yogyakarta City, Yogyakarta DIY Province.

Population and Sample: The population and samples in this study were all Road Racetour De Singkarak Bicycle Racing Athletes from Pelatnas PGN, amounting to 10 people. The following is a sample table of this study:

The sample in this study consisted of 10 respondents. Researchers divided the two groups of athletes who were given the same treatment of massage, physiotherapy, and nutritional requirements based on the RDA and the increased muscle and heart strength in the experimental and control samples.

Data Collection Techniques and Instruments

• Data Collection Techniques
a. The researcher asked for permission to collect research data from the sample who was a Road Racetour De Singkarak bicycle racer with a research permit.
b. Researchers determined a number of study samples from the population, and obtained a total of 10 study samples.
c. The study sample was given a briefing related to the technical instructions for filling in informed consent (the willingness to be a research sample) and the time of the study.
d. The researcher gave research instruments in the form of SOP massage sheets, Physiotherapy and Nutrition Needs based on RDA Numbers with Endurance of Leg and Heart Muscles in Pelatnas Athletes with numerical scale standards to the samples.
e. Researchers took pretest data to control and experimental samples of 10 people. Data taken in the form of endurance value of leg and heart muscles in athletes before receiving national treatment of massage, physiotherapy and nutritional needs based on the RDA figures after being given treatment
f. Experimental samples and research controls were treated in the form of massage, physiotherapy and nutritional needs based on the RDA numbers according to Standard Operational Procedure (SOP).
g. Researchers took posttest data to a sample of 10 people. Data taken in the form of the value of the endurance conditions of the limbs and heart muscles after being given a massage treatment with heat therapy.
h. Researchers collected all raw data from the measurement results, then it was processed using SPSS.
Research Instruments

The instruments used in this study are tools used to obtain the results of the degree of pain in the trapezius muscle, namely: Numeric Rating Scale (NRS) or modified Numerical Scale. Numeric Rating Scale (NRS) which has a score of 0 to 10. To provide an overview of the instruments used in research, the authors present below:

Figure 1. Numeric Rating Scale (NRS) (Berman, 2016: 1097)

Several scales on the modified Numeric Rating Scale (NRS) can be classified as follows:

1. Scale 0 : Very poor
2. Scale 1-3 : Less
3. Scale 4-6 : Medium
4. Scale 7-9 : Good
5. Scale 10 : Very Good

Results and Discussion

Research Result

• Data Description

• Pretest and Posttest Massage Data on Increased Endurance of Leg and Heart Muscles in Road Racetour De Singkarak Bicycle Racing Athletes

Pretest massage data on increased endurance of leg and heart muscles in the control group were obtained from the results of measurement tests on the study sample, where initial data collection was carried out before the study sample received massage treatment. The final data (posttest) of the massage for the increase in endurance of the leg and heart muscles was obtained from the measurement test results in the study sample, in which the data collection was carried out after the study sample received treatment in the form of sports massage. The following is a description of the pretest and posttest massage data for increased endurance of the leg and heart muscles in the control group.

It can be seen that there was an increase in massage using the method of pressing at the acupuncture point and friction (grinding) to increase endurance of the leg and heart muscles in the control group. Pretest Mean 3.4 and posttest mean 6.4.

After the researcher made observations in the control group, the next researcher made observations in the experimental group with massage using the Strocking Effleurage, traction and Effleurage methods. The researcher took the pretest data before the treatment was given and then took the posttest data after the sample was treated. The following is a description of the pretest and posttest massage data for increased endurance of the leg and heart muscles in the experimental group:

It can be seen that there was an increase in massage using the Strocking Effleurage, traction and Effleurage methods to increase endurance of the leg and heart muscles in the experimental group at the Road Racetour De Singkarak Bicycle Racing Athletes. Pretest Mean 2.6 and posttest mean 7.4.

• Pretest and Posttest Physiotherapy Data on Increased Endurance of the Leg and Heart Muscles

Data on physiotherapy pretest on increasing endurance of leg and heart muscles in the control group were obtained from the results of measurement tests on the study sample, where initial data collection was carried out before the study sample received physiotherapy treatment. The final data (posttest) of physiotherapy on increasing endurance of leg and heart muscles was obtained from the results of measurement tests on the study sample, in which the data collection was carried out after the study sample received treatment in the form of physiotherapy. The following is a description of the pretest and posttest physiotherapy data for increasing endurance of the leg and heart muscles in the control group.

There was an increase in physiotherapy with exercise therapy therapy (exercise therapy) to increase endurance of leg and heart muscles in the control group. Pretest Mean 2.4 and posttest mean 7.

After the researchers made observations in the control group, then the researchers conducted observations in the experimental group with physiotherapy using the Thermotherapy (Heat therapy / Heat Therapy) technique, the researchers collected the data after the sample performed Thermotherapy (Heat therapy) on the Road Racetour De Singkarak Bicycle Racing Athletes. The following is a description of the pretest and posttest physiotherapy data on the increase in endurance of the leg and heart muscles in the experimental group:
Leg and heart muscles in the experimental group: there was an increase in physiotherapy using Thermotherapy (Heat therapy) techniques to increase endurance of the leg and heart muscles in the experimental group of the PGN Road Racetour Bicycle Athletes. Pretest Mean 2.6 and posttest mean 6.4.

- Pretest and Posttest Data Nutrition Needs Based on RDA on Increased Endurance of Leg and Heart Muscles

Pretest nutritional data based on RDA for increased endurance of leg and heart muscles in the control group was obtained from the measurement test results in the study sample, where initial data collection was carried out before the study sample received nutritional support under normal circumstances. The final data (posttest) of physiotherapy for increasing endurance of leg and heart muscles was obtained from the results of measurement tests on the study sample, in which the data collection was carried out after the study sample was given nutrition based on the RDA. The following is a description of nutritional pretest and posttest data based on RDA to increase endurance of leg and heart muscles in the control group.

There was an increase in the nutritional requirements based on the RDA with a balanced menu by providing more carbohydrates, protein for increased endurance of the leg and heart muscles in the control group. Pretest Mean 4 and posttest mean 8.

After the researchers made observations in the control group, the next researchers conducted observations in the experimental group using other different balanced menus, the researchers took the data after the samples received the nutritional requirements based on the RDA at the Road Racetour De Singkarak Bicycle Athletes. The following is a description of the pretest and posttest data of RDA nutrition for increasing endurance of leg and heart muscles in the experimental group:

There was an increase in nutrition based on the RDA to increase endurance of the leg and heart muscles in the experimental group at the Road Racetour De Singkarak Bicycle Racing Athlete. Pretest Mean 4.6 and posttest mean 8.2.

a  Testing the Analysis Prerequisites

- Normality test

Based on the results of the analysis, it can be concluded that the pretest and posttest data given to increase athlete’s leg and heart muscle power have sig values. > 0.05 and is at the normal distribution level. Thus, one of the statistical testing requirements has been fulfilled.

- Homogeneity Test

The next step after the normality test is done, the researcher conducts a homogeneity test, whose purpose is to find out whether the data is homogeneous in a study.

In this step, the probability value (sig.) obtained from the Lavene statistic for the initial test (pretest) of the control group massage results is 1,000 with a homogeneous description of the experimental group massage results that is 0.617 with homogeneous information, the control group physiotherapy results are 0.169 with homogeneous information, the physiotherapy results of the experimental group were 1,000 with homogeneous information, the results of the AKG nutrition giving control group were 1,000 with homogeneous information, the results of the AKG nutrition giving the experimental group were 0.296 with homogeneous information.

Based on the analysis of homogeneity test using the lavene test (lavene statistics) shows that all pretest and posttest data in each group has a sig value. > 0.05, means that the pretest and posttest data of the control and experimental groups are homogeneous. Thus both groups are homogeneous and normal so that they meet the requirements for t-tests.

b Hypothesis Testing

- Effect of Giving Massage Against Increased Leg Muscle Power and Heart

Based on the results of data processing that has been done, the results show that the administration of massage affects the increase in leg muscle power and heart, with the decision criteria for hypothesis testing by comparing the probability value (sig.) With α = 5%. The decision criteria are as follows: (1) if sig. > 0.05 then H0 is accepted and H1 is rejected; (2) if sig. <0.05 then H0 is rejected and H1 is accepted. Hypothesis test results are presented in the following table:
Table 1. Paired T Test for Giving Massage

<table>
<thead>
<tr>
<th>Levene’s Test for Equality of Variances</th>
<th>Sig</th>
<th>t count</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Massage Control Results</td>
<td>0.014</td>
<td>3.128</td>
<td>Significant</td>
</tr>
<tr>
<td>Experimental Massage Results</td>
<td>0.000</td>
<td>5.657</td>
<td>Significant</td>
</tr>
</tbody>
</table>

It is known from table 1, the t-value for giving massage to the control group was 3.128 with a probability (sig.) Of 0.014. Because the probability value (sig.) Is 0.014 <0.05, while the t-value in the experimental group massage is 5.657 and the probability (sig.) Is 0.000, because the probability value (sig.) Is 0.000 <0.05, thus H0 is rejected and H1 is accepted in the control group. and experimentation. Based on the table above, there is an effect of giving massage to increase the leg and heart muscle power of PGN athletes. Then it can be concluded that there is an effect of giving massage to increase leg and heart muscle power of the Road Racetour De Singkarak Athletes.

Table 2. Paired T Test Physiotherapy

<table>
<thead>
<tr>
<th>Levene’s Test for Equality of Variances</th>
<th>Sig</th>
<th>t count</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physiotherapy Control Results</td>
<td>0.000</td>
<td>4.468</td>
<td>Significant</td>
</tr>
<tr>
<td>Physiotherapy Results of Experiments</td>
<td>0.001</td>
<td>5.270</td>
<td>Significant</td>
</tr>
</tbody>
</table>

The t-test value for giving physiotherapy in the control group is known to be 4,468 with a probability (sig.) Of 0.000. Because the probability value (sig.) Is 0.000 <0.05, while the value of t-count in the experimental group physiotherapy is 5.270 and the probability (sig.) Is 0.001, because the probability value (sig.) Is 0.001 <0.05, thus H0 is rejected and H1 is accepted in the control group. and experimentation. Based on the table above, there is an effect of the provision of physiotherapy to the increase in leg and heart muscle power of PGN athletes in the National Racing Road Racetour De Singkarak Bicycle Race. Then it can be concluded that there is an effect of the provision of physiotherapy to the increased muscle power of the legs and heart of the Road Racetour De Singkarak Athletes.

Table 3. Paired T Test Nutrition Needs Based on AKG

<table>
<thead>
<tr>
<th>Levene’s Test for Equality of Variances</th>
<th>Sig</th>
<th>t count</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>RDA Control nutrition results</td>
<td>0.000</td>
<td>8.944</td>
<td>Significant</td>
</tr>
<tr>
<td>RDA Nutrition Results Experiments</td>
<td>0.002</td>
<td>4.648</td>
<td>Significant</td>
</tr>
</tbody>
</table>
The t-count value for the provision of nutritional requirements based on the RDA in the control group was 8,944 with a probability (sig.) Of 0.000. Because the probability value (sig.) is 0.000 <0.05, while the value of t-count in the provision of nutritional needs based on the RGG of the experimental group is 4.648 and the probability (sig.) 0.002, because the probability value (sig.) 0.002 <0.05, thus H0 is rejected and H1 accepted in the control and experiment groups. Based on the table above, there is an effect of providing nutritional needs based on the RDA to increase the leg and heart muscle strength of PGN athletes. So, it can be concluded that there is an effect of nutritional needs based on RDA to increase the leg and heart muscle power of the Road Racetour De Singkarak Athletes.

Discussion

The Effect of Giving Massage on Increased Leg and Heart Muscle Power: The t-value for giving massage in the control group was 3.128 with a probability (sig.) Of 0.014, because the probability value (sig.) Of 0.014 <0.05. While the t-count in the experimental group massage was 5.657 and the probability (sig.) Was 0.000, because the probability value (sig.) Was 0.000 <0.05. Thus there is an influence of giving massage to increase the leg and heart muscle power of PGN athletes. Giving massage to the control group in the form of pressing on the acupressure and friction points (grind) and giving massage with the Strocking Effleurage, traction (Effraction) and Effleurage method in the experimental group showed that the use of massage techniques in the experimental group was better than the control group. This can be seen from the average results of 7.40 in the experimental group whose values were higher than the control group which averaged only 6.40. The more optimal cause of massage in the experimental group was due to the rhythmic Effleurage technique that was performed on the entire surface of the injured body, could reduce pain (bruising), accelerate blood circulation so as to speed up the transport of metabolic remnants, and provide a feeling of calm.

Giving massage manipulation to the control and experimental class both had an effect on increasing athlete’s leg and heart muscle power. The reaction before being treated at the tugkai muscle power value and moving heart increased after being treated both the control group and the experimental group. This is because giving massage aims to improve blood circulation. Massage will help the process of solving and removing lactic acid so that the recovery process will be faster. In addition, sports massage is also beneficial to increase muscle suppleness, reduce nerve tension, and reduce pain, so that it can be used to help the recovery process of lower extremity muscle tension.

Giving massage to all members of the body and certain body parts will improve the body’s work system. One example is giving massage to the lower extremities at the Road Racetour De Singkarak Bicycle Racing Athlete after doing physical activity or training. The provision of sports massage on the lower extremities at the Road Racetour De Singkarak Road Racing Athletes after exercise will have an effect of accelerating the process of absorbing the remains of combustion that is in the muscle tissue that can cause fatigue so that it is good to help speed up the recovery process. According to Johnson 4 giving massage will facilitate blood flow, relax muscles, and stimulate the body’s work system, so that muscle tension will decrease and muscles will return to normal.

Massage after exercise or physical activity is given after cooling and stretching. This aims to reduce muscle tension and increase the disposal of metabolic waste that occurs after exercise. In addition, efforts are also made to reduce post-exercise pain that occurs immediately or some time after physical work, maintain joint reach and increase blood and lymph circulation in muscles that experience tension.5 The benefits of sports massage after exercise can help speed up muscle recovery to be able to return to a state of relaxation and rest. Massage in this situation an increase in venous blood return (venous return) so that it can improve the process of cleaning the rest of metabolism.

It can be concluded that there is an effect of giving massage to increase leg and heart muscle power, with the average rating of the experimental group using the Strocking Effleurage, traction and Effleurage methods more dominant than the average value of the control group.

Effects of Physiotherapy on Increased Leg and Heart Muscle Power: The t-count value for the administration of physiotherapy in the control group was 4.468 with a probability (sig.) Of 0.000, because the probability value (sig.) Of 0.000 <0.05. While the t-count value in the experimental group physiotherapy was 5.270 and the probability (sig.) Of 0.001, because the probability value (sig.) Of 0.001 <0.05. Thus there
is an influence from the provision of physiotherapy to increase the leg and heart muscle power of PGN athletes.

The provision of physiotherapy in the control and experimental groups using two different techniques can affect the increase in leg and heart muscle strength of PGN athletes. The control group that was given physiotherapy techniques, Exercise therapy and the experimental group that was given Thermotherapy (Heat therapy), found that physiotherapy with Exercise therapy techniques was more dominant than the administration of Thermotherapy (Heat therapy / Therapy) Hot. It can be seen that the comfort felt by the control group athletes is 7.00 higher than the experimental group with an average of 6.40.

According to Johnson physiological administration is proven to reduce heart rate, increase blood pressure, increase blood and lymph circulation, reduce muscle tension, and increase joint space and reduce pain. Providing exercise therapy techniques such as exercises that can be done in the form of isometric, isotonic, aerobic and aquatic exercises. These types of exercises usually aim to improve range of motion, increase strength, coordination, endurance, balance and posture. Exercise can be done actively where the patient controls their own movements without the help of others or passively where the movements are carried out based on help from a physiotherapist. Exercise therapy can be done in the rehabilitation phase of various types of disorders such as stroke, joint replacement or aging.

While the provision of exercise techniques Thermotherapy (Heat therapy / Heat Therapy) is a therapy using heat temperatures are usually used in combination with other physiotherapy modalities such as exercise and manual therapy. Warm moist air can be used to reduce muscle stiffness and pain. Heat therapy can be done by using various methods, including using hot packs, warm towels, hot water bottles, ultrasound devices, infra-red devices and liquid paraffin tanks. This therapy can also be combined with hydrotherapy because warm water can relax muscles, joints and increase joint reach.

It can be concluded that there is an influence of giving physiotherapy to increase the leg and heart muscle power of PGN athletes, and the administration of control group physiotherapy with Exercise therapy techniques is more dominant than the administration of Thermotherapy (Heat therapy / Heat Therapy).

Effects of Nutritional Needs Based on RDA on Increased Leg and Heart Muscle Power: The t-value for the provision of nutritional requirements based on the RDA in the control group was 8.944 with a probability (sig.) Of 0.000, because the probability value (sig.) Of 0.000 <0.05. While the value of t-count in the provision of nutritional needs based on the RDA of the experimental group is 4.648 and the probability (sig.) 0.002, because the probability value (sig.) 0.002 <0.05. Thus there is an influence from the provision of increased muscle power to increase the leg and heart muscle power of PGN athletes.

Nutrition adequacy for nutritional adequacy in the control group with 900 kcal breakfast calories, 500 kcal snacks, 1200 kcal lunches, 1000 kcal dinners and 600 kcal snacks and compared to menu items in the experimental group with 1050 kcal breakfast meals, light meals 700 kcal, lunch 1350 kcal, 1150 kcal dinner and 750 kcal snacks are more effective for increasing the leg and heart muscle strength of PGN athletes as evidenced by the higher evaluation group average score of 8.20 while the average value of the control group which is 8.00.

The results of the assessment of sports nutritionists show that with optimal food, enough energy can be available so that work ability and recovery time is better. Fatigue can be dealt with more effectively because reserve nutrients can be used to return to a homeostatic state. Nutrition for athletes is designed to achieve optimal nutrition adequacy.

Food for an athlete must contain high substances in accordance with those needed for daily activities. Food must contain a certain amount of energy-producing nutrients. Accordingly, food must also be able to replace gzi in the body which is reduced due to use for sports activities. Body movements during exercise can occur due to muscle contraction. Aerobic and anaerobic exercise both require energy intake. However, determining the energy requirements properly is not simple and very difficult. The development of science now can only calculate energy needs based on the energy expended.

Sports nutrition is applied nutrition to athletes to be able to achieve optimal performance. Sports nutrition is the study of the relationship between food management and physical performance that is beneficial for health, fitness, child growth and the promotion of sports
achievements. Nutrition settings for athletes are not much different from those for non-athletes.

It can be concluded that there is an influence of nutritional needs based on the nutritional adequacy rate on the increase in leg and heart muscle power of the Racecour De Singkarak Road Racecourse, with the average experimental group being more dominant than the control group.

**Conclusion**

Based on the results of data analysis and discussion in the previous chapter, the conclusions in this study are:

1. There is an effect of giving massage to increase leg and heart muscle power, with the average rating of the experimental group using the Strocking Effleurage, traction and Effleurage methods more dominant than the average value of the control group.

2. There is an influence of the provision of physiotherapy to increase the leg and heart muscle power of PGN athletes, and the administration of control group physiotherapy with Exercise therapy techniques is more dominant than the administration of Thermotherapy (Heat therapy / Heat Therapy).

3. There is an influence of nutritional needs based on the Recommended Dietary Allowances (RDA) on the increase in leg and heart muscle power of the Racecour De Singkarak Road Racecourse, with the average experimental group being more dominant than the control group.

**Source of Fund:** Self

**Ethical Approval:** Universitas Negeri Padang Tahun 2019.

Conflict of interest : nil

**References**


Efficacy of Philippine Ageratina Adenophora as Home Remedy to Stop Bleeding among Natives of Western Mountain Province

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¹Public School District Supervisor, DepEd–Mountain Province, Philippines, ²Master Teacher, Banaao Elementary School, Banaao, Tadian, Mt. Province, Philippines, ³Nursing Department Extension Coordinator, Mountain Province State Polytechnic College, Philippines

Abstract

The use of home remedies in the management of minor health complaints is an area of health care that up to date has not been yet extensively researched. Regarding existing literature, there are numerous information can be heard, but scientific literature is scarce. The purpose of this study is to properly determine the efficacy of Philippine Ageratina Adenophora as home remedy to stop bleeding in minor wounds or tissue trauma. Three concentrations were determined from the extracts of the plant where tap water was the diluent. Control variable was used to see if differences exist. It has been noted that the higher the concentration of the extract, the higher its potency. It was also validated that, significant difference between the two variables was noted at which, the extract of the experimental variable has shorter clotting time than the control variable. Indeed, it is important to disseminate the importance of the Philippine Ageratina Adenophora and learn how it will be propagated.

Keywords: Philippine Ageratina Adenophora, home remedy, coagulant, natives of Mountain Province.

Introduction

Natives in a certain locality usually depend on own culture to manage their lives at which, in terms of their health, they primarily depend on their traditions of using herbal plants. It was a claim that, herbs are natural products having chemical composition that are commonly used by people according to the influence of their culture. These were transferred from one generation to another, race, nation and geographical location, and how it was processed that entails a sum total of the practices based on beliefs and experiences that is often enigmatic.¹

Generally, cultural rootedness enduring and widespread use may indicate safety, but not the efficacy of treatments, especially on remedies containing active principles at very low and ultra low concentrations, or relying on knowledge that was transferred to them.¹ However, the use of home remedies in the management of minor health complaints is an area of health care that up to date has not been yet extensively researched. One thing, numerous information can be heard, but scientific literature is scarce.² Furthermore, the use of herbal plants is the result of many years struggles against illnesses to which man learned to pursue drugs in barks, seeds, fruit bodies, and other parts. It has been acknowledged by contemporary on the active actions that was included in modern pharmacotherapy in a range of drugs of plant origin known by ancient civilizations and used throughout the millennia.³ Moreover, the interest in phytomedicine has been renewed over the few last decades and consequently, several plant species with traditional medicinal significance have been phytochemically and pharmacologically investigated in the quest of effective and safe herbal remedies.⁴

Herbal remedies are prepared in several standardized ways which usually vary based upon the plant utilized, and sometimes the condition that is being treated. Methods include: infusions (hot teas), decoctions (boiled teas), tinctures (alcohol and water extracts), macerations (cold-soaking), and the making of salves and poultices. For some conditions, steam inhalation may be used.

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Among the herbal plants that was commonly used to stop bleeding in the western part of Mountain Province in the Cordillera Administrative Region, Philippines is the Ageratina Adenophorawhere its leaves are crushed and applied to wounds as a poultice without any knowledge of its efficacy and risks. It has been used traditionally in the previous generations yet, never been scientifically proven. This plant is common and can be seen in tropical regions not only in the Philippines but the entire world.

Ageratina Adenophora is a perennial herbaceous exotic shrub which may grow up to 1 or 2 m height. It has opposite trowell-shaped serrated leaves that are 6–10 cm long by 3–6 cm in width. The small compound flowers occur in late spring and summer, and are found in clusters at the end of branches. Each flower head is up to 0.5 cm in diam and creamy white in colour. They are followed by a small brown seed with a white feathery parachute. Studies revealed benefits from Ageratina Adenophora. Kumar, Singh, Sharma and Kishore claimed that this plant produces numerous secondary metabolites, which have antimicrobial (antibacterial and antifungal), antiseptic, analgesic, molluscicides and insecticidal potential. Moreover, the essential oil of this plant showed significant antibacterial activity against both gram positive (Klebsiella pneumoniae and Staphylococcus aureus) and gram negative (Escherichia coli and Proteus vulgaris) bacteria. Further, Harish Kumar, Shanmugavadivu, Ranjithkumar & Selvam concluded that leaf extracts of ageratina adenophora was found to have a maximum antibacterial activity against tested human pathogens. Whereas, the chloroform extracts of plant’s leaves can offer significant potential for the development of novel antibacterial therapies. On the other hand, Jigme and Bajga confirmed that the aqueous extract of A. adenophora has excellent antifungal activity against A. candida. Thus, it demonstrates high potential in its use as alternative eco-friendly agent in controlling, reducing and managing A. candida infection and incidences. In spite of potentially helpful biochemical characteristics and harmful biodynamic characteristic, the potential of A. adenophora for controlling fungal diseases in crops has not been evaluated. However, despite of these literatures, the natural products profile and consequently the bioactivity of ageratina adenophorais known to vary with the climate and geographic location of the plants.

This practice of natives in western Mountain Province and literatures cited were the issues leading to the contextualization of this study as Firenzuoli & Gori claimed that herbal medicine needs to be tested for efficacy using conventional trial methodology and several specific herbal extracts to be efficacious for specific condition. Nevertheless, the public is often misled to believe that all-natural treatments are inherently safe. At this point, this study will determine the blood coagulation effect of the Ageratina Adenophora plant extract based on various concentration through Prothrombin time test and to validate significant difference of the said extract with a commercially prepared thrombotic agent based on its clotting time.

### Materials and Method

#### Method:
The experimental design was utilized in this scientific investigatory research. The focus is on the effect of treatments or varied concentration of dependent variable to hold all conditions constant except the independent variable that ensures high internal validity in comparing the experimental group to the control group. If internal validity is high, differences between groups could be confidently attributed to the treatment, thus ruling out rival hypothesis will attribute on the effects to extraneous factors.

#### Plant Material and extract preparation:
About 1 kg plant material (leaves and trunk) of Ageratina Adenophora or crofton weed was collected in the western part of Mountain Province, Cordillera Administrative Region, Philippines. It was washed thoroughly and cut into small pieces then minced using mortar and pestle. The milled mass was expressed and strained using a muslin cloth to obtain the liquid portion. The filtrates were placed in a specimen bottle and kept at room temperature. The extracts were further diluted by adding tap water to have ranges of concentration as follows: 1) 50% tap water and 50% extract, 2) 25% tap water and 75% extract, and 100% of extract. These were all kept at room temperature for 15 days. The preparation is closely similar with how Nashwa & Abo-Elyousr formulated their ageratina adenophora aqueous extract.

#### Authentication of bioactive component coagulation and treatment of data:
For ethical consideration, the extract was brought to a legitimate laboratory in the capital city of the Cordillera Administrative Region for chemical analysis. This is to determine if the extract has the component to clot blood. The specimen contains bioactive component for
blood coagulation. Thus, the specimen were brought to the municipal health center where the research was conducted for clinical trial to test its efficacy. Further, data were subsequently subjected to statistical treatment using the Statistical Package for Social Sciences Version 22.0 wherein, the independent-samples t-test was used to compare the efficacy of controlled and experimental groups as home remedy to stop bleeding.

Results and Discussions

Clotting time measure the time required to form a clot. In most tests, an activator is used to initiate coagulation and test the response of a portion or portions of the cascade model of coagulation. According to the updated Wikipedia in 2020, clotting time is the time required for a sample of blood to coagulate in vitro under standard conditions with normal value of 3 – 8 minutes while Ford & Mazzaferro posed that Activated coagulation time normal value ranges from 90 to 120 seconds and 80 to 100 seconds. In this study, there were three (3) concentrations prepared for the experimental group used as activators to initiate blood coagulation. These are: Code001 which composed of 50% tap water and 50% Ageratina Adenophora extract, Code002 has concentration of 25% tap water and 75% Ageratina Adenophora extract, while Code003 has 100% of Ageratina Adenophora extract. On the other hand, control group used was a commercially prepared liquid substance used in simple cuts or wounds to stop bleeding which can be usually availed from a small scale store, shops and in any health center. Its concentration follows how the experimental group was prepared. Furthermore, Prothrombin time test was used to evaluate the duration of coagulation effect of the experimental and control variables. Blood samples were taken from healthy volunteers to finally assess clotting time of the control and the experimental variables. The replication of the drop of blood is done after every 15 minutes.

Clotting Time: Table 1 revealed the result of testing of the two different variables if how many seconds it takes for the blood to clot. The number of seconds were recorded in 3 trials per variable based on its preparation.

Table 1. Clotting time of variables by trials

<table>
<thead>
<tr>
<th>Variables</th>
<th>Trials</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Code001</td>
</tr>
<tr>
<td>Control</td>
<td>198 sec.</td>
</tr>
<tr>
<td>Experimental</td>
<td>168 sec.</td>
</tr>
</tbody>
</table>

From the table, the experimental blood clots at 2.36 minutes – 2.8 minutes compared to the control which is 2.98 to 3.3 minutes which means that the Philippine Ageratina Adenophora extract coagulated the blood faster. Moreover, the higher the concentration of the extract, the faster it cause blood coagulation and bleeding shortly stops. At this point, the culturally practiced home remedy to stop bleeding is practically effective than the commercially prepared substance that can be bought in a store or taken from the health center. Indeed, an advantage for people who use the indigenous herbal plant as home remedy to stop bleeding not worrying where to get an amount for the purchase or where to avail commercially prepared drug since the Philippine Ageratina Adenophora can be found anywhere even when they are at the farm. The only thing to do that is essential is, on how people understand the importance and use of this weed so they will not just take it away if found in their farm. Instead, find ways on how this plant can be propagated and its proper care.

Difference in clotting time: Most of the time, people believes on things coming outside for the notion that it has quality. This made people most believe on products coming outside than locally developed one at which, its the same in research. Simple output do not justify the quality of the findings. This made the researchers subject their finding to further test that can validate its reality. At this point, to validate if there is significant difference between the efficacy of controlled and experimental groups as home remedy to stop bleeding, an independent-samples t-test was utilized.

Table 2. Significant difference on clotting time of two variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>t</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control group</td>
<td>151.67</td>
<td>14.22</td>
<td>-3.12</td>
<td>4</td>
<td>0.04</td>
</tr>
<tr>
<td>Experimental group</td>
<td>184.67</td>
<td>11.59</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

It was gleaned from the table that, the result revealed a statistically reliable difference between the mean number of controlled group (M=151.67, SD=14.22) and experimental group (M=184.67, SD=11.59) where condition of t(4)= -3.12 and p = 0.04 at α = .05. Thus, results suggested that the experimental group is more effective in blood coagulation than the control group. With the result, it only proves that naturally prepared medication is more effective than that of commercially
prepared for some additive that affects its potency. Indeed, it is important to disseminate the finding to people in the community how important the weed they are considering not useful in their environment.

**Conclusion**

The finding shows that natural product is the most effective yet, it can be easily prepared for free. The only thing it need is the effort and interest of people. Moreover, its abundance in every part of the country exist and can easily propagate if intended. However, though it was traditionally used, its importance was not that much known for what people knew is just a weed that hinder growth of their plants. Therefore, it is highly recommended to disseminate its importance and on how it will be propagated. One thing, further study to explore other health benefits as stated in the literature to maximize its utilization that is beneficial to the community.

**Conflict of Interest:** There is no professional, personal or family allegiance, bias, inclination, obligation or loyalty which may in any way affects the objectivity, independence or impartiality in the accomplishment of this study.

**Funding:** This research did not receive any specific grant from funding agencies in the public, commercial, or non-for-profit sectors.

**Ethical Clearance:** Guidelines for the protection of human rights outlined in the American Nurses Association was observed.

**References**


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- Findings
- Conclusion
- Discussion
- Acknowledgements
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Print-ISSN:0971-720X, Electronic - ISSN:0974-1283, Frequency: Quarterly (4 issues in a year)

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