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IN THE NAME OF ALLAH,
THE MOST GRACIOUS,
THE MOST MERCIFUL

Kingdom of Saudi Arabia
Ministry of Education
Majmaah University

جامعة المجمعة
Majmaah University

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About the Journal

Majmaah Journal of Health Sciences

Vision

The Majmaah Journal of Health Sciences shall be an international peer reviewed journal, which intends to serve researchers through prompt publication of significant advances, and to provide a forum for the reporting and discussion of news and issues concerning health sciences.

Mission

To lead the debate on health and to engage, inform, and stimulate the academicians, researchers, and other health professionals in ways that will improve outcomes for patients.

Objectives

To promote research & evidence based practice in health sciences, so that a firm scientific knowledge base is developed, from which more effective practice may be evolved.

To ensure that the results of the research are rapidly disseminated to the practicing clinicians and educators, in a fashion that conveys their significance for knowledge, culture and daily life.

Correspondence and Subscription

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Majmaah Journal of
Health Sciences

Editorial

From Editor's Desk…..

Once again it gives me immense satisfaction to reach you all through the Vol 7 issue 1 2019 of MJHS. At the outset let me express my gratitude to our beloved Rector Dr.Khalid Bin Saad Al Meqrin and Vice Rector for Graduate Studies and Scientific Research Prof. Dr.Mohammad Bin Abdullah Al-Shaaya for the trust endowed upon me.

May Almighty Allah bless all. Ramadan Kareem! I would like to wish all achieve the purification of the soul upon commemorating the month of Ramadan. Wishing all a blessed and Happy Ramadan!

The editorial team has set goal to publish the issues on time, and for indexing in PubMed and Medline, the journal needs to publish more research works. The editorial board and reviewers made it possible to select only quality articles to bring the trend of increased publication of more quality research work compared with case reports and reviews. We have also included an international panel of experts as advisory panel for our Journal. We have set all things in order to get our journal indexed.

The editorial team would like to thank all authors, reviewers, readers for your continuous support for the success of MJHS.

Dr. Khalid Mohammad Alabdulwahhab
Editor in Chief

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Original Article

Food Poisoning Knowledge, Attitudes, and Practice of Students in Majmaah University

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ABSTRACT

Background and Objectives: Food-borne illnesses commonly referred to as food poisoning are a rising public health issue affecting the population across the globe. The objective of this study is to determine the knowledge, attitude and practice of students in Majmaah University regarding the food poisoning.

Methods: A stratified random sample of 244 students (both male and female) participated in this cross-sectional study. Data regarding demographic characteristics, knowledge, attitude and practice regarding food poisoning were obtained using pre-tested, semi-structured and close-ended questionnaire.

Results: A total of 66% students lacked the knowledge that the raw white cheese processed from raw milk has a high risk of food poisoning. Approximately 88% of the participants had a negative attitude and belief that there is no risk of disease from eating unwashed vegetables and herbs picked up directly from the plant. With regard to practice, 93% of the students did not wash their hands with soap and water before eating meal.

Conclusion: This study showed the lacuna in knowledge, attitude and practice regarding food poisoning among the students of Majmaah University. Appropriate health promotion measures are advised to improve the knowledge, attitude and practice related healthy and hygienic food habits to reduce the risk of food-borne illness.

Key words: Knowledge, Attitude; Practice, Food poisoning, Food borne disease, Food poisoning.

الملخص

ملخص :تعد أمراض التسمم الغذائي مشكلة مهمة ومن المشاكل الصحية الشائعة والتي بدورها تهدد حياة الطالب بالمرحلة الجامعية في كل من الدول المتقدمة والنامية. أحد أهم أسباب الإصابة بأمراض التسمم الغذائي هي العدوى أو السمية التي تنتجها او تفرزها البكتيريا أو الفيروسات أو الطفيليات أو المواد الكيميائية التي تدخل الجسم عن طريق الأغذية أو المياه الملوثة.

الهدف: ا لهدف الرئيسي من هذه الدراسة هو التعرف على مستوى المعرفة والمواقف والسلوك على ماهية التسمم الغذائي لطلاب جامعة المجمعة، المملكة العربية السعودية.

منهج الدراسة: في هذه الدراسة المهمة سوف نستعرض عدد من الأسئلة ونشرها على أكبر شريحة بين طلاب وطالبات جامعة المجمعة بكل المراحل الأكاديمية وبكل أقسام وكليات الجامعة المترامية الأطراف حوالي ٢٤٤ طالب وطالبة شاركوا بهذه لاستبيانه وذلك لتقييم مستوى المعرفة والمواقف والسلوك الصحي والغير صحي بما يتعلق بالتسمم الغذائي.

النتائج: أكثر من ٦٥٪ من الطلاب والطالبات بجامعة المجمعة في مختلف المراحل الجامعية ليس لديهم المعلومات الكافية بأن الجبن الأبيض الخام المجهزة من الحليب الخام قد يتسبب بمخاطر التسمم الغذائي. حوالي ٨٨ ٪ من المشاركين من طلاب وطالبات جامعة المجمعة لديهم موقف سلبي وخطير باعتقادهم أنه لا يوجد خطر للتعرض للتسمم الغذائي جراء تناول الخضروات والأعشاب الغير مغسولة والتي التقطت مباشرة من المزرعة. فيما يتعلق بالممارسة، لم يغسل ٩٣٪ من الطلاب أيديهم بالصابون والماء قبل تناول وجبة الطعام.

الاستنتاج: نتجت هذه الدراسة بوجود نسبة كبيرة من طلاب وطالبات جامعة المجمعة يفتقرون الي أعلى مستويات المعرفة والمواقف والسلوك على ماهية التسمم الغذائي. وتبينت أيضا أن طلاب وطالبات جامعة المجمعة يحتاجون الى مزيد من الوعي الصحي حول كيفية تعاملهم في حياتهم الجامعية بما يضمن لهم حياة صحية مستديمة.

Introduction

Food-borne illnesses commonly referred to as food poisoning is usually caused by consuming contaminated food and water that contain infection or toxin produced by bacteria, viruses, parasites or poisonous chemical that are responsible for more than 200 diseases. Statistically, approximately 600 million people had food poisoning after consuming contaminated food and around 420.000 die, causing loss of 33 million healthy lives annually. Moreover, total of ~ 40% of victims affected by food poisoning diseases are children under 5 years with 125.000 deaths yearly [1, 2]. Food poisoning diseases include a broad spectrum of diseases and are responsible for the increase in mortality rate worldwide [3].

Food poisoning is a major and rising public health concern in both developing and developed countries. Food can become contaminated at any point during production, distribution and preparation [4, 5]. In developing countries, poor knowledge about food handling, safety, and hygiene may cause food-borne diseases. For example, diarrhea is the most common infection resulting from the consumption of contaminated food, resulting 550 million people to become ill and 230.000 deaths every year [6]. According to World Health Organization (WHO) every 1 out of 10 of people fall sick every year resulting consuming contamination food. Everyone involves in the production chain, starting from producer to consumer, all has an important role to play to ensure the food we eat does not get contaminated. Food can also be contaminated by heavy metals or naturally occurring toxins resulting in long-term health problems such as cancer and neurological disorder. This highlights the importance of making sure the food we eat is not contaminated with potentially harmful bacteria, parasites, viruses, toxins and chemicals. The great majority of young adults or college students from 18-29 years of age will experience a foodborne disease at some point in their college lives [7]. The most common symptoms of food borne diseases include stomach pain, diarrhea and vomiting [8].

Many studies were done around the world about knowledge, attitudes, and practice regarding food poisoning among university students for example, one study on college students at USA, showed that ~60% of the students had knowledge about food poisoning [9]. Similar percentage of knowledge score had been found in a study on college students of University of Missouri, USA [10]. In Turkey, a large-scale survey on students of Gazi University in Ankara, showed that approximately 37.3 % of the students had knowledge on food poisoning [11]. Another study from University of Turkey found that students have 54% knowledge for food poisoning[12]. In Lebanese American University, students had 53.6% knowledge on food poisoning and handler [13]. In comparison to other communities, the food safety knowledge of young adults in Jordan University students was as low as 33.9% [14]. Very few studies about knowledge, attitudes, and practice regarding food poisoning among university students were conducted in Saudi Arabia. A study from Taif University, Saudi

Arabia determined that the overall knowledge, attitudes, and practice mean score was 74.78% and almost 50% of the students lacked the knowledge on food poisoning. However, the mean score for knowledge, attitudes, and practice components were 74.95%, 67.26%, and 80.29%, respectively [15].

The most important factors that play major role in the prevention of food poisoning are knowledge, attitude and practice among university students. Hence, our aim is to determine the level of knowledge, attitudes, and practice of students of Majmaah University, Saudi Arabia on food poisoning.

Methods

Study Design & Setting

It is a Cross-sectional study; students from the constituent colleges under Majmaah University in Al-Majmaah, Saudi Arabia participated in this study. This study was conducted during academic year of 2017/2018.

Ethical consideration

The Ethical approval was obtained from Ethics committee of Majmaah University (Ethical approval No. MUREC-Feb.07/COM-2017/8). The details regarding objectives and benefits of this research were explained to participants and informed consent was obtained before filling the online research questionnaire. All information were kept confidential and used only for purpose of statistical analysis.

Structure questionnaire

The data regarding demographic characteristics, knowledge, attitude and practice regarding food poisoning were obtained using pre-tested, semi-structured and close-ended questionnaire. The questionnaire was structured and modified [9] (Figure1) as followed: It contained 46 core questions or statements divided into three parts: first part contain13 question about the knowledge. Second part was 14 questions about attitude, and last part is about 19 questions for practice on current food poisoning. Basic demographic data information was also included. The measurement scale of response was range, disagree 1-1.66, don't know 1.67-2.33, and agree response was between 2.33 to 3. For dichotomous classification the score less than 1.67 is considered a negative response (wrong answer), while the scores more than 1.67 is considered a positive response (right answer). The questionnaire was peer reviewed and underwent a pilot study before the final version distributed to students. All 46 core questions about knowledge, attitude and practice were scored on three-points scale with option yes, no, maybe. The questionnaire stated clearly to the participants that the information will be used only for scientific purposes and the participants signed a consent form. The questionnaire was in bilingual (Arabic and English). Instruction was included, for the participants to simplify the filling up of the questionnaire. Also, they are encouraged to respond back with any queries regarding the content of the questionnaire.

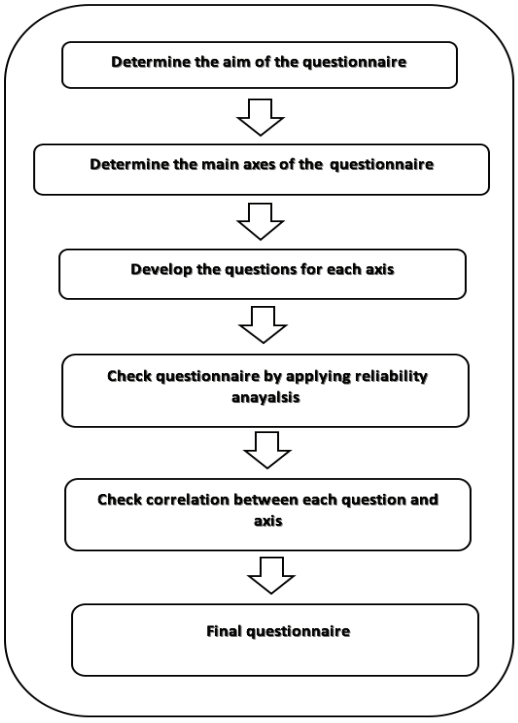

Figure 1. Food poisoning questionnaire creation flowchart

Data collection

The questionnaie was developed in Google forms and was mailed to all the students in different level and departments. A total of 244 students (Male and Female) were included by stratified random sampling method based on their educational level and department at the university: level 1-9 of preparatory year, Business administration, College of Education – Zulfi, College of Education – Majmaah, College of applied medical sciences, College of Engineering, College of Medicine, College of Dentistry, College of Community, College of Science and Human Studies Romah, College of Science and Human Studies Sudair, College of Science and Human Studies Alghat, College of Sciences (Table 1).

Table 1. Demographic characteristics of food handlers in students at Majmaah University.

Parameters		Frequency	Percent
Gender	Male	150	61.5
	female	94	38.5
Education Level	One	60	24.6
	Two	27	11.1
	Three	31	12.7
	Four	17	7.0
	Five	25	10.2
	Six	16	6.6
	Seven	35	14.3
	Eight	15	6.1
	nine	18	7.4
College	preparatory year	4	1.6
	Business administration	2	8.
	College of Education – Zulfi	14	5.7
	College of Education – Majmaah	12	4.9
	collage of applied medical sciences	113	46.3
	Engineering	7	2.9
	Medical	7	2.9
	Dental	10	4.1
	Community	4	1.6
	College of Science and Human Studies romah	33	13.5
	College of Science and Human Studies sudir	22	9.0
	College of Science and Human Studies AlGhat	10	4.1
	Collage of Sciences-Zulfi	6	2.5

Statistical analysis

The data was coded and analyzed by SPSS statistical computer program. The response was analyzed as categorical variable (yes or no answer). For knowledge questionnaire, right answer is considered as having knowledge and wrong answer as no knowledge. For attitude questionnaire right and wrong answers considered as positive or negative attitude respectively, and for the practice questionnaire, right answer is considered as hygienic, and wrong answer is considered unhygienic. The score of knowledge, attitude, and practice were analyzed as numerical variable. The percentage score for knowledge, attitude, and practice were analyzed as comparing between education level and departments. We used one way analysis of variance (ANOVA) to compare mean score of knowledge, attitude, and practice among the groups of males and females in colleges of Majmaah University, Saudi Arabia. Scheffe test were used after ANOVA to identify significant difference between groups.

Results

The student`s responses to the knowledge questionnaire on food poisoning is showed in Table 2. More than 80% of the students responded had excellent knowledge (answering right) on almost all statements. Question number 1 "Some toxins produced by microbes and cause food poisoning are resistant to heating temperature of food", 50.81%. Questions 3"Eating raw eggs is highly risky for food poisoning ", 56.6%. Question number 4 "Eating raw or half-cooked meat is highly risky for food poisoning", 77.5%. Questions 5 "Eating raw unwashed vegetables is highly risky for food poisoning", ~ 85.7% of the students in all deferent levels and departments had knowledge. Question number 6 "Eating unwashed and not pealed fruits is highly risky for food poisoning" students were responding right ~ 84%. Question number 7" Food handlers with unhygienic practice could be the source of microbial contamination of the food which causes food poisoning", 79.1%. Question number 8 "Well cooked food is free from microbes which cause food poisoning", 64.8%. Question number 9 "Eating uncovered leftover cooked food, kept at room temperature for 12–24 h, is at high risk to cause food poisoning", 72.5%. Question number 12 "Keeping food at refrigerator temperature will slow down the microbial growth and multiplication, thus prevent food spoilage and food poisoning", 59.4%. In comparison, it seems that students have lack of knowledge (answering wrong) on almost all statements having more than 50%. For example, one statement number 2 "Drinking raw milk is highly risky for food poisoning", 52.9%. Question number 13 "There is no risk of food poisoning from eating left-over cooked food kept in refrigerator for 2–3 day" students' response was wrong ~65.6 % on this statement.

Table 2. Response of the students of Majmaah University to knowledge questionnaire on food poisoning.

	Questionnaire Statements	Having Knowledge n (%)	No Knowledge n (%)
Q1	Some toxins produced by microbes and cause food poisoning are resistant to heating temperature of food	124(50.81%)	120(49.1%)
Q2	Drinking raw milk is highly risky for food poisoning	115(47.1%)	129(52.9%)
Q3	Eating raw eggs is highly risky for food poisoning	138(56.6%)	106(43.4%)
Q4	Eating raw or half-cooked meat is highly risky for food poisoning	189(77.5%)	55(22.6%)
Q5	Eating raw unwashed vegetables is highly risky for food poisoning	209(85.7%)	35 (14.4%)
Q6	Eating unwashed and not pealed fruits is highly risky for food poisoning.	205(84 %)	39 (16%)
Q7	Food handlers with unhygienic practice could be the source of microbial contamination of the food which causes food poisoning	193(79.1%)	49(20.9%)
Q8	Well cooked food is free from microbes which cause food poisoning	158(64.8%)	86(35.3%)
Q9	Eating uncovered leftover cooked food, kept at room temperature for 12–24 h, is at high risk to cause food poisoning	177(72.5%)	67(27.4%)
Q10	Raw white cheese processed from raw milk has a high risk of food poisoning	83(34%)	161(66%)
Q11	Pasteurized milk can be drunk directly with no risk of food poisoning	113(46.31%)	131(53.7%)
Q12	Pasteurized milk can be drunk directly with no risk of food poisoning	145(59.4%)	99(40.5%)
Q13	Drinking surface water like rivers, streams and rain water reservoirs without any treatment as boiling or adding chlorine, is at high risk to cause food poisoning	84(34.4%)	160(65.6%)

The percentage score of the knowledge questionnaire is 81.22%

Responses for the attitude question on food poisoning are presented in Table 3. More than 50 % of students have a positive attitude (answering right) on each of 4 statements out of 14. These are question number 24 "Food handlers without clinical symptoms can contaminate food with pathogenic microbes which cause food poisoning", 82%. Question number 25 "Washing hands with soap and water prior to eating food is necessary to prevent food poisoning", 83.2%. Question number 26 "Thorough washing of vegetables and fruits in tap water is necessary to prevent food poisoning", 85.2%. Question number 27 "Washing hands with soap and water before preparing food is necessary to prevent food poisoning", 86.1%. On the other hand, more than 60 % of the students have negative attitude (answering wrong) and agreed in different 10 statements related to food poisoning. Questions are as follows: Question number 14 "Raw milk is more healthy and nutritious than pasteurized or boiled milk", ~ 65%; Question number 15 "There is no risk of disease from drinking raw goat or cow milk right after milking", ~ 67%. Question number 17 "Raw eggs are healthier and more nutritious than cooked ones", ~ 73%. Question number 18 "There is

no risk of disease from drinking raw eggs", ~ 72%. Question number 19" There is no risk of disease from eating raw meat of young animals", ~ 84%. Question number 20" Wiping vegetables or fruits make them safe to be eaten", ~ 67%. Question number 21 "There is no risk of disease from eating cooked food kept at room temperature for one day if covered", ~ 62%. Question number 22" There is no risk of disease from eating unwashed vegetables and herbs picked up directly from the plant", ~ 88%. Question number 23 was about "Rain water collected in reservoir is safe to drink without any treatment", ~ 77%.

Table 3. Response of the students of Majmaah University to attitude questionnaire on food poisoning.

	Questionnaire statements	**Positive Attitude n (%)**	**Negative Attitude n (%)**
Q14	Raw milk is healthier and more nutritious than pasteurized or boiled milk	86(35.2%)	158(64.7%)
Q15	There is no risk of disease from drinking raw goat or cow milk right after milking	79(32.4%)	165 (67.7%)
Q16	There is no risk of disease from drinking the milk of camel right after milking	102(41.8%)	142(58.2%)
Q17	Raw eggs are healthier and more nutritious than cooked ones	66(27%)	178(72.9%)
Q18	There is no risk of disease from drinking raw eggs	68(27.9%)	176(72.1%)
Q19	There is no risk of disease from eating raw meat of young animals	38(15.6%)	206(84.4%)
Q20	Wiping vegetables or fruits make them safe to be eaten	79(32.4%)	165(67.6%)
Q21	There is no risk of disease from eating cooked food kept at room temperature for one day if covered	94(38.52%)	150(61.5%)
Q22	There is no risk of disease from eating unwashed vegetables and herbs picked up directly from the plant	30(12.3%)	214(87.7%)
Q23	Rain water collected in reservoir is safe to drink without any treatment	56(23%)	188(77%)
Q24	Food handlers without clinical symptoms, can contaminate food with pathogenic microbes which cause food poisoning	200(82%)	44(18.1%)
Q25	Washing hands with soap and water prior to eating food is necessary to prevent food poisoning	203(83.2%)	41(16.8%)
Q26	Thorough washing of vegetables and fruits in tap water is necessary to prevent food poisoning	208(85.2%)	48(14.8%)
Q27	Washing hands with soap and water before preparing food is necessary to prevent food poisoning	210(86.1%)	34(14%)

The percentage score of the attitude questionnaire is 67.5%

The student`s responses to the practice questionnaire on food poisoning is showed in Table 4. More than 50 % of the students had excellent practice (answering right) on almost all statements. Questions number 28" Do you wash fresh vegetables and fruits in tap water before eating?" ~ 79 %. Questions number 30"Do you wash your hands with water and soap before preparing food?" ~ 64%. Questions number 31"Do you wash your hands with water and soap after handling raw unwashed vegetables?" ~ 87%. Questions number 32 "Do you wash your hands with soap and water after using the toilet?" ~87%. Questions number33 "Do you wash your hands after contact with animals?" ~62%. Questions number 34 "Do you eat fresh vegetables and fruits without washing?" ~51%. Questions number 35 "Do you just wipe fresh vegetables and fruits before you eat them?" 60.2%. Questions number 36 "When you make a field trip, do you pick up vegetables or herbs from the plants and eat them without washing?" 65.2%. Questions number 37 "Do you eat raw eggs?" ~52%. Questions number 38 "Do you eat half-cooked eggs (egg yolk is soft)?" 67.2%. Questions number 39 "Do you eat raw meat?" 58.4%. Questions number 44 "Do you eat cooked food left at room temperature for over 6 h without sufficient heating?", ~58%. Questions number 45 "Do you eat food from a restaurant/cafeteria looks not clean?" ~55%. In compare, significant number of students from Majmaah University has negative practice. Questions number 29 "Do you wash your hands with soap and water before eating your meal?" ~94%. Questions number 42" Do you drink raw milk of camel?" ~ 81%. Questions number 43 "Do you eat raw white cheese prepared from raw unpasteurized milk?" ~ 83%. Questions number 46 "Do you drink from rain water collected in reservoir or surface stream water without any treatment?" ~ 74%.

We targeted two groups of students: Group one, male in all colleges (n=150), group two females (n=94) in all colleges. Interestingly, we found that there is no significant difference ($p > 0.05$ by Scheffe test after ANOVA) in mean score of knowledge and attitude between male and female students at Majmaah University. While regarding practice there is significant difference ($p < 0.05$ by Scheffe test after ANOVA) in the mean score between male group and the female group and this could be because the male students are more concerns about personal hygiene and are more modern in their life style. (Table. 5).

Table 4. Response of the students of Majmaah University to practice questions on food poisoning.

	Questionnaire statements	Hygienic Practice n (%)	Unhygienic Practice n (%)
Q28	Do you wash fresh vegetables and fruits in tap water before eating?	192(78.7%)	52(21.3%)
Q29	Do you wash your hands with soap and water before eating your meal?	16(6.6%)	228(93.56%)
Q30	Do you wash your hands with water and soap before preparing food?	156(63.9%)	88(36%)
Q31	Do you wash your hands with water and soap after handling raw unwashed vegetables?	212(86.9%)	33 (13.1%)
Q32	Do you wash your hands with soap and water after using the toilet?	212(86.9%)	31(13.1%)
Q33	Do you wash your hands after contact with animals?	151(61.9%)	93(38.1%)
Q34	Do you eat fresh vegetables and fruits without washing?	124(50.8%)	120(49.2%)
Q35	Do you just wipe fresh vegetables and fruits before you eat them?	147(60.2%)	97(39.7%)
Q36	When you make a field trip, do you pick up vegetables or herbs from the plants and eat them without washing?	159(65.2%)	85(34.9%)
Q37	Do you eat raw eggs?	126(51.6%)	118(48.4%)
Q38	Do you eat half-cooked eggs (egg yolk is soft)?	164(67.2%)	80(32.8%)
Q39	Do you eat raw meat?	145(59.4%)	99(40.6%)
Q40	Do you eat half-cooked meat (inside is red)?	117(48%)	127(52.1%)
Q41	Do you drink raw cow or goat milk?	110(45.1%)	134(54.9%)
Q42	Do you drink raw milk of camel?	47(19.3%)	206(80.7%)
Q43	Do you eat raw white cheese prepared from raw un-pasteurized milk?	41(16.8%)	203(83.2%)
Q44	Do you eat cooked food left at room temperature for over 6 h without sufficient heating?	141(57.8%)	103(42.2%)
Q45	Do you eat food from a restaurant/cafeteria looks not clean?	134(54.9%)	110(45.1%)
Q46	Do you drink from rain water collected in reservoir or surface stream water without any treatment?	63(25.8%)	181(74.2%)

The percentage score of the practice questionnaire is 65.71%

Table 5. Mean score for knowledge, attitude, practice (KAP) regarding food poisoning according to gender

Students gender and education	Knowledge Mean score ±SD	Attitude Mean score ±SD	Practice Mean score ±SD
Male and collage	2.4650.3483±	1.7110.492±	1.8570.448±*
Female and collage	2.435± 0.279	1.6850.417±	1.5060.337±
All student	2.480 ±0.3329	1.7180.483±	1.7580.458±

Significant difference between the means ($p < 0.05$) by ANOVA *

The descriptive statistical on a scale of three points for the knowledge of Majmaah University students on food poisoning (data not shown). The highest mean score is 2.79 and was recorded in answer of question 5 "Eating raw unwashed vegetables is highly risky for food poisoning". In compare, the lowest mean score was recorded for question No. 13 "Drinking surface water like rivers, streams and rain water reservoirs without any treatment as boiling or adding chlorine, is at high risk to cause food poisoning" and score was about 2.02. In general, the overall score mean of knowledge part is 2.48 (data not shown).

The descriptive statistical on a scale of three points for the attitude of Majmaah University students on food poisoning (data not shown).The highest mean score is 2.79 and was recorded in answer of question 27"Washing hands with soap and water before preparing food is necessary to prevent food poisoning". In the other hands, the lowest mean score was recorded for question No. 22 "There is no risk of disease from eating unwashed vegetables and herbs picked up directly from the plant" and score was about 1.38. In general, the overall score mean of attitude part is 1.72(data not shown).

The descriptive statistical on a scale of three points for the practice of Majmaah University students on food poisoning (data not shown). The highest mean score is 2.81 and was recorded in answer of question 31 "Do you wash your hands with water and soap after handling raw unwashed vegetables?" and question 32 "Do you wash your hands with soap and water after using the toilet?". However, the lowest mean score was recorded for question No. 36 "When you make a field trip, do you pick up vegetables or herbs from the plants and eat them without washing?" and score was about 1.45. In general, the overall score mean of practice part is 1.76 (data not shown).

Discussion

Students from Majmaah University had shown in general a good level of knowledge in most of core statements that reflect their level of education. The overall mean percentage score of all Majmaah University students in knowledge is about 81.22% and it was the highest score among Knowledge, attitude and practice (KAP) components. In comparing with previous studies, we found Majmaah University student`s percentage level of knowledge about food poisoning was higher than Taif, Ulsan, Turkey, and Seaul Universities students [2, 9, 13, 16, 17]. However, studies on high school students in Majmaah and Ethiopia found that student`s percentage level of knowledge was 54% which is lower compared to Majmaah University students [18, 19]. It is revealed that as the student's education level is increased there is increase in knowledge on food borne diseases [20]. In some of important factors for knowledge on food poisoning, we found students of Majmaah University have low knowledge on that particular issue. Over 50% of the students lack the knowledge on several statements, such as drinking raw milk is highly risky for food poisoning, pasteur-

ized milk can be drunk directly with no risk of food poisoning, and raw white cheese processed from raw milk has a high risk of food poisoning. This result is in agreement with the findings of the similar study among Taif university students. [9]. It is found more than 50% of students had low knowledge in statement of raw white cheese and egg processed from raw milk has a high risk of food poisoning. There are no significant differences in mean score of knowledge between male and female students in different colleges at Majmaah University.

The results reveal low attitude of Majmaah University students on food poisoning reflected by their percentage mean score (67.5%). 11 out of 15 (73%) of questions on attitude had low right answer and most of wrong answer were mostly disagree and they don't know the right answer. Five negative attitude response out of 11 were had more than 30% belief that drinking or eating raw camel, goat, and egg are safer and health. These results were to the findings of study carried out at Taif University. This kind of attitude of eating and drinking raw food are common in Saudi Arabia. As desert and farmer community are quite around and people in these areas are raising animal and find a way to eat organic food as much as they can. Study in USA found that around 50% of farmers in general eat raw egg and drink raw milk and strongly believe they are very safe from any risk [21-23]. There are no significant differences in mean score of attitude between male and female students in different colleges at Majmaah University.

The practice has the lowest percentage mean score (65.71%) of KAP components. Obviously, drinking raw camel milk and eating raw cheese were the most unhygienic practices with more than 80% by students of Majmaah University. This unhygienic practice may lead to food borne illnesses caused by drinking raw milk from animal such as Camels, Goats, Cows, or sheep. These sources of raw milk can carry very dangerous bacteria, for example E. coli, Salmonella, Brucella, and listeria which are causing major foodborne diseases [24-26]. Results from mean score for KAP according to gender for food poisoning in students at Majmaah University were close especially in practice.

Conclusion

This study exposed the lacuna in knowledge, attitude and practice regarding food poisoning among the students of Majmaah University. Appropriate health promotion measures should be implemented to improve the knowledge, attitude and practice related healthy and hygienic food habits to reduce the risks of food-borne illness. Future multicentre studies addressing the issues related to food poisoning among the university students are recommended to add more information to this topic.

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Original Article

Prevalence of Musculoskeletal Disorders in the Physical Therapy Clinic at Najran University in Different Anatomical Sites and Association with Age

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Abstract:

Background and Aims: A musculoskeletal disorder (MSD) is one of the most common disorders worldwide. It includes a wide spectrum of degenerative and inflammatory diseases. The aim of this study is to establish and compare the prevalence of MSD in different anatomical sites in physical therapy clinic at Najran University.

Methods: This is a retrospective study. We retrieved the diagnosis of 1211 referrals made over a three-year period between January 2015 until September 2018.

Results: After filtration of the 1211 referrals, 851 were specifically included in this study and out of these, 779 were for a musculoskeletal disorder (MSD). Low back pain (LBP) was the most referred case to the clinic 244 (31.3%) and knee joint was the second-most referred disorder with 230 cases (29.5%). There was a significant association between age and affected anatomical site [$\chi 2 = 145.09$, df = 70, Cramer's V= 0.19, $p < 0.001$].

Conclusion: MSD is a very common disorder and needs more attention. In the physical therapy clinic in Applied Medical Sciences College at Najran University, LBP and knee joint disorder are more prevalent than other MSD disorders. There is a significant association between age and affected anatomical sites of MSD.

Key Words: Musculoskeletal disorders, Physical therapy University clinic, Low back pain, Knee pain.

الملخص

الخلفية: الاضطرابات العضلية الهيكلية هي واحدة من أكثر الاضطرابات شيوعا في العالم وتشمل مجموعة واسعة من الأمراض التنكسية والالتهابات. الهدف من هذه الدراسة هو تحديد ومقارنة انتشار الاضطرابات العضلية الهيكلية في مواقع تشريحية مختلفة على مرضى عيادة العلاج الطبيعي في جامعة نجران.

الطريقة: هذه دراسة مرجعية حيث تمت مراجعة 1211 تحويل لمرضى الاضطرابات العضلية الهيكلية خلال ثلاث سنوات بين يناير ٢٠١٥ وسبتمبر 2018.

النتائج: من بين ١٢١١ إحالة، تم إدراج ٨٥١ على وجه التحديد في هذه الدراسة، ومن بين هؤلاء المرضى 779 يشكون من الاضطرابات العضلية الهيكلية. كانت آلام أسفل الظهر هي الأكثر تحويلا إلى العيادة وهي عبارة عن 244 حالة (31.3٪). يشكل الم مفصل الركبة الثاني في ترتيب الاحالات 230 (٪ 29.5). كان هناك ارتباط ضعيف بين العمر والموقع التشريحي المتأثر [$\chi 2 = 145.09$, df = 70, Cramer's V= 0.19, $p < 0.001$].

الخلاصة: الاضطرابات العضلية الهيكلية هي اضطراب شائعة جدا وتحتاج إلى مزيد من الاهتمام. تشكل اضطراب أسفل الظهر واضطراب مفصل الركبة هي الأكثر انتشارًا من غيرها لدى عيادة العلاج الطبيعي بكلية العلوم الطبية التطبيقية, جامعة نجران. يوجد ارتباط بين العمر والمواقع التشريحية المتأثرة بالمرض.

Introduction:

Musculoskeletal disorders (MSD) are the second-most common cause of disability worldwide. They include a wide spectrum of degenerative and inflammatory disorders affecting joints, ligaments, muscles, peripheral nerves, facet joints, tendons, and blood supply [1-3] . The symptoms of MSD include pain, aching, tingling, burning, stiffness, numbness, or throbbing [4]. The cause of MSD can be trauma, repetitive movement, exertion, and/or sustained movement [2] .

The burden of MSD on the community and primary care services is huge. In a study conducted in Great Britain, they found around 15% of patients who visited primary care services were due to MSD disorders [5]. MSD comprises a diverse group of diseases and pathophysiology. However; MSD is anatomically related and its links with pain and disability. MSD can be acute and for a short duration, to a lifelong disability disorder. The prevalence of MSD obviously rises with age and levels of physical activity [6] . With the increasing number of older people in the population and the new lifestyle trend in, the burden on healthcare and communities will increase significantly. The United states and World Health Organization (WHO) have recognized this danger and it was endorsed with the Bone and Joint Decade [6]. MSD affects people of different ages. It is relevant in 1 in every 3 to 5 people that it limits mobility and function [7] . Most common forms of MSD are low back pain, knee pain, neck pain, shoulder pain, and hip pain. More specifically, spinal disorders are the most common ones [8].

Spinal disorders are heterogeneous conditions that affect the vertebral column and structure surrounding it [9] . These conditions may involve an intervertebral disc, tendons, facet joints, muscles, ligaments, the spinal cord, and nerve root [9]. Spinal disorders may include, but are not limited to degenerative changes, pain, radiculopathy, spondylosis, spondylolisthesis, osteoporosis, fracture, stenosis, and tumors. One of these specific spinal disorders is low back pain (LBP), which as a general ailment has a huge impact from personal, community, economic, and psychosocial aspects. For instance, it is the most common reason for disability in people who are 45 years or younger in the United States. It is the second-most common reason for someone requiring an appointment with their doctor or physician. Also, it is the third-most common reason for physical intervention (surgery) [10].

Physical therapy is usually utilized as a conservative (nonsurgical) intervention for different forms of MSD. Physical therapy plays an important role in assessing and treating patients with different forms of MSD. For example, 80% of doctors from different specialties look at physical therapy as a preferred intervention choice for low back pain [11]. In countries such as the United States, direct access is available for patients with LBP. However, in developing countries like Saudi Arabia, a medical doctor needs to refer their patient to obtain a physical therapy assessment and treatment [12].

The literature review revealed the lack

of study on the prevalence on MSD on different parts of the body in Saudi Arabia and the World. Identifying the prevalence of MSD in different anatomical sites and their association with age can guide resource allocation and enhance the outcome of the provided services. Therefore, this study aims to establish and compare the prevalence of MSD in different anatomical sites in the physical therapy clinic at Najran University over a three-year period and determine whether the patients' ages play a role in the prevalence of MSD.

Methods:

This is a retrospective study conducted at physical therapy clinic in Applied Medical Sciences College, Najran University. The ethical approval was obtained from the research ethics committee in Najran University.

For this study, we had to transform the data from paper-based into electronic based. Patients' files were retrieved, reviewed, and data recorded electronically. We retrieved all the referrals from doctors for patients attending this clinic for the three-year period between January 2015 up to September 2018. In certain circumstances, physicians referred the same patient with a recurring problem more than once. As a result, we excluded repeated referrals for the same patient and for the disorder. All diseases were re-coded from different forms into the anatomical site of the disorders. For instance, the term L4-L5 disc prolapse was recoded as low back pain (LBP). The disorders were categorized based on the anatomical sites for MSD as follows: neck, elbow, shoulder, hand, arm, forearm, wrist, upper back, low back, hip, thigh, knee, leg, ankle, and foot. Two certified physical therapists with10 years of experience had to agree on the name of the anatomical location of the disorder. If they did not reach a consensus on the site of the disorder, a third physical therapist would be consulted.

Statistical analyses:

Descriptive statistics of frequencies, percentages and confidence interval (CI) were utilized in presenting the subjects demographic and musculoskeletal disorders data. The prevalence of MSD for each anatomical site was calculated. The association between age and anatomical site affected was analyzed using the Chi-square test of association with Cramer's V tests. The 5% level of probability was used to indicate statistical significance. All statistical measures were performed through the statistical package for social sciences (SPSS) version 19 for windows (IBM SPSS, Chicago, IL, USA).

Results:

The physical therapy clinic in applied medical sciences at Najran University received 1211 new referrals in the period from January 2015 up to September 2018. We excluded pediatric and neurological cases to end up with 779 cases, with 91.5% of these cases involving MSD disorders. The age group 21-30 years represents the highest percentage of MSD disorders (30.3%) followed by 31-40 years age group (26.9%). 79.3% of patients were Saudi. All of our subjects were male. Table 1 illustrates the demographic characteristics of the sample.

Table 1: Demographic characteristics of studied data of 799 patients referred to the physical therapy clinic.

Parameter	n	(%)
Age (year)		
< 20	32	(4.1)
21-30	236	(30.3)
31-40	210	(26.9)
41-50	133	(17.1)
51-60	84	(10.8)
61 and more	84	(10.8)
Nationality		
Saudi	618	(79.3)
Non-Saudi	161	(20.7)

Low back was the most referred case to the clinic with 244 cases (31.32%), which included lumber and sacral spine disorders. Knee joint was the second-most common site of a disorder with 230 cases, (29.52%), (figure 1). The MSD anatomical site referred to the clinic and the year of the visit is illustrated in (Table 2 and Figure 2). MSD that included LBP or the knee joint were the most-referred ailment to our clinic.

Table 2: Numbers of cases categorized by anatomical sites and year of visiting the clinic

Part / Year	Cervic spine	Upper back	Low back pain	Shoul. joint	Arm	Elbow joint	Forearm	Wrist joint	Hand	Hip joint	Thigh	Knee joint	Leg	Ankle joint	Foot
2015	12 (17.9)	02 (25)	44 (18)	07 (9.7)	02 (25)	01 (6.2)	00 (0)	05 (38.4)	03 (13.6)	03 (2)	05 (31.3)	39 (16.9)	01 (100)	07 (14.3)	03 (27.3)
2016	13 (19.4)	0 (0.0)	49 (20.1)	09 (12.5)	03 (37.5)	03 (18.8)	00 (0.0)	02 (15.4)	01 (4.5)	06 (3)	02 (12.5)	45 (19.6)	00 (0.0)	12 (24.5)	00 (0)
2017	25 (37.3)	04 (50)	103 (42.2)	35 (48.6)	00 (0)	00 (0)	00 (0)	03 (23.1)	10 (45.5)	07 (3)	05 (31.25)	91 (39.6)	00 (0)	00 (0)	00 (0)
2018	17 (25.4)	02 (25)	48 (19.7)	21 (29.2)	3 (37.5)	12 (75)	02 (100)	03 (23.1)	08 (36.4)	04 (20)	04 (25)	55 (23.9)	00 (0)	30 (61.2)	08 (71.7)
Total (%)	67 (100)	08 (100)	244 (100)	72 (100)	08 (100)	16 (100)	02 (100)	13 (100)	22 (100)	20 (100)	16 (100)	230 (100)	01 (100)	49 (100)	11 (100)

Table (3) shows the association between age and affected anatomical site. There was a weak significant association between age and affected anatomical site [$\chi 2 = 145.09$, df = 70, Cramer's V= 0.19, $p < 0.001$]. Knee joint is the highest site affected in below 20 years age group (34.38%) and 21-30 years age group (36.86%). Low back pain is the highest site affected in 31-40 years age group (35.24%), 41-50 years age group (39.1%), 51-60 years age group (36.9) and in >61 of age group (40.48%).

Table 3: Numbers of cases categorized by anatomical sites and their relationship with age groups

	Cervical spine	Upper back	Low back	Shoulder joint	Arm	Elbow joint	Forearm	Wrist joint	Hand	Hip joint	Thigh	Knee joint	Leg	Ankle joint	Foot
< 20	0 (0)	0 (0)	4 (12.5)	2 (6.25)	2 (6.25)	3 (9.38)	0 (0)	2 (6.25)	1 (3.13)	3 (9.38)	0 (0)	11 (34.38)	0 (0)	3 (9.38)	1 (3.13)
21 - 30	11 (4.66)	4 (1.7)	49 (20.76)	19 (8.05)	3 (1.27)	3 (1.27)	1 (0.42)	3 (1.27)	6 (2.54)	6 (2.54)	12 (5.08)	87 (36.86)	0 (0)	30 (12.71)	2 (0.85)
31 - 40	17 (8.1)	3 (1.4)	74 (35.24)	22 (10.48)	2 (0.95)	4 (1.9)	0 (0)	6 (2.86)	7 (3.33)	5 (2.38)	1 (0.48)	57 (27.14)	0 (0)	9 (4.29)	3 (1.43)
41 - 50	18 (13.55)	0 (0)	52 (39.1)	13 (9.77)	0 (0)	3 (2.26)	0 (0)	2 (1.5)	2 (1.5)	1 (0.75)	2 (1.5)	33 (24.81)	1 (0.75)	5 (3.76)	1 (0.75)
51 - 60	11 (13.1)	1 (1.2)	31 (36.9)	11 (13.1)	1 (1.19)	3 (3.57)	1 (1.19)	0 (0)	2 (2.38)	2 (2.38)	0 (0)	17 (20.24)	0 (0.75)	1 (1.19)	3 (3.75)

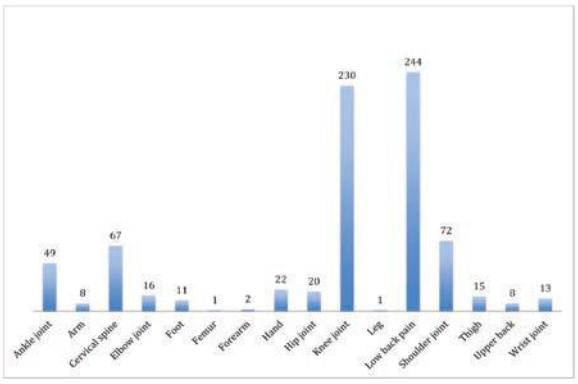

Figure 1: Numbers of disorders categorized by anatomical sites.

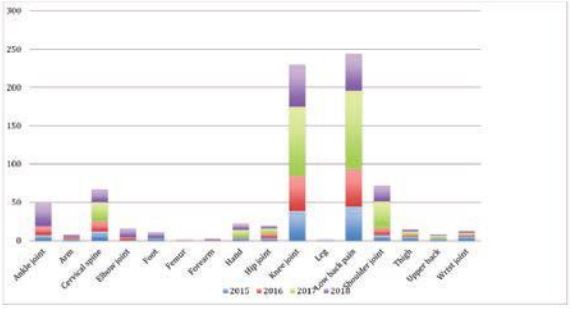

Figure 2: Numbers of disorders categorized by anatomical sites and year of visiting the clinic.

Discussion:

To the best of our knowledge this is the first research that has looked at the prevalence of MSD in patients who have visited the physical therapy clinic in College of Applied Medical Sciences at Najran University. We identified 779 cases with different diagnoses. Looking at the anatomical sites, low back pain, knee joint, shoulder joint, and cervical spine were the most common disorders presented at the clinic 31.3%, 29.5%, 9.2%, and 8.6%, respectively. Our results agreed with Brooks et al. research who revealed that low back pain and knee joint pain were the most prevalent MDS [3].

In the year 2018, knee joint disorder was more common than low back pain (25.3 % and 22.1%). Ankle joint disorder was third with 13.8%. For the other years 2015, 2016, and 2017 low back pain was the most common disorder, followed by knee joint disorder. For 2018, any anomaly may be due to the fact that data was correlated for only nine months, up to the month of September. However, October, November, and December months tend to have a higher frequency of patient referrals, as it is the beginning of the new semester.

knee joint disorder was more common in patients who were below 30 years of age with 36.6% of all patients with a knee joint disorder and 19.8% with low back pain. However, Symmons et al. revealed knee joint pain is more common in older patients [13]. This may

be due to the fact that more of our patients are college students and more involved in sports activities. Low back pain was more common in patients who were more than 30 years of age. So, MSD is a common ailment in different age group, but becomes more prevalent as the population ages. It is well known that MSD is commonly found in the adult community and prevalence of physical disability increases with age. Almost 35% of people over 75 have a significant musculoskeletal problem and mobility problems increases by up to 50% in patients over 75 years of age [14].

Low back paina and disc prolapse were most common diagnosis in our clinic, and non-specific low back pain was the second-most common. In a study of 35,000, individuals Leboeuf-Yde et al [15] revealed that LBP was most common disorder. The prevalence of LBP during a person's lifetime occurred in 85% of people and the prevalence and recurrence in the 12-month period subsequent to first diagnosis was up to 40% and 60%, respectively [9]. In a study of work-related MSD in Brazil, LBP was most prevalent form (54.8%). Another study in Saudi Arabia revealed a rate of 38.1% for LBP in work-related cases of MSD, while female school teacher in Alkhobar, Saudi Arabia had a rate of 63.8% in all MSD work-related forms [16-18]. LBP is a wide-ranging disorder that can be named based on the etiology or based on the time of the course of the disease. It can be Specific or non-specific, based on the etiology, or acute, sub-acute, or chronic based on the time of the course of the disease [9].

A current study showed that knee joint disorder was the second-most prevalent form of MSD in this clinic, with around 29.5% of all patients presenting with this specific ailment. Ligamentous/meniscal injury was the most common disorder with 44.8% of all knee joint disorders and osteoarthritis was the second-most common with 30.4% of all knee joint cases. This study agrees with the findings of Urwin M et al [14] that revealed the most common site of pain was the lower back and the knee joint constituted 23% and 19% respectively. In our research, LBP was more prevalent than knee joint disorder, which contradicts Symmons et al, which stated that knee pain is more common than LBP. This difference may be due to the limitation policy or the targeted population within our clinic for new patients' acceptance since this clinic is exclusive to students, staff, faculties and their immediate relatives.

Shoulder joint was the third-most common disorder. This is consistent with a study by Urwin where low back, knee and shoulder pain were the most common disorders [14]. More specific in our study, rotator cuff and adhesive capsulitis disorders were most common disorders in shoulder joint pathology. Sirajudeen et al. found a correlation between shoulder joint disorder and body mass index [19]. We were unable to establish this correlation between the two factors because we lack essential demographic information.

Limitation of the study:

We acknowledge that our data lacked important demographic information such as

weight, height, marital status, smoking history and occupation. Research showed that these factors may be associated with certain forms of MSD [20]. We recoded some terminology because referring physicians used different term for the same disorder, so we correlated them to their anatomical sites. This may have some impact on the results of this study.

Conclusion:

In the physical therapy clinic of the Applied Medical Sciences College at Najran University, cases of LBP and knee joint disorder were more prevalent than other forms of MSD. There was weak association between age and affected anatomical sites.

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Original Article

Assessment of Knowledge, Attitude and Practice in Relation to Travel Health among Travelers in Qassim Region

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Abstract

Background: The international traveling is annually growing and is expected to reach 1.6 billion travelers in 2020. The risk of infectious diseases during traveling are not only related to the destination and duration of the trip, but also the personal health. The risk of these diseases not limited to the traveler, it's also a risk for the community. The risk can be reduced by taking some pre-traveling, travelling and post-traveling precautions. In general, only about 10% of the travelers usually consult a travel-health specialist.

Aim To determine the level of travel health knowledge, attitude and practice (KAP) among Saudi travelers at Prince Nayef international airport and to identify their source of travel health-related information.

Methods: A cross sectional study conducted at Prince Nayef International Airport in Qassim Region from 10-17 January 2018. A total of 535 travelers aged 18-60 years old had been voluntarily recruited in this study. We used the questionnaires regarding the knowledge, attitude and practices of travel health among travelers published by Neika Vendetti.

Results: Males were dominated the females with 62.8% versus 37.2%. Family and friends were the main source of general travel advice (64.5%). Poor and adequate knowledge constituted 84.3% and 15.7% respectively. Regarding attitude, 50.3% and 49.7% of respondents had positive and negative attitude respectively. For travel practice 86.0% and

الملخص

يزداد معدل السفر الدولي بشكل سنوي ويتوقع أن يصل إلى ١,٦ بليون مسافر في عام ٢٠٢٠. لا يرتبط خطر الأمراض المعدية أثناء السفر بوجهة الرحلة ومدتها فقط ولكنه يرتبط بالصحة الشخصية ايضاً. لا يقتصر خطر هذه الأمراض على المسافر وحده بل هو يشكل خطراً على المجتمع ككل. يمكن تقليل مخاطر السفر من خلال اتخاذ بعض الاحتياطات قبل وأثناء وبعد السفر. وبصفة عامة فإن نسبة ١٠ بالمائة فقط من المسافرين يستشيرون أخصائي صحة السفر.

الهدف: تحديد مستوى المعرفة، السلوك والممارسة للمسافرين السعوديين في مطار الأمير نايف الدولي وتحديد مصدر معلوماتهم الصحية المتعلقة بالسفر بشكل صحيح.

طريقة البحث اعتمد البحث على اجراء دراسة مقطعية في مطار الأمير نايف الدولي في منطقة القصيم في الفترة من ١٠ إلى ١٧ يناير ٢٠١٨. بلغت عينة الدراسة ٥٣٥ مسافر تتراوح أعمارهم بين ١٨-٦٠ سنة حيث تمت المشاركة بشكل طوعي. تم استخدام الاستبيانات المتعلقة بالمعرفة والسلوك والممارسات المتعلقة بصحة السفر بين المسافرين التي نشرها نيكا فيندي (iNeika Vendett).

النتائج: نسبة الذكور والإناث هي ٦٢,٨٪ مقابل ٣٧,٢٪ على التوالي. المصدر الرئيسي للنصائح العامة للسفر هو العائلة والأصدقاء بنسبة (٦٤,٥٪). أظهرت الدارسة ضعف انتشار الثقافة المتعلقة بالمعرفة والسلوك والممارسات الخاصة بصحة المسافرين بنسبة ٨٤,٣٪. بلغت السلوكيات الصحية الإيجابية والسلبية

14.0% acquired poor and good practice respectively.
Conclusion This study found that most travelers were having poor knowledge and practices toward pre-travel medical advice. Many of the travelers don't seek pre-travel medical advice.
Keywords
Knowledge, attitude, practices, travelers, travel health, medical advice

للمسافرين ٥٠,٣ ٪ و٤٩,٧ ٪ على التوالي. بلغت الممارسات السيئة ٨٦ ٪ مقابل ١٤,٠ ٪ للممارسات الجيدة.
الخلاصة: وجدت الدراسة أن غالبية المسافرين يعانون من ضعف المعرفة والسلوك والممارسات الصحيحة المتعلقة بالسفر. لا يهتم العديد من المسافرين بطلب المشورة الصحية قبل السفر.
الكلمات المفتاحية:
المعرفة والسلوك والممارسات والمسافرين والصحة أثناء السفر والمشورة الصحية

Introduction:

The international traveling is annually growing and is expected to reach 1.6 billion travelers in 2020.1 And in 2030, traveling to developing countries is expected to reach 57% of the international destinations.2 The risk of infectious diseases during traveling are not only related to the destination and duration of the trip, also the personal health. 1 The risk of these diseases not limited to the traveler, it's also a risk for the community and relatives in contact with the traveler. 1 The risk can be reduced by taking some pre-traveling, travelling and post-traveling precautions. 3

Traveling history can be the cornerstone in identifying the cause of such travel-related diseases.4 Some studies reported that most of the travelers are unaware about the prophylaxis and standby treatment measures which needed in their trips.5 In general, only 10% of the travelers have seen a travel-health specialist.

The aim of this study is to determine the level of travel health knowledge, attitude and practice (KAP) among Saudi travelers at Prince Nayef international airport in Qassim and to identify their source of travel health-related information.

Methods:

A cross-sectional design to assess knowledge, attitude and practice of travelers at Prince Nayef International Airport in Qassim Region (ELQ) in Qassim region. International travelers aged ≥18 years were considered on Jan 10th to Jan 17th, 2018 with exception of those who don't speak Arabic or English languages or younger than 18 years old. The data were collected randomly from different flights and different times of airplanes departures.

Sample was 600 participants from whom 535 responded to this study. Self-administered and pre-tested questionnaire was used 6,17. The questionnaire covered the following aspects: demographic data, pre-travel, travel and post-travel health parts. The data was collected by trained medical students after acquiring a written consent from the participants. The data was kept confidential and only used for the purpose of the study.

The data was analyzed by Statistical Packages for Social Sciences (SPSS) version 20. Both descriptive and inferential statistics were performed where numbers and percentages were used to presents all categorical variables. A p-value cut off point of 0.05 at 95% CI was used to determine statistical significance. The analyses measured the re-

lationship between socio-demographic and knowledge, attitude and practices of travelers regarding health pre-travel advice by using chi square test.

The evaluation of attitude of travelers toward health pre-travel advice which comprised of 2 questions where "yes" coded as 1, "no" coded as 0 were the answer options and the total score had been calculated by adding the 2 questions. The minimum score was 0 and the maximum was 2, score of 1 – 2 were classified as positive attitude while no score (0) were classified as negative attitude.

The assessment of practices of travelers toward health pre-travel advice which composed of 5 questions and the answers were coded as 2 (most appropriate answer) or 1 (least appropriate answer) and for "yes" as 1, and "no" coded as 0 were the answer options and the total score had been calculated by adding all 5 questions. The minimum score was 0 and the maximum was 7. Score of 0 – 3 had been classified as poor practices while score of 4 – 7 were classified as good practice.

The measurement of traveler's knowledge toward health pre-travel advice which comprised of 8 questions and "yes" coded as 1, "no" and "I don't know" coded 0 were the answer options and the total score had been calculated by adding all 8 questions. The minimum score was 0 and the maximum score was 8. Score of 0 – 4 was classified as poor knowledge and score of 5 – 8 were classified as good (adequate) knowledge.

Results:

The socio demographic data of 535 travelers were voluntarily enrolled in this study. Of the 535 participants, 412 (77.0%) were Saudi and 123 (23.0%) were non-Saudi. Age ranged was from 18 to 60 years old of whom 295 (55.1%) were in the age group of 18 – 25 years, 125 (23.4%) were in the age group of 26 – 35 years, 79 (14.8%) were in the age group of 36 – 45 years, 31 (05.8%) were in the age group of 46 – 60 years and 05 (0.9%) participants were in the age group of more than 60 years. Males were 336 (62.8%) while females were 199 (37.2%). Nearly all travelers were living in Saudi Arabia (95.0%) with only 27 participants living abroad. Most participants (89.7%) had already been traveled outside of Saudi Arabia and few of them don't (10.3%). Majority of the travelers had 1–2 companion during the travel (40.6%), 27.9% traveled with 3 – 5 companions, 11.2% traveled with more than 5 companions while 20.4% traveled alone. Many participants already been traveled to their preferred destination (79.8%) while 20.2% were travelling for the first time. Travelers preferred to stay for days only were (48.6%), for months (36.6%), for weeks (10.5%) and for years (4.3%). Most of the travelers were going to tourist spot country (87.7%) while few of them on the opposite (12.3%). Most (61.5%) were planning to visit rural areas or countryside. About a half of the participants (49.5%) planned the trip at least one month prior to travel, 15.6% 2 to 4 weeks prior to travel, 14.5% during 1 to 2 weeks and 20.4% during the week of the

trip. Nearly all travelers debriefed toward the general travel information of destination prior to the trip and only 11.2% don't. Table1

Table 1: Demographic data and travel characteristics of participants

Study Variables	N (%)
Nationality	
• Saudi	412 (77.0%)
• Non-Saudi	123 (23.0%)
Age group in years	
• 18 – 25 years old	295 (55.1%)
• 26 – 35 years old	125 (23.4%)
• 36 – 45 years old	79 (14.8%)
• 46 – 60 years old	31 (05.8%)
• >60 years old	05 (0.9%)
Gender	
• Male	336 (62.8%)
• Female	199 (37.2%)
Is KSA your country of residence?	
• Yes	508 (95.0%)
• No	27 (05.0%)
Have you ever traveled out KSA?	
• Yes	480 (89.7%)
• No	55 (10.3%)
Companions during the travel	
• No	109 (20.4%)
• 1 – 2 persons	217 (40.6%)
• 3 – 5 persons	149 (27.9%)
• >5 persons	60 (11.2%)
Is this your first time traveling to this country?	
• Yes	108 (20.2%)
• No	427 (79.8%)
How long are you staying at your destination?	
• Days	260 (48.6%)
• Months	196 (36.6%)
• Weeks	56 (10.5%)
• Years	23 (04.3%)
Is your primary destination a tourist/vacation area?	
• Yes	469 (87.7%)
• No	66 (12.3%)
Do you plan on visiting rural area/countryside?	
• Yes	329 (61.5%)
• No	206 (38.5%)
When did you begin planning this trip prior to your departure date?	
• At least one-month prior	260 (49.5%)
• 2 to 4 weeks prior	82 (15.6%)
• 1 – 2 weeks prior	76 (14.5%)
• During the week of the trip	107 (20.4%)
Did you get general travel information about your destination prior to your trip?	
• Yes	475 (88.8%)
• No	60 (11.2%)

Figure 1 shows the distribution of the favorite travel destination, majority of them preferred both Middle East and Asia (31.4%), 31% preferred Africa, 6.2% likes North America and very few likes South America (0.6%).

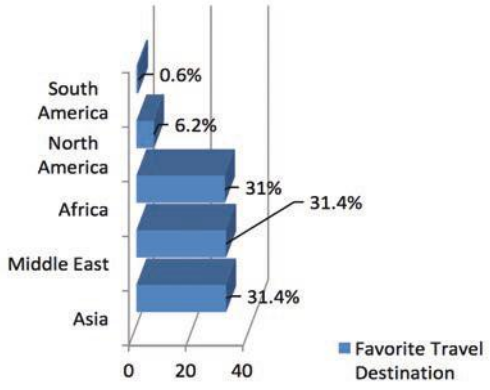

Figure 1: Distribution of the favorite travel destination

The distribution of sleeping arrangement of trip. Among the travelers, 64.5% of them choose hotel or resorts, 25.2% like private home, and 2.8% preferred dorm or youth hostel with very few like camping and 3% with other staying arrangements as shown in Fig. 2.

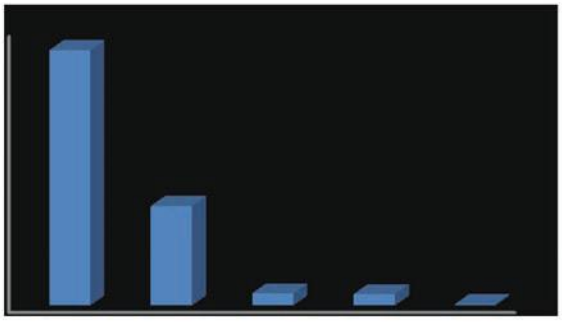

Figure 2: Distribution of sleeping arrangement of trip

Many travelers do not seek travel health medical advice prior to departure with 71.2% contrary to those who seek with 28.8% while more of the travelers do not have health insurance (68.8%) compared to those with travel insurance (31.2%). About 80 percent of the travelers do not purchase nor receive any preventive medications prior to trip while 20.8% of them were having preventive medication for the trip where more than a half of them (54.3%) were having non-prescription medicine while on the other hand, 45.7% have vaccine. Only 14 participants adhere to anti-malaria medicine. 33.1% of them were planning to participate in any outdoor activities such as running or walking (72.3%), swimming and other water sports (17.5%) with 10.2% of them planned to participate both activities. For health safety during the travel, 40.4% of them preferred to cover arms or legs while outside at night, 18.3% will use bug repellant and 17.6% will close windows or might use mosquito nets. The following food might cause illness according to travelers such as; food from street vendor's (71.2%), tap water (32.9%), raw fruits or vegetables (25.5%), sushi/shellfish (19.5%), ice cream (15.5%), ice cubes (13.3%) and milk (09.2%)

The Percentage of knowledge, attitude and practices toward health travel has been presented at table 3. Poor knowledge dominated the good knowledge with 451 (84.3%) as poor while only 84 (15.7%) were having good knowledge while attitude shows, half of the participants were having positive attitude as 269 (50.3%) and 266 (49.7%) were having negative attitude. Poor practices were more on travelers with 460 (86.0%) with relatively low ratings on good practices with 75 (14.0%).

Majority of them obtained informa-

tion about medical advice prior to departure from pharmacist (40.6%), followed by primary doctor (23.9%), next travel health clinic (12.2%) and health department (2.2%) with 21.1% from mixed sources (Figure 3).

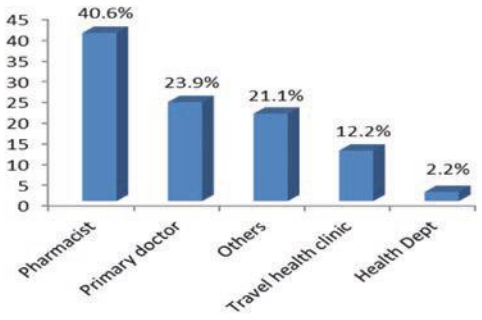

Figure 3: Sources of information about medical advice prior to departure

The reason for not seeking pre-travel medical advice were 37% who were not seeking pre-travel medical advice because they knew already the necessary information, 24.2% were too busy, 21.7% had no idea where to find information, 8.1% without health problems, 1.4% were concerned about the cost of pre-travel medical advice and 7.5% had other reason for not seeking pre-travel advice.

There was significant difference on nationality against attitude (p-<0.001) while both knowledge and practices have no significant difference. Age group in years were not statistically significant for all the dependent variables while gender was statistically significant at knowledge (p-<0.001). Saudi Arabia residency also shows negative relationship and travel to country outside Saudi Arabia shows the same. Number of companions during the travel was statistically significant at knowledge (p-<0.001) and on the other hand plan on visiting rural area or countryside was statistically significant at attitude (p-0.010).

Table 2: Attitude and practices of travelers toward health pre-travel advice (n=535)

Statement	**n (%)**
Attitude	
Did you seek travel health or medical advice prior to departure	
• Yes	154 (28.8%)
• No	381 (71.2%)
Do you have health insurance	
• Yes	167 (31.2%)
• No	368 (68.8%)
Practices	
Q1. Prior to your travel date did you receive or purchase any preventative medications for this trip specifically (including vaccine)?	
• Yes	109 (20.8%)
• No	414 (79.2%)
Q1a. If yes to question, what type of preventative medication did you receive?	
• Vaccines	43 (45.7%)
• Non-prescription medicine	51 (54.3%)
Q2. If you received anti-malarial medicine, did you begin taking them?	
• Yes	14 (02.8%)
• No	483 (97.2%)

Q3. Do you plan on participating in any outdoor activities?	
• Yes	177 (33.1%)
• No	358 (66.9%)
Q3a. What kind of outdoor activities?	
• Walking and running • Swimming/water sports • Both	128 (72.3%) 31 (17.5%) 18 (10.2%)
Q4. Do you plan outdoor activities?	
• Using bug repellant	98 (18.3%)
• Covering arms/ legs while outside at night	216 (40.4%)
• Sleeping with windows closed or under mosquito nets	94 (17.6%)
Q5. Food that might cause illnesses:	
• Food from street vendor's	381 (71.2%)
• Tap water	176 (32.9%)
• Raw fruit or vegetables	136 (25.5%)
• Sushi/shellfish	104 (19.5%)
• Ice cream	83 (15.5%)
• Ice cubes	71 (13.3%)
• Milk	49 (09.2%)

Table 3: Percentage of knowledge, attitude and practices toward travel health

Factor	N (%) (n=535)
Knowledge	
• Poor	451 (84.3%)
• Good	84 (15.7%)
Attitude	
• Negative	266 (49.7%)
• Positive	269 (50.3%)
Practices	
• Poor	460 (86.0%)
• Good	75 (14.0%)

Discussion:

In this study, despite that fact that many of the travelers were visiting high risk countries with some infectious diseases still most of them did not seek any pre travel medical advice (71.2%). This number is quite alarming since some of these diseases are endemic for those high-risk countries. Obtaining medical advice prior to travel is as necessary as the travel. This is in order to obtain general information about the disease which is prevalent in the planned country to visit. Generally, the medical advisor would suggest what is necessary to bring and avoid in the planned country of destination. Incidentally, several of the published articles locally and internationally showed that travelers were not accustomed to getting pre-travel medical advice.6,7,16,19,20,21,22 However, studies suggest that Europeans were more aware of the danger of diseases from those high-risk countries as many of them sought medical ad-

vice prior to the travel. 5,12,15

The most common reason for not seeking pre-travel health advice as the travelers remarked was about "they already knew" and others indicated busy schedules. In Oman, Al-Jabri et al 3, among travelers who did not seek pre-travel advice, they stated that "having no time" was the main reason for not seeking and another reason traveler's mentioned was about "having no idea about it" whereas in UAE 20, travelers stated that the most common reason for not seeking pre-travel health advice was about "not seeing the importance of pre-travel health advice." On the other hand, In Asia Pacific, Wilder-Smith et al 22, reported that the main reason of the travelers regarding the subject was the perception of not being at risk and short duration of travel.

Moreover, our study found that many of the travelers who sought pre-travel medical advice considered pharmacist and medical doctor as the best sources of information. This finding is consistent with most of the published articles where either general practitioner or other health care providers were the most sought for sources of information about pre-travel medical advice. 5,7,12,15,16,19,20,21,22 However, Al-Abri et al stated that most of the travelers preferred internet as the sources of health advice prior to travel rather than healthcare providers. 6

Vaccination prior to travel was the least important issue for the travelers in this study, only 20.8% of the travelers received or purchased preventative medications and vaccination. We further observed that the most common preventive vaccination used were that against communicable diseases such as polio vaccine and MMR and few took Hepatitis virus vaccine (A or B). Low adherence to pre-travel vaccination was stated from international literature. 16,19,21,22 However, this is contrary from the studies conducted by Al-Jabri et al as well as Alghamdi et al. 6,7 Both studies exhibited a relatively higher prevalence of adherence to pre-travel vaccination (52.7% and 57.1% respectively). Moreover, in regard to preventive vaccination of communicable diseases our report was not in agreement with most of the published articles in the same subject, where we observed that the most common pre-travel vaccination of the travelers from the previous literature for Hepatitis virus. 6,7,8,16,19,21,22

The level of knowledge, attitude and practices (KAP) regarding health travel showed, poor knowledge with (84.3%) versus (15.7%) while attitude shows, half of the participants were having positive (50.3%) and (49.7%) were negative. More travelers were having poor practices toward health travel with (86.0%). Regarding relationship between knowledge, attitude and practices versus socio demographic characteristics of travelers it was revealed that there was significant difference on nationality against attitude while gender was statistically significant at knowledge whilst number of companions during travel was statistically significant at knowledge. On the other hand, plan on visiting rural area or countryside was statistically significant with the attitude. Results published by Alghamdi

et al was slightly higher in prevalence. They also showed more significant results when comparing KAP to the socio demographics characteristics. 7 In Oman, most travelers were having good knowledge and positive attitude while the correlation between KAP and socio demographic data viewed to be consistent.6 We further observed that the knowledge and practices of travelers in our study were lower than the previous mentioned studies. This signifies the need to educate Saudi Arabian travelers more about the importance of pre-travel health advice

The present study also measured the determinants of KAP among the socio demographic characteristics of travelers. We found out that the determinants of knowledge in this study was gender and companions to travel while the determinants of attitude were nationality and planned to visit rural area whereas practices showed no determinants. Al Jabri et al, reported that the determinant of knowledge and attitude were gender and travel destination respectively.6 On the other hand, Alghamdi and colleagues 7, revealed that the KAP was statistically significant at age, education, companions' settings and chronic diseases.

Limitations:

Just like any other study, this paper is also subjected to some limitations such as; the limited destinations that departed directly from Prince Nayef International Airport.

Conclusion:

This study found out that most travelers were having poor knowledge and practices toward pre-travel medical advice. Many of the travelers don't seek pre-travel medical advice. Travel clinics and campaign are needed to reflect the importance of getting pre-travel medical advice. Travel agency as well as general practitioner are requested to educate the travelers about the risks in the country of destination. Proper medications and awareness to about risks at country of destination is advised to be taught by the concerned parties prior to travel.

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Original Article

Emotional Intelligence and Conflict Management Styles of Faculty Members Teaching Nursing and Other Allied Health Programs

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Abstract

Background: A basic difficulty underlying many of the serious problems of academic administration is the inability to deal effectively with conflict among faculty members, between faculty members and administrators, between faculty and students, and between representatives of the institution and external stakeholders. When those responsible for institutional policy are able to focus and resolve conflicts arising from different ideologies, values and vested interests, it is possible for decision-making and problem-solving to be governed by commitment to the pursuit of academic excellence.

Objective: This study analyzed the correlation of emotional intelligence (EI) and conflict management styles (CMS) of faculty members teaching nursing and other allied health programs.

Materials and Methods: Adopted questionnaires were used to collect data from respondents (n=104) and structural equation modeling (SEM) was used to tabulate and statistically analyze the data.

Results: Some EI components of faculty members affect their CMS skills; specifically, on EI awareness and management to CMS collaborating (β=-0.157, $p<.05$), EI social skills to CMS competing (β=-0.216, $p<.05$), and EI social skills to CMS avoiding (β=0.198, $p<.05$).

Conclusion: Some aspects of EI were significantly related to CMS. Further study is needed to explore other indicators for both EI and CMS in higher education and other sectors to create appropriate recommendations and theory-based actions to optimize the efficiency and effectiveness of organizations.

Keywords: Educational Management; Emotional Intelligence; Conflict Management Styles; Saudi Arabia

الملخص

أحد الصعوبات الأساسية وراء الكثير من المشكلات الخطيرة للإدارة الأكاديمية هو عدم القدرة على التعامل بفعالية مع الصراع بين أعضاء هيئة التدريس، كذلك بين أعضاء هيئة التدريس والإداريين او الطلاب او أصحاب المصلحة من خارج المؤسسة. عندما يكون المسؤولون عن السياسة المؤسسية قادرين على تركيز وحل النزاعات الناشئة عن الأيديولوجيات والقيم والمصالح الخاصة المختلفة ، فمن الممكن أن يكون صنع القرار وحل المشكلات من خلال الالتزام بالسعي لتحقيق التميز الأكاديمي.

الهدف: حللت هذه الدراسة العلاقة بين الذكاء العاطفي وأساليب إدارة الصراع لأعضاء هيئة التدريس الذين يقومون بتدريس التمريض وبرامج الصحة الأخرى المرتبطة بها.

طريقة البحث: تم استخدام الاستبيانات المعتمدة لجمع البيانات من عينة الدراسة (العدد = ١٠٤) وتم استخدام نمذجة المعادلة الهيكلية لجدولة وتحليل البيانات إحصائياً.

النتائج: تؤثر بعض مكونات الذكاء العاطفي لأعضاء هيئة التدريس على مهارات وأساليب إدارة الصراع الخاصة بهم؛ على وجه التحديد، بشأن مهارة الوعي والإدارة - التعاون (β = -٠,١٥٧, $p <$ ٠.٠٥) التنافس (β = -٠,٢١٦, $p <$ ٠.٠٥) التجنب (β = ٠,١٩٨, $p <$ ٠.٠٥).

الخلاصة: كانت بعض جوانب الذكاء العاطفي مرتبطة بشكل كبير بأساليب إدارة الصراع، هناك حاجة إلى مزيد من الدراسات لاستكشاف مؤشرات أخرى لكل من الذكاء العاطفي وأساليب إدارة الصراع في التعليم العالي والقطاعات الأخرى لإنشاء التوصيات المناسبة والإجراءات المستندة إلى النظريات لتحسين كفاءة وفعالية المنظمات.

الكلمات المفتاحية: الإدارة التربوية؛ الذكاء العاطفي؛ أساليب إدارة الصراع؛ المملكة العربية السعودية

Introduction

One of the most researched areas in applied medical science education is the Emotional Intelligence (EI). It is described as the person's ability to monitor his own feelings, understand emotions and feelings of other people and to use this understanding to in influence his thinking and action [1]. The assumption that there is a relationship between EI and successful management in education (such as decision-making process, planning process, functional relationships, performance assessments) institutions began to emerge in management literature in the early 1980s.

In light of this recent academic focus on EI, it is imperative to investigate its role in the management of schools, especially Saudi universities which are mandated to prepare youth for gainful employment and good citizenship. It is undisputed that the current focus of universities in the age of globalization should be to hire faculty members who have the ability to manage workplace conflicts which are inherent in culturally diverse organizations [2-4].

More than ever, institutions of higher learning, like other organizations, are faced with the challenge of formalizing effective management approaches and leadership styles, taking into account the phenomenon of conflict in its many forms and dimensions. Holt and DeVore pointed out that "conflict and violence are a part of our world, both on the microscopic and macroscopic levels" [5]. In the context of a rapidly changing society, higher education systems are inevitably beset with various types of conflict. Universities have to recognize not only the challenge of educating future professionals with appropriate knowledge and skills in dealing with conflict, but also to manage actual conflicts in their organizations [6,7]. Schools are not free from the stressful pressures of conflicting issues which involve not only economic, cultural, and political factors but also those borne by technology-related concerns [8].

Certain forms of conflict can also provide managers with information about the operations for which they are accountable and where corrective actions might be needed. An understanding of conflict and the concomitant remedial skill should be a significant part of the administrator's tasks in order for the organization to prosper. It is thus imperative that educational managers should acquire skills that will help them to manage conflict effectively [9,10].

Studies reveal that conflict management requires skills and competencies that are emotionally based. It is clear that with a dynamic environment and changing human values, organizations continually undergo change. But change is almost always accompanied by conflicts [9]. Today's organizations are confronted by daily conflicts caused by a multitude of factors ranging from struggles for power, the desire for economic gain, the need for status, the realization of unfulfilled values, the assertion of rights not yet fulfilled, and many other human and non-human components of an institution [11-13].

Background of the study

Primarily, this study is based on three leading theories on personality, emotional intelligence and conflict management: Daniel Goleman's [14] groundbreaking theory on the functions and components of EI and Thomas and Kilmann's [15] "Conflict Handling Mode Model".

Goleman's theory avers that EI is more important than technical skills and intelligence quotient (IQ) for career success at all levels. In measuring success in senior leadership positions, EI is a better predictor than IQ; the importance of EI increases proportionately with rungs up the career ladder. Goleman states that EI consists of four fundamental capabilities: "self-awareness, self-management, social awareness and social skills". Each capability is associated with a specific set of attributes or behaviors. Nineteen EI-related capabilities and attributes are listed as basic components of EI. These factors are claimed to influence with an individual's family life and career progression [14].

Self-awareness is understanding one's own personal preferences, strengths and limitations. Self-management is ability of one person to manage personal internal states and intuitions to assist in pursuing goals. On the other hand, social awareness is the ability of a person to sense and understand what other people are going through including their feelings and concerns. Social skill is the ability to encourage appropriate responses in other people

In identifying existing conflicts, different conflict management approaches are appropriate for different types of conflict. The Thomas-Kilmann Conflict Handling Mode Model was used in this study. According to Thomas and Kilmann, conflict management styles are classified according to the two basic dimensions of personal intentions: assertiveness and cooperativeness [15]. Assertiveness refers to the person's concern for himself and his own personal goals. Cooperativeness, on the other hand, refers to the person's concern for relationships (interpersonal and intergroup) and the goals of others. There are five (5) Conflict Management Styles (CMS), each has advantages and disadvantages.

The avoiding style is low in assertiveness and cooperativeness. This style can be expressed in several ways such as when the manager avoids confrontational situations or when he defers answering a disturbing letter or by maintaining neutrality by not expressing any views on the conflict. Here, the manager may act merely as a communication link by transmitting messages between superiors and subordinates [15].

However, an avoiding style can make sense when a conflict situation has relatively minor implications for managerial effectiveness, when there appears to be little chance for the person to win, when the potential damage of confronting a conflict outweighs the benefits of its resolution. The avoiding style is likewise appropriate in order to reduce tensions and when others can resolve the conflict more effectively.

The compromising style is moderate

in both assertiveness and cooperativeness dimensions. Through this style, a manager may sacrifice his personal opinion and interest on controversial issues to seek a middle ground by splitting the differences in conflict situations. Compromise is a cornerstone to negotiation. Conflicting parties discuss proposals concerning terms and conditions of a possible agreement to find a mutually acceptable solution to satisfy their interests and concerns partially. They share in some degree of winning and losing because both have to give up something. It does not dig into the underlying problem but rather seeks a more superficial arrangement like splitting the difference. It is based upon party concessions and is seen as the most practical approach to conflict management. It is useful when goals are moderately important, when there is a need to achieve temporary settlements to complex issues or arrive at expedient solutions under pressure [15].

However, the early use of compromise may leave the parties feeling uneasy and somewhat dissatisfied. This style should not be used too early in the conflict episode when the problem-solving approach is more appropriate.

The competing style is high in assertiveness and low in cooperativeness. This style relies upon the power in the formal position or possible superior knowledge, to require a resolution satisfactory to only one of the parties. The manager assumes that the conflict involves a win-lose situation. When dealing with conflicts between subordinates or between organizational levels, the manager may threaten or actually invoke punishments, which may include demotion, dismissal, or threat of a poor performance evaluation. This style may be useful when a quick, decisive course of action must be done, when the issues are vital to company welfare, when the manager knows that he is right [15].

However, this style may coerce, suppress or intimidate other parties to a conflict. Subordinates may avoid communication with the manager who uses this style. A competing style may prevent the real causes of a conflict from coming into the open.

The collaborating style, which is high in both assertiveness and cooperativeness, requires the willingness to identify underlying causes of conflict, openly share information and search out an alternative considered to be mutually beneficial. This happens when the conflicting parties recast the scheme into a problem-solving situation. This involves accepting both parties' concerns as valid and digging into an issue in an attempt to find innovative possibilities. It also means being open and exploratory [15].

Collaborating style is useful when both sets of concerns are too important to be compromised, when there is a need to merge insights from people with different perspectives on a problem, and to gain commitment by incorporating the other party's concern into a consensual decision. While collaborating style is high in both the assertiveness and cooperativeness dimensions, it does not mean that it is always the best approach to conflict

management. Other styles are more practical and beneficial under certain situations.

The accommodating style is low in assertiveness and high in cooperativeness. In this approach, the manager acts as though the conflict will pass time, and he merely invokes the need for cooperation. The manager tries to reduce tensions by reassuring and providing support to the parties. This approach may be useful as a starting point to defuse a potentially explosive conflict situation. This allows time for further efforts toward changing negative perception and communication patterns [15].

Hopkins stressed that leadership is a dynamic interpersonal process integrating an extensive range of cognitive as well as emotional competencies and functioning in a gendered social context [16].

Moreover, Ellis [17] utilized respondent who were MBA students at a small university and found significant relationships between EI and CMS. Ellis stressed that there is an increasing importance in higher education and corporate America to use interpersonal skills, EI, and the ability to resolve conflict in the workplace.

As society aspires to growth and modernization, there is a need for greater knowledge and expertise in leadership and an earnest commitment to pursue a systematic and long-range program for improving an institution. This expertise in leadership includes effective management of conflict to ensure higher productivity and efficiency of both the academic and administrative personnel of an educational institution.

The literature has clearly shown that the characteristic approaches to conflict management are diverse and varied. Moving the organization to fulfill its mission is a formidable task every manager must face. The task can be a lot easier if employees in the organization are able to capture the mind of the manager. No organization can achieve its mission if the organization's requirements are in conflict with the individual needs, wants and values.

However, organizations at present have become a "complex human arena" with diverse idiosyncrasies, beliefs, racial ideologies, personal interests, value systems, and educational backgrounds on which needs of its members for self-worth and satisfaction must be significantly met. Man after all is a creative being and as such has the power to explore challenges, to discover and utilize new ideas and new ways of doing things, and to develop personally to achieve his needs and wants even, at times, at the expense of the organization [16].

Conflict is not new for humankind or for academia. That said, faculty are finding themselves dealing with new conflicts in a complex environment. At no time in history has there been a greater demand for strong and competent faculty members. Changing values, philosophies, legislative mandates, and technological developments are among the many factors that reinforce the need for competent faculty members to guide and direct educational organizations.

Therefore, faculty members must be

competent in every aspect of management especially in terms of instructional leadership and conflict management since the ability to manage conflict is undoubtedly one of the most important skills a manager can possess.

Objective

This study analyzed the correlation of EI and CMS of faculty members teaching nursing and other allied health programs. It sought to answer the research question "How does EI affects the CMS of faculty members teaching nursing and other allied health program?". Moreover, it is hypothesized that more emotionally intelligent faculty members possessed the capability to effectively manage conflicts. This study is deemed as an opportunity to institute management innovation that is applicable to the prevailing culturally diverse academic environment.

Materials and methods

We used a descriptive-correlational design and utilized two adopted questionnaires as the main instrument in gathering data.

This study involved 104 faculty members of different nationalities (Saudi, Filipino, Indian, Egyptian, Sudanese, and Tunisian) from the College of Applied Medical Sciences at Majmaah University between November and December 2017. Purposive sampling was used based on the characteristics of the target population and the objective of the study. The college includes the departments of Medical Equipment Technology, Medical Laboratories, Physical Therapy, Radiological Sciences and Medical Imaging, and Nursing.

This study adopted two instruments, namely the Goleman's Emotional Intelligence Inventory and the Thomas-Kilmann Conflict Mode Instrument [15]. EI inventory is a 32-item checklist used to gather information about emotional intelligence in its four components, such as self-awareness, self-management, social awareness and social skills. A 5-point Likert scale was use to score each of the four capabilities is associated with a specific set of attributes or behaviors.

The second part is designed to describe the conflict management styles of participants. This study used a standardized questionnaire developed by Thomas and Kilmann and patented and distributed by XICOM, Inc [15]. It is designed to assess an individual's behavior to conflict situations. It consists of 30 pairs of statements which are dichotomous in nature. Each CMS mode ("competing, collaborating, compromising, avoiding and accommodating") is paired with other modes three times and items describing a given mode are evenly distributed between the "A" and "B" choice of pairs which are randomly distributed throughout the instrument. The answers indicate conflict management behaviors which are described along two basic dimensions: Assertiveness and Cooperativeness. The five modes are represented by the five columns which consist of the possible scores on that mode, from 0 (for every low use) to 12 (for very high use).

Approval for this study was secured from the dean of the College of Applied Med-

ical Sciences and the Ethics Review Board at Majmaah University prior to data collection. Also, the anonymity and confidentiality of study participants were assured.

The WarpPLS software was used to analyzed the data. Because of the small sample size issue of this study, we decided to use the partial least squares-structural equation modeling (PLS-SEM) approach which entails less rigid measurement levels of variables [18, 19]. PLS-SEM is component based. In comparison to covariance-based SEM, PLS-SEM requires less stringent assumptions related to measurement levels of the manifest variables, multivariate normality, and sample size [18-19]. The two-stage approach suggested by Hulland [18] was adopted in testing the SEM. This approach includes the evaluation of the measurement model in the first stage, and evaluation of the structural models in the last stage. The former assesses the reliability and validity of the study measurements, while the latter illustrates the statistical support provided for the hypothetical relationships among constructs. criteria undertaken by Kock [20] The following goodness of fit and quality indices are within the acceptable range: "Average path coefficient (APC) = 0.138 (p<.062), Average block VIF (AVIF) = 1.004 (acceptable if <= 5, ideally <= 3.3), Average full collinearity VIF (AFVIF) = 1.487 (acceptable if <= 5, ideally <= 3.3), Tenenhaus GoF (GoF) = 0.196" [20]. If the p value if greater than .05, it means not statistically significant

Results

On this study, a factor analysis was conducted for the four variables of EI. Some model fit and quality indices are not acceptable if EI will be treated as one factor. The factor analysis yielded two factors, namely: emotional intelligence social skills (EI-SS) and emotional intelligence awareness and management (EI-AM). On the other hand, CMS consist of five dimensions. One model fit and quality index (specifically, the average full collinearity value inflation factor [VIF]) is very large if variable "compromising" is included in the model; hence, variable "compromising" was excluded from the model. The CMS questionnaire was designed by the authors so the total score of the five dimensions is constant (equal to 30). This scoring system extremely affects the value of the full collinearity VIF.

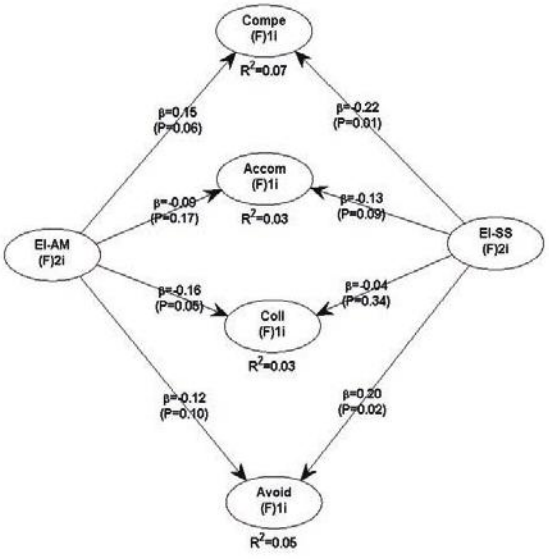

Figure 1. Factor analysis of emotional intelligence and conflict management styles.

The structural equation model as a whole presented a statistical confirmation that the estimates of the model are appropriate. According to the criteria undertaken by Kock,[9] the following goodness of fit and quality indices are within the acceptable range: "Average path coefficient (APC) = 0.138 (p<.062), Average block VIF (AVIF) = 1.004 (acceptable if <= 5, ideally <= 3.3), Average full collinearity VIF (AFVIF) = 1.487 (acceptable if <= 5, ideally <= 3.3), Tenenhaus GoF (GoF) = 0.196" [9].

The structural model shown that EI, on the aspect of awareness and management (EI-AM), is significantly associated to the conflict management style of collaborating (β=-0.157, p<.05). On the other hand, EI, on the aspect of social skills (EI-SS), is significantly related to the conflict management style of competing (β=-0.216, p<.05). Moreover, the structural model reveals that the EI-SS is significantly associated to the conflict management style of avoiding (β=0.198, p<.05).

Table 1. The relationship of Emotional Intelligence on the Conflict Management Styles of the participants.

	Path Coefficient	p-value	f^2
EI-AM* →Competing	.146	.062	.022
EI-AM →Collaborating	**-.157**	**.049**	.025
EI-AM →Avoiding	-.124	.096	.015
EI-AM →Accommodating	-.093	.166	.009
EI-SS† →Competing	**-.216**	**.011**	.047
EI-SS →Collaborating	-.040	.341	.002
EI-SS →Avoiding	**.198**	**.018**	.038
EI-SS →Accommodating	-.128	.090	.017

*Awareness and Management
†Social and Skills

Discussion

This descriptive correlational study established the relationship between EI and the CMS of faculty members teaching nursing and other allied health programs in Saudi Arabia. The sample size is small (N= 104) to perform covariance-based SEM, that is why PLS-SEM approach was used which entails less rigid measurement levels of variables.

Goleman's Emotional Intelligence Inventory was used to measure the respondent's EI on the components: self-awareness, self-management, social awareness and social skills. However, some model fit and quality indices are not acceptable if EI components will be treated as one factor. For this study, EI was presented with 2 factors: EI-SS and EI AM.

Thomas-Kilmann Conflict Mode Instrument assessed the CMS of the respondents on 5 components: competing, collaborating, compromising, avoiding and accommodating. However, one model fit and quality index is very large if the variable "compromising" is included. Hence, CMS was presented with 4 factors: competing, collaborating, avoiding and accommodating.

This study found that EI and awareness and management (EI-AM) are significantly related to the conflict management style related to collaborating. A number of related studies presented that a manager with self-awareness is significantly beneficial in preventing job burnout, increasing workplace satisfaction and hurdling organizational commitment of members [21-23]. Goleman said

that self-awareness is the foundation of EI [14]. Knowing one's internal state of emotion, allows for self-control and leads to empathy toward others [6-8]. The knowledge of the gaps between the values and expectations of one's principles and expectations and those of one's organization may serve as a useful tool to adopt and cope with the requirements of leadership including dealing with everyday conflicts on the job [7-10, 23, 24].

Goleman associates this competency to the capacity to calm oneself, to effectively manage anxieties, convert pessimism, and transforms the results of failure [14]. People who are poor in this ability are constantly battling feelings of distress, while those who excel in it can bounce back far more quickly from life's setbacks and upsets [8]. This study revealed that faculty members can manage their own internal states and impulses. They can hold back anger, anxiety, gloom, and turn them to become active in work and life. Faculty members possessed the skill to adjust in changing situations and overcoming organizational challenges. Developing EI in self-management contributes to improving professional and personal life. In addition, Jordan and Troth believed that individuals with high EI preferred to seek collaborative solutions when confronted with conflict [10-12, 22].

On the other hand, this study established that EI on the aspect of social skills (EI-SS) affects faculty members who uses the conflict the management style of competing. Strong social skills facilitate the leading and moving of people in the desired direction [10-13].

Further analysis revealed that the EI-SS is significantly related to the conflict management style of avoiding. Understanding emotions and feelings during conflicts will result to more acceptable outcomes [11, 23, 24]. Hence, a more direct approach such as accommodating and collaborating could manage conflicts.

Conclusion

In conclusion, some aspects of EI are significantly related to CMS such as EI-AM to collaborating, EI-SS to competing, and EI-SS to avoiding. Therefore, effective conflict management in a university setting can be achieved by improving the EI of faculty members.

Further studies are recommended to explore other indicators and parameters for EI and CMS in higher education and other sectors, to create appropriate recommendations and theory-based actions that optimize the efficiency and effectiveness of organizations.

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Conflict of interest:

The authors declared no conflicts of interest on this paper.

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Original Article

Effect of nulliparity, Body Mass Index and residency on bone mineral density in women between 40 and 50 years in Al-Medina, KSA

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Abstract

Background:

Osteoporosis causes adverse effects on the quality of life of individuals. We need to evaluate its risk factors in women between 40 and 50 years. Because they are either a t e a r l y menopause or not reaching menopause, so the hormonal effect is minimal.

Our aim was to investigate the effect of nulliparity, body mass index (BMI) and

location of residency on bone mineral density (BMD) in woman aged between 40 and 50 years.

Methods: A cross sectional study was conducted between February and April 2018. The study included 271 women aged between 40 and 50 years, with abnormal Dual Energy X-Ray Absorptiometry (DEXA) scan. The data was collected through a questionnaire, site of abnormality and its severity (osteoporosis or osteopenia) as well as nulliparity, BMI and location of residency. Data was collected from patients' files and by contacting them through their mobile phones. consent taken verbally.

Results: 46.1% of the subjects were overweight and 53.1% were obese, there was an inverse relationship between BMD and BMI ($p < 0.05$). Eighty-nine percent of women were living in urban areas, but there was no relationship between DEXA diagnosis and residency ($p > 0.05$). Nulliparity women were78.3%, There was no relationship between BMD in spine or left femur and nulliparity ($p > 0.05$), but there was a relationship with the right femur ($p < 0.05$).

الملخص

المقدمة:

تؤثر هشاشة العظام سلبا على الحياة اليومية للفرد ونحتاج الى ان نقيم عوامل الخطر التي تؤدي لحدوثها للسيدات في الفترة العمرية ما بين ٤٠ الى ٥٠ عاما، لأنهن في هذه المرحلة إما أن يكن قد وصلن إلى بدايات سن اليأس أو ما قبلها، فيكون تأثير الهرمونات شبه معدوم. هنالك قلة في الأبحاث المنشورة عن هذه الفئة العمرية، فالغالبية العظمى تتحدث عن الهشاشة في سن اليأس. لهذا يهدف البحث إلى دراسة تأثير عدم الحمل، معدل كتلة الجسم ومكان الإقامة على كثافة العظام لدى السيدات من ٤٠ الى ٥٠ عام.

طريقة البحث:

هذه دراسة مقطعية، أقيمت في الفترة ما بين فبراير وأبريل من عام ٢٠١٨ بمستشفى الملك فهد بالمدينة المنورة. الدراسة شملت الدراسة ٢٧١ من السيدات اللاتي تبلغ أعمارهن بين ٤٠ و٥٠ عام ولديهن نتائج غير طبيعية في فحص الديكسا (أشعة تستخدم لقياس كثافة العظام). تم جمع البيانات عن طريق استبانات تحتوي على أسئلة عامة كالعمر والحالة الاجتماعية ومجموعة من المتغيرات مثل: مكان نقص كثافة العظم ومقداره، الطول والوزن وكذلك مكان الإقامة. تم جمع البيانات من المرضى أنفسهم عن طريق الهاتف ومن السجلات الطبية بعد أخذ الإذن وضمان سرية المعلومات.

النتائج:

أكثر الأماكن تأثرا بنقص كثافة العظام هي عظام الفقرات القطنية ب ٦٩,٧ ٪ قلة الكثافة و٢٢,٩ ٪ هشاشة العظام. هنالك ٤٦,١ ٪ من السيدات يعانين من الوزن الزائد و٥٣,١ ٪ يعانين من السمنة. هناك علاقة عكسية بين معدل كتلة الجسم

Conclusion: In women, BMI has an inverse relationship with BMD. Nulliparity has an inverse
relationship with right, but not with the left femur. There is no relation between
location of residency and BMD.

Keywords: body mass index, bone mineral density, DEXA, osteoporosis, risk factors

وكثافة العظام. ٧٨,٣ ٪ من السيدات لم يلدن. لا توجد علاقة بين كثافة العظام في الفقرات والفخذ الأيسر وعدم الولادة، لكن هنالك علاقية عكسية مع عظام الفخذ الأيسر. لا توجد علاقة بين كثافة العظام ومكان الإقامة.

الخلاصة:

هناك علاقة عكسية بين معدل كتلة الجسم وكثافة العظام. لا توجد علاقة بين كثافة العظام في الفقرات والفخذ الأيسر وعدم الولادة، لكن هنالك علاقة عكسية مع عظام الفخذ الأيسر. لا توجد علاقة بين كثافة العظام ومكان الإقامة.

Introduction

Low bone mineral density (BMD) represents a significant risk factor for osteoporosis and its associated fractures [1]. Over the past decade, osteoporosis has been considered a large-scale health issue by both the public and the medical profession [2]. Osteoporosis is a skeletal disease characterized by low BMD and microarchitectural deterioration of bone tissue, which leads to increase in bone fragility and its susceptibility to fractures [2,3]. osteopenia is the low grade which occurs before osteoporosis.

Bone tissue remodels itself continuously throughout life, through bone resorption and bone formation [4]. As we grow older, bone resorption exceeds bone formation. As a result, bones become osteopenic due to decrease in the stored calcium and minerals in the bones and makes them less dense, lighter in weight and more fragile [1].

Bone strength can be assessed by measuring the BMD. [1,5] Currently, dual-energy x-ray absorptiometry (DEXA) is used widely to measure BMD and is considered the gold standard [6]. This wide use has enabled specialists to assess BMD in many skeletal sites [7,8], a technique that is verified widely [7]

BMD is regulated mainly by genetics, but it is influenced by many environmental factors too, such as pregnancy, period of lactation, body mass, nutrition, physical activity, smoking, alcohol consumption, and Follicle Stimulating Hormone (FSH) deficiency. [3,8,9] Many studies have reported the significant variation in BMD levels by gender, age group, geographical area and ethnicity/race [1]. Values of BMD also differ widely between different local regions of one country or nearby countries, such as the Gulf States. [8]

Low BMD is a main public health problem around the world, but, in most of the Middle East countries, the epidemiology of osteoporosis is not well known yet. [1,5] Osteoporosis is also an important cause of fractures which may keep the person bedridden. In addition to be a major cause of fractures, osteoporosis is also an important cause of bedridden and its complications. These complications could be life-threatening specially among elderly people. [7]

Ito et al. reported that the maximum BMD among females is in the mid-30s, and then it tends to decrease with a particularly drastic decrease around menopause [10]. According to the WHO, osteoporosis is defined as a BMD that lies 2.5 standard deviations or more below the average value for young

healthy women (a T-score of <-2.5 SD) [7]. While, Osteopenia is defined as below normal bone density and the precursor to osteoporosis, with a T-score –1 to –2.5[11]. Based on global estimates around the world, there are about 200 million women have osteoporosis [12]. In the USA, osteoporosis affects about 30% of postmenopausal white women, and the ratio rises to 70% among the women over 80 years old [13]. While in Saudi Arabia, low BMD is a public health issue as AlQuaiz et al. (2014) reported that 58.6 % of Saudi women >40 years old have a low BMD [12].

Low BMD adversely affects the public health and country's economy in general due to the high medical cost. In addition, almost all previous osteoporosis studies focused on postmenopausal females and some focused on young females, or children [13,14]. Therefore, there is still a need to study risk factors related to osteoporosis among women aged 40-50 years, because women at this age are either at early menopause or not reaching menopause, so the hormonal effect will be minimal. Hence, this study aimed to evaluate the effect of nulliparity, body mass index (BMI), and residency on bone mineral density (BMD) in woman aged 40-50 years at king Fahad hospital in Al-Medina, Saudi Arabia.

Materials And Methods

Study design and setting:

A retrospective descriptive study was conducted in King Fahad hospital in Al-Madinah, KSA from February to April 2018.

Study population and sampling:

Women whose age was 40-50 years, who had abnormal DEXA scan wen visited King Fahd Hospital in Al-Madinah for a DEXA scan purpose between the first of January 2015 until the end of August 2017, as a new case or had a previous scan with an abnormal result, whether she had a complaint or not were selected for the study

Study tools:

Specialized questionnaire was designed for data collection. A pre- test was done for 50 persons and modifications was done by removing items that were hard to collect, and items that were not clear were revised. It covers the socio-demographic data, site of abnormality and its severity (osteoporosis or osteopenia) as well as the data needed to assess the risk factors of osteoporosis as nulliparity, BMI, residency, hormone levels, calcium level, previous Gastrointestinal (GI) surgery, medications, chronic diseases. Data were obtained from the patients' files and by contacting them through their mobile phones. BMI was calculated through equation: weight in kilograms divided by square of the person's height in meters. Ethical approval was obtained from King Fahad Hospital in Medina and from Taibah University. Consent was taken verbally after ensuring the confidentiality of data.

Statistical Analysis:

The Statistical Package for Social Studies (SPSS 22; IBM Corp., New York, NY, USA) was used for data analysis. Chi-square test was used for categorical data and the t-test was used for the quantitative data analysis and $p < 0.05$ was considered significant.

RESULTS

Table 1
participants distribution according to BMI, marital status, location, and null- parity

Variable		Frequency (n= 271)	%
Class of BMI	Normal (BMI <25 kg/) Overweight (BMI <30 kg/ Obese	2 125 144	0.7 46.1 53.1
		Frequency (n= 145)	%
Marital status	Married Single Divorced Widow	120 20 3 2	82.8 13.8 2.1 1.4
		Frequency (n= 245)	%
Residency	Urban Rural	218 27	89.0 11.0
		Frequency (n= 153)	Percentage %
Null parity	Yes	116	75.9
	No	37	24.1

The mean age of participants was 45.43 years (SD=2.879). The mean BMI of participants' is 30.43 Kg/m^2 (SD=5.614). Most participants were married (82.8%), live in urban area (89.0%) and null- parous (75.9%).
Table 1

Table (2) shows the participants' distribution according to the diagnosis based on DEXA done for the spine, right femur, and left femur, and shows that, the most affected area was spine with 69.7% osteopenia and 22.9% osteoporosis.

Table 2:
participants' distribution according to DEXA diagnosis for the spine, right femur, and left femur (n=271)

Variable		Frequency	Percentage
DEXA diagnosis for spine	osteoporosis	62	22.9
	osteopenia	189	69.7
	normal	20	7.4

DEXA diagnosis for right femur	osteoporosis	16	5.9
	osteopenia	86	31.7
	normal	169	62.4
DEXA diagnosis for left femur	osteoporosis	18	6.6
	osteopenia	99	36.5
	normal	154	56.8

Table 3: Participants distribution according to steroid use, chronic diseases, GI surgery, previous calcium level, parathyroid level, thyroid level, sex hormone level, and corticosteroid level (n=247)

Variable		Frequency	Percentage
Steroids use	No	2	0.8
	Yes	18	7.3
	None	227	91.9
Chronic diseases	IBD	1	0.4
	Kidney disease	5	2.0
	liver disease	3	1.2
	None	238	96.4
GI surgery	Yes	5	2.0
	No	242	98.0
Previous calcium level	High	2	0.8
	normal	93	37.7
	Low	3	1.2
	None	149	60.3
Parathyroid level	High	7	2.8
	normal	78	31.6
	Low	6	2.4
	None	156	63.2
	Missing	24	9.7
Thyroid level	High	4	1.6
	normal	87	35.2
	Low	34	13.8
	None	122	49.4
FSH hormone level	High	9	3.6
	normal	2	0.8
	Low	9	3.6
	None	227	91.9
Serum corticosteroid level	normal	12	4.9
	Low	2	0.81%
	None	233	94.33%

The participants' distribution according to steroids use, chronic diseases, GI surgery, previous calcium level, parathyroid level, thyroid level, FSH hormone level, and corticosteroid level is shown in table 3, and most of factors were not available for all patients and majority of them had no history of GI surgery (98.0%).

There is a relationship between DEXA diagnosis for spine, right femur and left femur and BMI, but there is no relationship between DEXA diagnosis and residency location or nulliparity (Table4).

Table 4
The relation between DEXA diagnosis and (BMI, residency, and nulliparity)

Variables		**BMI**			**Residency**		**Nulliparity**	
		over-weight	normal	obese	urban	rural	Yes	No
DEXA diagnosis for spine	osteoporosis	36	1	25	47	5	18	7
	osteopenia	79	0	110	153	21	83	20
	Normal	10	1	9	18	1	7	3
P-value		0.012			0.624		0.521	
DEXA diagnosis for right femur	osteoporosis	15	0	1	12	2	3	4
	osteopenia	51	1	34	72	5	26	11
	Normal	59	1	109	134	20	79	55
P-value		0.000			0.306		0.015	
DEXA diagnosis for left femur	osteoporosis	12	0	6	13	2	5	3
	osteopenia	54	2	43	86	5	37	12
	Normal	59	0	95	119	20	66	15
P-value		0.008			0.104		0.391	

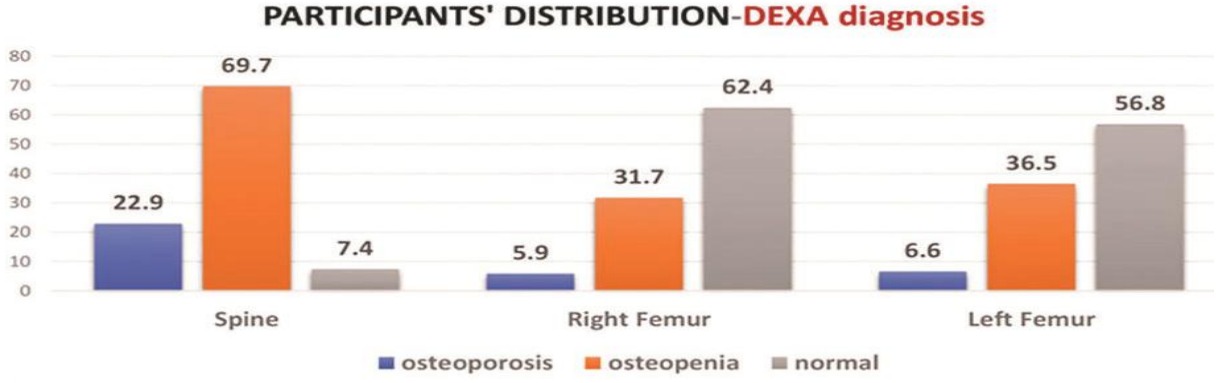

Figure 1. participants distribution for DEXA diagnosis

The current study showed that there is a high prevalence of osteoporosis and osteopenia among the women in the study population. The analysis of DEXA diagnosis for our participants revealed significant differences among measurements of spine and femurs (figure 1).

Discussion

This difference of BMD among different human body parts could be due to the variation of bone loss velocities between these different parts [16]. The presence of BMD differences between different body parts is one of the reasons for measuring BMD in several body sites, which can affect the diagnosis and therapeutic plan in an individual person [17].

In the present study, the BMD in the spine was less than the femurs. The spine had the highest prevalence of osteoporosis and osteopenia (22.9% and 69.7% respectively). Our findings here are consistent with Moayyeri et al., finding that lower BMD values were reported in the lumbar spine [17]. The literature showed that the vertebral fractures are the most common clinical manifestation of osteoporosis [16]. Otherwise, most of the etiologies of the secondary osteoporosis affect the spinal column first [18]. In general, the health status and history of our participants were not totally accessible due to change from paper record to electronic one, but we can say that there was no widespread prevalence of chronic diseases or previous surgeries among the participants.

High BMI is one of the strongest risk factors for osteoporosis [19]. Almost all participants in this study ranged from overweight to obese, our results here revealed an inverse relationship between BMD and BMI. Studies differed in their results regarding the relationship between BMD and BMI as some studies found that increased BMI reduces BMD [19,20], which is consistent with our results. While other studies have found that increased BMI increases BMD and thus reduces osteoporosis [21,22]. Differences in results can be explained by the fact that there is a negative genetic correlation between fat mass and weight-adjusted bone mass [19], so fat mass has a negative effect on bone mass in contrast with the positive effect of weight-bearing itself [23] Obesity, therefore, has negative effect on BMD [20].

Lifestyles particularly physical activity levels and dietary patterns generally vary between rural and urban areas. In the current study, most women (89%) were living in Urban areas. There is no relationship between BMD and location of residence. Since the study was in Saudi Arabia, which is a high-income country, our results here are consistent with Matsuzaki et al., study, which found that in some low and middle-income countries, BMD was higher in urban areas. While in high-income countries, the urban areas didn't show higher BMD [24]. While in Norway, Meyer et al., found higher BMD in rural areas compared with urban areas [25]. Also, In Thailand, Pongchaiyakul et al., found that BMD of the femoral neck was higher in rural men and women than their counterparts in urban areas [26]. This may be because the rural areas are usually having higher level of physical activity, high serum vitamin D level, and

lower levels of air pollution. The difference in the results between our study and these studies may be due to the difference of the target group in the studies in terms of age, gender, sample size and time of the study.

During pregnancy, the rise in bodyweight, multi-vitamin supplement and increasing estrogen hormone are thought to have positive effects on BMD. Otherwise, mothers' inability to compensate for the calcium loss with diet during pregnancy and lactation is thought to exert a negative effect on BMD [27]. So, differences appeared in the results of studies about the relationship between nulliparity and BMD. In the present study, about 75.9% of women were null-parous. Our results showed that there is no relationship between BMD in spine or left femur and nulliparity, but there is an inverse relationship between BMD in the right femur and nulliparity. Terzi et al.; Hillier et al. and Lenorav et al., found that there was no effect of nulliparity on the BMD among women [27,28]. While Cure-Cure et al., found that pregnancies appear to be a protective factor against the development of osteoporosis [29]. However, Ozdemir et al., findings indicate that the increased number of pregnancies and abortions and higher age at first pregnancy increases the risk of osteoporosis [30]. As well as, Gur, Ali et al., who found that among the group of 40-59-year women, the BMD of the spine in both the null-parous and one-to-two-parity groups was significantly higher than that of the more-than-five-parity group. No significant differences were found among the groups with respect to the BMD values at any femur sites [31].

The study revealed that bone mineral density (BMD) in the spine is less than femurs. The study showed that there is an inverse relationship between BMD and BMI. There is relationship between BMD on right femur and nulliparity, but not with left one. There is no relationship between BMD and residence of patients.

Limitations of the study

This study included only females aged 40-50, therefore the results cannot be generalized to males and females of other ages. Also, participants were selected from King Fahd Hospital in Al-Madinah only and may not be representative for the general population in Saudi Arabia.

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Review Article

Adaptive Leadership Among Nurses: A Qualitative Meta-Synthesis

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ABSTRACT

Background & Aims: With ever-changing innovations in health care, nurses need a proactive approach to patient care management from the perspectives of both patient and the health care team. Like any other allied health professions, nursing entails adaptive leadership approaches which judiciously explore the multifaceted aspects of management. This review explored the concept of how staff nurses and nurse managers utilize adaptive leadership behaviors in hospital and community settings.

Methods: A systematic review of literature was performed on nine electronic databases, namely, i) CINAHL, (ii) Medline, (iii) ProQuest: Nursing and Allied Health, (iv) DOAJ, (v) Springer, (vi) Wolters Kluwer, (vii) Taylor and Francis, (viii) Web of Science, and (ix) Google Scholar, with no year restrictions. English language and peer-reviewed journal articles were included. Joanna Briggs Institute Qualitative Assessment and Review Instrument (JBI-QARI) was used as a critical appraisal instrument to assess the articles for methodological validity.

Results: Nine research articles were selected for the review. There were three main themes generated in presenting nurse's adaptive leadership. This includes: leadership qualities, leadership challenges and leadership capacities.

Conclusion: The review findings provide valuable insights on the complex issues of how staff nurses and nurse managers utilize adaptive leadership behaviours in hospital and community settings.

Keywords: Adaptive leadership, Community, Hospital, Meta-synthesis, Nurse, Qualitative

الملخص

الخلفية والأهداف: مع الابتكارات المتغيرة باستمرار في مجال الرعاية الصحية ، يحتاج الممرضون إلى نهج استباقي لتقديم الرعاية للمرضى مع مراعاة وجهة نظر كل من المرضى وفريق الرعاية الصحية. و كأي مهنة من المهن الصحية المساندة ، فإن التمريض يتطلب أساليب قيادة تكيفيةحكيمة قادرة على الالمام بكافة جوانب الإدارة متعددة الأوجه.هذه المراجعةاسكشفت مفهوم كيفية استخدام الممرضون ومدراء التمريض لسلوكيات القيادة التكيفية في المستشفيات وفي مؤوسسات المجتمع..

المنهجية: تم إجراء مراجعة منهجية للأدب لتسع قواعد بيانات إلكترونية ، وهي: i) CINAHL, (ii) Medline, (iii) ProQuest: Nursing and Allied Health, (iv) DOAJ, (v) Springer, (vi) Wolters Kluwer, (vii) Taylor and Francis, (viii) Web of Science, and (ix) Google Scholar
للبحث عن مقالات وأبحاث منشورة باللغة الانجليزية وبمجلات محكمة وبدون وضع تحديد لسنوات النشر. تم استخدام أداة التقييم والتقييم المعيارية لجوانا بريجز (JBI-QARI) كأداة تقييم نقدية لتقييم المواد للتحقق من صحتها المنهجية.

النتائج: تم اختيار تسعة مقالات بحثية لمراجعتها. بينت المراجعة بأن هناك ثلاثة مواضيع رئيسية لتقديم القيادة التكيفية للممرضين. وشملت هذه المواضيع الصفات القيادية و تحديات القيادة والقدرات القيادية.

الخلاصة: قدمت نتائج المراجعة رؤى قيّمة حول القضايا المعقدة المتعلقة بكيفية استخدام الممرضين ومدراء التمريض لسلوكيات القيادة التكيفية في المستشفيات وفي مؤوسسات المجتمع.

الكلمات المفتاحية: القيادة التكيفية ، المجتمع ، المستشفى ، التلخيص التجميعي ، الممرضة ، النوعية

Introduction

The practice of adaptive leadership has been introduced as a more hands-on approach in identifying personal and organizational practices related to mobilizing organizations around adaptive challenges [1, 2]. It is the activity of mobilizing people to tackle tough challenges and thrive. The concept of thriving in nursing was brought by the stressful environment the nurses are dealing with. From long hours of providing care to patients and collaborative effort exerted from a multidisciplinary and culturally- diverse setting, nurses in all specialty areas [3] are very much exposed to emotional, mental and physical exhaustion. Like any other healthcare professions, up to 60% of nurses often feel that they are burned out [4]. Burnout is linked to absenteeism and lower job performance [5], and it has also been shown to partially explain turnover intention among nurses [6].

Recent technological advances change the way nurses deliver patient care [7]. With this, nurses adapt to the process of change as it is manifested for both patient and the nurse [8] and also requires to promote a continuing process of change for the patients' significant others [9]. With these advances and changes in nursing practice, nurses are often times faced with challenges. This notion of how nurses do their job amidst the challenges of advancement is clearly reflected on the unique function of a nurse [10]: "To assist the individual, sick or well, in the performance of those activities contributing to health or its recovery (or to peaceful death) that he (sic) would perform unaided if he had the necessary strength, will or knowledge and to do this in such a way as to help him gain independence as rapidly as possible" [10].

The current situation and future trends in nursing practice require nurses to respond and be prepared to the challenges which may affect the provision of quality care for patients and establishment of professional relationships. It was foreseen that the employment landscape will be affected by disruptive changes to business models over the coming years [11]. The challenges in adaptive leadership are presented in two separate aspects. One is technical challenge, in which problems can be defined and an expert can be found to solve it. The second is adaptive challenge, in which the problem cannot be solved by expertise alone. With the continuous change and increasing intricacies of health care, nurses need a proactive approach to patient care management. Adaptive leadership is presented as significant in nursing in judiciously analyzing the multifaceted problem- solving required within a dynamic health context [1]. Adaptive leadership in nursing collaborate with other disciplines and levels of experience to solve on challenging problems of the organization. Adaptive leadership is a collaborative effort of stakeholders to find the best solution on the challenge of the organization.

The success of effective nursing practice does not rely solely among nurses. This requires collaboration and coordination among members of the health care team, patients themselves and their families or rela-

tives. Mobilizing people to meet their adaptive challenges and allowing them to participate in finding solutions will build the organization's adaptive capacity.

In what follows, the researcher synthesized the concept of adaptive leadership in hospital and community settings, suggest ways it applies to the practice of nursing, explore how nurses utilize in hospital and community settings, and discuss the implications for nursing profession.

Despite of the evidence about adaptive leadership, there is dearth in the body of literature that presents the concepts of adaptive leadership to the practice of nursing. The researcher proposes that viewing the practice of nursing as adaptive leadership, as first suggested by Heifetz, promises to empower nurses and make progress on the challenges of nursing practice.

This systematic review aimed to identify, evaluate and integrate the evidences exploring concepts of adaptive leadership in nursing. More specifically: How staff nurses and nurse managers utilize adaptive leadership behaviors in hospital and community settings?

Methods

Study Design

This systematic review followed a priori protocol [12] based on Joanna Briggs Institute (JBI) Reviewers' Manual [13]. A mnemonic for qualitative reviews was developed to judiciously direct the structure and determine important aspects of the search. The focus was primarily the investigation of how staff nurses and nurse managers utilize adaptive leadership behaviors in hospital and community settings, which was reflected on the research question **(Table 1).**

Table 1. *Participant-Interest-Context (PICo)*

Type of participants (P)	Types of phenomena of interest (I)	Types of contexts (Co)
This review will investigate staff nurses and nurse managers in their practice.	This review will explore existing frameworks and practices of adaptive leadership in nursing.	This review will investigate nursing practice in hospital and community settings.

Data Sources

The literature search strategies using electronic databases were implemented to search for relevant literature on adaptive leadership [14]. Nine electronic databases were utilized, namely, i) CINAHL, (ii) Medline, (iii) ProQuest: Nursing and Allied Health, (iv) DOAJ, (v) Springer, (vi) Wolters Kluwer, (vii) Taylor and Francis, (viii) Web of Science, and (ix) Google Scholar. Keywords were identified using mesh terms. Keywords with truncation and Boolean logic used in all databases were listed in Table 2. Only those articles which explored the concept of adaptive leadership in nursing were included.

Table 2. *Systematic search terms referring to PICo*

Participants	Phenomenon of interest	Context
"nurse* OR staff nurse* OR hospital nurse*" AND "community health nurse* OR public health nurse*"	adaptive leadership* OR adaptive behavior*	"hospital unit* OR hospital setting*" AND "community setting* OR public health unit*"

Inclusion and exclusion criteria

Inclusion criteria include (a) no year restriction (with such criteria, this review attempts to cover the historical perspective of adaptive leadership in nursing), (b) English language, and (c) peer-reviewed journal articles. Exclusion criteria include articles in press, conference proceedings abstracts, irrelevant to research keywords, and unpublished manuscripts (abstracts or dissertations), non-English language, non-nurse participants, and editorial pieces.

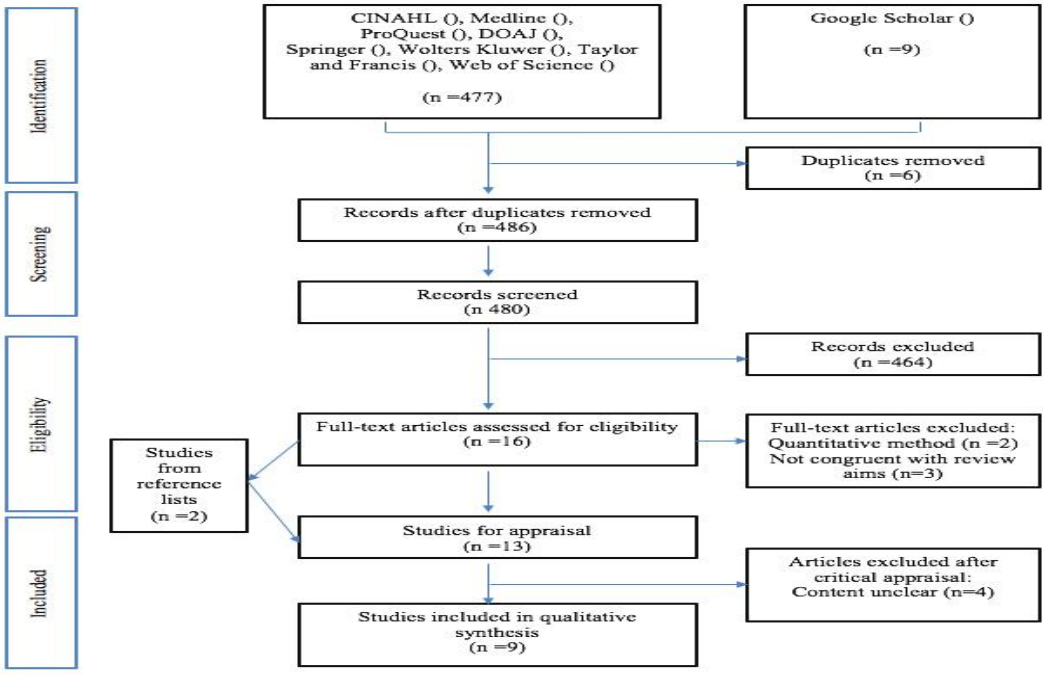
Critical Appraisal

The researcher together with two other reviewers assessed the articles for methodological validity. A consensus of all reviewers was established on which articles should proceed to the next phase of review using the Joanna Briggs Institute Qualitative Assessment and Review Instrument (JBI-QARI). It is a standardized critical appraisal instrument on which the reviewers need to answer 10 questions applying a four-point scale: yes, no, unclear, and not applicable [15]. The first two authors independently assessed the identified primary studies for validity prior to inclusion in the review using JBI-QARI. The disagreements that arose between the first and second author were resolved through discussion with the researcher.

Data Extraction and Synthesis

Abstracts of the articles were matched against the inclusion and exclusion criteria. A total of 486 articles were identified relevant. After retrieval of the full copies of these articles, sixteen articles met the inclusion criteria. Two of the sixteen articles were quantitative, and three were not congruent with the review aims. The reference lists of the sixteen articles were manually searched. The Saudi Digital Library was used for the manual search of relevant references from the sixteen articles. The search revealed two potential articles. After having read the abstracts and full texts, both articles fit the inclusion criteria, which resulted in thirteen articles. The flow diagram illustrating the search process of the identified relevant articles is presented in **Figure 1.** Guided by the Critical Appraisal, the researcher and two reviewers individually evaluated the thirteen articles using the JBI-QARI reviewer's matrix. Quotations from the participants and paraphrases by the authors were extracted following the JBI procedure for meta-synthesis [13]. Moreover, the researcher used a meta-aggregative approach to come up with themes from the identified findings.

Figure 1. ***PRISMA flowchart***



Results

After the articles were critically appraised, nine research articles were considered in the meta-synthesis due to relevance and appropriateness of method. Four articles were excluded because they pertain to curriculum development in the nursing graduate school and narratives of students on about their field experience in the community. Figure 1 shows the PRISMA flow diagram [16] in the selection of articles for inclusion in the .review

The nine included articles used case qualitative methodologies. Three were case studies [17-19], one used a qualitative descriptive approach [20], one used grounded theory approach [21], one used a framework model development [22], one used content analysis [23], one is a qualitative observational study [24], and one used a phenomenological approach [25]. The methods used in the nine studies were in-depth interviews; focus group discussions; intrinsic case study approach using journals, interviews, video-recorded team performance; and field notes observations. The participants involved were staff nurses, nurse managers and patients. The studies were conducted from 2013 to 2016 in five countries: USA, South Africa, Germany, Switzerland, and China. All articles were written and published in English language. A summary of studies included for the review was illustrated .in Table 3

Table 3. *Summary of studies that included for the review*

Author / Year / Country	Design	Aim of the study	Sample population	Data collection and analysis	Key findings
Funari et al. (2011) (USA)	Qualitative, descriptive	To determine specific education and developmental experiences that will assist in developing Army Nurse Corps (ANC) officers to become adaptive leaders.	Purposive sampling, ANC senior officers (n=15)	Questionnaire, theme development	Field experience and further education is necessary to develop leadership competency and adaptability. There is a need to include a new career pathway to ensure equal opportunity of advancement to leadership roles. Long-term health education and training program should be sustained to strengthen leadership capacities. An adaptive ANC leader is a clinical expert who can alter his leadership styles across organizational structures to achieve its mission. An adaptive leader is knowledgeable and possessed the ability to view problems as challenges in a holistic manner.
Xiao et al. (2004) (USA)	Qualitative, grounded theory approach	To describe the functions of team leadership and how do they vary according to task situations.	152 video segments from 18 trauma patient resuscitation cases	Video-recorded team performance, inductive analysis	The adaptive leadership was reflected among team members on various task situations such as when protocol is normal, task completed, change in status, resources inadequate etc. Six leadership functions were identified as follows: strategic planning, reporting plans, critiquing plans, coaching, maintaining awareness, and information requests.

Preece (2016) (South Africa)	Qualitative, comparative case study approach	To describe how adaptive leadership and asset-based development illuminate the community engagement process	3 case studies (disability rehabilitation projects)	Interviews, site visits, field notes observations, 'member checking', inductive analysis	The ultimate goal for adaptive leadership is not necessarily to promote change in any organizational sense, but to motivate people to take responsibility for decision-making and provide added value to existing activities. Multiple layers of communication hinder the adaptive capability of a leader and members during community engagement.
Raney (2014) (USA)	Qualitative, case study approach	To understand how a community mental health center cultivates organizational agility in adversity, using mindfulness and adaptive leadership to guide the provision of resources for all stakeholders.	1 case study (community mental health center experience)	Interviews, field notes observations, inductive analysis	Staff members practice self-care at work and feel they were included in all administrative actions such as those services for low-income clients. A critical element to establish a successful environment for clients is the administrator-clinician relationship. Adaptive leadership strengthens the practice of mindfulness. Adaptive leadership focuses on the present and encourage everyone to participate in a conversation about what is possible and that the outcome may be unknown. Adaptive leaders must have the highest level of competency to respond with empathy and support to each member's frustration.

Anderson et al. (2015) (USA)	Qualitative, framework model development	To describe how providers and patients/ families might collaborate to create shared meaning of symptoms and challenges to coproduce appropriate approaches to care.		Heifetz et al's Adaptive Leadership Framework	The goal of Adaptive Leadership Framework for Chronic Illness is to identify, in collaboration with patients, which challenges are technical and which are adaptive, and this requires understanding of shared meaning of the challenge and knowing the patient's adaptive capacities. Relationship development is an important aspect of adaptive leadership. Anyone on the collaborative team might assume the role of adaptive leader.
Adams (2013) (USA)	Qualitative, descriptive case study	To describe behaviors that providers used while interacting with family members facing the challenges of recognizing their loved ones was dying in the ICU.	Criterion sampling, family members (n=4), nurse (n=1), physician (n=1)	Interviews field notes, deductive content analysis, ATLAS.ti qualitative data analysis software system	Adaptive leadership behaviors include provide information, provide decision support, support realistic hope and address work avoidance. The application of adaptive leadership behaviors allows the family to be more prepared in facing adaptive challenges and to do their adaptive work. Healthcare professional's use of adaptive leadership techniques helps the family members of a dying patient in the ICU to develop a realistic understanding of the prognosis, expected outcomes, options and to make important decisions consistent with the patient and family goals.

Bogdanovic et al. (2015) (Germany & Switzerland)	Qualitative, content analysis	To explore the perceptions of surgical team members on the specific coordination behaviors and the need for adaptive coordination.	nurses (n=17) surgeons (n=16)	Interviews, qualitative content analysis, MaxQDA software	Coordination is the central key of adaptive behaviors. Task management involves adaptive coordination strategies such as planning, task distribution, prioritization, delegation, clarification of task, assistance and team and process monitoring. Information management in surgical setting refers to adaptive strategies of procedure and patient related information, situation assessment, team member information, and decision making. Teaching for clinicians involves adaptive strategies of explanation/ guidance, and balancing teaching and other tasks Leadership in a surgical setting involves adaptive strategies of defining each member's leadership role and changing of leader depending on patient's current situation. The adaptation to situational requirements is a strategy to prevent potential problems and critical incidents.

Corazzini et al. (2014) (USA)	Qualitative, observational study	To describe key adaptive challenges and leadership behaviors to implement culture change for person-directed care.	Convenience sampling, staff nurses (n=26), MD (n=6), nursing home administrators (n=9)	Focus group discussions, template organizing style with immersion/ crystallization	Six themes of facilitators and barriers were identified. These were relationships, standards and expectations, motivation and vision, workload, respect of personhood, and physical environment. Although some adaptive challenges appear to be readily addressed through technical solutions, also can be framed as adaptive challenges that require adaptive leadership. Recognizing the importance of adaptive challenges in implementing person-directed care is vital in developing necessary leadership practices for culture change.
Luo et al. (2016) (China)	Qualitative, phenomenology	To identify core competencies needed in the transition of nurse managers on the way to excellence	Purposeful sampling, nurse managers (n=12)	Tape-digital recorded, face-to-face, in-depth, open-ended guided interviews, Colaizzi's data analysis, NVivo 8	The initial step towards excellence is being adaptive. Nurse managers need to develop multifaceted competencies, specifically communication.

Meta-synthesis

A concept of how staff nurses and nurse managers utilize adaptive leadership in hospital and community settings. The meta-synthesis is presented under the three main themes comprising (1) leadership qualities, (2) leadership challenges, and (3) leadership capacities. The three themes had nine synthesized categories which were revealed from relevant themes (Figure 2). Illustrated in Figure 3 is the grouping of the findings into synthesized categories. Commonalities of theme were noted despite variances in the quality of the research. There is a frequency effect size [26] of 100% each for all of the three themes (Table 4).

Table 4. Effect size of themes

References	Themes		
	Leadership qualities	Leadership challenges	Leadership capacities
Funari et al. (2011)	x	X	X
Xiao et al. (2004)	x	X	X
Preece (2016)	x	X	X
Raney (2014)	x	X	X
Anderson et al. (2015)	x	X	X
Adams (2013)	x	X	X
Bogdanovic et al. (2015)	x	X	x
Corazzini et al. (2014)	x	X	x
Luo et al. (2016)	x	X	x
%	100	100	100

Figure 2. *The relationship between meta-synthesis, themes and categories in the review.*

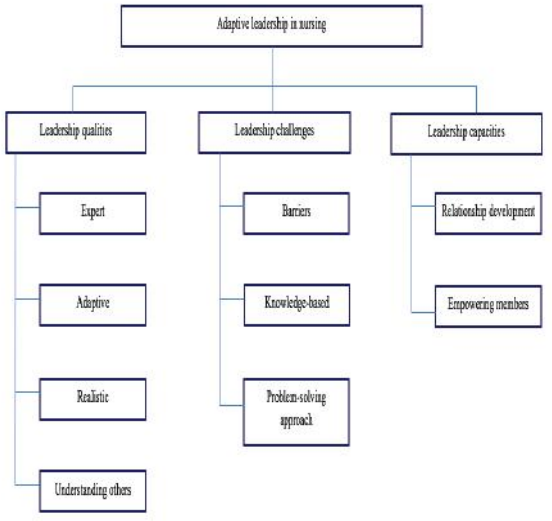


Figure 3. The meta-aggregative approach from grouping the study findings into categories, and synthesizing the categories into themes

Grouping the study findings into categories	**Synthesized categories**	**Themes**
Field experience Clinical expertise Career pathway Towards excellence	Expert	Leadership qualities
Ability to alter leadership styles Reflected when there is change in status Communication barrier	Adaptive	
Evident on normal protocol Support realistic hope Focused on present	Realistic	
Respond with empathy Understanding of shared meaning Collaborative Knowing patient's adaptive capacities Provide decision support	Understanding others	

Reflected when resources are inadequate Be more prepared in facing challenges Communication barrier Outcome may be unknown	Barriers	Leadership challenges
Holistically view problems as challenges Strengthen mindfulness Discusses possibilities Develop realistic understanding	Problem-solving approach	
Further education Knowledgeable Provide information	Knowledge-based	
Motivate people to take responsibility Encourage everyone to participate Encourage to develop relationship Assist in decision-making Coordination	Relationship development	Leadership empowering-capacities
Ownership Independent Seen when task completed Anyone can be a leader Address work avoidance	Effect on members	

Leadership Qualities

This theme originated from 15 grouped study findings [17-25] and four synthesized categories: expert, adaptive, realistic, understanding others. The theme illustrated that staff nurses and nurse managers possess adaptive leadership qualities such as being expert, adaptive, realistic and shows empathy among others.

There is a notable contrast between nurses with and without field experience [20]. All nurses with previous field experience cited the importance of skills and developing a relationship. Those nurses without field experience focused exclusively on clinical competency and technical skills. The work environment requires that nurses convey organizational citizenship, and a clear understanding of the mission. In addition, nurses as adaptive leaders should possess the competency of delivering the clinical skills [18]. However, any team member including patient and family might assume the roles of being an adaptive leader by understanding and identifying adaptive work and promoting adaptive change [22]. Whenever adaptive nurses face with new roles, they must have focused on adjusting themselves in strengthening their clinical knowledge and skills. Next, they built their professional credibility and role-modeling abilities [25]. Another adaptive leadership quality of nurses is being able to present information to patient and family on a clear, honest and in lay terms.

Providing the family with such a clear prognostic information allow families to un-

derstand the actual condition of their patient and to prepare themselves in making decisions about treatment. This makes the family view the problem on a more holistic manner. On the other hand, an adaptive nurse leader is a clinical expert and is very much aware of the responsibilities that the team members perform on various task situations [21]. Adaptive nurse leader should be a patient-advocate by providing sufficient information to patients; likewise, supportive to his team members by communicating clear information especially during technically challenging phases [23].

An adaptive nurse leader should know empathy that is, he carefully understands the situation of others. On a study conducted [17], the community felt they were given greater status because they were acknowledged. Relationships were acknowledged in terms of the quality of the nurse-patient encounter [24]. In establishing relationships, an adaptive leader must learn how to empathize with them. Moreover, respect of individuality is essential to prevent conflicts.

Leadership Challenges

This theme derived from 11 grouped study findings [17-25] and three synthesized categories: barriers, problem-solving approach, and knowledge-based.

This cumulative source of evidences presents two separate aspects of challenges in adaptive leadership. One is technical challenge, in which problems can be defined and an expert can be found to solve it. The second is adaptive challenge, in which the problem cannot be solved by expertise alone. The person who own this challenges is the one who must do the adaptive work [22].

Poor quality relationships among nurses were seen as adaptive challenge, this barrier cannot be addressed by the expertise of the manager. Rather, staff nurses describe the need for responsibility for one's peer.

Adaptive leadership addresses tensions of various perspectives. This is why organizations must consider to develop flexibility and resilience, including establishing crucial relationships with a wide variety of stakeholders [18]. On the other hand, adaptive nurses were able to sustain their leadership while performing either or both clinical and administrative roles. However, on a separate study, majority of senior officers felt that there should have 2 clearly defined developmental tracks for clinical and administrative [20]. Adaptive leadership was reflected among team members on various task situations such as when protocol is normal, task completed, change in status, and resources inadequate [21]; however, it always important the adaptive nurses promote a pleasant work atmosphere. Adaptive leadership behavior has an essential coordinative function because it is often focused on effective and efficient accomplishment [23].

On a study among family members in the ICU, some family members show avoidance when nurses engage them to do adaptive work because of their preoccupation of losing their ICU patients [19]. When this occur, adaptive nurses demonstrate support and hope through compassion, reframing hope, giving

time to process information, and assurance of adequate symptom management to support decision making and strengthen therapeutic relationship [19].

Leadership Capacities

This theme derived from 10 grouped study findings [17-25] and two synthesized categories: relationship development, and effect on members.

One of the authors [20] mentioned on their study the importance of developing relationship with the operational officers because it enhances the clinical competence for senior leadership roles. In establishing relationship, adaptive leaders look at what is happening and invite everyone into the conversation about the possible solutions to the problems at hand [18, 21]. The members of the team realized that they were the experts of the field when dealing with people labelled as deprived.

Discussion

This review aims to explore the concept of how staff nurses and nurse managers utilize adaptive leadership behaviors in hospital and community settings. Three main themes and nine sub-themes are discussed in this section.

First, staff nurses and nurse managers practicing adaptive leaders were described to possessed distinctive leadership qualities. Nurses were experts who focuses on clinical competency and technical skills [20, 21]. They convey a high level of awareness to the organization's mission and excellent clinical skills [18]. They have an intensive experience acquired through practice and education. Therefore, adaptive leadership among nurses is a continuous journey of nursing over time; it can be learned and developed through practice and education. An innovative management strategy can be developed to properly guide nursing students and novice nurses become adaptive leaders in the future. Whenever there's a need arise to promote adaptive change, nurses must focus on adjusting themselves in strengthening their clinical knowledge and skills [25]. Organizations should provide appropriate avenue for learning to accommodate such adaptive work. For example, hospitals may develop a mentorship program for novice nurses to improve their clinical competencies in practicing collaborative work among healthcare team. In this way, the process of learning adaptive leadership will be sustained because novice nurses can easily adjust to changes. Furthermore, adaptive nurses were realistic. They were patient-advocates and provide sufficient information to patients [23]. Thus, adaptive nurses do not offer false hope to patients and family members but only provide realistic information about one's clinical condition. In addition, an adaptive nurse carefully understands the situation of others. One of the authors mentioned [17], community members felt they were given greater status because they were acknowledged. Therefore, it is a very essential element in establishing nurse-client relationships. It is suggested that nursing students should thoroughly understand the meaning of empathy versus sympathy because this quality should be developed in the practice of professional nursing.

Second, this review supported that nurses may encounter barriers as they practice adaptive leadership. These barriers were presented in the literature in two aspects [22]. One is technical challenge, in which problems can be defined and an expert can be found to solve it. The second is adaptive challenge, in which the problem cannot be solved by the expert alone. The person who own this challenges is the one who must do the adaptive work. Carefully understanding the nature and aspect of the problem, nurses would know how to properly solve it. Organizations may provide training among nurses to address the need for this understanding. Furthermore, they may also utilize this knowledge during strategic planning and in managing workplace conflicts. Adaptive leadership addresses tensions of various perspectives and difficult situations [18]. Thus, adaptive nurses should involve stakeholders in finding appropriate solutions to various organizational issues. On the other hand, one of the major challenges adaptive nurses may encounter is on how they will be able to sustain their leadership while performing either of both clinical and administrative roles. Organizations should also consider nurses' exhaustive tasks and responsibilities which may lead to burnout and low job satisfaction. On the other note, clinical and technical knowledge are essential in planning for solutions to adaptive challenges in the organization. That is why, adaptive nurse leaders should be experts because they obtained the appropriate knowledge in the field of nursing.

Third, leadership capacities were notably evident in the practice of adaptive leadership. Developing relationship is crucial because it enhances the clinical competence for senior leadership roles [20]. This review also supported that adaptive leadership enhances relationship among superiors, peers and staff members. For example, chief nurses would have a more effective leadership command toward staff in the implementation of a particular program or during conflict resolution. Moreover, staff members should always be invited to involve themselves in the discussion of issues and communicate their ideas and concerns within the organization [18, 21]. Continuous mentorship program could be an effective strategy to help both the mentor and mentee for adaptive leadership roles. Mentees will be trained to become experts and become more adaptive in their leadership practice. Working with mentees such as novice nurses, mentors will be identified as experts and will further enhance their leadership capacities to sustain their adaptive work.

Conclusion

A meta-synthesis was developed: nurses utilizing adaptive leadership possessed distinctive qualities that can be learned and acquired over time. It is a continuous exploration in nursing which is directed towards enhancing clinical skills and knowledge to become experts and improve professional traits of becoming more adaptive, realistic and empathic. Thus, establishing professional relationship among superiors, peers and staff members is essential to develop these adaptive leadership traits. Using one's expertise

and knowledge were not being used to dictate what the organization needs. In finding for the most appropriate solution, adaptive nurse leaders were not the mere source of information to solve the problem. Instead, they facilitate collaboration and involvement of other members to come up with more concrete and inclusive solution. Adaptive nurse leaders use their expertise to assist the organization to properly solve the issues. Although there were leadership challenges along the way, adaptive nurse leaders still learn how to manage these problems by looking into its aspects, whether it is a technical or an adaptive challenge, and addressing this problem accordingly.

Moreover, this literature review provided substantive information about adaptive leadership as a knowledge-based practice. Adaptive nurse leaders should always abreast themselves with continuous training and education to enhance and update their knowledge. Thus, organizations should maintain their training programs for nurses to promote and sustain the practice of adaptive leadership. Furthermore, trainings should not only aim to update information or enhance skill sets of nurses but also to promote professional traits directed to their co-workers and clients.

Although concepts of adaptive leadership were presented, this met-synthesis suggested the need to critically explore the pathway of becoming an adaptive nurse leader. Understanding this picture will also help future researchers and leaders to address issues and challenges of utilizing adaptive leadership roles in their respective organizations.

Implications for Nursing Education

Schools of nursing and clinical training institutions should pay attention to students' understanding about the interrelation of continuous improvement of clinical competencies and professional traits to becoming an adaptive nurse leader. With the ever-changing innovations in the nursing practice, students should be taught to become more adaptive to these changes. Nursing education should also be directed towards developing of adaptive nurses who will acquire leadership qualities needed to employ capacities and sustain its beneficial effects on nurses and clients. When students valued the importance of adaptive leadership, they might maintain this trait as they transformed to become professional nurses. In this manner, there will be a continuous process and the pathway of becoming an adaptive leader will be sustained.

Furthermore, schools and institutes should ensure that their educational programs include this information about adaptive leadership and address the development of qualities necessary to become adaptive nurse leaders.

Implications for Practice Settings

An effective strategy to promote adaptive leadership in the practice setting is the mentorship program. Organizations benefit from this through training of staff nurses particularly novice nurses to improve their clinical competencies and leadership qualities. Working with mentees such as novice nurses, mentors will be identified as experts and will further enhance their leadership capacities to

sustain their adaptive work.

This meta-synthesis supported the idea of employing a professional staff development program which will provide continuous training programs for staff nurses to update their knowledge and enhance their leadership qualities. Nurse leaders such as supervisors and managers might use this meta-synthesis to effectively deal with their staff and clients without causing any further conflicts in the organization. Adaptive nurse leaders use their expertise and knowledge to facilitate collaborative efforts among staff nurses and clients.

Implications for Research

This meta-synthesis suggested the need to critically explore the pathway of becoming an adaptive nurse leader. Despite of the evidence about adaptive leadership, there is dearth in the body of literature that explains an adaptive leadership model in the nursing practice. Future research may also support additional information about leadership challenges and problem-solving approaches.

Limitation of the study

Despite the availability of relevant research articles, this meta-synthesis was limited to number of included studies and participants' practice settings. Although there is an extensive search strategy, some relevant studies may have been missed. However, the use of quality appraisal enhanced the assessment of available evidences. One of the strength is that the three reviewers reviewed each study independently.

Conflicts of interest statement

No conflicts of interest are declared on this systematic review.

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Review Article:

Nursing Students' Academic Performance and Success in Nursing Licensure Examination: A Narrative Literature Review

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Abstract

Background: Nursing licensure examination is considered a gold standard is fast becoming a minimum standard in clinical practice in the nursing profession. A comprehensive literature review facilitates the aggregation of diverse literature from a variety of contexts pertaining to nursing students' academic performance and its relation to success in nursing licensure examination.

Objectives: This review investigates nursing students' academic performance and its relation to success in nursing licensure examination.

Methods: CINAHL, Medline, Web of Science, ProQuest—Nursing and Allied Health Database, PubMed, and Science Direct Taylor & Francis databases were searched.

Results: All studies (n=15) were conducted in the United States. Two major themes were derived from the synthesis of the findings: (i) Nursing academic courses and their grades, (ii) Different types of test-taking assessment skills strategies. Conclusion: Nursing academic courses and their grades and different types of test-taking assessment skills strategies are significantly associated with the success of the nursing licensure examination. More research could deliver further suggestion for nursing programs to develop actions regarding different types of test-taking assessment skills strategies and academic progression policies. This could encourage graduates to pass the nursing licensure examination and improved safe quality nursing care. This review highlights the student's factors in success for NLE and increasing current effective actions for enhancing NLE readiness.

Key Words: academic performance; core graduation; exit examination; nursing licensure examination, nursing students

الملخص

خلفية: يعتبر فحص ترخيص التمريض معيارًا ذهبيًا يتحول بسرعة إلى الحد الأدنى من المعايير في الممارسة السريرية في مهنة التمريض. تسهل مراجعة الأدبيات الشاملة تجميع الأدب المتنوع من مجموعة متنوعة من السياقات المتعلقة بالأداء الأكاديمي لطلاب التمريض وعلاقته بالنجاح في امتحان ترخيص التمريض.

الأهداف: تبحث هذه المراجعة في الأداء الأكاديمي لطلاب التمريض وعلاقته بالنجاح في امتحان ترخيص التمريض.

الطريقة: تم البحث في قواعد بيانات CINAHL و Medline و Web of Science و ProQuest - قاعدة بيانات التمريض والصحة الحليفة و PubMed و Science Direct Taylor & Francis.

النتائج: أجريت جميع الدراسات (ن = ١٥) في الولايات المتحدة. تم استخلاص موضوعين رئيسيين من توليفة النتائج: (١) الدورات الأكاديمية للتمريض ودرجاتهم ، (٢) أنواع مختلفة من استراتيجيات مهارات التقييم في الاختبار.

الخلاصة: ترتبط الدورات الأكاديمية للتمريض ودرجاتها وأنواع مختلفة من استراتيجيات مهارات تقييم الاختبارات بشكل كبير بنجاح اختبار ترخيص التمريض. يمكن إجراء المزيد من البحوث تقديم اقتراح آخر لبرامج التمريض لتطوير الإجراءات المتعلقة بأنواع مختلفة من استراتيجيات مهارات التقييم أخذ الاختبار وسياسات التقدم الأكاديمي. هذا يمكن أن يشجع الخريجين على اجتياز امتحان ترخيص التمريض وتحسين جودة الرعاية التمريضية. هذا الاستعراض يسلط الضوء على عوامل الطالب في نجاح NLE وزيادة الإجراءات الفعالة الحالية لتعزيز استعداد NLE.

الكلمات الأساسية: الأداء الأكاديمي. التخرج الأساسية. امتحان الخروج امتحان ترخيص التمريض ، طلاب التمريض

Introduction

In recent years, there has been an increasing interest in student success in the nursing profession. This is critical for nursing schools in preparation for students for the nursing licensure examination (NLE). NLE is the final step prior to become an independently qualified nurse practitioner. 1 NLE preparation varies from country to country among nursing programs. This is vital in order to ensure that nursing students are well prepared for rendering patient quality care. 2 Several universities have taken a policy action for the standardized examinations to foresee NLE success. 3 In spite of utilizing the standard examination preparation, still several graduate nurses failed to pass the NLE on their first attempt. The reason for this is lack of preparation, lack of test-taking strategies, and poor study habits. students recognized that test-taking anxiety prevents them in passing the NLE. 4 In the same study mentioned failure in NLE affects test takers' confidence and hope of becoming a registered nurse (RN). Failure can lead to feelings of embarrassment, anxiousness and guilt realizing income at the level of an RN. Subsequently, the need to recognize the best predictors of successful student results and the educational policy strategies are crucial for nursing programs. Numerous studies have attempted to explain the reason why students failed in NLE. 5,6,7 For example, anxiety, student confidence level, Health Education Systems, Inc. (HESI) examination, affects their performance in NLE.6,7Given these factors, several preparation strategies are needed to facilitate NLE success. Although a number of studies have explored predictors in passing NLE, limited works demonstrated consistent over time.8,9,10 In addition, with the various variables and wide-ranging diversity of findings, it is challenging to conclude which predictors are greatest. Some studies have investigated the variances between students who passed the NLE for the first time and those who unsuccessful 4,11,12 but they were eventually unable to answer. Therefore, this study addressed this gap pertaining to factors that affect NLE performance among nursing students.

A comprehensive literature review facilitates the aggregation of diverse literature from a variety of contexts pertaining to Nursing students' academic performance and its relation to success in nursing licensure examination. As a result, this rising need to consider relevant research could provide nursing competency-evidence-based sound judgment in the development of strategies when nurses work in the clinical practice setting.

Methods

This narrative review provides a rigorous understanding of the Nursing students' academic performance and its relation to success in nursing licensure examination.

Search strategy

The literature search strategies using electronic databases were implemented to search for relevant literature on PA. 12 Six electronic databases were utilized, namely: CINAHL, Medline, Web of Science, ProQuest—Nursing and Allied Health Database,

PubMed, and Science Direct Taylor & Francis databases. Keywords were identified using a thesaurus of the searched databases and mesh terms. Keywords with truncation and Boolean logic used in all databases were as follows: 'Nursing students' or 'future nurses' AND 'academic performance' or 'academic success' or AND 'nursing licensure examination' or 'nursing board examination'. Inclusion criteria include (a) 2000-2017-year restriction (with such criteria, this review attempts to cover the contemporary perspective of nursing licensure performance during the past decade), (b) English language, and (c) peer-reviewed journal articles.

Search outcomes

A comprehensive search review nursing students' academic performance and its relation to success in nursing licensure examination based on the inclusion and exclusion criteria was conducted. A total of 179 articles from the title were identified as relevant. After reading the abstract, 83 were included from the study. Then, after reading the complete text article versions, a total of 23 articles were judged to meet the criteria. Finally, a total of 15 articles for the final inclusion of articles. The flow diagram illustrating the search process of the identified relevant articles is presented in Figure 1.

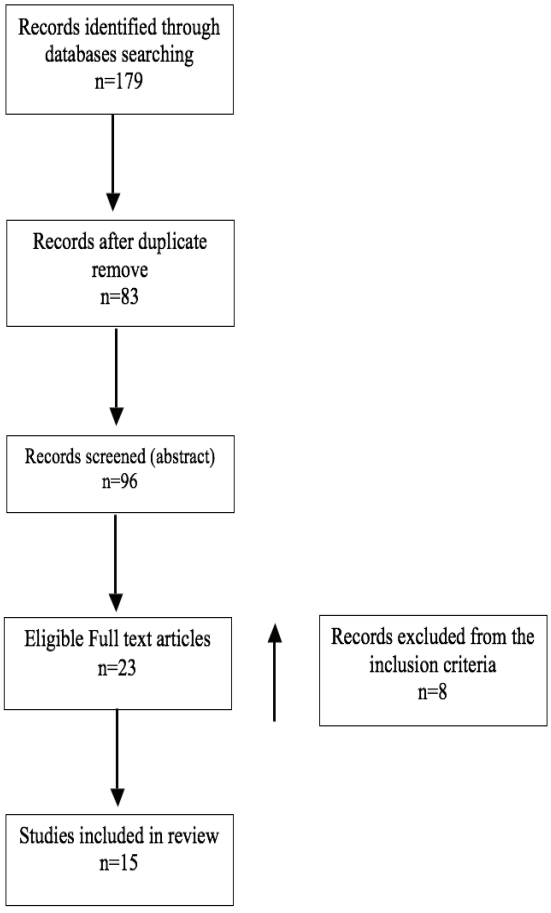

Figure 1: Flow diagram illustrating the selection of studies to explore the Nursing students' academic performance and success in nursing licensure examination.

Quality appraisal and data synthesis

Each article was appraised for methodological validity review using a critical appraisal checklist.13, 14 Further, the author performed data extraction and data analysis. However, due to the nature of research objectives, diverse sample, data collection method, results were not synthesized statistically. As an alternative, the results were organized in a tabular manner that demonstrated the features of the studies (author/year/country, design, study aim, sample population, data collection and analysis, and key findings), so that it will make sense of the reviewed evidence, (see Table 1). After which, literature analysis

was guided using a thematic approach.15This approach analyzed the patterns and consistencies of substantive themes generated. two major themes were derived from the synthesis of the findings: (i) Nursing academic courses and their grades, (ii) Different types of test-taking assessment skills strategies.

Table 1: Summary of selected studies

Author/year/ country	Design	Aim of the study	Sample population	Data collection and analysis	Key findings
Bosch et al. [8]	Quantitative	To examine the association between five different features of freshmen students and their later success in NCLEX-RN exams.	Purposive sampling (Group 1 n=27; Group 2 n=23; Group 3 n=21 students).	Institutional data (January 2003-December 2007) Logistic regression	The higher the student's GPA score, the higher chance to pass the Nursing licensure examination
Crow et al.[9]	Quantitative, Cross sectional	To identify specific requirements and educational intervention that might impact NCLEX_RN success and to determine its predictor	A convenience sample (n=206)	Non-standardized Questionnaire Non-parametric test	Factors affecting NCLEX passing rates: (1) Standardized entrance examination score and Scholastic Aptitude Test (SAT) scores during admission criteria, (2) Clinical practice proficiency and exit examinations score as part of graduation requirements, (3) nursing reviews
Hinderer et al.[10]	Retrospective descriptive,	To discover the association between the Health Education Systems, Inc. (HESI) Admission Assessment (A2), preadmission grade point average (GPA), and nursing GPA into the NCLEX performance	A baccalaureate nursing program during the period 2008–2010. (n=89)	Department records. Inferential statistical analyses	No significant association between preadmission, exit examination, and GPA
Homard [21]	Quantitative, ex post facto correlational	To match the exit examination grade scores towards NCLEX-RN success	Purposive sampling (N = 269)	HESI Exit Exam	standardized test examination test taking strategies is associated to higher exit examination scores and higher NCLEX-RN passing rates
Horton et al. [16]	Quantitative, descriptive,	To evaluate the success of an remediation study on the NCLEX-RN first time takers	Convenience sample, (n1=41;n2=51)	Total curriculum support (TCS) from MEDS Publishing for remediation and tutorials t test Logistic regression	Remediation classes and academic courses (e.g., medical–surgical course) is associated to NCLEX-RN passing rate
Kaddoura [11]	Retrospective ex post facto, descriptive, correlational	To assess the association between the Critical thinking (CT) skills and NCLEX-RN success.	Convenience sample, Students who graduated from 2007 - 2009, (n = 110)	Nursing school records t-test logistic regression	Entry and exit assessment score is associated NCLEX-RN pass rate.

Lauer & Yoho [22]	Quantitative, descriptive	To compare the mean HESI Exit Exam (E2) scores of student who attended review with students who did not attended schools	Convenience sample, September 1, 2007, and August 31, 2008 (n=3,758)	Eighth Validity Study Questionnaire t test	Examination scores were significantly is significantly related to NCLEX-RN pass rate.
Lockie et al.[17]	Quantitative, descriptive	To examine the relationship between students' demographic and academic variables towards performance on the NCLEX-RN	Purposive sample (n= 197)	Questionnaire two-sample t tests, chi-square	Student's learning style and chemistry grade is associated to NCLEX-RN
McCarthy et al.3	Quantitative, retrospective	To assess the relationship between NCLEX-RN pass rates to their prenursing academic aptitude variables	All nursing students academic years 2009–2010 and 2010–2011(n= 794)	TEAS preadmission test, Multiple linear regression analysis, logistic regression	Assessment Technologies Institute scores is significantly NCLEXRN pass rates.
Newton & Moore [4]	Quantitative, descriptive	To assess the associations between nursing aptitude test, BSN student attrition grade, scholastic aptitude, and student readiness for the NCLEX-RN.	All first semester nursing students during SY 2004 (n=107)	Institution's prenursing database, Logistic regression	nursing aptitude test, BSN student attrition grade, scholastic aptitude is associated to NCLEX-RN
Romeo [18]	Quantitative, ex post facto	To examine the students' GPA, SAT score in towards NCLEX-RN.	A convenience sample of the records of two-year nursing program From 2005 to 2007,(n=182)	Assessment test composite score, Logistic regression analysis	Students' nursing GPA and standardized assessment examination score predict NCLEX-RN success
Schooley|& Kuhn [19]	Quantitative	To examine the association between course grades, HESI test results towards NCLEX-RN passing rate	A convenience sample from SY 2007 -2010, (n=306)	HESI scores Students' academic records, ANOVA	Examination test scores is associated of NCLEX-RN passing rates. • General education courses affect Examination test scores
Spurlock & Hunt [23]	Quantitative, Retrospective descriptive	To identity reason on why the actual NCLEX-RN pass rate towards the nursing program.	Graduating Student records January 2004 to July 2005(n=179)	Students' names, Health Education Systems, Inc. (HESI) Exit Exam scores Logistic regression, ANOVA	Clinically focused on standardized examination evaluates students' readiness to graduate
Dorris Todd et al.[24]	Quantitative, single-group pre-test/post-test	To assess the Kaplan educational modules for NCLEXRN preparation, towards student's readiness	Purposive sample (n=15)	Questionnaire t-tests	review class and readiness testing examination was felt to be a viable strategy to help with NCLEX-RN success
Trofino [20]	Quantitative, descriptive	To examine the program criteria towards NCLEX-RN students first time takers	Convenience sample,(n=99)	Pre-entrance test, nursing program courses, Logistic regression	The preadmission examination score in nursing courses is associated to NCLEX-RN passing rate.

Results

Nursing academic courses and their grades

Six studies included academic nursing courses predicts success in nursing board examination.8,16,17,18,19,20 Three of these were related to high GPA.8,17,18 Bosch8 explored the association between five different features of entering students in the bachelor's program and success in National Council Licensure Examination-Registered Nurse (NCLEX-RN) exams. Romeo18 found that higher GPAs investigated the nursing GPA, and remediation exercise examination score was significantly related to a higher passing NCLEX-RN percentage. Lockie 17 examined the association between students' demographic profile towards NCLEX-RN performance and found that academic courses and student learning style can predict board examination. Meanwhile, three separate quantitative studies in the US16,19,20 that explored the success of remediation on NCLEX-RN passing rates. These studies found that remediation and student's medical-surgical course score predicts NCLEX-RN passing rate.

Different types of test taking assessment skills strategies

Several studies highlighted the different types of test-taking assessment skills strategies to pass the national board examination.2,3,12,16,17,18,19,20,21,22,23,24 Crow9 cited that entrance exam and aptitude test during admission, exit examination and subjects' reviews determine the NCLEX_RN success. Six separate studies conducted in the US 12,18,19,21-23 found that test examination and higher exit examination grade predicts NLE success. Two separate studies McCarthy et al. 3 revealed that aptitude nor nursing aptitude was NCLEX-RN pass rates.

Discussion

This study aims to provide a rigorous understanding of the Nursing students' academic performance and its relation to success in nursing licensure examination. This review provides evidence on the student's success in nursing licensure examination. All studies (n=15) were conducted in the US. Two significant themes are generated from this study.

First, nursing academic courses and their grades are significantly associated with NCLEX. Seven studies 8,16,17,18,19,20 revealed that high-grade point average (GPA) of academic courses. The lack of academic preparedness and lower GPA grade is frequently mentioned as a vital challenge of nursing student facing less successful in nursing programs.8 Specifically, the success of the NCLEX-RN exam is considerably connected to pre-GPA ($p = 0.025$). 7,17

Horton et al.;16 Schooley\& Kuhn;19 described an association between NCLEX-RN passing rate with fundamental academic courses with nursing students. The chances of NCLEX-RN passing rate are lower if a student repeats the fundamental nursing course.19 Hence, poor grade performance on the fundamentals courses directs for early administrative.

Next, nursing GPA is an indicator of a student's performance which positively af-

fects NLE over time. The higher GPA score the higher NCLEX-RN outcomes.16,18, 19,24 This is similar to findings of one study that students with grades C or D below have a lower chance of passing the NCLEX-RN. 3 Therefore, GPA is an essential aspect for NLE passing score. However, limitations should be acknowledged and considered when utilizing the findings of the three studies, which only focused on one institution, a self-reported interview, and used convenient sampling. These factors limited the generalizability of the results.

Second, nursing education institutions are constantly striving for different types of test-taking assessment skills strategies in preparation for future qualified nurses. The success of the exit examination predicts NCLEX-RN success has been revealed in several types of research of NCLEX-RN examinees. 18,19, 24 Three studies Crow et al., 9 Homard, 21 Kaddoura, 11 have reported in evaluating student learning skills during the nursing program is required because of speedy variations in health care practice, which mandate parallel revision in nursing education to improved student's clinical performance in NLE scores.19,23,24 This implies that discussing the learning styles during the first year must be measured in the earlier nursing courses. Hence, faculty and administrators need to recognize different learning style which supports students in understanding how they learn.

HESI evaluates students' readiness to take the NCLEX-RN. 21, 22,23,24 These frequent test examinations may offer an instant response, including rationales material for recognised weakness area (HESI). 17,21,23 Nevertheless, findings of these three studies should be interpreted carefully, given that the local of the study is in the US setting. Thus, future research should study other countries components in a bigger sample population.

Conclusion

The main challenge for nursing education programs is to produce graduates who are successful in the NLE. This review highlights the student's factors in success for NLE and increasing current effective actions for improving NLE readiness. Nursing academic courses and their grades and different types of test-taking assessment skills strategies are significantly associated with the success of NLE. More research could deliver further suggestion for nursing programs to develop an action regarding different types of test-taking assessment skills strategies and academic progression policies. Therefore, in turn, could encourage graduates to improved safe quality nursing care based on the success of NLE.

Summary implication

The study findings can be used as a guide in establishing commercially available measurement tools, and monitoring students' nursing GPA are readily available methods. Students found to be lower GPA grade in each course can be offered timely remediation in weak areas. Remediation should contain exercises patterned by NLE preparatory programs and directed towards teaching strategies in the classroom and clinical setting. Also, mentor-

ing courses for students who perform poorly in academic courses in order to improve test-taking skills and study habits. Effective learning program outcomes, academicians could have incorporated a diverse of teaching approaches depending on their teaching styles. Finally, study result could enlighten nurse academicians to influence curriculum revision and guide future decisions anchored in the NLE concepts.

Key Point Box

In recent years, there has been an increasing interest in student success in the nursing profession.

Different types of test-taking assessment skills strategies predict nursing licensure examination

The higher the student's GPA score, the higher the chance to pass the nursing licensure examination

The study findings can be used as a guide in establishing commercially available measurement tools and monitoring students' nursing GPA are readily available methods.

Mentoring courses for students who perform poorly in academic courses in order to improve test-taking skills and study habits Two major themes were derived from the synthesis of the findings: (i) Nursing academic courses and their grades, (ii) Different types of test taking assessment skills strategies.

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Conflicts Of Interest

The author declare that there are no conflicts of interest.

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Case Report:

Multidisciplinary Approach To Treat A True Combined Perio- Endo Lesion

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Abstract

The merging of periodontal and endodontic disease has created much confusion amongst most of the dental practitioners regarding the diagnosis and its treatment plan. More than 50% of tooth mortality faced in the present scenario includes both Pulpal and Periodontal problems.

Severe periodontal disease would result in destruction of supporting tissue further bringing down the prognosis of a true combined lesion to poor (or) even hopeless. This paper highlights on a case of a lingually inclined tooth with a combined perio-endo lesion, which has been treated using both endodontic and periodontic measures. Successful management of such problems depends on patient compliance, possibility of tooth restoration and cost effectiveness together favoring in proper treatment planning.

Key words - Periodontic – Endodontic Lesion, Healiguide, Periobone-G, Plasma rich – derivative, Free gingival graft.

نبذة مختصرة

أدى دمج أمراض اللثة وأمراض عصب الأسنان إلى حدوث الكثير من الالتباس بين معظم أطباء الأسنان فيما يتعلق بالتشخيص وخطة العلاج. أكثر من ٥٠ ٪ من خسارة الأسنان يكون سببها مشاكل في العصب السني واللثة.

من شأن أمراض الأنسجة المحيطة بالأسنان الحادة أن تؤدي إلى تدمير الأنسجة الداعمة مما ينتج عنه مزيد من الانخفاض في نجاح علاج امراض اللثة وعصب الأسنان المشتركة أو حتى الى ان تكون ميؤوس منها. تسلط هذه الورقة الضوء على حالة السن مائل الى الجهة اللسانية مع آفة لثوية ولبية مشتركة ، والتي تمت معالجتها باستخدام تدابير لبية ولثوية. تعتمد المعالجة الناجحة لمثل هذه المشكلات على امتثال المريض للخطة العلاجية وإمكانية ترميم الأسنان وفعاليتها في الحصول على نتيجة جيدة وسليمة للخطة العلاجية.

الكلمات المفتاحية: لثوي, افة ذروية, طعوم عظمية, .زرعة لثوية منفصلة

Background:

The merging of periodontal and endodontic disease has created much confusion amongst most of the dental practioners regarding the diagnosis and its treatment plan. More than 50% of tooth mortality faced in the present clinical cases today manifest both Pulpal and Periodontal problems [1].

Simring and Goldberg in 1964[2] were the first to describe the relationship between periodontal and pulpal disease. From then onwards the term "perio-endo lesion" was used to explain the lesions with varying severity of inflammation found in both periodontal and pulpal tissues [2].

Inflammation and pulpal necrosis are initiated by dental caries, faulty restoration, iatrogenic trauma caused due to irritation of pulpal irrigants used and thermal stimulation. As the root canal system is a low compliance system, an increased intrapulpal pressure may cause toxic agents to be expressed through

patent canals and dentinal tubules which can result in retrograde periodontitis. Abscess formation follows periodontal inflammation which spreads through the connecting pathways between the pulp and periodontium. The abscess may drain through a fistula resulting in destruction of the periodontal ligament and adjacent alveolar bone involving the entire root of the tooth involved. Periodontal occlusal trauma may cause pulp ischemia, especially in teeth with greatly reduced periodontal support [3, 4].

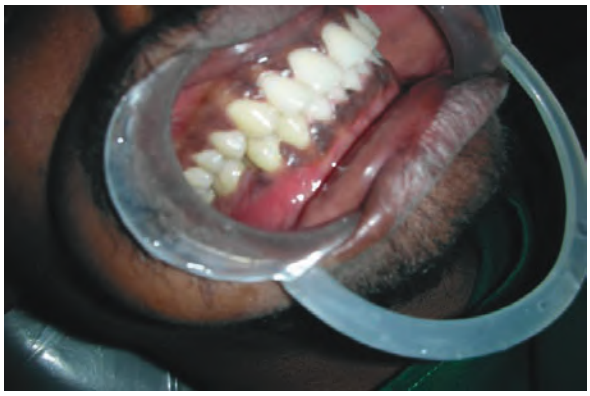
Mostly the tooth with a true-combined lesion with severe periodontal destruction will have a poor or hopeless prognosis. The prognosis of tooth with severe periodontal destruction can be improved by regenerating the damaged periodontal tissue including periodontal ligament, cementum and the alveolar bone which can be achieved by bone grafts and guided tissue regeneration membrane [4].

This paper highlights on a case report on a tooth with a combined lesion which has been treated using both endodontic and periodontic measures. The case was treated endodontically followed by periodontal treatment using bone graft, and guided tissue regeneration membrane. Further a second stage surgical procedure was attempted with platelet rich fibrin and gingival graft to widen the keratinized gingiva.

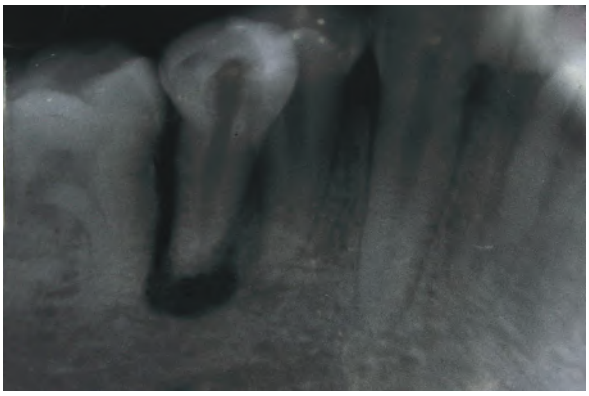
Case Report:

A 25 year old male patient was referred to Periodontics department, Meenakshi Ammal Dental College from the Department of Oral Medicine and diagnosis. The patient complained of excruciating pain and swelling in relation to lower right posterior region. The patient reported with a history of fall from his bike four days before he reported to the clinic. Past dental history of the patient indicated that the patient experienced dull pain in relation lower right posterior region before and did not consult any dentist for the past four months. The patient noticed mobility in relation to 45 after the accident.

Palpation of attached gingiva revealed pain and inflammation with expulsion of pus through gingival sulcus in relation to 45. (Fig.1). An abnormal painful response to percussion on 45 indicated the inflammation of periodontal ligament which could be of pulpal or periodontal origin. The tooth was lingually inclined and presented with plaque and calculus. Cold test using ice sticks were performed to check the pulp vitality which indicated no response and the results were confirmed using pulse oximeter[3], hence the pulp of 45 was considered to be non-vital.



A



B

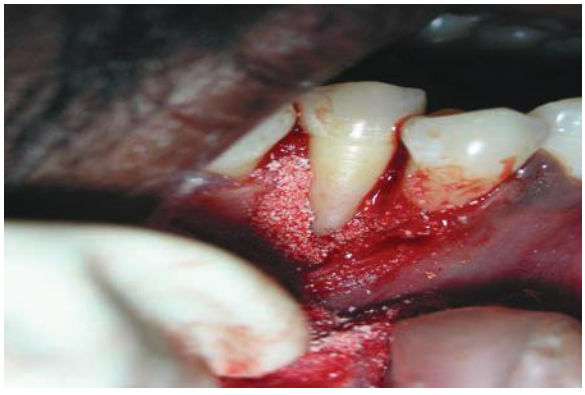
Fig.1

(A) Intraoral swelling in relation to 45. (B) Intraoral periapical radiograph in relation to 45

Periodontal examination in relation to 45 revealed a pocket depth of 7mm, clinical attachment loss of 10 mm and Grade II mobility. Radiographically, a vertical defect extending till the apex was found in relation to the distal aspect of 45. The case was diagnosed as combined perio – endo lesion with acute periodontal abscess in relation to lower right second premolar tooth.

Following the drainage of the periodontal abscess, the patient was advised to take antibiotics and analgesics. The tooth 45 was temporarily splinted and referred to the Department of Endodontics for endodontic therapy. [5] Patient was recalled after a week and complete scaling and root planning was initiated.

Periodontal examination after a month revealed a pocket depth of 5mm and clinical attachment loss of 8 mm in relation to 45 .Surgical management of intrabony defect was attempted using bone graft [6,7] and guided tissue regeneration(GTR) membrane [8]. Full thickness mucoperiosteal flap was reflected using horizontal sulcular incision and two vertical releasing incisions extending beyond mucogingival junction along the 44 and 46. Root debridement was done in relation to 45 followed by placement of porous hydroxyapatite bonegraft (periobone G) and bioresorbable GTR membrane (Healiguide). (Fig. 2)



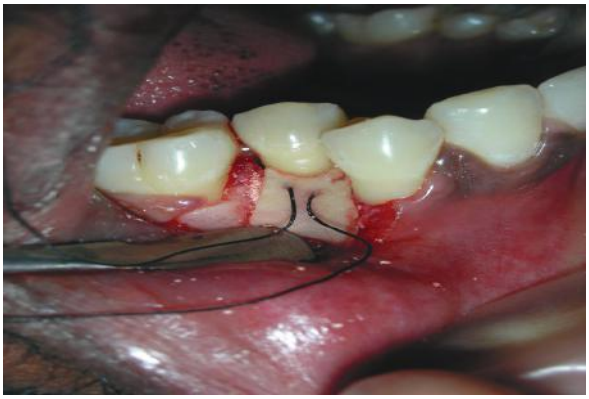


Fig.2 A B

(A) Placement of periobone G (alloplastic bone graft) in relation to 45. (B) Guided tissue regeneration membrane (Healiguide) in 45

Periobone G is synthetic hydroxyapatite (Periobone G, top- notch health care products pvt. Ltd, kerala) it is biocompatible and osteoconductive bone repair material. This was followed by placement of guided tissue regeneration membrane [9,10] (Healiguide, Advanced Biotech Products Pvt Ltd, Chennai).

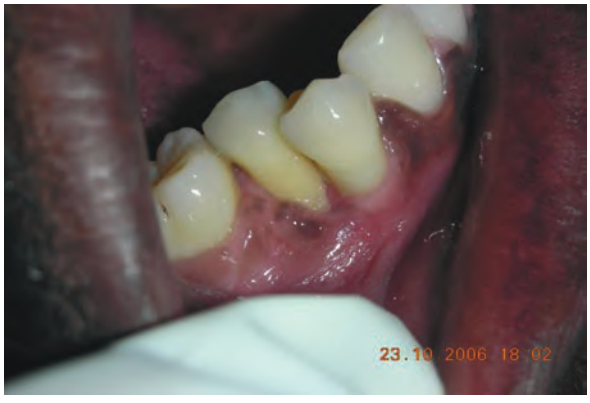
A thin type I collagen based membrane, Healiguide was used for guided tissue regeneration procedure, to enhance the formation of new alveolar bone. Resorbable ethicon suture was used to stabilize the membrane which was followed by placement of non resorbable ethicon suture, for the closure of the flap. The surgical site was protected using periodontal pack. Patient was given post operative instructions, and 0.12% chlorhexidine rinse was advised as home oral care regimen for two weeks. After two weeks the sutures were removed and healing was found to be adequate.

Periapical radiographs taken at 4 month after placement of bone grafts , revealed bone fill in relation to 45 (Fig. 3) but the recession was left uncovered as the tooth was lingually inclined. The width of the attached gingiva in relation to 44 and 45 was also insufficient for coronal advancement of the flap. The periodontal pocket depth was reduced to 3mm and the clinical attachment loss was found to be 6mm in relation to 45.

A) Postoperative clinical presentation after 4 months. (B) Post-operative radiograph after 4 months shows adequate bone fill

After 4 months of initial surgery, second surgical attempt was planned to increase the width of the attached gingiva by using a free gingival graft with plasma rich derivative (PRF) [11].

Prior to the surgery, PRF was obtained by centrifugation of the patient's whole blood [12]. The recipient site was prepared first by de-epithelization of the area of 44 and 45 regions. Free gingival graft was obtained from the palatal aspect of 24 and 25 regions. The prepared PRF membrane, (Fig 4) followed by free gingival graft were placed and stabilized



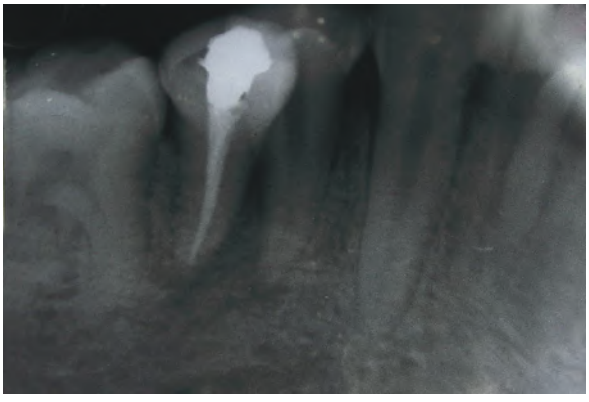
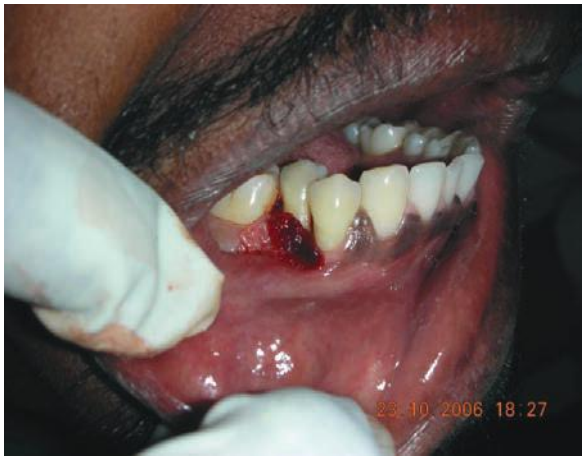


Fig. A B

in relation to 45 followed by placement of Coe-pac. Patient was recalled after two weeks and it was found that along with the increase in width of the attached gingiva, root coverage of 2mm was achieved.

(A) Second stage surgery-Plasma rich derivative placed in 45. (B) Postoperative healing after 1 month shows increased width of keratinized tissue

The treatment was successfully completed by giving a full ceramic crown restoration, in alignment with the adjacent teeth after 8 months of initial surgical procedure. (Fig.5.A) Radiographically, adequate bone fill on the distal aspect of 45 was noted after eight months. (Fig.5.B)



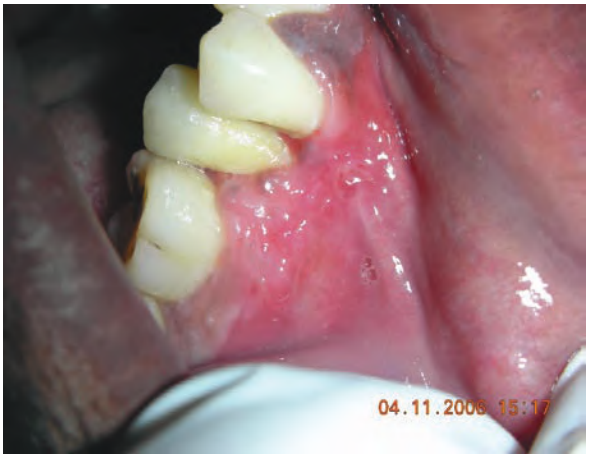
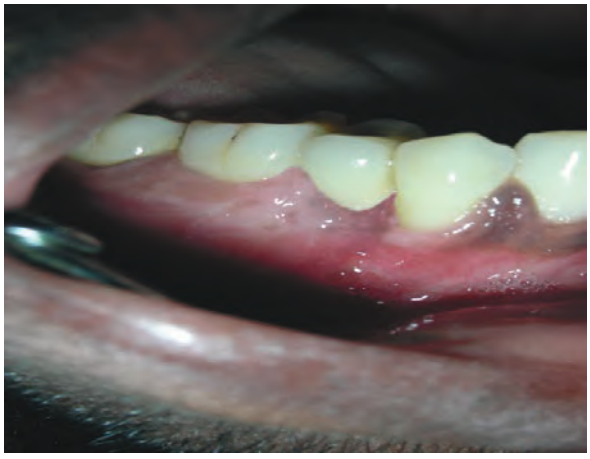


Fig.4. **A** **B**



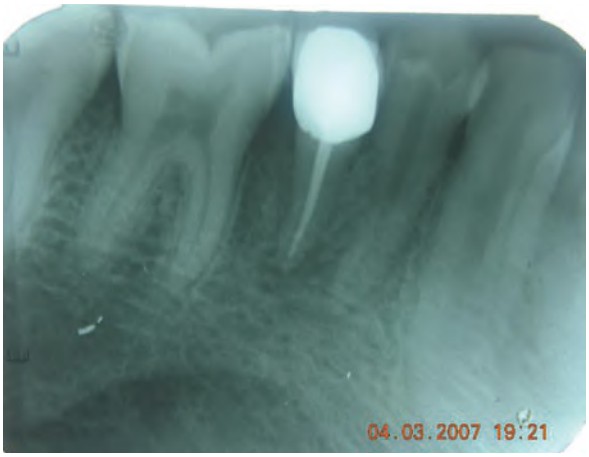


Fig.5. **A** **B**

*(*A) Full ceramic crown placed in relation to 45. (B) Post treatment radiograph after 8 months

Discussion

Various factors contribute in healing following periodontal therapy, like post-operative oral hygiene and effective treatment method. Recent studies have demonstrated that infection of root canal can have a negative influence on the healing of periodontal tissues [13]. Studies comparing the effect of scaling and root planing on teeth with periapical lesions and without periapical lesions demonstrated a significant reduction of probing depth overtime in cases without periapical compared to teeth with periapical infection. This clearly suggests that root canal can serve as a bacterial reservoir, maintaining periapical inflammation further favoring marginal inflammation [14].

In this case, it was seen that the outcome of endodontic treatment followed by flap surgery along with bone regeneration therapy, could reduce the grade II mobility in 45 to less than grade l. There was a reduction in the probing depth from 7mm to 3 mm. The biological principle proposed by Melcher et al on the use of guided tissue membrane was based upon the use of mechanical barriers to prevent the unwanted cells and allowing the selective periodontal ligament cells to re-populate on the root surface [10]. Healiguide (guided tissue regeneration membrane)[9] was used in the present study along with porous hydroxyapatite (Periobone-G)[6] for periodontal regeneration. For regenerating an infrabony defect, the space between the root surface and the GTR membrane has to be filled with a blood clot further allowing the migration of periodontal ligament cells into the wound area from the residual ligament [7].

In this present case, during the second stage surgery, an attempt was made to cover the gingival recession. A Platelet–rich derivative (PRF) was used along with free gingival graft to cover gingival recession and to increase the width of the attached gingiva [9]. Study done by Okuda K et al in 2003, demonstrated that fibrin-rich clot , Platelet- rich plasma (PRP)contain several growth factors, like platelet derived growth factor (PDGF) and transforming growth factor-beta (TGF-beta), responsible in stimulating fibroblastic and osteoblastic proliferation [15]. Various mechanisms are involved in the action of Platelet rich plasma on periodontal ligament cells. Firstly, PRP contains fibrinogen which is cleared by serine protease thrombin produced by periodontal ligament cells and converts it to insoluble fibrin. Secondly, the formation of fibrin clot is enhanced by a components derived from the platelets. Thirdly, fibrin clot stimulates the synthesis of type 1 collagen. Finally the growth factors contained in the PRP like PDGF and TGF-beta was capable of promoting PDL cell proliferation. Henceforth PRP supported in periodontal regeneration by increasing the numbers of progenitor cell of the periodontal ligament in the healing site and simultaneously up-regulating collagen matrix production. All these factors

promoted wound healing in the area of damaged periodontal tissue.

A free gingival graft was used along with PRF in order to cover the recession and to attain adequate vestibular depth. It was found that PRP on combination with free gingival graft decreased post operative bleeding, enhanced soft tissue healing, promote initial stabilization and revascularization of the graft, and reduced post operative infection and graft sloughage. [9,15] Post operative results after eight months of initial surgical procedure indicated increased vestibular depth with 80% coverage of the root in relation to 45, since it was lingually inclined. The outcome of two stage surgical therapy resulted in reduction in probing depth from 5 mm to 3mm, and clinical attachment loss was reduced from 8mm to 4.5 mm. After the second surgical procedure, the gingival recession of the tooth was also reduced from 3mm to 1.5mm. Overall the clinical attachment gain for the tooth was achieved due to the combined treatment modalities attempted for hard tissue as well as soft tissue regeneration. The prime factor beneath any successful therapy depends on the patient cooperation and post-surgical maintenance therapy. The patient was reviewed regularly and the lingually placed tooth (45) was restored with full ceramic crown in alignment with the adjacent tooth.

Systematic review on the endodontic periodontic lesions have pointed out that success in treatment depends on the identification of the etiology, controlling of microbacteria and the immunological response of the individual towards the infection. The prognosis of the lesion depends on the origin of the infection, whether it's from endodontic or periodontal and the persisting supporting tissue surrounding the tooth [16].

Conclusion

Inspite of complex and varied pathogenesis of combined endo-perio lesion, the primary goal of any treatment effort must be to rid the patient of the infection. This case report suggest that treatment creditability of combined endo-perio lesion, despite of having a questionable prognosis, depended on patient co-operation, restorability and economics, which helped in taking treatment decisions.

Acknowledgement: nil

Conflict of interest:
there are no conflicts of interest

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Guidelines for Manuscript Preparation

A. TYPES OF MANUSCRIPTS

I. ORIGINAL MANUSCRIPTS

Manuscripts submitted in this category are expected to be concise, well organized, and clearly written.
The maximum length is 5000 words, including the abstract, references, tables, and figure legends. The maximum length is 5000 words, including the abstract, references, tables, and figure legends.

- The structured abstract must not exceed 250 words.
- The title must not exceed 130 characters.
- A maximum of 4 tables and 4 figures is allowed.
- References should not exceed a maximum of 100.
- The abstract must be organized as follows:
- Background & Aims
- Methods
- Results
- Conclusions
- Do not use abbreviations, footnotes or references in the abstract.
- An electronic word count of the abstract must be included.
- Three to ten key words at the end of the abstract must be provided.

The manuscript must be arranged as follows:

- Title page
- Abstract
- Introduction
- Materials and methods (or Patients and methods)
- Results
- Discussion
- Acknowledgements
- References
- Tables
- Figure legends
- Figures

Acceptance of original manuscripts will be based upon originality and importance of the investigation. These manuscripts are reviewed by the Editors and, in the majority of cases, by two experts in the field. Manuscripts requiring extensive revision will be at a disadvantage for publication and will be rejected. Authors shall be responsible for the quality of language and style and are strongly advised against submitting a manuscript which is not written in grammatically correct English. The Editors reserve the right to reject poorly written manuscripts even if their scientific content is qualitatively suitable for publication. Manuscripts are submitted with the understanding that they are original contributions and do not contain data that have been published elsewhere or are under consideration by another journal.

II. REVIEW ARTICLES

Review articles on selected clinical and basic topics of interest for the readers of the Majmaah Journal of Health Science will be solicited by the Editors. Review articles are expected to be clear, concise and updated.

- The maximum length is 5000 words, excluding the summary, references, tables, and figures.
- References should not exceed a maximum of 150.
- The inclusion of a maximum of 4 high-quality tables and 4 colored figures to summarize critical points is highly desirable.
- Review articles must be accompanied by a title page and a summary.

- Reviews should include at least one Key Point Box, with a maximum of 5 bullet points, that briefly summarizes the content of the review.

Review articles are reviewed by the Editors and may be sent to outside expert reviewers before a final decision for publication is made. Revisions may be required.

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This section consists of invited brief editorial comments on articles published in the Majmaah Journal of Health Science

The length of an editorial should not exceed 1500 words, excluding references.

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IV. CASE REPORTS

Case reports would be only accepted if they represent an outstanding contribution to the Etiology, pathogenesis or treatment of a specific condition.

- The maximum length is 3000 words, including the summary and references.
- A maximum of 2 tables and 2 figures is allowed.
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Letters to the Editor will be considered for publication if they are related to articles published in recent issues of Majmaah Journal of Health Science. Occasionally, Letters to the Editor that refer to articles not published in Majmaah Journal of Health Science will be considered.

The length of a Letter to the Editor should not exceed 800 words.

- A maximum of 1 table or 1 figure is allowed.
- References should not exceed a maximum of 10.
- No more than 4 Authors may appear in the author list.

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International commentaries will be solicited by the Editors only.

- Commentary articles should not exceed a maximum of 800 words, excluding tables or figures.
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B. MANUSCRIPT SUBMISSION

ORGANIZATION OF THE MANUSCRIPT

- The submitted manuscript must be typed double-spaced throughout and numbered (including references, tables and figure legends). Preferably using a "standard" font (we prefer Times/Arial 12).
- For mathematical symbols, Greek letters, and other special characters, use normal text. The references must be in accordance with the Vancouver reference style (see References).
- Approved nomenclature for gene and protein names and symbols should be used, including appropriate use of italics (all gene symbols and loci, should be in italics) and capitalization as it applies for each organism's standard nomenclature format, in text, tables, and figures.
- Full gene names are generally not in italics and Greek symbols are not used. Proteins should not be italicized.
- Improperly prepared manuscripts will not be entered into the peer review process and will be sent back to the author for correction.

TITLE PAGE MUST CONTAIN:

- A title of no more than 130 characters.

- Running title (not to exceed 60 characters)
- Names of the Authors as it should be published (first name, middle initial, last name)
- Affiliations of all authors and their institutions, departments, or organizations (use the following symbols in this order to designate authors' affiliations: *, †, ‡, §, ¶, ||, #, **, ††, ‡‡, §§, ¶¶, || ||, ##).
- Name, address, telephone and fax numbers, and electronic mail address of the corresponding Author.
- Electronic word count.
- Number of figures and tables.
- List of abbreviations in the order of appearance.
- Conflict of interest.
- Financial support.

Animal trials: Manuscripts reporting experiments using animals must include a statement giving assurance that all animals received human care and that study protocols comply with the institution's guidelines. Statistical methods used should be outlined.

Human trials: Manuscripts reporting data from research conducted on humans must include a statement of assurance in the methods section of the manuscript reading that:

1. Informed consent was obtained from each patient included in the study and
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Drugs and chemicals: Drugs and chemicals should be used by generic name. If trademarks are mentioned, the manufacturer's name and city should be given. All funding sources supporting the work, either public or private, especially those from pharmaceutical companies, must be provided.

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REFERENCES

References must be in accordance with the Journal of Hepatology reference style. References are ordered as they appear in the text and citation numbers for references are placed between "brackets" ("[ ]") in the text as well as in the reference list.

Authors should be listed surname first, followed by the initials of given names (e.g. Bolognesi M). If there are more than six authors, the names of the first six authors followed by et al. should appear.
Titles of all cited articles are required. Titles of articles cited in reference list should be in upright, not italic text; the first word of the title is capitalized, the title written exactly as it appears in the work cited, ending with a full stop. Journal titles are abbreviated according to common usage, followed by Journal years, semicolon (;) before volume and colon (:) before full page range (see examples below).

All articles in the list of references should be cited in the text and, conversely, all references cited in the text must be included in the list.

Personal communications and unpublished data should be cited directly in the text by the first Author, without being numbered. Please make sure you have the latest, updated version of your reference management software to make sure you have the correct reference format for Majmaah Journal of Health Science.

An example of how references should look within the text:

"HVPG was measured by hepatic vein catheterization using a balloon catheter according to a procedure described elsewhere [14, 15] and used as an index of portal hypertension [16]."

An example of how the reference list should look:

[14] Merkel C, Bolognesi M, Bellon S, Zuin R, Noventa F, Finucci G, et al. Prognostic usefulness of hepatic vein catheterization in patients with cirrhosis and esophageal varices. Gastroenterology 1992;102:973-979.
[15] Groszmann RJ, Wongcharatrawee S. The hepatic venous pressure gradient: anything worth doing should be done right. Hepatology 2004;39:280-282.

FIGURES

A maximum of 4 figures is allowed
(This can be modified if needed by Editorial board).

- Figures will be often, but not always, re-designed by graphic designers. By signing and transferring the Copyright Agreement to MJHS, the author gives permission to the graphic designers to alter the visual aspect of any figures, tables, or graphs. The scientific content of figures will not be altered. Please provide this information with your covering letter.
- All graphics submitted to Majmaah Journal of Health Science should be sent at their actual size, which is 100% of their print dimension and in portrait orientation.
- Two standard widths are used and figures should fit in one (8.5 x 23.5 cm) or two (17.5 x 23.5 cm) columns
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- Photographs (scans, immunofluorescences, EM, and histology images) should be submitted as: 1. TIFF (*.tif) with a resolution of at least 300 pixels per inch, or
- Illustrator compatible EPS files with RGB color management (*.eps),
- Photoshop (*.psd) or PDF (*.pdf) files (grayscales or RGB) at the appropriate resolution, which is:

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3. 1200 dpi for line-art figures

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- Include tables in the submitted manuscript as a separate section.

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- Figure legends should be listed one after the other, as part of the text document, separate from the figure files.
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- The abbreviated word for figure "Fig." should be typed and bolded, followed by the figure number and a period

(i.e. "Fig. 1."). Every figure legend should have a Title written in bold.
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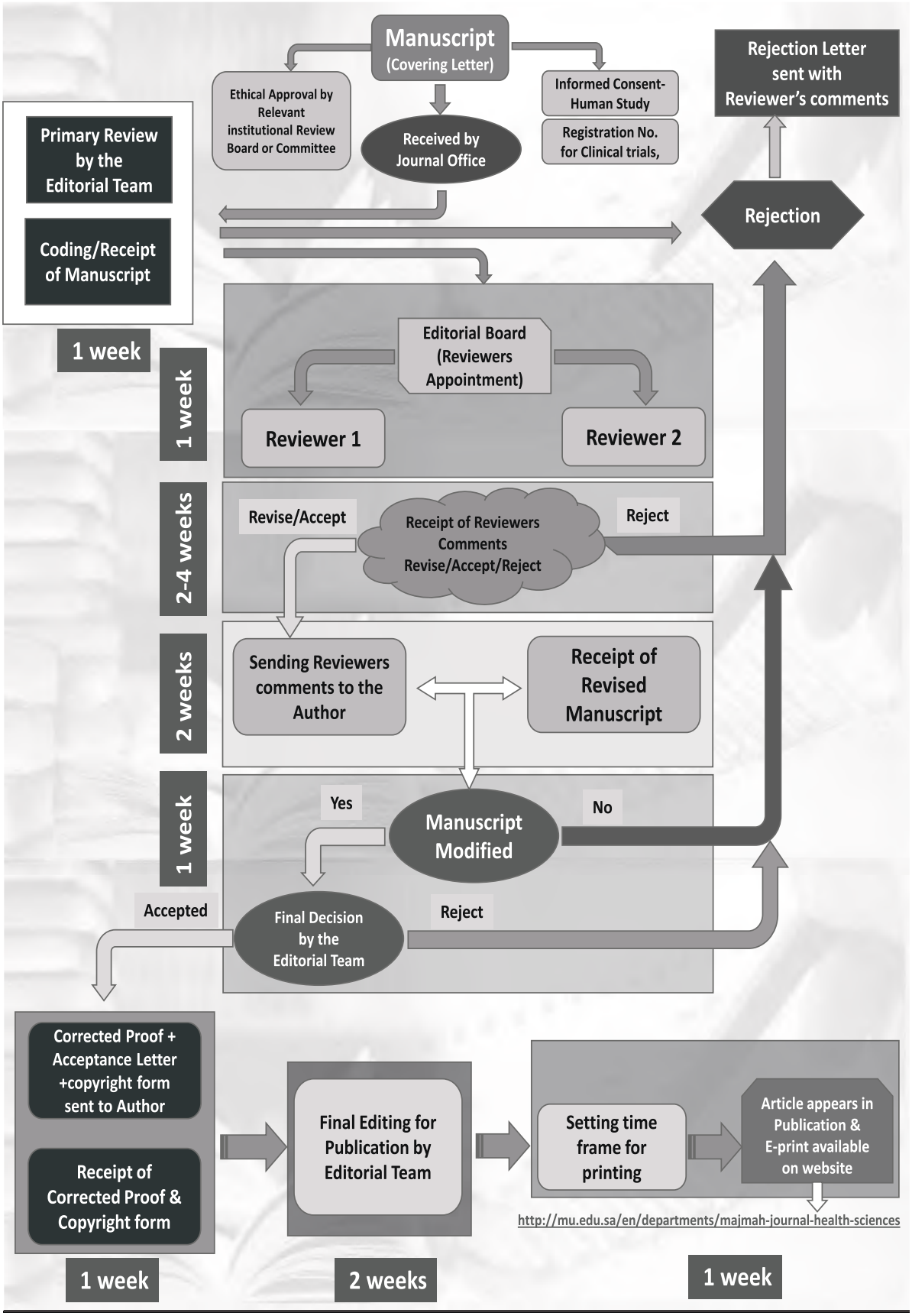
For randomized clinical trials the following should also be clearly documented: treatments, sample size estimation, method of random allocation and measures taken for maintaining its concealment including blinding, numbers treated, followed-up, being withdrawn, dropping out, and having side effects (numbers and type). The statistical methods used should be relevant and clearly stated. Special or complex statistical methods should be explained and referenced.

Complex analyses should be performed with the assistance of a qualified statistician. Unqualified use of such analyses is strongly discouraged. The underlying assumptions of the statistical methods used should be tested to ensure that the assumptions are fulfilled.

For small data sets and if variable distributions are non-normal, distribution free (non-parametric) statistical methods should be used. The actual p values - whether significant or not - should always be presented (not NS). Confidence intervals convey more information than p values and should be presented whenever possible. Continuous variables can always be summarized using the median and range which are therefore preferred. Only in the infrequent case of a Normal distribution are the mean and standard deviation (SD) useful. Complex analyses (including Cox and logistic regression analysis) should be presented in sufficient detail: i.e. variable scoring, regression coefficients, standard errors and any constants. Odds-ratios or relative risks are not sufficient documentation of such analyses. The handling of any missing values in the data should be clearly specified. The number of statistical tests performed should be kept at a minimum to reduce spurious positive results. Explorative (hypothesis generating) analyses without confirmation using independent data are discouraged. Figures showing individual observations e.g. scatter plots are encouraged. Histograms may also be useful. Tables should indicate the number of observations on which each result is being based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