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Effect of Oral Care Intervention and Safe-Swallowing Education on Dysphagia among ICU Patients Post Endotracheal Extubation

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Abstract:

Background: Post Extubation Dysphagia (PED) can potentially cause life-threatening consequences, early detection of PED is essential to reduce complications. Understanding the treatment modalities of PED is essential to minimize complications and improve quality of treatment. Oral care intervention and safe-swallowing education are valuable to improve and prevent dysphagia in vulnerable patients' post-extubation. **The aim** of this study is to assess the effect of oral care intervention and safe-swallowing education on dysphagia among ICU patients post endotracheal extubation. **Subjects and Method: Design:** A quasi-experimental design was utilized. **Setting;** Medical intensive care units (ICUs) in Emergency hospital affiliated to Tanta University hospitals. **Sample:** A purposive sample of 40 adult patients, who underwent emergency oral endotracheal intubation for at least 48 hours. **Tool 1:** Bio socio-demographic data questionnaire; **Tool 2**: Modified Standardized Swallow Assessment (MSSA). Data was collected through three phases; assessment, implementation and evaluation through 10 months. **Results:** there is a dramatic improvement in in MSSA score and in the satisfactory level of MSSA post intervention in the study group which are highly statistically significant, compared to a slight gradual improvement in MSSA score post intervention in addition; there are no significant differences in the satisfactory level of MSSA scores throughout the study period in the control group. **Conclusion:** oral care intervention along with safe-swallowing education for the patients and their family care giver reduces dysphagia of ICU patients post endotracheal extubation. **Recommendation:** Nurses can play an important role in reducing dysphagia among ICU patients post endotracheal extubation by include the oral care intervention and safe-swallowing education in the daily routine care provided for patients post endotracheal intubation.

*Key wards***:** Oral Care Intervention, Safe Swallowing Education, Post Extubation Dysphagia

Introduction:

Patients admitted in critical condition and suffering from respiratory insufficiencies are frequently subjects to mechanical ventilation, which then assists the lungs to be ventilated properly. Mechanical ventilation is used as a supportive treatment of several disorders, such as those derived from tracheal intubation. Orotracheal intubation, for life to be sustained, may result in post-extubation swallowing dysfunction, delaying oral feeding, specifically patients experiencing long period intubation, (≥48 hours) have more hazard for dysphagia[1]. Dysphagia after extubation affects up to 62% of intensive care unit (ICU) patients, and when dysphagia continues, resumption of oral intake is delayed, necessitating patients to tube feeding[2].

Post-extubation dysphagia (PED) is the inability or difficulty to safely and efficiently swallow food and fluid after extubation of endotracheal tubes; it has been documented in 3% to 62% of persons who experienced intubation causes that lead to post-extubation swallowing dysfunction are multifactorial and include oropharyngeal muscle inactivity, glottis injury, mucosal inflammation leading to the loss of tissue architecture, and vocal cord ulcerations [3,4]. PED undesirably disturbs patient outcomes resulting in delayed resumption of oral intake, poor quality of life, aspiration pneumonia, prolonged ICU and hospital stays, and high mortality[5, 6].

Since PED can potentially cause life-threatening consequences, early detection of PED is essential to reduce complications. Understanding the treatment modalities of PED is essential to minimize complications, improve quality of treatment[7].

The evidence for dysphagia treatment, however, is limited as few intervention studies have been designed to reduce dysphagia or the time needed to resume total oral intake after extubation. The improving of oral lubrication, oral sensation, and strength in the lips, tongue, jaw, and cheeks by applying tooth brushing/salivary gland massage, oral range of motion (ROM) exercises for the lips, tongue, jaw, and cheeks, and safe-swallowing education, would decrease time to restart oral intake and improve salivary flow for patients who underwent prolonged endotracheal intubation[6,8]. Also, oral lubrication either by endogenous saliva or exogenous by oral care preparations or food particles lubricate; tooth-tooth, tongue-palate, and tongue mucosal surfaces plays an important role in effective swallowing, mastication, and tactile perception [9]. Additionally, oral

sensation is important as the oral cavity has a rich somatosensory innervation and stimulating these sensory receptors in the tongue and parts of the mouth cavity may enhance proprioception and oral sensorimotor regulation in swallowing [10]. Dysphagia treatment modalities -still- have been relatively not well established and the recent publications of literature reviews delineating the need for future researches of dysphagia treatment [11]. Oral Care intervention and Safe-Swallowing education are valuable to improve and prevent of further harm in vulnerable patients post-extubation [12]. Therefore, the aim of this study is to assess the effect of oral care intervention and safe-swallowing education on dysphagia among ICU patients post endotracheal extubation.

Aim of the study:

To assess the effect of oral care intervention and safe-swallowing education on dysphagia among ICU patients post endotracheal extubation.

Research hypothesis

H₁: The study group who receives oral care intervention and safe-swallowing education will exhibit higher Modified Standardised Swallow Assessment (MSSA) score than control group.

H₂: Participants' sociodemographic characteristics and clinical data will be correlated to the SSA score.

Materials and method

Design:

A quasi-experimental design was utilized for the aim of this study.

Setting:

The study was conducted at the Medical intensive care units (ICUs) in Emergency hospital affiliated to Tanta University hospitals.

Subjects:

A purposive sample of 40 adult patients, who are alert and able to communicate, able to sit up, and underwent emergency oral endotracheal intubation for at least 48 hours.

Exclusion criteria:

History of neuromuscular disease, head and neck deformities, preexisting swallowing difficulty, and agitated patients.

The sample size calculation based on the number of patients who are admitted to medical ICUs at Emergency hospital, Tanta University hospitals and expected improvement of patients post endotracheal extubation outcomes among the studied groups. The power analysis calculation was based on software program for the studied subjects at 95% confidence.

The 40 subjects were divided into 2 equal groups; control and study as follows:

The control group; comprises 20 patients

after successfully extubated and were maintained on routine hospital care provided by ICU staff.

The study group; after successfully extubated, and received Oral Care Intervention on the next day daily for 7 days post-extubation. In addition; a brief safe-swallowing education was provided to the participants and their family care giver.

Tools: Two tools were developed by the researchers for the purpose of the study as follows:

Tool 1: Bio sociodemographic data questionnaire:

Which includes two parts as follow; **Part A:** Socio-demographic characteristics such as age, gender, educational level. **Part B:** Health relevant data; that include; weight, height, BMI, admission diagnosis, past medical history, smoking habit and oxygen therapy device.

Tool 2: Modified Standardized Swallow Assessment (MSSA) Tool:

The tool was devolved by (Perry, 2001) [13]. Was modified by the researcher; it was validated and found to have high levels of internal consistency, inter-examiner reliability, and test-retest reliability. It includes two sections, **section one (Assessment):** first assess the conscious level, postural control in order to ensure the patient is physically capable of undertaking screening, then 5 criteria are

assessed: ability to cough, to control saliva, to move the tounge , to breath, and voice quality (absence of signs of pooling of secretion around the laryngeal opening) with a response of Yes scored 1 and No scored 0, except the fifth cirterion its score is reversed , if the patient fulfilled the above mentioned criteria, the researcher proceeds to the next section. **Section Two: Water Swallow Test I:** this part to assess patient' for absence of swollow when given three teaspoon of water by the following criteria; dribbling of water out of mouth, coughing, choking, breathless, and wet or gurgle voice with a response of Yes scored 0 and No scored 1. **Water Swallow Test II:** this part to assess patient' absence of swollow when given 50 ml water in a glass using the same criteria of water swollow test I.

Scoring system: The total score of the scale was summed up and categorized as follows;

Satisfactory Level of (SSA)	Percentage %
Unsatisfactory	< 60%
Moderate	60-75%
Satisfactory	> 75%

Methods:

Data collection:

Permission to carry out the study was obtained from the authorized person from both Emergency hospital and medical

ICUs in Tanta University hospitals. The researchers meet the eligible participants and explained the purpose of the study and the participants were informed that they have the right to participate in the study, and to withdraw at any time without any effect on their care given and assured that there is no harm from the study. Subjects who agreed to take a part were asked to provide written consent. **The control group**; after successful extubation, were maintained on usual care consisted of routine hospital care provided by ICU staff.

The Study group; after successful extubation, they were received oral care intervention starting from the next day after extubation and daily for 7 consecutive days. In addition; a brief safe-swallowing education was provided to the participants and their family care giver. Ethical consideration for privacy and confidentiality of the data and results was concluded. Confidentiality and anonymity were maintained. Oral care intervention and safe-swallowing education were conducted in three phases.

A- Assessment phase: Baseline data was collected from patients in both control and study group by using tool I part A and B and tool 2 sections; I and II.

MSSA tool section I was used for the initial assessment of the patient, if the patient fulfilled the criteria; the researcher proceeded to the next section, and if the patient didn't fulfill the criteria, it indicated that the patient is not eligible to procced for section 2 and the screening procedure was terminated. Regarding section II: Water Swallow Test I; the patient was given three teaspoon of water and was assessed for absence of swallow, if the patient failed any item of the swallow test I, the procedure was terminated and he was put on nil by mouth, if the patient screening procedure indicates ability to swallow, the researcher proceeded to Water Swallow Test 2; the patient was given 50 ml water in a glass and again was assessed for absence of swallow using the same criteria of swallow test I.

To avoid data transmission from study to control group, data were collected first from control group over a period of 4 months. After reaching 20 subjects for the control group, data collection from the study group was started. Data collection for the study group lasts for 6 months to be completed.

B- Implementation phase: This phase was implemented to the study group only where the researchers meet the participants after collecting the baseline data and the researcher implement the program as follows:

Brushing participants' oral cavity including teeth, gum, tongue, and palate with a soft toothbrush, using distilled water to remove the coated plaque, mechanically stimulate tissues, and rinse the oral cavity. Moisturizing participants' lips with Vaseline 4 times daily. Placing fingers on participants 'cheeks and gently massaging and pressing the surface overlying the parotid, sublingual, and submandibular salivary glands. Participants were asked to purse the lips, move the tongue, open the mouth widely, and inflate the cheeks each with 3, 5, or 10 repetitions with or without resistance, as tolerated by the patient, cheek retractor, and tongue holder was used when needed to help in the oral care. A brief safe-swallowing education was provided for the patients and their family care giver.

C- Evaluation phase: This phase was implemented for both groups using tool 2 pre interventions and daily for subsequent 7 days.

Results

Table (1): Revealed that; the majority of the control group was in age group of 50-60 years, while half of the study group was in the same age group. Regarding the gender; more than half of them were male in the control and study group.

In relation to the level of education same table represents that; less than half and same percentage of the control and study group have primary and preparatory education respectively.

For the Body Mass Index (BMI); more than half of the control group compared to near to one third of the study group have ideal body weight. While one quarter of the control group, compared to more than half of the study group were overweight.

In addition; mean and standard deviation of BMI is 24.55±2.39 and 26.29±2.19 for the control and study group respectively.

Table (2): Illustrated percent distribution of the studied patients according to their admission diagnosis; less than one third of the control group were admitted with pulmonary edema, while fifth of them were admitted with stroke.

For the study group, small and same percent of the participants were admitted with lung cancer and meningitis, moreover, tenth and same percent of them were admitted with diagnoses of head injury and chronic obstructive pulmonary disease.

Table (3): As illustrated in this table; the majority of the control group and more than half of them has a past medical history of cerebrovascular (CVS) and respiratory disorder respectively, while tenth of them have a past history of cancer. Regarding to the study group; same table illustrated that less than half and about third of them has a past history of

cerebrovascular (CVS) and respiratory disorders respectively. In addition more than tenth and same percent of control and study group have past medical history of hepatic and renal disease.

As regard to the smoking habit; tenth compared to fifth of the subjects were smokers with a mean ± SD of (20.00±0.00) and (27.50±2.58) for control and study group respectively.   In relation to the number of cigarettes/day it is ranging from 2-3 and 1-3 for the control and study group respectively.

Regarding to the oxygen therapy device; more than half of the control group and one fifth of them were on simple O2 mask and nasal cannula respectively. While in the study group; about third and same percent were on nasal cannula and Bi-level positive airway pressure.

The same table revealed that there are no statistical significant differences between the studied groups in relation to their medical history.

Table (4): Presents total mean scores of items of the Modified Standardized Swallow Assessment (MSSA) among the studied groups throughout periods of the study. For the control group, the table shows that there was a slight improvement in the mean of the assessment score (0-2) and (0-4) in pre-intervention and day 7

respectively, and that improvement was statistically significant, with p value = 0.005, while, the improvement was the same throughout the periods of the study with a mean score of; (0-3), (0-3), (0-3) and (0-4) in the pre intervention, day 1, 4, and 7 respectively for both water swallow test1 and test 2. Although there were no statistically significant differences for both test since p value = > 0.05, but there was a statistical significance in the total score of MSSA where p value = 0.006. As regard to the study group; the results showed that the mean of the total score of MSSA has been increased dramatically (0-6), (0-8) (4-14), (5-15) in the pre, day 1, 4, and 7 post intervention respectively, moreover; the same table revealed that; there were a highly statistical significant differences in the mean score of; Assessment; Water swallow test 1, Water swallow test 2 and Total score of MSSA where P value equal 0.000 each.

Table (5): Demonstrated the distribution of the studied groups according to their level of Modified standardized swallow assessment (MSSA) throughout periods of study. As illustrated in table 5; all patient of the control group have unsatisfactory level of standardized swallow assessment score pre the intervention which has been decreased to majority of them in day 7, while only small percent of them have

satisfactory level in day 7 with no statistical significant differences in the level of MSSA scores throughout the study period.

As related to the study group; the same table reveals that all patient have unsatisfactory level of standardized swallow assessment score pre intervention and day 1 post intervention which has been decreased dramatically to tenth of them in day 7 post intervention; in contrast none of the patient have satisfactory level of standardized swallow assessment score pre intervention and day 1 post intervention which has been increased dramatically to majority of them in day 7 post intervention with high significant difference of MSSA level throughout the study period.

Table (6): Presents comparison and correlation between the sociodemographic characteristics of the studied groups and their mean score of the Modified Standardized Swallow Assessment (MSSA) throughout periods of study. The table revealed that; there was a significant correlation between the age and the total MSSA mean score throughout periods of study and in the 7th day for control and study group respectively. Moreover; it was observed that the younger participants of the control group aged from twenty-one to thirty got high MSSA scores throughout the study period 8.00±0.00, 9.00±0.00,

10.00±0.00 and 12.00±0.00 in the pre, day 1,4, and 7 post the intervention respectively, while for the study group the same age category got the highest score in pre day 1 and 4 post the intervention5.00±1.155, 5.00±1.155 and 10.75±2.630 respectively and the difference was statistically significant between the age group in day seven since P =0.044. For the gender; the present table illustrated that; there was significant difference between both sex of the study group in day 7 post intervention since P = 0.044, where the female got high mean score 14.38±0.744 than male 11.83±3.243 since. Regarding the level of education and body mass index (BMI); there were no any significant correlation between those characteristic and the MSSA in both the control and the study group.

Table (7): Illustrates the comparison and correlation between the clinical data of the studied groups and their mean score of the Modified Standardized Swallow Assessment (MSSA) throughout periods of study. The table shows that; there was no any significant correlation between the admission diagnosis and the MSSA in both in the control and the study group. In relation to the past medical history; there is a significant correlation between the past medical history and the mean scores of MSSA in day 1 and day 7 with P value of

0.024 and 0.006 respectively in the control group, the participants who had past medical history of hepatic, respiratory, neurologic and gastrointestinal disorders got high mean scores of MSSA than the others. For the study group there was no correlation between the past medical history and the MSSA mean scores. In relation to smoking habit; the result illustrated that there is no correlation between the number of cigarettes per day and the MSSA mean scores in the control group since p value = > 0.05, same table showed that for the study group participant who were nonsmoker got higher MSSA score followed by 1 cigarette smoker participant with a mean of 13.56± 1.672 and 13.00± 0.00 respectively while the patients who smoke 3 cigarettes got the lowest MSSA with a mean score 7.00±0.00 and difference was statistically significant in day 1 and 7 since P= 0.046 and 0.044 respectively.

As regard to the Oxygen therapy device; it is cleared that; there is a high significant correlation between the Oxygen therapy device and the MSSA mean score in the control group, the participant who were connected to Bi-level positive airway pressure device got the higher scores than the participants who were connected to other oxygen therapy devices in the pre, day 1 and 4 of the study period with mean

score of 6.50±2.121, 7.50±2.121 and7.50±3.536 respectively. In contrast, there was no significance relation in the study group since p value = > 0.05.

Table (1): Percent distribution of the studied patients according to their socio–demographic characteristics

Characteristics	Control group (n=20)		Study group (n=20)		χ^2 P
	N	%	N	%	
Age (in years)					
▪ (21 -< 30)	1	5.0	4	20.0	
▪ (30 -<40)	1	5.0	1	5.0	2.578
▪ (40< 50)	4	20.0	5	25.0	0.461
▪ (50-60)	14	70.0	10	50.0	
Gender					
▪ Male	13	65.0	12	60.0	FE
▪ Female	7	35.0	8	40.0	1.00
Level of education					
▪ Primary	7	35.0	5	25.0	
▪ Preparatory	4	20.0	7	35.0	1.294
▪ Secondary	5	25.0	5	25.0	0.730
▪ High	4	20.0	3	15.0	
Height (in cm)					
Range	(150-180)		(148-178)		t=0.065
Mean ± SD	163.70±3.55		163.55±3.14		P=0.949
Weight (in kg)					
Range	(48-90)		(52-90)		t=1.196
Mean ± SD	64.50±2.79		68.25±1.96		P=0.239
Body mass index					
▪ Ideal weight (18.5- 24.9)	12	60.0	6	30.0	
▪ Over weight (25- 29.9)	5	25.0	12	60.0	5.082
▪ Obese (30- 39.9)	3	15.0	2	10.0	0.079
Range	(19.3-34.1)		(19.2-37.5)		t=1.326
Mean ± SD	24.55±2.39		26.29±2.19		P=0.193

FE: Fisher' Exact test

Table (2): Percent distribution of the studied patients according to admission diagnosis

Characteristics	The studied patients (n=40)				χ^2 P
	Control group (n=20)		Study group (n=20)		
	N	%	N	%	
Admission diagnosis					
▪ Sarcoidosis					
▪ Lung cancer					
▪ GERD	0	0.0	1	5.0	
▪ GBS	0	0.0	3	15.0	
▪ Chest rib fracture	0	0.0	1	5.0	
▪ Meningitis	0	0.0	1	5.0	
▪ Head injury	0	0.0	1	5.0	
▪ Brain tumor	1	5.0	3	15.0	
▪ COPD	0	0.0	2	10.0	
▪ Stroke	0	0.0	1	5.0	
▪ Cancer of larynx	2	10.0	2	10.0	27.133
▪ Skull fracture	4	20.0	2	10.0	0.102
▪ Post thoracentesis	0	0.0	1	5.0	
▪ Bronchiectasis	0	0.0	1	5.0	
▪ Pulmonary infarction	1	5.0	0	0.0	
▪ Pulmonary edema	2	10.0	1	5.0	
▪ Pneumonia	1	5.0	0	0.0	
▪ ARDS	6	30.0	0	0.0	
▪ Atelectasis	1	5.0	0	0.0	
	1	5.0	0	0.0	
	1	5.0	0	0.0	

Table (3): Percent distribution of the studied patients according to their medical history

Medical history	The studied patients (n=40)				χ^2 P
	Control group (n=20)		Study group (n=20)		
	N	%	N	%	
# Past medical history of disease					
1. CVS disorder	16	80.0	9	45.0	
2. Diabetes mellitus	8	40.0	6	30.0	
3. Hepatic disease	3	15.0	3	15.0	6.254
4. Cancer	2	10.0	5	25.0	0.085
5. Respiratory disorder	13	65.0	7	35.0	
6. Neurologic disorder	3	15.0	5	25.0	
7. Gastrointestinal disease	3	15.0	2	10.0	
8. Renal disease	3	15.0	3	15.0	
Smoking habit					
Number (%)	2 (10.0)		4 (20.0)		t=0.795
Range	(20-20)		(10-40)		P=0.471
Mean ± SD	20.00±0.00		27.50±2.58		
No of cigarettes/day					
Range	(2-3)		(1-3)		t=0.730
Mean ± SD	2.50±0.77		2.00±0.86		P=0.506
Oxygen therapy device					
▪ Simple O_2 mask	13	65.0	6	30.0	
▪ Nasal cannula	4	20.0	7	35.0	7.175
▪ Non-rebreathing mask	1	5.0	0	0.0	0.067
▪ Bi-level positive airway pressure	2	10.0	7	35.0	

More than one answer was chosen

Table (4): Total Mean Scores of Items of the Modified Standardized Swallow Assessment (MSSA) Among the Studied Groups throughout Periods of Study

Modified Standardized Swallow Assessment (MSSA) items	The studied patients (n=40) Range Mean ± SD									
	Control group (n=20)				F P	Study group (n=20)				F P
	Pre intervention	Day 1	Day 4	Day 7		Pre intervention	Day 1	Day 4	Day 7	
1. Assessment score	(0-2) 0.45±0.759	(0-3) 0.70±0.865	(0-4) 1.10±1.165	(0-4) 1.55±0.146	**4.63** **0.005***	(0-4) 0.90±0.373	(0-4) 1.00±0.376	(2-4) 3.40±0.940	(3-5) 4.60±0.754	**51.13** **0.000***
2. Water swallow test 1 score	(0-3) 1.15±0.875	(0-3) 1.15±0.875	(0-3) 1.35±0.988	(0-4) 1.85±1.226	2.17 0.098	(0-3) 1.15±0.813	(0-4) 1.75±1.209	(0-5) 3.40±1.603	(0-5) 4.00±1.589	**20.03** **0.000***
3. Water swallow test 2 score	(0-3) 1.15±0.875	(0-3) 1.15±0.875	(0-3) 1.35±0.988	(0-4) 1.85±1.226	2.17 0.098	(0-3) 1.50±0.827	(0-3) 1.90±0.912	(0-5) 3.55±1.317	(1-5) 4.25±1.020	**32.11** **0.000***
Total score of SSA	**(0-8)** **2.75±1.197**	**(0-9)** **3.00±1.294**	**(0-10)** **3.80±1.353**	**(1-12)** **5.25±1.613**	**4.518** **0.006***	**(0-6)** **3.55±1.701**	**(0-8)** **4.65±1.927**	**(4-14)** **10.35±2.739**	**(5-15)** **12.85±2.815**	**72.59** **0.000***

* Significant at level P < 0.05.

Table (5): Percent distribution of the studied groups according to their satisfactory level of Modified Standardized Swallow Assessment (MSSA) throughout periods of study.

Level of satisfactory of MSSA	The studied patients (n=40)																	
	Control group (n=20)								χ^2 P	Study group (n=20)								χ^2 P
	Pre intervention		Day 1		Day 4		Day 7			Pre intervention		Day 1		Day 4		Day 7		
	N	%	N	%	N	%	N	%		N	%	N	%	N	%	N	%	
▪ Unsatisfactory	20	100.0	19	95.0	19	95.0	17	85.0	5.253 0.512	20	100.0	20	100.0	4	20.0	2	10.0	68.78 0.000*
▪ Moderate	0	0.0	1	5.0	1	5.0	2	10.0		0	0.0	0	0.0	7	35.0	2	10.0	
▪ Satisfactory	0	0.0	0	0.0	0	0.0	1	5.0		0	0.0	0	0.0	9	45.0	16	80.0	

<60% Unsatisfactory   (60-75) % Moderate   >75% Satisfactory

* Significant at level P < 0.05.

Table (6): Comparison and correlation between the sociodemographic characteristics of the studied groups and their mean score of the Modified Standardized Swallow Assessment (MSSA) throughout periods of study

Characteristics	The studied patients (n=40)							
	Total MSSA score							
	Mean ± SD							
	Control group (n=20)				Study group (n=20)			
	Pre intervention	Day 1	Day 4	Day 7	Pre intervention	Day 1	Day 4	Day 7
Age (in years)								
▪ (21 -< 30)	8.00±0.00	9.00±0.00	10.00±0.00	12.00±0.00	5.00±1.155	5.00±1.155	10.75±2.630	14.00±2.000
▪ (30 -<40)	0.00±0.00	0.00±0.00	3.00±0.00	2.00±0.00	4.00±0.00	7.00±0.00	9.00±0.00	13.00±0.00
▪ (40< 50)	2.50±1.00	3.50±0.577	4.75±0.957	5.75±0.957	2.60±1.949	4.20±2.490	11.80±2.168	14.40±0.548
▪ (50-60)	2.64±2.023	2.64±1.985	3.14±2.033	4.86±2.282	3.40±1.578	4.50±1.958	9.60±3.062	11.60±3.406
t , P	**3.371 , 0.045***	**4.881 , 0.013***	**4.603 , 0.017***	**4.487 , 0.018***	1.712 , 0.205	0.611 , 0.618	0.800 , 0.512	1.494 , 0.254
r , P	-0.044 , 0.855	-0.221 , 0.348	-0.402 , 0.079	-0.229 , 0.332	-0.263 , 0.263	-0.092 , 0.700	-0.194 , 0.412	**-0.454 , 0.044***
Gender								
▪ Male	2.85±0.844	2.92±0.932	3.77±0.833	5.54±1.099	3.58±1.564	4.58±1.929	9.50±2.908	11.83±3.243
▪ Female	2.57±0.413	3.14±0.552	3.86±0.215	4.71±0.380	3.50±2.000	4.75±2.053	11.62±1.996	14.38±0.744
t , P	0.068 , 0.798	0.040 , 0.844	0.006 , 0.939	0.439 , 0.516	0.011 , 0.918	0.034 , 0.856	3.228 , 0.089	**4.669 , 0.044***

Level of education								
▪ Primary	2.00±2.236	2.14±2.478	2.57±2.507	4.00±2.517	3.00±2.121	4.00±2.646	10.00±3.082	12.40±3.130
▪ Preparatory	3.00±2.000	3.25±1.258	4.00±1.414	6.50±1.732	3.14±1.864	4.00±1.633	9.86±3.716	11.71±3.684
▪ Secondary	3.80±2.683	4.40±2.793	4.80±3.114	6.00±3.464	4.40±0.548	5.40±1.140	10.60±1.517	13.80±1.095
▪ High	2.50±1.915	2.50±1.915	4.50±1.291	5.25±2.217	4.00±2.000	6.00±2.000	11.67±1.528	14.67±0.577
t , P	0.649 , 0.595	1.030 , 0.406	1.078 , 0.387	0.972 , 0.430	0.765 , 0.530	1.245 , 0.326	0.310 , 0.818	1.034 , 0.404
r , P	0.190 , 0.423	0.193 , 0.414	0.399 , 0.082	0.335 , 0.148	0.267 , 0.256	0.342 , 0.140	0.163 , 0.493	0.338 , 0.146
Body mass index								
▪ Ideal weight	2.50±2.431	2.75±2.527	3.58±2.503	5.17±2.887	4.00±0.632	4.83±1.472	10.33±2.503	13.50±1.517
▪ Over ideal weight	3.60±1.517	4.00±1.581	4.80±0.837	5.40±1.140	3.42±2.109	4.33±2.060	10.17±3.070	12.25±3.388
▪ Obese	2.33±2.517	2.33±2.517	3.00±3.606	5.33±4.041	3.00±1.414	6.00±2.828	11.50±2.121	14.50±0.707
t , P	0.478 , 0.628	0.648 , 0.536	0.651 , 0.534	0.014 , 0.986	0.327 , 0.726	0.655 , 0.532	0.186 , 0.832	0.756 , 0.485
r , P	0.288 , 0.218	0.318 , 0.172	0.260 , 0.268	0.255 , 0.277	-0.223 , 0.345	-0.110 , 0.644	0.119 , 0.619	0.075 , 0.754

r: Pearson/Spearman' correlation coefficient

* Significant at level P < 0.05.

Table (7): Mean score comparison and correlation between the clinical data of the studied groups and their mean score of the Modified Standardized Swallow Assessment (MSSA) throughout periods of study

Clinical data	The studied patients (n=40) Total MSSA score Mean ± SD							
	Control group (n=20)				Study group (n=20)			
	Pre intervention	Day 1	Day 4	Day 7	Pre intervention	Day 1	Day 4	Day 7
Admission diagnosis								
▪ Sarcoidosis	-	-	-	-	2.00±0.00	2.00±0.00	14.00±0.00	15.00±0.00
▪ Lung cancer	-	-	-	-	4.00±1.732	4.67±0.577	9.33±3.055	11.67±4.163
▪ GRDS	-	-	-	-	3.00±±0.00	4.00±0.00	10.00±0.00	13.00±0.00
▪ GBS	-	-	-	-	3.00±±0.00	3.00±0.00	14.00±0.00	15.00±0.00
▪ Chest rib fracture	-	-	-	-	6.00±±0.00	6.00±0.00	13.00±0.00	15.00±0.00
▪ Meningitis	4.00±0.00	2.00±0.00	4.00±0.00	6.00±0.00	2.00±0.013	4.67±4.041	10.00±1.732	13.00±0.00
▪ Head injury	-	-	-	-	5.00±1.414	5.00±1.414	9.50±3.536	13.00±2.828
▪ Brain tumor	-	-	-	-	4.00±±0.00	4.00±0.00	4.00±0.00	5.00±0.00
▪ COPD	3.50±2.121	4.00±2.828	3.50±2.121	3.50±0.707	2.50±3.536	3.50±2.121	11.00±2.828	14.50±0.707
▪ Stroke	2.25±2.062	2.50±2.082	3.25±2.986	4.75±3.304	3.00±±0.00	6.00±0.00	8.00±0.00	9.00±0.00
▪ Cancer of larynx	-	-	-	-	4.00±±0.00	6.00±0.00	12.00±0.00	13.00±0.00
▪ Skull fracture	-	-	-	-	4.00±±0.00	4.00±0.00	11.00±0.00	15.00±0.00
▪ Spinal cord injury	-	-	-	-	4.00±±0.00	8.00±0.00	13.00±0.00	14.00±0.00
▪ Post thoracentesis	2.00±0.00	3.00±0.00	3.00±0.00	5.00±0.00	-	-	-	-
▪ Bronchiectasis	4.00±2.828	4.00±1.414	5.00±.00	7.50±2.121	5.00±±0.00	5.00±0.00	9.00±0.00	14.00±0.00
▪ Pulmonary infarction	2.00±.00	4.00±.00	6.00±.00	7.00±.00	-	-	-	-
▪ Plumonary edema	1.33±1.633	1.50±1.761	2.67±1.633	3.83±1.602	-	-	-	-
▪ Pneumonia	5.00±.00	5.00±.00	5.00±.00	5.00±0.00	-	-	-	-
▪ ARDS	8.00±.00	9.00±.00	10.00±.00	12.00±.00	-	-	-	-
▪ Atelictasis	2.00±.00	2.00±.00	2.00±.00	6.00±.00	-	-	-	-
F , P	1.531,0.258	1.775,0.192	1.511, 0.264	1.739, 0.201	0.428, 0.906	0.356, 0.944	0.995, 0.537	1.148, 0.459

# Past medical history of disease								
1. CVS disorder	2.38±1.928	2.44±1.896	3.13±1.708	4.50±1.966	3.89±1.167	5.67±1.414	9.67±3.041	12.00±3.536
2. Diabetes mellitus	2.63±1.188	2.88±1.356	3.25±1.165	4.63±1.302	2.67±1.506	4.67±2.338	11.50±2.074	14.00±0.894
3. Hepatic disease	3.00±1.732	3.00±1.732	3.67±2.887	5.00±3.606	3.00±1.000	6.00±2.000	10.33±2.517	12.67±3.215
4. Cancer	2.00±0.000	2.50±0.707	2.50±0.707	4.50±0.707	3.20±1.304	4.20±1.483	11.60±1.673	13.80±1.095
5. Respiratory disorder	2.62±2.329	3.00±2.582	3.69±2.428	4.77±2.522	3.71±1.890	4.14±1.215	10.43±2.760	13.00±2.769
6. Neurologic disorder	2.67±3.055	2.33±2.517	2.67±2.082	5.00±3.606	2.80±0.837	5.60±2.074	11.40±2.408	13.20±2.490
7. Gastrointestinal disease	3.67±1.528	3.67±1.528	4.00±1.732	5.00±1.00	2.50±3.536	2.50±3.536	9.00±0.000	13.50±0.707
8. Renal disease	2.00±0.013	2.00±0.013	2.33±2.517	3.00±2.646	3.00±1.000	5.67±1.528	8.00±1.000	9.00±1.00
F , P	2.516, 0.130	**6.100, 0.024***	**0.811, 0.380**	**9.558, 0.006***	0.637, 0.435	5.676, 0.028	1.019, 0.326	1.534, 0.231
Smoking habit & No. of cigarettes/day								
▪ 0	2.94±2.209	3.22±2.290	4.11±2.246	5.67±2.401	3.69±1.621	5.06±1.692	10.88±2.062	13.56±1.672
▪ 1	-	-	-	-	0.00±0.00	0.00±0.00	9.00±0.00	13.00±0.00
▪ 2	2.00±0.00	2.00±0.00	2.00±0.00	2.00±0.00	3.50±0.707	3.50±0.707	9.00±1.071	10.00±1.071
▪ 3	0.00±0.00	0.00±0.00	0.00±0.00	1.00±0.00	5.00±0.00	5.00±0.00	6.00±0.00	7.00±0.00
F , P	0.902, 0.424	1.039, 0.375	1.925, 0.176	2.754, 0.092	2.005, 0.154	**3.329, 0.046***	1.350, 0.293	**3.400, 0.044***
Oxygen therapy device								
1. Simple O_2 mask	2.46±1.984	2.46±1.808	3.23±1.878	4.85±2.410	3.50±2.168	5.17±2.639	10.00±2.449	12.33±2.733
2. Nasal cannula	2.50±1.000	3.25±0.957	4.50±1.732	5.50±1.732	4.43±1.134	5.00±0.816	9.29±2.928	12.00±3.697
3. Non-rebreathing mask	0.00±0.00	0.00±0.00	1.00±0.00	4.00±0.00	-	-	-	-
4. Bi-level positive airway pressure	6.50±2.121	7.50±2.121	7.50±3.536	8.00±5.657	2.71±1.496	3.86±2.035	11.71±2.563	14.14±1.464
F, P	**3.607, 0.037***	**6.141, 0.006***	**3.460, 0.041***	0.918, 0.454	1.962, 0.171	0.915, 0.419	1.526, 0.246	1.181, 0.331

* Significant at level P < 0.05.

Discussion

The present study was conducted in an attempt to assess the effect of oral care intervention and safe-swallowing education on dysphagia of ICU patients post endotracheal extubation.

The result of the present study illustrated that; half and more than two third of study and control group respectively aged between 50 and 60 years, majority were male. More than half and same percent of control and study group had ideal and over body weight respectively. In addition; one third and fifth of the control group admitted with pulmonary oedema and stroke respectively, while less than fifth of the study group admitted by lung cancer and meningitis. More than half of control group compared to less than half of the study group, had a history of cerebral vascular disease (CVS) and respiratory disorders, compared to less than half in the study group. Less than fourth of both groups were smoker from 1 to 3 cigarettes per day. More than half and one third of the study and control group respectively were on simple oxygen mask.

The current study revealed that; there is a dramatic improvement in all items and in Total MSSA score post intervention in the study group which was highly statistically significant. On the other hand; there was a slight gradual improvement in assessment score and MSSA score in the control group post intervention. Regarding the satisfactory level of MSSA; there were no significant differences in the level of MSSA scores throughout the study period in the control group, related to study group; there was a high significant difference of MSSA satisfactory level throughout the study period, thus the majority of the participants showed satisfactory level at day seven post intervention compared to none of them pre-intervention, thus the first study hypothesis has been proved.

Wu et al. (2019) [8], supported the results of the current study; he proved that; the participants who received the Swallow and Oral Care (SOC) intervention following extubation took less time to resume total oral intake than controls, he concluded that the SOC intervention successfully increased patients' chances of resuming total oral intake and enhanced salivary flow 14 days post extubation after prolonged ($\geq$ 48 h) endotracheal intubation; this result is significant since Chen et al. (2018) [14], assured that; patients who were successfully extubated after $\geq$ 48 h endotracheal intubation frequently complained of dry mouth and had difficulty to resume total oral intake. Also, El Gharib et al. (2019) [1], stated that; improvement of swallowing was observed

after five consecutive days of swallowing exercises in the majority of patients and the exercises done in the rehabilitation program assisted the patients to improve their swallowing ability, by decreasing the neuromuscular weakening resulted from orotracheal intubation.

In addition, Crary et al. (2012) [15], supported the present study and concluded that McNeill Dysphagia Therapy Program (MDTP) resulted in marked functional swallowing improvement in a limited time frame with no dysphagia-related problems during or after program.

Moreover, Affoo et al. (2018) [16] indicated that; whole salivary flow amounts increased markedly for up to five minutes after either manual or electric brushing of the teeth, tongue, and palate. It is documented by Affoo (2015) [17] that; saliva, a vital secretion for preserving oral homeostasis and completing the oral preparatory and oral stages of swallowing, and the amount of oral saliva helps for activating the pharyngeal phase of swallowing and increasing swallowing ability.

The current study demonstrated that; there was a significant correlation between the patient's age and the total MSSA mean score throughout the study period and in day seven for control and study group respectively, this may explained by the fact that the muscular tone is expected to be decline with advanced age. These results congruent with Sassi et al. (2018) [4], who denoted that; patients with positive results of Swallowing functional level were significantly younger when compared with other groups. Also, Skoretz et al. (2014)[18], concluded that; patients had a double increase in their chances of developing dysphagia for each additional decade in age added that a higher dysphagia risk was reported in patients aged greater than or equal to fifty-five years post extubation. Moreover, Rech et al. (2018) [19], stated that there was higher incidence of oropharyngeal dysphagia in elders over seventy six years old than younger adults. In contrast to the current study; Wu1 et al. (2019) [8], founded that; patient who are equal to or more than sixty-five years and received the SOC were more likely to resume total oral intake than their younger counterparts aged from fifty to sixty-four.

In relation to the correlation between gender and MSSA mean score, this study revealed that the only significant was in the study group, and the female have high MSSA mean score in day seven than male which may be attributed to different sex will not greatly affect the MSSA mean score. This result contradicted with Sassi et al. (2018) [4], who founded that there is no

significant relation between the gender and Swallowing functional levels, also Rech et al. (2018) [19], founded the incidence of oropharyngeal dysphagia was more in female than male, also; the results of the study done by Wu1 et al. (2019) [8], revealed that there is no any significant relation between the gender and resuming oral intake for participant received SOC. Moreover, Park et al. (2017) [20], indicated that no relation between patients' age or gender and occurrence of post extubation dysphagia.

The results of the present study indicates that; there is no significant correlation between level of education and the MSSA mean score in both control and study group, which may be explained by the fact that education level have no effect on physiology of swallowing; this result is inconsistent with Rech, et al. (2018) [19], who documented that there was higher incidence of oropharyngeal dysphagia in patients with up to elementary education than who have higher education.

Also the current study denotes that; there is no significant correlation between the body mass index (BMI) and the MSSA mean score in both control and study group, and this result agreed with Macht et al. (2011) [7], who founded that there is no relation between the body weight and the severity of post extubation dysphasia, also Rech et

al. (2018) [19], indicated that no correlation between the occurrence of oropharyngeal dysphagia and the BMI.

This study revealed that; there is no significant correlation between the admission diagnosis and the MSSA mean score in both control and study group. This result is contradicted with Macht et al. (2013) [11], who concluded that; the occurrence of post-extubation dysphagia is linked with worse outcomes in survivors of acute respiratory failure who required mechanical ventilation and had neuromuscular or cerebrovascular disease. The current study demonstrated that; there is a significant correlation between the past medical history and the mean scores of MSSA in day one and day seven in the control group, while; for the study group there is no correlation between the past medical history and the MSSA mean scores, for control group; the present study showed that the participants who had past medical history of hepatic, respiratory, neurologic and gastrointestinal disorders got high mean scores of MSSA than others. The result of Rech et al. (2018) [19], founded that; the participants with three or more chronic disorder have more incidence of oropharyngeal dysphagia than others; also Barker, Martino, Ralph-Edwards (2009) and Macht et al. (2011) [21], founded that there is norelationbetween the degree

of post extubation dysphasia and presence of comorbidities.

In relation to the smoking habit for the study group; the non-smoker participants got high mean score of MSSA followed by smokers who smokes one cigarette per day, while the smoker participants who smoke three cigarettes per day got lower score of MSSA, with a statistical significance in days one and seven post intervention. This result is contradicted with Rech et al. (2018) [19], who proved that the non-smoker patients have oropharyngeal dysphagia than smokers, also Barker, Martino, Reichardt, Hickey, Ralph-Edwards (2009) [21], documented that no association between smoking and post extubation dysphagia.

As regard to the Oxygen therapy device; this study revealed a high significant correlation between the Oxygen therapy device and the MSSA mean score in the control group, the participant who were connected to Bi-level positive airway pressure device got the higher scores than the participants who were connected to other oxygen therapy devices along the study period. No previous studies correlated the post extubation dysphasia and oxygen therapy device or particularly Bi-level mask, only Rattanajiajaroen and Kongpolprom (2020) [22], founded that high flow nasal oxygen enhanced the swallowing-breathing coordination in the post extubation patients and possibly decreased the hazard of aspiration.

Conclusion

Although numerous recent developments in ICU practices, dealing with dysphagia post extubation; still a big challenge to healthcare workers and carries a significant weight of morbidity and mortality. The study results shows that oral care intervention consists of brushing participants' oral cavity with a soft toothbrush, mechanically stimulate tissues, and rinse the oral cavity, moisturizing participants' lips, gentle massaging of participants 'cheeks / pressing the surface overlying the parotid, sublingual, and submandibular salivary glands, and ROM exercises for the lips, tongue, jaw, and cheeks, along with safe-swallowing education for the patients and their family care giver reduces dysphagia of ICU patients post endotracheal extubation.

Recommendations

1. Nurses should acquire comprehensive knowledge related to oral care intervention and safe-swallowing education to reduce dysphagia of ICU patients post endotracheal extubation.

2. Nurses should play an important role in reducing dysphagia of ICU patients post endotracheal extubation by including oral care intervention and safe-

swallowing education in the daily routine care provided for patients post endotracheal intubation.

3. Conducting further similar studies in different intensive care units in Egypt with larger number of participants to widely assess the effect of oral care intervention and safe-swallowing education on dysphagia among ICU patients post endotracheal extubation.

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Effect of Utilizing Perineal Massage, Warm Compresses and Hands on Techniques during the Second Stage of Labor on Perineal Outcomes

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Abstract

Background: Maternal morbidity is one of the most common consequences of perineal tear associated with vaginal birth. Thus, prevention of perineal tear becomes an urgent need. **The aim of this study:** was to evaluate the effect of utilizing perineal massage, warm compresses and hands on techniques during the second stage of labor on perineal outcomes. **Subjects and Method:** A convenient sample of (120 parturient women) were selected from labor and delivery units in obstetrics departments at Tanta university and El-Menshawy hospitals and were divided into four groups (three study groups and one control group). **Four tools** were used for data collection; **Tool I, Structured interview schedule;** it included two parts. **Part 1:** Socio- demographic characteristics. **Part 2:** Reproductive history. **Tool II: Visual Analogue Scale (VAS). Tool III: A modified Behavioral Pain Scale (BPS). Tool IV: Assessment of second stage and perineal outcomes. Results:** The results of the present study revealed that perineal pain intensity and associated behavioral responses as well as perineal tear had significantly reduced among women to whom lubricated massage, warm compresses and hands on techniques were applied compared to the control group. **Conclusion and recommendations:** it can be concluded that the use of perineal supportive techniques were effective in improving perineal outcomes which was highly significant among lubricated perineal massage group. So, in-service training programs should be implemented for maternity nurses regarding the applications and benefits of perineal lubricated massage, warm compresses and hands on techniques during the second stage of labor to improve perineal outcomes.

Keyword: Warm compresses, perineal massage, hands on technique, perineal outcomes.

Introduction

Labor is the process whereby the products of conception are expelled from the uterine cavity after the 28th weeks of gestation. Generally, the labor process is divided into four stages**; first, second, third and the fourth stage** [1]. Second stage of labor is considered to be the peak of the birthing process; it refers to the period elapses between the onset of full cervical dilatation, effacement and delivery of the fetus. This stage is the most dangerous time that needs appropriate nursing intervention based on evidence based nursing practice to prevent continuous perineal pain associated with perineal tear[2, 3].

Perineal tear is an extremely common and expected complication of vaginal birth that results from any perineal injury during childbirth. It may happen as a spontaneous tear due to pressure of fetal presenting part on the perineum during vaginal delivery. Worldwide, more than 53-89% of women during childbirth experience different degrees of perineal tear especially among primipara women. According to a study conducted in Egypt 43% of the study sample had peineal tear associated with severe perineal pain [4, 5].

Perineal pain is the worst pain that any woman may endure in her life especially among primipara women. It may be associated with many complications such as; insomnia, anxiety, delays in mother-neonate bonding and failure of the woman to have a favorable position for breastfeeding. In addition, this pain interferes with mother's ability to care for their neonate, and negatively impact on the sexual intercourse. The prevalence of perineal pain has been reported as 92% one day after childbirth [6,7].

Perineal tear and pain are complex interplay between different predisposing factors such as; old or young age parturient women, primiparity, abnormal presentations, macrosomic fetus, instrumental delivery, precipitated labor, previous episiotomy especially median type, previous perineal trauma and undue fundal pressure during 2nd stage of labor[8].

Perineal tear can be classified according to its severity into four degrees; the first-degree of tear occurs spontaneously in the perineal skin, the second- degree consists of the perineal muscles and skin, while the third- degree include the anal sphincter complex and the fourth-degree includes anal sphincter complex and anal epithelium. Moreover, previous studies have shown that **perineal tear** is accompanied by various short and long term complications including; rupture of the anal sphincter, urinary and fecal incontinence, recto-vaginal fistula, perineal pain, dyspareunia, and bleeding [9,10].

The prevention is much better than treatment. Most of the trials that had been done to prevent perineal tear concluded that there is a positive correlation between perineal muscle elasticity, perineal blood supply, perineal lubrication during the second stage and decreased rate of perineal pain and tear. Maternity nurses can use different non-pharmacological approaches and strategies to prevent perineal tear and pain during the second stage of labor [11, 12].

These strategies includes: perineal muscle exercises, perineal lubrication and massage, hands on (perineal supports) and hands off techniques, cold and warm applications during the second stage of labor. Each one of these strategies may be used alone or in combination with another one. Recent research studies reported that perineal massage during second stage of labor is very effective in relaxing the perineum, reducing perineal pain and preventing laceration through increases elasticity, blood supply to the perineum and the release of internal endorphin (pain reliever) which leads to easier pulling and less pain during childbirth [13,14].

Perineal warm compresses can be used to reduce perineal tear and improve maternal comfort during second stage of labor which lead to vasodilatation; increasing tissues blood supply; assisting tissue stretching as well as facilitating the removal of tissues waste products. In addition, warm sensation is known to make dermal stimulation that decreases the pain perception, induces relaxation and reduces the nerve tension [15].

Moreover, hands-on technique used to protect the perineum and prevent perineal tear during the 2nd stage of labor. This technique has been used as a routine midwifery practice for a long time which reduces the speed of birth of the fetal head and allowing the smallest diameter to emerge. Despite the wide use of the previous three techniques in reducing the peineal pain and preventing perineal tear all over the world. In Egypt there is little attention about the effectiveness and applications of these techniques during the second stage of labor [16,17]. So, this study will be conducted to determine the effect of utilizing perineal massage, warm compresses and hands on technique during the second stage of labor on perineal outcomes.

Aim of the study: the aim of this study was to evaluate the effect of utilizing perineal massage, warm compresses and hands on techniques during the second stage of labor on perineal outcomes.

Research Hypothesis: Parturient women who will receive lubricated perineal massage, warm compresses and hands on techniques will experience lower adverse perineal outcomes during the second stage

of labor than those who receive routine hospital care.

Operational Definition: Perineal outcomes in this study refer to the perineal condition after fetal expulsion (intact perineum, episiotomy, tear and perineal pain during the second stage of labor).

Subjects and Method

Study Design: Comparative experimental research design was used to conduct this study.

Setting: The study was conducted at labor units in obstetrics departments at: Tanta University Hospital and El-Menshawy Hospital affiliated to the Ministry of Health and Population.

Subjects: A convenient sample of 120 parturient women were selected from the previously mentioned settings according to the following inclusion criteria: age ranged from 20-35 years, gestational age from 37-42 weeks, had a single fetus with cephalic presentation, no history of medical or obstetrical diseases, normal vaginal delivery and willing to participate in the study.

The subjects were divided equally into four groups:

- **Group I (control):** 30 women who received the routine care provided by the hospital.

Study groups:

- **Group II:** 30 parturient women to whom lubricated massage were applied on the perineal area.

- **Group III:** 30 parturient women to whom warm compresses were applied on the perineal area.

- *Group IV:* 30 parturient women to whom hands on technique was applied on the perineal area.

Tools of data collection: To achieve the aim of the study. Four tools were used.

Tool (I): A structured interview schedule: This tool was developed by the researchers after reviewing the related recent literature [3]. It was used to collect basic data about women. It consisted of two parts:-

Part 1: Socio demographic data including: age, educational level, occupation, residence, income and family type.

Part 2: Reproductive history including: gestational age, number of gravidity, number of abortion and antenatal follow up visits.

Tool (II): Visual Analogue Scale (VAS): It was originally developed by **Mc Caffery and Pasero (1999)** [18] and adapted by the researchers to be used in this study. It is self-reported device consisting of 10 cm straight line, which represents a continuum of pain intensity and has verbal anchors at

opposite ends representing no pain to severe pain. This scale used to assess intensity of perineal pain as follows: Zero (no pain), 1-2 (mild pain), 3-4 (moderate pain), 5-6 (severe pain), 7-8 (very severe) and 9-10 the worst pain.

Tool (III): A modified Behavioral Pain Scale (BPS): It is adapted from **Mateo and Krenzischeck (1992)** [19]. It was used in this study to evaluate the behavioral response to pain. It assessed four parameters of behavioral responses to pain: tense muscles (relaxed muscles, slightly tense, moderate tense and severe tense), restlessness (quiet, slightly restless, moderate restless and very restless), grimacing (no grimacing, some grimacing, moderate grimacing and constant grimacing), and sound (normal sound, groans/moans, groans/moans loudly and cry out or sobs).

Tool (IV): Assessment of second stage and perineal outcomes: it was adapted from

Ibrahim H etal., (2017) [20] that included two main parts:

Part 1: Second stage and newborn characteristics as: progress of labor, duration (min), need for pain relief measures, newborn' birth weight (kg) and also Apgar score at one and five minutes.

Part 2: Perineal outcomes assessment sheet: It incorporated perineal condition

after labor (intact, episiotomy, or tear) region and degree of perineal tear, and the need to repair.

Method

The study was implemented according to the following steps:

1. **Administrative approval:**

2. Official permission was obtained from the responsible authority before conducting this study through official letters from Faculty of Nursing Tanta University after clarifying the purpose of the study directed to hospitals directors of obstetric departments at Tanta University hospital and El-Menshawy hospital to obtain their approval and cooperation for carrying out the study.

3. **Tools development**:

- Tool I was developed and used by the researchers after extensive review of recent and relevant literature [3].

- It was tested for its reliability by test-retest technique.

- The content validity of the developed tool was tested by a jury of five experts in the field.

- Tool II, Tool III and Tool IV were adapted, necessary modifications were done; then these tools were translated into Arabic language.

Ethical consideration:

An informed written consent was obtained from all the study participants after explaining the purpose of the study. The researchers were assured that the nature of the study did not cause any harm and /or pain for the entire sample. Also, confidentiality and privacy was put into consideration regarding the data collected and the participants' rights to withdraw from the study at any time.

Pilot study:

After development of the tools, a pilot study was carried out on 10% of the total sample (12) laboring women who were excluded from the main study sample (3 from each group). This pilot study was conducted one month before the data collection.

The purposes of the pilot study were to:

- Test the feasibility and applicability of the tools, for the purpose of modification and clarification, to ensure the relevance and content validity of the tools, estimate the time needed to complete the tools and to detect any problem that might interfere with data collection.

Results of the pilot study:

After conducting the pilot study, it was found that:

- The tools were clear, applicable, relevant and valid. No problems that interfere with the process of data

collection were detected. Following the pilot study the tools were became ready for use.

Data collection:

- Collection of data covered a period of six months from the beginning of (October 2020 to March 2021) from Tanta University hospital and El-Menshawy hospital. The researchers were attended the places of data collection three days per week at the (morning, afternoon, and night shifts) until the predetermined sample was collected. The researchers started with the *group I* (women who received the routine hospital care) to avoid contamination of the sample.

The study was carried out in four phases:

 a. **Assessment and planning phase**:

The assessment was done during the first stage of labor. The researchers had interviewed with every woman from each group individually, greeted her respectfully with kindness to gain her cooperation and introduced themself to each woman, explained the aim of the study and the time needed for data collection as well as take the participants oral and written consent. Then, the researchers prepared a container that included papers by names of the different perineal supportive techniques, then each woman of the study groups

selected the perineal technique randomly that she will receive. After that, the researchers asked the woman questions in Arabic language and recorded the answers in the pre developed tool I (*A structured interview schedule part 1 and 2*). This interview had taken15 minutes.

b. Implementation phase:

The selected protective perineal technique was implemented by the researchers for each parturient woman among the intervention groups during the second stage of labor as follows:

- **Group I (Control)**: The women received the routine care provided by the hospital where the physician makes gentle pressure on the lower wall of the vagina using both the index and the middle fingers till crowning occur. The head flexion is also maintained during its expulsion.

- **Group II (Lubricated massage technique):** in which the researchers put five milliliters of KY gel (water-soluble lubricant) on the two index and middle fingers, Then began to massage the perineum in U shape reciprocal movement. Five milliliters KY gel was introduced also inside the vagina with massaging of the vaginal wall toward the rectum up and down. The massaging process was intermittent through all the duration of the second

stage even during the period of contraction and at crowning. The interval between messaging sessions was 5 minutes.

- **Group III (Warm compresses technique):** in which the researchers applied compresses on the parturient's perineum and external genitalia as well as holding it continuously with gloved hands during and between pushes.

- **Group IV (Hands on technique)**: at crowning of fetal head the researchers used the index and middle fingers of the left hand and placed on the fetal occiput to maintain the flexion of fetal head and the right hand placed on the perineum with thumb and index fingers forming a U shape so expulsion is controlled. Once the anterior shoulder is delivered, gentle traction is applied upward to facilitate delivery of the posterior shoulder. After both shoulders have been delivered, the researchers were removed the right hand from the posterior perineum and supports the fetal neck with one hand, while supporting the remainder of the body with the other hand.

c. Evaluation phase:

- The researchers used **Tool II and Tool III** two times first at complete cervical dilatation before intervention as well as 15 minutes after the intervention during

the 2nd stage of labor for assessing intensity of pernieal pain and woman's behavioral responses to perineal pain.

- The researchers used **Tool IV part 1** during second stage of labor for assessing the progress of labor, duration (min), need for pain relief measures, newborn' birth weight (kg) and also Apgar score at one and five minutes.

- At the end of the second stage of labor the four groups assessed by the researchers for the presence of genital tract tear and lacerations, region and degree of tear using **Tool IV part 2.**

- Comparison between the four groups was done to determine which technique had positive effect during the second stage of labor on perineal outcomes (perineal tear and pain).

Results

Table (1): Shows the socio-demographic characteristics of the studied women. It was noticed that the mean age of group I, group II, group III and group IV were (25.03±2.40, 23.90±1.32, 24.40±1.81 and 25.90±1.32 respectively), It was also, observed that nearly two thirds (63.3%) of group I, group III and group IV corresponding to more than half (56.7%) of group II were housewives with no

statistically significant difference between the four groups ($X^2 = 0.374$, P = 0.829).

As regard to the residence, it was demonstrated that (73.3%) of group I and group IV corresponding to (56.7% and 60.0%) of group II and group III respectively were born in rural areas. Also, it was recorded that nearly half (46.7%) of group II, III and group IV had preparatory education corresponding to two fifth (40.0%) of group I with no statistically significant difference between the four groups ($X^2 = 6.947$, P = 0.326).

Regarding the income of the studied women it was clear that (80.0%) of group II and III corresponding to two thirds (66.7%) of the group I and IV had enough income with no statistically significant difference between the three groups ($X^2 = 4.013$, P= 0.236). Furthermore, it was noticed that more than half (56.7%) of group I, III and IV corresponding to most (90.0 %) of group II were living in nuclear family with a statistically significant difference between the four groups ($X^2 = 11.100$, P = 0.004*).

Table (2): Illustrates the reproductive history of the studied women. It was observed that the mean gestational age was (39.43±1.01, 39.13±1.10, 39.43±1.01 and 39.00±1.31 respectively) among group I, II, III and group IV with no statistically significant difference between the four

groups (F = 1.120, P = 0.331).   It was evident that (76.7 % and 73.3 % respectively) of group I and group III corresponding to the most (93.3 % and 96.7% respectively) of group II and IV were primigravida and had no abortion without statistically significant difference between the four groups (X^2 = 4.649 and 0.310, P= 0.325, 0.855 respectively).

Regarding, the antenatal booking, it was evident that half (50 %) of group II and III corresponding to (40% and 66.7% respectively) of group I and IV had their first antenatal visit at the third trimester while half (50.0%) of group I and III were received their antenatal follow up at governmental hospitals compared to (60% and50.0% respectively) of group II and IV were received their antenatal follow up at the maternal and child health centers (MCH). The table also demonstrated that (53.3%, 90.0%, 56.7% and 60% respectively) of group I, II, III and group IV had less than 4 antenatal visits with a statistically significant difference between the four groups (X^2 =17.603, P=0.007*).

Figure (1):   Illustrates the percent distribution of the parturient women according to their perineal pain intensity before and 15 minutes after starting the intervention according to Visual Analogue Scale. It was revealed that half (50.0%) of group II and group IV corresponding to

(46.7% and 43.7% respectively) of group I and III had reported severe degree of perineal pain before the utilization of perineal supportive techniques with a statistically significant difference between the four groups (χ^2 = 90.020, P=0.000*).

While, there were evident increase in the intensity of perineal pain among group I compared to group II, III and group IV 15 minutes after the utilization of perineal supportive techniques where two fifth (40%) of group I reported very severe degree of perineal pain compared to (0.0%, 0.0%, and 10.0% respectively) among group (II, III and IV) with a statistically significant difference between the four groups (χ^2 = 93.030, P = 0.000*).

Table (3): Shows the percent distribution of the parturient women according to their behavioral responses to perineal pain before and 15 minutes after starting the intervention according to a modified Behavioral Pain Scale. It was revealed that there were evident increase in the percent of women who had assumed tense body postures,   became very restless, had constant frowning and cried out before utilization of perineal supportive techniques among the four groups with no statistically significant difference (X^2 =2.334, 13.3, 1.921, 2. 965 and P = 0. 0433, 0.112, 0.232, 0.117 respectively).

Whereas, 15 minutes after utilization of

the perineal supportive techniques there was a significant improvement in women's behavioral responses to perineal pain among the three study groups that was so evident among group II (43.3%, 43.3%,

43.3% and 33.3 respectively), group III (46.7%, 40%, 40% and 40% respectively) and group IV (50%, 50%, 46.7% and 43.3% respectively) compared to significant improvement among group I (83.3%, 80%, 86.7% and 56.7% respectively) of women had assumed tense body postures, became very restless, had constant frowning and cried out with a statistically significant difference between the four groups (X^2 = 83.274, 65.769, 63.566, 77.732 and   P= 0.0001*, 0.0001*, 0.0001*, and 0.021* respectively)

Table (4): revealed the percent distribution of parturient women according to their second stage and newborns characteristics. It was obvious that there were increase in the percent of women who had induced labor among group I (33.3%) compared to significant decrease among group II, group III and group IV (3.3% ,3.3% and 6.7%, respectively). Regarding the need for pain relief it was evident that most (83.3%) of group I compared to (20%, 26.7%, and 33.3% respectively) of group II, group III and group IV need for pain relief during 2nd stage of labor with a statistically significant difference (χ^2 =70.499, 0 .002*).

Regarding the mean duration of the second stage of labor/ min, it is evident that group I had the longest duration (68.425 ± 6.710) compared to the other three studied groups (64.760 ± 6.585, 65.150 ± 6.585, and 66.698 ± 6.585 respectively) and this so evident among group II with a statistically significant difference (χ^2 =72.499, 0.002*). Concerning, the mean newborn birth weight, it is evident that it was within the normal range (3.05 ± 0.212, 3.121 ± 0.154, 3.250± 0.506, 3.01 ± 0.282 respectively) among the four groups with no statistically significant difference (χ^2 =1.882, P= 0.154). By this context, as regard Apgar score at 1 and 5 min, it was obvious that Apgar score within the normal range among the majority (96.7%, 93.3% and 93.3% respectively) of group II, group III and group IV compared to (73.3%) among group I with a statistically significant difference (χ^2 =78.526 and P = 0.000*).

Table (5) and Figure (2): represent the percent distribution of the parturient women according to their perineal outcomes after delivery. It was evident that there was an increase in the percent of tear (43.3%) among group I where (20%) of them had perineal tear compared to (3.3%, 10% and 3.3% respectively) among group II, III and group IV. Regarding the degree of perineal tear it was revealed that (53.8%) of group I compared to (3.3%, 10% and 3.3% respectively) of group II, group III and group IV had first degree of

perineal tear**.** Furthermore, most (83.3%) of group I require perineal repair compared to (33.3%, 40% and 33.3% respectively) of group II, group III and group IV with a statistically significant difference (x^2= 12.499, P= 0.002*).

Table (1): Percent distribution of the studied parturient women regarding their socio-demographic characteristics.

Variables	The studied women (N=120)								χ²	P
	Group I (Control) (N=30)		Group II (Lubricated message) (N=30)		Group III (Warm compress) (N=30)		Group IV (Hands on technique) (N=30)			
	N	%	N	%	N	%	N	%		
Age years: Range Mean±SD	20-33 25.03±2.40		22-28 23.90±1.32		22-29 24.40±1.81		22-30 25.90±1.32			
F value **P**	2.691 0.073									
Job: House wife Employee	19 11	63.3 36.7	17 13	56.7 43.3	19 11	63.3 36.7	19 11	63.3 36.7	0.374	0.829
Residence: Rural Urban	22 8	73.3 26.7	17 13	56.7 43.3	18 12	60.0 40.0	22 8	73.3 26.7	2.010	0.366
Education level: Illiterate Primary or preparatory Secondary University or postgraduate	1 12 10 7	3.3 40.0 33.3 23.4	0 14 7 9	0 46.7 23.3 30.0	0 14 13 3	0 46.7 43.3 10.0	0 14 7 9	0 46.7 23.3 30.0	6.947	0.326
Income/month: Not enough Enough	10 20	33.3 66.7	6 24	20.0 80.0	6 24	20.0 80.0	10 20	33.3 66.7	4.013	0.236
Family type: Nuclear family Extended family	17 13	56.7 43.3	27 3	90.0 10.0	17 13	56.7 43.3	17 13	56.7 43.3	11.100	0.004*

Table (2): Percent distribution of the studied parturient women regarding their reproductive history.

Variables	The studied women (N=120)								χ^2	P
	Group I (Control) (N=30)		Group II (Lubricated message) (N=30)		Group III (Warm compress) (N=30)		Group IV (Hands on technique) (N=30)			
	N	%	N	%	N	%	N	%		
Gestational age at birth (weeks):										
Range	38.00-41.00		37.00-41.00		38.00-41.00		37.00-41.00			
Mean±SD	39.43±1.01		39.13±1.10		39.43±1.01		39.13±1.10			
F value	**1.120**									
P	**0.331**									
Gravidity:										
Primigravida.	22	73.4	28	93.3	23	76.7	29	96.7	4.649	0.325
Two	7	23.3	2	6.7	6	20.0	1	3.3		
Three	1	3.3	0	0	1	3.3	0	0		
Number of abortions: None										
	22	73.4	28	93.3	23	76.7	29	96.7		
One	7	23.3	2	6.7	6	20.0	1	3.3		
Two	1	3.3	0	0	1	3.3	0	0	0.310	0.855
Ante-natal booking: - Time of initial visits:										
First trimester	8	26.7	0	0	0	0	0	0		
Second trimester	10	33.3	15	50.0	15	50.0	10	33.3	1.714	0.788
Third trimester	12	40.0	15	50.0	15	50.0	20	66.7		
- Place of receiving the antenatal follow up:										
Governmental hospital	15	50	0.0	0.0	15	50	0.0	0.0		
Private hospital	10	33.3	10	33.3	11	36.7	9	30	6.373	0.383
Private clinic	5	16.7	2	6.7	4	13.3	5	16.7		
Maternal and child health center (MCH)	0.0	0.0	18	60.0	0.0	0.0	15	50		
- Number of follow up visits:										
< 4	16	53.3	27	90.0	17	56.7	20	66.7	17.603	0.007*
≥4	14	46.7	3	10.0	13	43.3	10	33.3		

*Significant (P<0.05
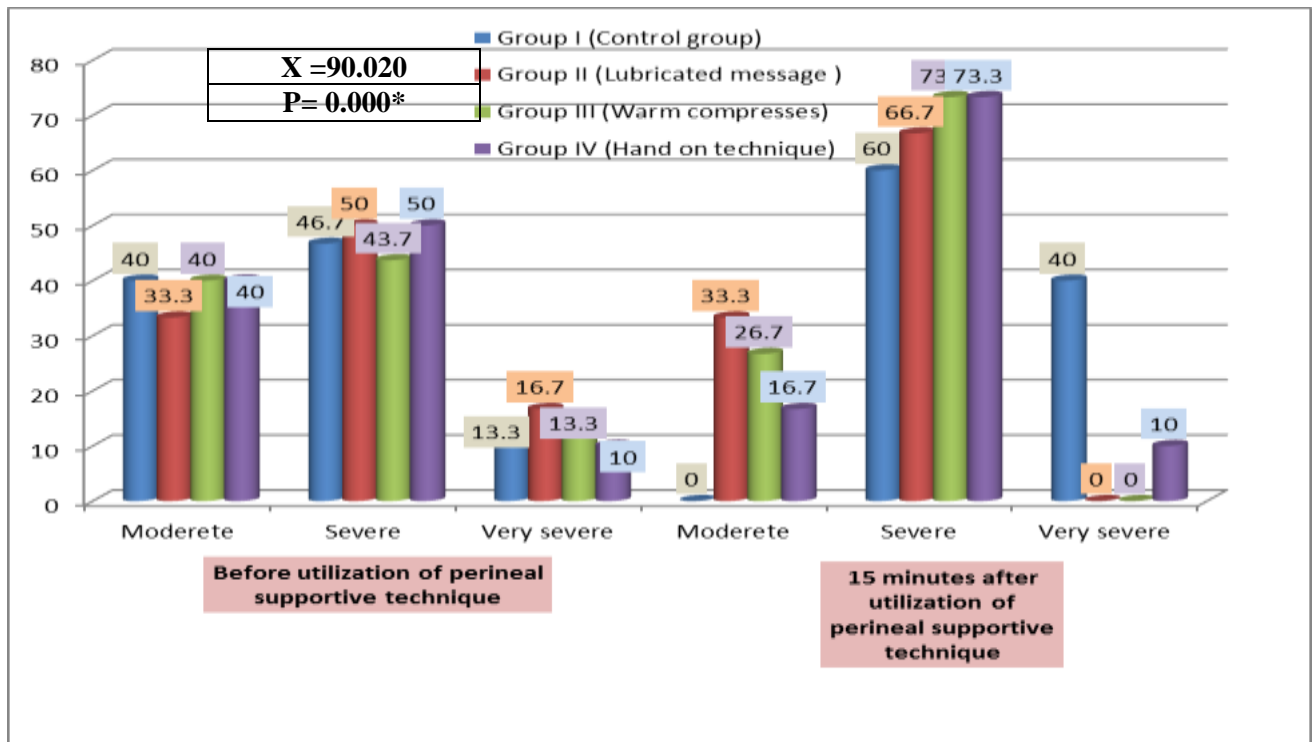
Figure (1): Percent distribution of the studied parturient women according to their perineal pain intensity before and 15 minutes after starting the intervention according to Visual Analogue Scale

Table (3): Percent distribution of the studied parturient women according to their behavioral responses to perineal pain before and 15 minutes after starting the intervention according to A modified Behavioral Pain Scale.

Variables	The studied women (N=120)								χ^2	P
	Group I (Control)		Group II (Lubricated message)		Group III (Warm compress)		Group IV (Hands on technique)			
	N	%	N	%	N	%	N	%		
Before utilization of perineal supportive technique										
Tense muscle:									2.334	0. 0433
-Slightly tense	3	10.0	4	13.3	3	10.0	3	10.0		
-Moderate tense	7	23.3	8	26.7	10	33.3	7	23.3		
-Severe tense	20	66.7	18	60	17	56.7	20	66.7		
Restlessness:									13.3	0.112
-Slightly restless	2	6.7	2	6.7	4	13.3	0	0.0		
-Moderate restless	10	33.3	8	26.7	10	33.3	8	26.7		
-Very restless	18	60.0	20	66.7	16	53.3	22	73.3		
Grimacing:									1.921	0.232
-No grimacing	0	0.0	0	0.0	2	6.7	0	0.0		
-Some grimacing	4	13.3	4	13.3	2	6.7	3	10.0		
-Moderate grimacing	5	16.7	8	26.7	13	43.3	7	23.3		
-Constant grimacing	21	70.0	15	50.0	13	43.3	20	66.7		
Patient sounds:									2.965	0.117
-Normal sound	0	0.00	3	10.0	0	0.00	0	00.0		
-Groans/moans	9	30.0	4	13.3	4	13.3	2	6.7		
-Groans/moans loudly	10	33.3	8	26.7	5	16.7	10	33.3		
-Cry out or sobs	11	36.7	15	50.0	21	70.0	18	60		
15 minutes after utilization of perineal supportive technique										
Tense muscle:									83.274	0.0001*
-Moderate tense	5	16.7	17	56.7	16	53.3	15	50.0		
-Severe tense	25	83.3	13	43.3	14	46.7	15	50.0		
Restlessness:									65.769	0.0001*
-Moderate restless	6	20.0	17	56.7	18	60.0	15	50.0		
-Very restless	24	80.0	13	43.3	12	40.0	15	50.0		
Grimacing:									63.566	0.0001*
-Moderate grimacing	4	13.3	17	56.7	18	60.0	16	53.3		
-Constant grimacing	26	86.7	13	43.3	12	40.0	14	46.7		
Patient sounds:									77.732	0.021*
-Groans/moans	6	20	11	36.7	6	20	5	16.7		
-Groans/moans loudly	7	23.3	9	30.0	12	40.0	12	40.0		
-Cry out or sobs	17	56.7	10	33.3	12	40.0	13	43.3		

Table (4): Percent distribution of the studied parturient women according to their second stage and newborns characteristics

Variables	The studied women (N=120)								χ^2	P
	Group I (Control) (N=30)		Group II (Lubricated message) (N=30)		Group III (N=30) (Warm compress)		Group IV (Hands on technique) (N=30)			
	N	%	N	%	N	%	N	%		
Progress of labor: Spontaneous Induced	20 10	66.7 33.3	29 1	96.7 3.3	29 1	96.7 3.3	28 2	93.3 6.7	78.526	0.000*
Need for pain relief Yes No	25 5	83.3 16.7	6 24	20.0 80.0	8 22	26.7 73.3	10 20	33.3 66.7	70.499	0 .002*
Duration (min) Mean ± SD	68.425 ± 6.710		64.760 ± 6.585		65.150 ± 6.585		66.698 ± 6.585		72.499	0.002*
Baby birth weight (g) Mean ± SD	3.05 ± 0.212		3.121 ± 0.154		3.250± 0.506		3.01 ± 0.282		1.882	0.154
Apgar score at 1 and 5 min Normal Abnormal	22 8	73.3 26.7	29 1	96.7 3.3	28 2	93.3 6.7	28 2	93.3 6.7	78.526	0.000*

Table (5): Percent distribution of the studied parturient women according to their perineal outcomes after intervention.

Variables	The studied women (N=120)								χ^2	P
	Group I (Control) (N=30)		Group II (Lubricated message) (N=30)		Group III (Warm compress) (N=30)		Group IV (Hands on technique) (N=30)			
	N	%	N	%	N	%	N	%		
Perineal condition										
-Intact	5	16.7	20	66.7	18	60.0	20	66.7		
-Episiotomy	12	40	9	30.0	9	30.0	9	30.0	14.387	0.001*
-Tear	13	43.3	1	3.3	3	10.0	1	3.3		
Sites of tear	N=13		N=1		N=3		N=1			
Vaginal tear	5	16.7	0	0	0	0	0	0		
Labial tear	2	6.7	0	0	0	0	0	0	13.303	0.001*
Perineal tear	6	20.0	1	3.3	3	10.0	1	3.3		
Degrees of perineal tear										
-First	7	53.8	1	3.3	3	10.0	1	3.3	11.100	0.004*
-Second	4	30.8	0	0.0	0	0.0	0	0.0		
-Third	2	15.4	0	0.0	0	0.0	0	0		
Need to repair										
-Yes	25	83.3	10	33..3	12	40.0	10	33..3	12.499	0.002*
-No	5	16.7	20	66.7	18	60.0	20	66.7		
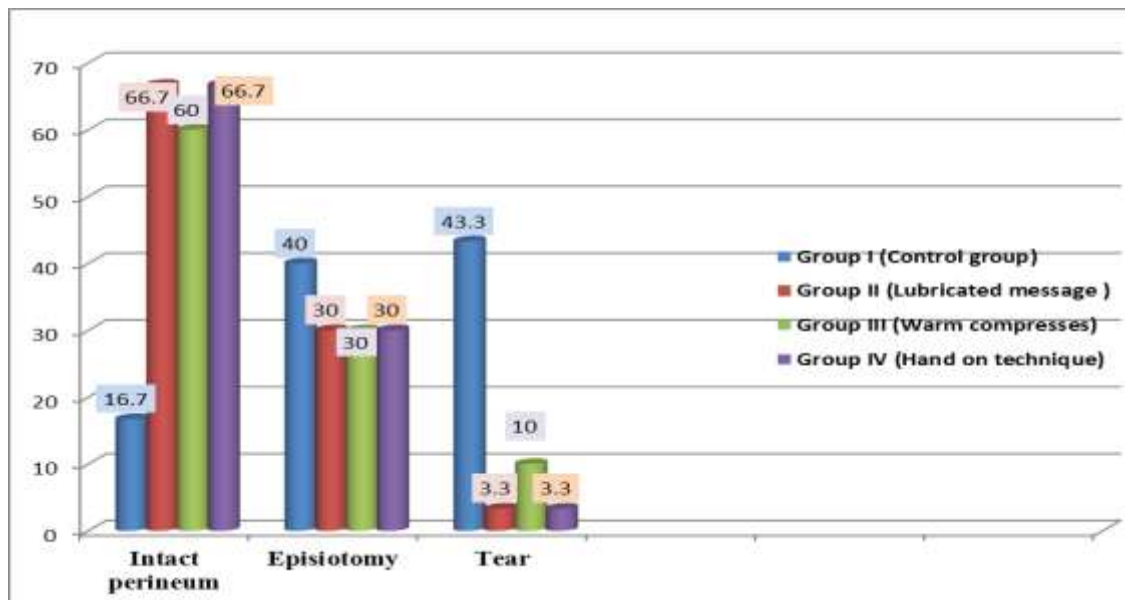
Figure (2): Percent distribution of the studied parturient women according to their perineal condition after intervention.

Discussion

Perineal pain and tear are common complications for vaginal birth that negatively impact on maternal physical and psychological health. So, prevention of perineal tear is an urgent need, midwives have a crucial role in its prevention using different non pharmacological techniques. Thus this study has shed some lights on the effect of utilizing perineal massage, warm compresses and hands on techniques during the second stage of labor on perineal outcomes [13].

The findings of the present study declared that the study subjects of the four groups were matching in nearly most of the aspects of their socio- demographic characteristics and their reproductive history with no statistically significant difference. This matching is useful in limiting the extraneous variables which may interfere with the effect of utilizing perineal massage, warm compresses and hands on techniques during the second stage of labor on perineal outcomes. This finding was in line with **Ibrahim H etal., (2017)** [20] they investigated "the effect of warm compresses versus lubricated massage during the second stage of labor on perineal outcomes among primiparous women" and **Abdel Monem A etal. (2020)** [21] they studied "the effect of hands-on, hands-off and warm compresses perineal

techniques during the 2nd stage of labor on perineal outcomes among primiparae with vaginal delivery". They reported that the study subjects of their groups (study and control) were homogenous in their socio-demographic characteristics and reproductive history with no statistically significant difference.

Concerning, the intensity of perineal pain measured by Visual Analogue Scale (VAS). The findings of the current study reported that there were evident increase in the intensity of perineal pain among group I compared to group II, III and group IV at 15 minutes after the utilization of perineal supportive techniques where one third of group I reported very severe degree of perineal pain compared to none of group II, III and group IV with a statistically significant difference between the four groups. This findings was compatible with **Türkmen H etal., (2020)** [22] who studied "the Effect of perineal warm application on perineal pain, perineal integrity, and postpartum comfort in the 2nd stage of labor: randomized clinical trial" and reported that the application of warm compresses on perineal area during second stage of labor was associated with less perineal pain.

The findings of the present study are also supported by **Vaziri F etal., (2014)** [23] who investigated "the effects of warm

perineum compress during the second phase of labour on first- birth outcome. The researchers had concluded that perineal pain severity in the 2nd stage of delivery was decreased significantly in warm compresses group than the control group. This similarity between the present study and previous studies can be explained by the fact that warm compresses increase perineal tissue's blood supply and cause dermal stimulation that decreases pain perception, induces relaxation and reduces nerve tension.

Furthermore, the present study was in accordance with **Karaçam Z etal., (2012)** **(24)** they investigated "the use of perineal massage in the second stage of labor and follow-up of postpartum perineal outcomes" and summarized that perineal massage was very effective in reducing perineal pain. This agreement between the current study and the above study can be attributed to the therapeutic advantages of perineal massage, such as increased vasodilatation, blood flow, tissue elasticity and reduced perceived pain.

Moreover, the present study is in agreement with **Thomas P and Jayabharathi B (2016)** (25) they studied the "effectiveness of hands off versus hands on techniques on perineal trauma, and perineal pain among parturient mothers" they proved that hands on technique was

very effective in reducing perineal pain. The similarity between these studies can be return to the effectiveness of hands on technique on protecting and supporting the perineum and reducing perineal pain.

Regarding parturient women's behavioral responses to perineal pain, the findings of the present study revealed that there was a significant improvement in women's behavioral responses to perineal pain among the three study groups and this so evident among group II compared to a significant increase among group I at 15 minutes after utilization of the perineal supportive techniques with a statistically significant difference. The findings of this study was in agreement with **Essa R and Ismail** N **(2016)** (26) they studied "effect of 2nd stage perineal warm compresses on perineal pain and outcomes among primiparae". They found that the behavioral responses to perineal pain were decreased significantly after the use of warm compresses among the intervention group compared to control group. The findings of the current study aligns with **Ibrahim H etal., (2017)**(20) the researchers concluded that warm compresses and lubricated massage significantly improve the behavioral responses to perineal pain compared to the control group.

As regard to the characteristics of the second stage of labor; it was obvious that

there was a significant decrease in the percent of women who had induced labor and require pain relief among the three study groups compared to the control group with statistically significant difference. This findings was matching with **Abdel Monem A etal., (2020)**[21] they summarized that there was an evident decrease of labor induction among warm compresses and hands on groups and they did not require pain relief during the 2nd stage of labor.

Concerning, the mean duration of the second stage of labor/ min, the current findings revealed that the mean duration of the second stage of labor / min is shorter among the three intervention groups compared to the control group and this is so evident among group II. The results of the present study disagreed with **Ashwal E (2016)** [27] who conducted a randomized controlled clinical trial to "evaluate the effectiveness of obstetric gel on the length of 2nd stage of labor and perineal integrity". They reported that the mean length of the 2nd stage of labor was similar between the study and control groups. From the researcher's point of view, this contradiction may be attributed to the difference in the duration and frequency of application of lubricant perineal massage.

The results of this study also contradict with **Ganji Z et al., (2013)** [28] they

conducted a randomized controlled trial to "evaluate the effectiveness of local heat and cold compresses on labor pain and labor outcomes". They reported that application of a warm towel on perineal area did not make any difference in the length of the 2nd stage of labor. Again, the findings of the present study disagree with the **Foroughipour A et al., (2011)** [29] they reported that there was no significantly difference between the hands-off and the hands-on groups regarding the length of the 2nd stage of delivery.

Concerning, the mean newborn birth weight and Apgar score at 1 and 5 minutes. The results of this study reported that the mean newborn weight and Apgar score were within normal range among the four study groups. This study is in accordance with **Goh Y et al., (2020)** [30] they studied "combined massage and warm compress to the perineum during active second stage of labor in nulliparas". The researchers summarized that the mean newborn weight and Apgar score were within the normal range among the intervention groups.

Regarding perineal outcomes after delivery. The findings of the current study founded that there was an evident increase in the percent of tear among group I (the control) compared to a significant decrease among group II, III and group IV. The

results are supported by **Modoor S., etal., (2021)** [31] they investigated "the effect of warm compresses on perineal tear and pain intensity during the second stage of labor" and reported that the experimental (warm compresses group) had lower degrees of perineal tear than the control group.

This study findings also goes in line with Demirel G., and Golbasi Z (2015) [32] They studied "the effects of perineal massage during active labor on the frequency of episiotomy and perineal tearing" and declared that perineal massage was very effective in reducing perineal tear. Furthermore this study is supported by **Rozita R etal., (2014)** [33] they studied "a comparison of the ''hands-off'' and ''hands-on'' methods to reduce perineal lacerations" and reported that hands on technique was very effective in reducing the incidence of perineal lacerations.

Regarding the degree of perineal tear it was revealed that first degree perineal tear was the most common among the control group**.** This finding is supported by **Rozita R et al., (2014)** [33] who reported that more than half of the control group had first degree perineal tear. Furthermore, most of the control group require perineal repair, this finding also goes in line with **Goma L., etal., (2020)** [34]. They evaluated the "effect of utilization hands on versus off method during delivery of fetal head on the

occurrence of perineal tear". The researchers founded that more than half of the study samples require repair for perineal tear.

Conclusion: According to the findings of the present study, it can be concluded that the use of perineal supportive techniques including (lubricated massage, warm compress and hands on techniques) were effective in reducing the intensity of perineal pain and tear as well as improving maternal behavioral responses to perineal pain. This was highly significant among lubricated perineal massage group.

Recommendations: Based on the findings of this study, the following recommendations are suggested:

-   In-service training programs should be implemented for maternity nurses regarding the applications and benefits of warm compresses, perineal lubricated massage and hands on techniques during the second stage of labor to improve its outcomes.

-   Nursing management during the second stage of labor should be provided based on the evidence based practice guidelines.

-   Further research could be performed to evaluate the effect of different types of perineal techniques during vaginal birth on maternal and fetal outcomes

as well as assess to women's satisfaction with these techniques.

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Knowledge, Attitudes and Practices of Nurses Regarding Client Safety at Maternal and Child Health Care Centers

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Abstract

Background: Patient safety is the cornerstone of high-quality health care. Nurses play a critical role in ensuring patient safety by monitoring patients, detecting errors, understanding care processes, and performing countless other tasks to ensure patients receive high-quality care. **Aim of this study:** Assess knowledge, attitudes and practices of nurses toward client safety at maternal and child health care centers (MCH). **Subjects and methods**: A Convenience sample of 120 nurses included in the study. **Design:** Descriptive study design. **Setting**: All seven MCH centers at Tanta   city. **Tools:** Two tools were used, **Tool (I) Structured interview schedule:** which   developed by the researcher and is consisted of three parts as follows , nurses socio demographic data, their knowledge toward patient safety and nurses attitudes by using Safety Attitude Questionnaire ambulatory version (SAQ- AV) toward patient safety **Tool (II) An observational checklist regarding Nurses' practices:** This tool was done by using checklist that was developed and constructed by researcher based on related literature review and the nature of each clinic. **Results:** more than one third (40.8%) of studied nurses had good total knowledge score and   the majority (89.2%) of them had a positive attitude. The majority (95.8% , 90.9%) of studied nurses' total   practice levels were satisfactory in vaccination clinic and family planning clinic. There was a significant relation was found   between socio demographic data and total knowledge and attitude scores of the studied nurses. **Conclusion:** the more knowledge health care professionals have about patient safety, the more positive their attitudes and the better their skills regarding patient safety **Recommendations:** It was recommended that all nurses working in primary health care settings should complete regular periodic in-services training programs to keep them up to date regarding patients' safety culture and safety practices.

Keywords: patient safety, knowledge, attitude, practices ,   Maternal and Child health care.

Introduction

Patient safety has been marked as a key priority of healthcare in recent decades not only because of the recognition of the extent and severity of the problem but equally because of successful interventions can reduce, mitigate or prevent known harm. The challenge for healthcare match, prioritize and implement safety interventions that provide effective, evidence-based, relevant, achievable, measurable and best value protection from harm across the care spectrum. Safety is a fundamental principle of patient care and a critical component of quality management[1-2].

According to (WHO) patient safety is defined as "the absence of preventable harm to a patient during the process of health care". Patient safety is the reduction in the risk of unnecessary harm associated with health care, to an acceptable minimum [3]. Health care associated harm is a harm that arising from or associated with plans or actions taken during the provision of health care, rather than that associated with an underlying disease or injury. Patient safety often referred to as a safety climate or safety culture. [4]

Patient safety culture "the product of individual and group values, attitudes, perceptions, competencies and patterns of behavior that determine the compliance to, the style and efficiency of, an organization's health and safety management. However, this needs to be balanced with accountability in recognition that not all mistakes should go unpunished. The culture allows healthcare organizations to determine how they might deal with clinical errors, thus striking a balance between mistakes and accountability [5].

The concept of patient safety in primary care, not only focused on the primary care practice as the environment or setting for patient safety to be empowered, but also the health care system (e.g., issues associated with fragmentation of care or continuity of care between acute and primary care settings) and community (e.g., issues associated with community pharmacy or other community-level health care professionals) as determinants of safety [6].

According to (WHO) (2018) globally health safety failures   in primary and ambulatory care are common; many of them can be avoided. Estimates show that as many as 20%:25% of the general population harmed   in developed and developing countries respectively. Some estimates say that as many as 4 out of 10 patients are harmed in the primary/ambulatory setting. Most harmful are errors related to diagnosis and prescription and the use of medicines. Up

to 80% of harm in primary and ambulatory settings can be prevented [7] .

Agreeing to The World Health Organization (WHO), patient safety program has launched   the "Safer Primary Care" project, which focuses on risk exposures, harms that are preventable, and how to maintain   patients at essential care level as infection control program, communication skills that maintain accuracy of data, identification system in all parts of MCH center as prenatal, postnatal, dental clinic, immunization clinic and family planning [8].

In Egypt, patient safety culture still has numerous   areas for enhancement that require continuous evaluation and monitoring to attain a safe environment both for patients and health-care providers. Patient safety culture is an organizational culture that develops a positive environment in which patient safety is likely to happen.   In Egypt, there is increasing interest in patient safety in the presence of a general lack of perception of the problem. [9 -10] .

Maternal and child healthcare (MCH) is one of the most viable area   in the sustainable development goals. Maternal and Child health care Centers (MCH) services refer to the care provided   for children during growth and development period and care for women during pregnancy, childbirth and postpartum period. Such services involve not only medical interventions on illness conditions, but also health promotion activities and preventive care. Integration of these services is essential to ensure high standard of care, which often includes   many providers and cross-organizational collaborations. Unfortunately, MCH clients (women and children) are usually disadvantaged in access to healthcare due to their relatively low socioeconomic status [11] .

The aim   of the patient safety is to decreases the chance of injury or harm to patient from the structure and process of care by detection of safety problems, preventive and corrective action, processes to diminish action, setting up of corrective action plan and ongoing action measurement to ensure effective action. Safer PHC services throughout the world strive to provide care to people when they are unwell and assist them to stay well. Primary care services are increasingly at the heart of integrated people-centered health care in many countries. They provide an entry point into the health system, ongoing care coordination and a person focused approach for people and their families.   Accessible and safe primary care is essential to achieving universal health coverage. Health services

work hard to provide safe and high quality care, but sometimes people are inadvertently harmed. Unsafe health care has been recognized as a global challenge and much has been done to understand the causes, consequences and potential solutions to this problem [12] .

However, the majority of this work up to now has focused on hospital care and there is, as a result, far less understanding about what can be done to improve safety in primary care. Assessment of current safety culture in a primary healthcare organizations especially MCH centers is the first step to identify the most problematic areas for improvement. [10] Since healthcare staff knowledge, attitudes and pattern of behaviors are critical in the promotion of the workplace climate needed to secure an organizational culture of safety.

Three characteristics of the concept patient safety in primary care they are including Knowledge about safe practices among healthcare providers; deliver safe patient care in primary care that is free from harm with using of technology and compliance to origination policies of care: primary health care provider commitment to patient safety demonstration such as incident reporting and provide safe patient environment [13] .

Community health nurse play a critical role in preserving and ensuring patient safety due to the nature of their work. Nurses play a critical role in ensuring patient safety by monitoring patients, detecting errors, understanding care processes, and performing countless other works   to ensure patients receive high-quality care. Moreover, community health nurses should be assessed regularly for providing safety measures and detailed for nursing mistakes for avoiding risk factors which are threaten the patient safety. [14]

Nurses associate with team members to discuss the best safe treatment plan for the patients. Thus, nurses review the patients' plan of care and identify safety issues to discuss with team members. For example, nurses maintain effective communication with team members and patients to facilitate positive results [15]. The involvement of nurses in patient care rounds will promote safer outcomes.

Nurses also have a role in maintaining National Patient Safety Goals, through preventing medication Errors and   to use medicines safety. Nurses should follow their facilities' policies during medication administration to prevent medication errors. For example, nurses should identify patients correctly, follow the 10 medication Rights during medication review, and educate all patients about the

side effects of each medication and expected outcomes . Moreover, nurses can help in preventing infection through following guidelines to protect patients from hospital-acquired infections, such as hand hygiene, needle stick or sharp injuries prevention and carefully handle sharps and clinical waste carefully at all times [16-17]. In addition nurses identify patients at risk for falls and conduct appropriate assessment that enables applying individualized measures to avoid falls [18]

For nursing practice, it is recommended that patient safety among primary care practitioners should be evaluated from time to time to make sure that they are efficient enough in order to deliver health care. [1] .

Significance of the study

Until now, only few organizations in Egypt have assessed how much their staff culture backs up patient safety. Health care providers at primary health care (PHC) facilities should have sufficient background knowledge and deliver practices maintain patient safety in order to minimize the incidence of adverse events especially when PHCs are considered as the first line of health care provision [19] .

Aim of the study

The aim of this study is to

Assess knowledge, attitudes and practices of nurses toward client safety at maternal and child health care centers.

Research questions

- What are the levels of nurses' knowledge, attitudes and practices regarding client safety at maternal and child health care centers?

Subjects& Methods

Study design: Descriptive study was used in this study.

Setting of the study

This study was conducted at all the maternal and child health care centers at Tanta city. (There were 7 MCH in Tanta city include MCH centers in El-Embaby, Segar, kohafa, El-Agezy, El- mantka elazharia , Tal-elhadadeen and bottros center).

Subjects

A convenience number of all 120 nurses who worked in dental, antenatal, family planning, child out patient, child follow up and immunization clinics and emergency clinic in the previous mentioned centers were included in the study as follow: -

Mch centers	No of nurses
Bottros center	20
El-Embaby	15
Segar	25
kohafa	15
El-Agezy	15

El- mantka elazharia	15
Tal-elhadadeen	15
Total	120

Tools of the study:

Two tools were used in this study:

Tool (I) "Structured Interview Schedule " This tool was developed by the researcher after review of the relevant literature to assess nurses socio demographic data, their knowledge toward patient safety and nurse's attitudes toward patient safety. It included three parts as follow:

Part 1: Socio-demographic data of the nurses

It includes socio demographic data that contain the following variables: age, sex, years of experience, job title, type of clinic in which the nurse worked [20-21- 22- 23].

Part2: Nurses' knowledge toward client safety such as

Meaning of patient safety, Elements or components of patient safety, Importance of patient safety, International goals of patient safety in MCH. It was written in the form of (20) multiple choice questions

Scoring system of nurse's knowledge toward client safety was calculated as follow

-Each question of knowledge part was scored as: -

- Complete correct answer was taken(2)

-Incomplete correct answer was taken(1)

-Don't know was taken (zero)

The Total score of knowledge was classified as

-Good→>70% of the total score (> 28 degree)

-Fair→60-70% of the total score (24 - 28 degree)

-Poor→ <60% of the total score (<24 degree)

Part 3: **Nurses attitudes toward patient safety**

-This part was done by using Safety Attitude Questionnaire ambulatory version (SAQ- AV) that was adopted by the researcher. It was developed by Modak et.al in 2007.It measured nurse's attitude toward patient safety in primary health care centers where it has shown to be a reliable tool for comparing attitudes across different professional groups of health care providers outside hospitals. [24]

-Safety Attitudes Questionnaire measure nurse's attitude toward patient safety culture and also measure safety-related attitudes concerning teamwork climate, job satisfaction, perceptions of management, safety climate, working conditions and stress recognition. This scale consisted of 30 item.

a- **Teamwork climate:** the quality of therelationand cooperation amongst staff members (items from 1-6).

b-**Safety climate**: the professionals' perception regarding organizational commitment to patient safety (items from 7-13)

c- **Job satisfaction**: positive perception of workplace (items from 14-18).

d- **Stress perception**: recognizing the stress factors that might influence work performance (items from 19-22).

e- **Perception of primary health care setting management:** approval of the hospital management or actions regarding the unit in which the professional works (items from 23-26).

f- **Working conditions:** (items from 27-30)

Scoring system of patient safety attitude questionnaire was done as follow:

-The scale was designed in three -point Likert-type scale, ranging between "agree", "unsure", "disagree"**.** Nurse who was responded by " Agree answer " was given a score (Two) " Unsure answer" was given a score (one) and the   nurse   who   was responded" Disagree answer " was given a score (zero). Total score percentage of the scale ranged from (0) 0% the worst attitude to (60) 100% the best attitude.

The Total score of nurses' attitude was classified as follow

- Positive attitude was $\geq$ 70% of the total score. ($\geq$ 42 degree)

- Negative attitude was < 70% of total score. (< 42 degree)

Tool II: An observational checklist regarding Nurses' practices

- This tool was done by using checklist that was developed and constructed by researcher based on related literature review [25 - 26- 27] and the nature of each clinic. It was used to assess nurses' practice toward maintaining patient safety in every studied clinic - This checklist was covered practices related to the following items in each clinic.

- Patient identification- Patient communication- Safety environment - Infection control precautions done for each procedure.

The Scoring of the observational checklist was done as follows

-Complete done correct practice was taken two.

-Incomplete done correct practice was taken one.

-Not done practice was taken zero**.**

- Total practice score was classified as follows

- Satisfactory $\geq$ 70% of the total practice score.

- Unsatisfactory < 70% of the total practice score.

Method

1- Administrative process

1. An official permission to carry out the study was obtained from the Dean of the faculty of nursing Tanta university to the responsible authorities of maternal and child health centers.

2- Ethical consideration

a-The agreement of the ethical committee of the faculty of nursing was taken before conducting the study.

b- Informed consent was obtained from every nurse included in the study after explanation of the aim of the study and assuring them of confidentiality of collected data.

c- Confidentiality and anonymity was maintained by the use of code number instead of name and the right of withdrawal was reserved.

3- Tools development

Tool I (Structured Interview Schedule) . part 1 and 2 were developed by the researcher based on relevant literature review for collection of baseline data and part 3 using Safety Attitude Questionnaire ambulatory version (SAQ- AV) by Modak et.al in 2007 that was adopted by the researcher. Arabic translation of this tool was done by the researcher.

Tool II: An observational checklist regarding Nurses' practices which was developed and constructed by researcher based on related literature review and the nature of each clinic.

4- Content validity

Tools of study was tested for their face and content validity by a jury of five professor's expertise in the field of community health nursing before conducting the study after their translation into Arabic language and content validity was ranged from 90% to 100% to the questionnaires

5- A pilot study

A pilot study was carried out on (10% of subject) which include 12 nurse to test the tool for its clarity and understandability, feasibility and applicability of the tools.

6- Reliability of the tools

All tools of the study were tested for reliability using Cronbach alpha test and based on the results of the pilot study.

- **Cronbach's Alpha** for **first tool is 0.902** for 55 items applied on 12 nurses. **Cronbach's Alpha** for **second tool is 0.894** for 83 items applied on 12 nurses. **Cronbach's Alpha** for **the tools in total is 0.871** for 138 items applied on 12 nurses.

7- Data collection

- Data was collected during the morning shift according to MCH rules. The studied nurses were asked to participate in the study after establishing trustingrelationand explaining the aim of the study.

- researcher met nurses individually in selected clinics in each MCH centers according to schedule of each center to collect related to nurses knowledge toward patient safety and nurses attitudes toward patient safety using tool (I) .

- The researcher observed nurses' clinical practices related to enhancing patient safety, directly in each clinic using an observational checklist (toolII).

- The researcher spends around 3 days \ week for 2 weeks in each center.

- These methods carried out to all 7 MCH centers based on the working days of each center.

- Data collection was conducted over a period of three months and half, (started from first of September 2020 to the half of December 2020).

- Finally, after data collection, data was coded, analyzed then tabulated under the direction of a statistician to obtain results to answer the research questions.

8- Statistical analysis

The collected data were organized, tabulated and statistically analyzed using SPSS software statistical computer package version 26. For quantitative data, the range, mean and standard deviation were calculated. For qualitative data,

comparison was done using Chi-square test (χ^2). Correlation between variables was evaluated using Pearson and Spearman's correlation coefficient r. A significance was adopted at P<0.05 for interpretation of results of tests of significance (*). Also, a highly significance was adopted at P<0.01 for interpretation of results of tests of significance (**).

Results

Part 1: **Socio – demographic characteristics of the studied nurses**

Table **1** illustrates percentage distribution of studied nurses according to socio demographic characteristics. The table showed that, the mean age of studied nurses was (46.316.573 years). Half of the studied nurses (50.0%)were in the age group from 40 to less 50 years old, while only 15.0 % in the age group from 30 to less 40 years old. As regards to level of qualification, the majority (87.5%) of the studied nurses were technician nursing (3 years). Nearly half (47.5%) of them had years of experience from 20 to 30 years. While more than one third (38.3%) of them had work years of experience ranged from 30years to less than40 years.

Part 2: knowledge toward client safety in MCH center

Table 2 reveals the distribution of the studied nurses according to their knowledge toward client safety in MCH

center. The table showed that, three quarters(75%) of the studied nurses gave a complete   correct answer about   the instructions that must be followed up by nursing staff to prevent the spread of infection in the clinics of the center and nearly more than two thirds (70.0% and 68.3% respectively)   of them gave a complete correct answer about safety box specifications for the disposable of pins and sharp instruments in the clinics and nursing practices to prevent recipient from falling risks in the center respectively) .

More than half (65.8 %, 63.3%, 60.8%, and 55.8% respectively) of the studied nurses gave incomplete correct answer about guidelines must be followed when acupuncture, main patient safety standards inside the center , common causes of medical risks occurring inside the center and capabilities of the health center to maintain patient safety , and definition of safety in health care respectively.

Finally, more than one third (36.7% and 34.2%) of studied nurses gave don't know answer about medication errors that cause an unexpected error or harm to the patient and Incident report strategy of raising an unexpected event that is examined for the patients.   Also, one quarter (25.5%) of them didn't   know answer about common causes of medical risks occurring inside the center.

Table 3: represents percent distribution of the studied nurses according to their total knowledge level toward client safety in MCH center .It reported that the mean and standard deviation of total knowledge score were 27.095.489 with rang (17-40). The table showed that   more than one third (40.8%) of them had good total knowledge score while more than one quarter (31.7%) of them   had poor total knowledge score toward client safety in MCH center, slightly   more than one quarter (27.5%) of them had fair total knowledge score toward patient safety.

Figure 1: represents   mean scores of the attitude domains of the studied nurses towards patient safety. The figure showed that the mean score of   safety climate domain was 11,32%. While the mean score of the teamwork climate and client satisfaction domain were 9.72% and 9.12% respectively. Also the mean score of the work condition in the center and perception of primary health care center were 6.67% and 6.6% respectively, while the mean score of stress perception domain was 3.69%

Table 4 , represents percent distribution of the studied nurses according to their nursing total attitude score towards patient safety, It showed that, the majority(89.2%) of the studied nurses have a positive attitude, while the minority of them (

10.8%) have negative attitude toward patient safety with mean (**47.117.168**).

Table 5: represents percent distribution of the studied nurses according to their nursing practice toward maintaining patient safety in antenatal clinics based on observation. The table showed that, all of the studied nurses uses disposable syringes during IM\IV injection, and recording specific information completely. It was also found that the majority (83.3%) of them incompletely communicates clearly to ensure patient safety, wash hands before procedure and wearing gloves.

In the same table it can be seen that, 38.9%and 33.3% of studied nurses didn't perform practices related to uses hand rub for hand washing with water and soap/alcohol and checking cleanliness of the examination room respectively. Only 16.7% and 11.1% of nurses didn't explains procedure to women and rational for each step and prepares equipment respectively.

Table 6: reveals assessment of the studied nurses according to their nursing practice toward maintaining patient safety in family planning counseling clinic. The table showed that, most (95.5%) of the studied nurses uses disposable syringes during IM\IV injection completely and more than three quarters 86.4% and 81.8% of them completely use client record and explains methods of family planning about how to

use it and sterilizes family planning equipment respectively).

On the other hands the table also illustrated that more than half (59. 1%)of the studied nurses incompletely performed practices related to hand washing before procedure and wearing gloves and (50.0%) of them incompletely demonstrates good counseling skills as introducing themselves to clients. More than one third (36.4%) of them didn't perform hand rub for hand-washing or water and soap/alcohol.

Table 7: represents assessment of the studied nurses according to their nursing practice toward maintaining patient safety in vaccination clinics. The table showed that, all of the studied nurses completely perform practice regarding checking age indications for the vaccines, administering vaccines to the correct age groups, and put used needles and syringes immediately in a sharps container following administration. Also the majority (95.8% and 91.7%) of nurses completely perform practices regarding administering vaccines using the correct route per manufacturer instructions, identifying injection site correctly and identifies newborn and their parent on the card respectively.

The table also illustrated that, more than half (54.2%) of the studied nurses were in completely perform practices regarding using proper hygiene techniques to clean

hands before vaccine administration, between patients, and anytime when hands become soiled. Only one quarter (25 %) of the studied   nurses in completely perform practices   regarding screening the client for contraindications and precautions for the specific vaccine(s) in use before receiving that vaccine(s).

Table 8: reveals assessment of the studied nurses according to their nursing practice toward maintaining patient safety in child clinics. The table showed that, all of studied nurses perform practices completely regarding identifying newborn and their parent on the card, and recording all data about diseased child diagnosis, treatment and referral system. While more than two thirds (66.7%) of studied the nurses incompletely perform practices regarding wash their hands before any examination to newborn respectively. Only 13.3% and 6.7% of the studied nurses didn't   perform practices regarding the nurse prepare safe place to conduct follow up examination and nurse. In the same table it can be seen that all   of the studied nurses (100%) completely perform practices regarding recording all data about diseased child diagnosis, treatment and referral system. As well as, the majority (94.4%)of   them completely perform practices regarding identifying child attending outpatient clinic on his card.

Table 9 : represents assessment of the studied nurses according to their nursing practice toward maintaining patient safety in dental clinics The table showed that, more than three quarters (88.9% and 83.3%) of the studied nurses completely perform practices related to making sure that the dentist known that women was pregnant , and instructed parents to check dentist development for their children frequently, educated women and encouraged behaviors that support good oral health: brushing teeth twice daily with fluoridated toothpaste, especially before bedtime, and flossing daily, instructed parents to check dentist development for their children frequently and inspected and tested all equipment used in patient care on regular basis and according to manufacturer's specifications, encouraged all women at the first prenatal visit to schedule a dental examination and identification of patient done respectively.

Table 10: represents assessment of the studied nurses according to their nursing practice toward maintaining patient safety in emergency clinics. The table showed that, all of studied nurses (100%) completely performed practices related to identifying patient before giving any medication, identifying potential medication risks are Look-alike, sound-alike (LASA)and ensured that emergency

drugs, devices, equipment and supplies must be available for immediate use in the urgent care area for treating life-threatening conditions respectively. Moreover, (100%) one hundred percent of them didn't perform hand hygiene technique to prevent health care-associated infection.

Table 11: represents assessment of the studied nurses according to their nursing total practice level toward maintaining patient safety in the studied different clinics. The table showed that, the majority (95.8%, 90.9%, 86.7% and 80.0%) of studied nurses' total practice levels were satisfactory in vaccination clinic, family planning clinic, follow up newborn clinic and emergency clinic respectively. While more than three quarters (83.3%) of the studied nurses their total practice level was unsatisfactory in dental clinic and half of them (50%) their total practices level were unsatisfactory in child out-patient clinic.

Table 12: represents correlations between the knowledge score of the studied nurses about maintaining patient safety, their attitude and practice scores among the maternal and child health care centers. The table showed that, there was a positive non-significant correlation between knowledge score level and attitude score level (r: 0.059 p: 0.521). In the other hand there was negative non-significant

correlation between total knowledge score and total practical level in antenatal clinic, family planning clinic, child out-patient clinic, dental clinic and emergency clinic r (-0.024, 0.061, 0.218, 0.242 and0.427 respectively). While, there is a positive non-significant correlation between total knowledge score and total practical level in vaccination clinic, follow up newborn clinic (r: 0.189, o.113   p: o.688)

Table 13: revealsrelationbetween   socio demographic characteristics of the studied nurses and their total knowledge and attitude mean scores about maintaining patient safety. This table showed that, the maximum knowledge mean score were found it in among who   were aged from(40-< 50) (27.825.222) ,who had rural residence (27.675.688), who had Bachelor degree qualification   (29.003.367) and who had years of experience (20-< 30) (28.405.147)   There   is   statistically significantrelationfound   between total knowledge score and all items of   the studied   nurses   sociodemographic characteristics (P0.05)   except with years of experience (p=0.416)

The table showed   also   that, maximum attitude mean score were found in   who aged from (40-< 50) (47.576.258), who had rural residence (49.504.2,) who had Bachelor degree qualification(49.256.702) who had years of experience from (30-<

40)(48.735.366) with (p: 0.000*) There is statistically significantrelationbetween total attitude score and all items of the studied nurses sociodemographic characteristics(P0.05). except with age (P:o,333)

Table (I): Assessment of the studied nurses according to their socio–demographic characteristics

Characteristics	The studied nurses (N=120)	
Age (in years)		
- (30-< 40)	18	15.0
- (40-< 50)	60	50.0
- ≥ 50	42	35.0
Range	**(30-59)**	
MeanSD	**46.316.573**	
- **Gender**		
- Female	120	100.0
- **Place of residence**		
- Rural	18	15.0
- Urban	102	85.0
Qualification		
- Technician nursing (3 years)	105	87.5
- Technician nursing (5 years)	11	9.2
- Bachelor	4	3.3
Years of experience (in years)		
- (10-< 20)	17	14.2
- (20-< 30)	57	47.5
- (30-≤ 40)	46	38.3
Range	**(10-40)**	
MeanSD	**26.416.906**	
Clinics		
- Antenatal clinic.	18	15.0
- Family planning clinic.	22	18.3
- Vaccination clinic.	24	20.0
- Follow up newborn clinic.	15	12.5
- Child out-patient clinic.	18	15.0
- Dental clinic.	18	15.0
- Emergency clinic	5	4.2

Table (2) Assessment of the studied nurses according to their knowledge toward client safety in MCH center

Knowledge items	The studied nurses (N=120)					
	Don't know		Incomplete correct		Complete correct	
	N	%	N	%	N	%
- Definition of safety	1	0.8	56	46.7	63	52.5
- Definition of safety in health care	1	0.8	69	57.5	50	41.7
- Definition of the safety climate	4	3.3	67	55.8	49	0.8
- Benefit from the application of patient safety in MCH centers	0	0.0	63	52.5	57	47.5
- Means of improving nursing skills about patient safety	1	0.8	52	43.3	67	55.8
- Common causes of medical risks occurring inside the center	31	25.8	73	60.8	16	13.3
- Main patient safety standards inside the center	1	0.8	76	63.3	43	35.8
- Capabilities of the health center to maintain patient safety	3	2.5	73	60.8	44	36.7
- Nursing plan to deal with health risks	5	4.2	64	53.3	51	42.5
- Policies reinforce activities of patient safety on the center	7	5.8	56	46.7	57	47.5
- Principles that nursing must adhere to in order to maintain patient safety inside the clinics	2	1.7	56	46.7	62	51.7
- Environmental practices in the center to maintain patient safety	1	0.8	48	40.0	71	59.2
- Damages suffered by health service recipients from the absence of safe environment	37	30.8	55	45.8	28	23.3
- Instructions that must be followed up by nursing staff to prevent the spread of infection in the clinics of the center	0	0.0	30	25.0	90	75.0
- Nursing practices to prevent recipient from falling risks in the center	1	0.8	37	30.8	82	68.3
- Safety box specifications for the disposable of pins and sharp instruments in the clinics	1	0.8	35	29.2	84	70.0
- Guidelines must be followed when acupuncture	0	0.0	79	65.8	41	34.2
- Dental clinics provide basic services for pregnant women during follow-up and children visits	7	5.8	69	**57.5**	44	36.7
- Medication errors that cause an unexpected error or harm to the patient	44	36.7	55	45.8	21	17.5
- Incident report strategy of raising an unexpected event that is examined for the patients	41	34.2	60	50.0	19	15.8

Table 3: Percent distribution of the studied nurses according to their Total knowledge level toward client safety in MCH center

Total knowledge level	The studied nurses (N=120)	
	N	%
- Poor	38	31.7
- Fair	33	27.5
- Good	49	40.8
Range	(17-40)	
Mean SD	27.095.489	

<60% Poor   (60-70) % Fair   >70% Good.
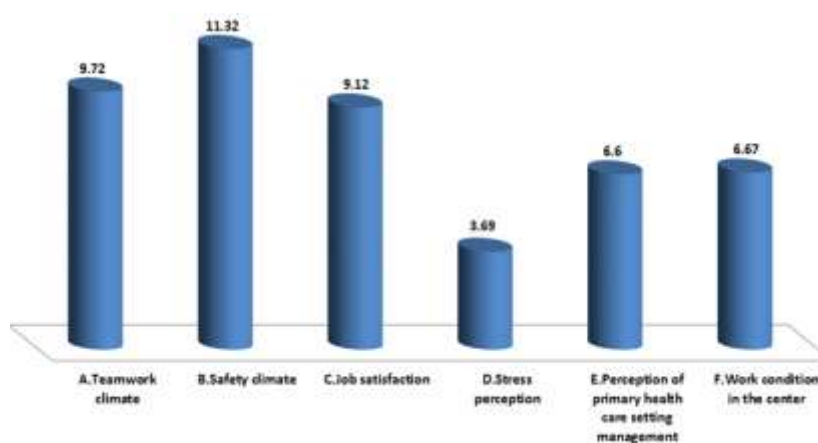
Figure1: Mean scores of the attitude domains of the studied nurses towards patient safety

Table 4: Percent distribution of the studied nurses according to their total attitude level towards patient safety

Total attitude level	The studied nurses (N=120)	
	N	%
- Negative attitude < 70%	13	10.8
- Positive attitude > 70 %	107	89.2
Range	(21-60)	
Mean SD	47.117.168	

<70% Negative attitude   ≥70% Positive attitude

Table 5: Assessment of the studied nurses according to their nursing practice toward maintaining patient safety in antenatal clinic

| Antenatal clinic | The studied nurses (N=18) | | | | | |
| | Not done | | Incomplete done | | Complete done | |
	N	%	N	%	N	%
- Greets the mother	0	0.0	7	38.9	11	61.1
- prepares place and adequate light room	0	0.0	9	50.0	9	50.0
- Prepares equipment	2	11.1	3	16.7	13	72.2
- Assures client confidentiality	0	0.0	7	38.9	11	61.1
- treats client with dignity and respect	1	5.6	6	33.3	11	61.1
- explains procedure to women and rational for each step	3	16.7	10	55.6	5	27.8
- communicates clearly to ensure patient safety	0	0.0	15	83.3	3	16.7
- washes hands before procedure and wear gloves	0	0.0	15	83.3	3	16.7
- Uses hand rub for handwashing with water and soap/alcohol.	7	38.9	11	61.1	0	0.0
- checks cleanliness of the examination room	6	33.3	5	27.8	7	38.9
- Uses disposable syringes during IM\IV injection	0	0.0	0	0.0	18	100.0
- The nurse is recording specific information	0	0.0	0	0.0	18	100.0
- The nurse sets date for next follow-up visit	0	0.0	4	22.2	14	77.8

Table 6: Assessment of the studied nurses according to their nursing practice toward maintaining patient safety in family planning counseling clinic

| Family Planning Counseling clinic | The studied nurses (N=22) | | | | | |
| | Not done | | Incomplete done | | Complete done | |
	N	%	N	%	N	%
- greets the mother	0	0.0	8	36.4	14	63.6
- prepares place and adequate light room	0	0.0	7	31.8	15	68.2
- prepares equipment	2	9.1	4	18.2	16	72.7
- assures client confidentiality	0	0.0	9	40.9	13	59.1
- treats client with dignity and respect	0	0.0	5	22.7	17	77.3
- Demonstrates good counseling skills as introducing themselves to clients	1	4.5	11	50.0	10	45.5
- Recognizes/identifies contraindications consistent with guidelines	2	9.1	6	27.3	14	63.6
- checks cleanliness of the examination room	1	4.5	10	45.5	11	50.0
- wash hands before procedure and wear gloves.	1	4.5	13	59.1	8	36.4
- Uses hand rub for hand-washing or water and soap/alcohol.	8	36.4	6	27.3	8	36.4
- Explains methods of family planning about how to use it.	1	4.5	2	9.1	19	86.4
- Sterilizes family planning equipment	0	0.0	4	18.2	18	81.8
- Uses disposable syringes during IM\IV injection	1	4.5	0	0.0	21	95.5
- Uses visual aids	1	4.5	6	27.3	15	68.2
- Uses client record	0	0.0	1	4.5	21	95.5

Table 7: Assessment of the studied nurses according to their nursing practice toward maintaining patient safety in vaccination clinics

Vaccination Clinics	The studied nurses (N=24)					
	Not done		Incomplete done		Complete done	
	N	%	N	%	N	%
- Identifies newborn and their parent on the card	0	0.0	2	8.3	22	91.7
- The nurse is administering vaccines reviewed vaccine manufacturer instructions for administration before vaccination	0	0.0	4	16.7	20	83.3
- The nurse is using proper hygiene techniques to clean hands before vaccine administration, between patients, and anytime when hands become soiled.	0	0.0	13	54.2	11	45.8
- The nurse prepared vaccine in a clean, designated medication area, away from any potentially contaminated items.	1	4.2	10	41.7	13	54.2
- Prepared vaccines at the time of administration.	2	8.3	2	8.3	20	83.3
- Screening the client for contraindications and precautions for the specific vaccine(s) in use before receiving that vaccine(s).	2	8.3	6	25.0	16	66.7
- The nurse is triple-checking labels, contents, and expiration dates or beyond use dates before administering vaccine.	0	0.0	5	20.8	19	79.2
- The nurse is administering vaccines using the correct route per manufacturer instructions.	0	0.0	1	4.2	23	95.8
- Staff has checked age indications for the vaccines and is administering vaccines to the correct age groups	0	0.0	0	0.0	24	100.0
- Identifying injection site correctly	0	0.0	1	4.2	23	95.8
- The nurse put used needles and syringes immediately in a sharps container following administration.	0	0.0	0	0.0	24	100.0
- The nurse instruct mother of the child regarding given vaccine and how to deal with the site of vaccine taking	0	0.0	5	20.8	19	79.2

Table 8: Assessment of the studied nurses according to their nursing practice toward maintaining patient safety in child clinics

| Child clinics | The studied nurses | | | | | |
| | Not done | | Incomplete done | | Complete done | |
	N	%	N	%	N	%
A-Follow up clinic (N=15)						
- Nurse identify newborn and their parent on the card	0	0.0	0	0.0	15	100.0
- Nurse take full clinical examination of the newborn	0	0.0	4	26.7	11	73.3
- Nurse wash hands before any examination to newborn	1	6.7	10	66.7	4	26.7
- Nurse record all data about newborn on his Card	0	0.0	2	13.3	13	86.7
- Nurse prepare safe place to conduct follow up examination	2	13.3	4	26.7	9	60.0
B- Outpatient clinic (n=18)						
- The children are treated with respect and patience	0	0.0	10	55.6	8	44.4
- All staff are relaxed and flexible	6	33.3	8	44.4	4	22.2
- The nurse prepares equipment before any examination	0	0.0	4	22.2	14	77.8
- The nurse identify child attending outpatient clinic on his card.	0	0.0	1	5.6	17	94.4
- The nurse will maintain high standards of hygiene by: - wash hand before conducting any procedure to the child rubbing hand with alcohol between cases	0	0.0	12	66.7	6	33.3
- maintain well ventilated clinic	0	0.0	15	83.3	3	16.7
- The nurse records all data about diseased child diagnosis, treatment and referral system.	0	0.0	0	0.0	18	100.0
- All cleaning products are inaccessible to children	4	22.2	14	77.8	0	0.0

Table 9 : Assessment of the studied nurses according to their nursing practice toward maintaining patient safety in dental clinics

Dental clinic	The studied nurses (N=18)					
	Not done		Incomplete done		Complete done	
	N	%	N	%	N	%
- The nurse inspected and tested all equipment used in patient care on regular basis and according to manufacturer's specifications.	0	0.0	3	16.7	15	83.3
- The nurse must ensure good ventilation dental procedure room.	3	16.7	9	50.0	6	33.3
- Assures client of confidentiality.	3	16.7	10	55.6	5	27.8
- Checks that dental needle preferably not be used in more than two insertion on same patient.	6	33.3	9	50.0	3	16.7
- Make sure your dentist knows that women are pregnant.	0	0.0	2	11.1	16	88.9
- Avoided routine x-rays in pregnancy women, but it may be necessary if there is a problem or an emergency.	1	5.6	5	27.8	12	66.7
- Checks that dental trays washed and sanitized after each patient.	3	16.7	8	44.4	7	38.9
- Uses single-dose (single-use) vials, ampules, and bags or bottles of intravenous solutions are used for only one patient.	4	22.2	12	66.7	2	11.1
- Ensures single-use devices are discarded after one use and not used for more than one patient.	3	16.7	10	55.6	5	27.8
- The nurse ensure that waterlines flushed after each patient.	12	66.7	5	27.8	1	5.6
- The nurse change dental chair head rest cap and patient apron after each patient.	18	100.0	0	0.0	0	0.0
- The nurse encourage all women at the first prenatal visit to schedule a dental examination.	1	5.6	2	11.1	15	83.3
- The nurse instructs parents to check dentist development for their children frequently	0	0.0	2	11.1	16	88.9
- The nurse educates women and encourage behaviors that support good oral health: brushing teeth twice daily with fluoridated toothpaste, especially before bedtime, and flossing daily	0	0.0	2	11.1	16	88.9
The nurse should check: - Consent form signed	1	5.6	4	22.2	13	72.2
- Patient case notes/x-ray checked	4	22.2	5	27.8	9	50.0
- Identification of patient done	0	0.0	3	16.7	15	83.3
- Allergies checked	10	55.6	6	33.3	2	11.1
- Pre-medication given	8	44.4	8	44.4	2	11.1
- check anti-coagulant used	16	88.9	2	11.1	0	0.0

Table 10 : Assessment of the studied nurses according to their practice toward maintaining patient safety in emergency clinics

Emergency clinic	The studied nurses (N=5)					
	Not done		Incomplete done		Complete done	
	N	%	N	%	N	%
- Identifies patient before given any medication.	0	0.0	0	0.0	5	100.0
- Assures client of confidentiality	0	0.0	2	40.0	3	60.0
- The nurse ensures that emergency drugs, devices, equipment and supplies must be available for immediate use in the Urgent Care area for treating life-threatening conditions.	0	0.0	0	0.0	5	100.0
- Prevents patient falls by providing well-designed patient rooms and bathrooms.	0	0.0	3	60.0	2	40.0
- The nurse has decentralized stations that allow easy access to patients.	0	0.0	1	20.0	4	80.0
- The nurse has daily inspection of the provision of stretchers / trolleys.	0	0.0	1	20.0	4	80.0
- The nurse increase provision of transport equipment.	1	20.0	2	40.0	2	40.0
- Identified potential medication risks are Look-alike, sound-alike (LASA).	0	0.0	0	0.0	5	100.0
- Uses hand hygiene technique to prevent health care-associated infection	5	100.0	0	0.0	0	0.0
- Observes continuously progress of emergency patient to avoid overlapping	0	0.0	3	60.0	2	40.0

Table 11: Assessment of the studied nurses according to their nursing total practice level toward maintaining patient safety in the studied different clinics

Clinics	Total practice level of the studied nurses			
	Unsatisfactory		Satisfactory	
	N	%	N	%
1.Antenatal clinic (n=18)	8	44.4	10	55.6
2.Family planning clinic (n=22)	2	9.1	20	90.9
3.Vaccination clinic (n=24)	1	4.2	23	95.8
4.Follow up newborn clinic (n=15)	2	13.3	13	86.7
5.Child out-patient clinic (n=18)	9	50.0	9	50.0
6.Dental clinic(n=18)	15	83.3	3	16.7
7.Emergency clinic (n=5)	1	20.0	4	80.0

Table 12: Correlations between the knowledge score of the studied nurses about maintaining patient safety and their attitude and practice scores among the maternal and child health care centers.

	Total knowledge score	
	r	**P**
Total attitude score	0.059	0.521
Practice score		
1.Antenatal clinic	-0.024	0.926
2.Family planning clinic	-0.061	0.787
3.Vaccination clinic	0.189	0.377
4.Follow up newborn clinic	0.113	0.688
5.Child out-patient clinic	-0.218	0.386
6.Dental clinic	-0.242	0.332
7.Emergency clinic	-0.427	0.474

r: Pearson' correlation coefficient

Table 13:relationbetween socio demographic characteristics of the studied nurses and their total knowledge mean score and their total attitude score about maintaining patient safety

Characteristics	Total knowledge score	t F	Total attitude score	t F
Age (in years) - (30-< 40) - (40-< 50) - ≥ 50	25.785.816 **27.825.222** 26.625.695	**24.748** **0.000***	45.6111.163 **47.576.258** 7.106.308	0.971 0.333
Place of residence - **Rural** - **Urban**	27.675.688 26.995.476	**50.120** **0.000***	49.504.218 46.697.506	68.603 0.000*
Qualification - **Technician nursing (3 years)** - **Technician nursing (5 years)** - **Bachelor**	27.105.559 26.275.623 29.003.367	**51.668** **0.000***	47.186.847 45.6410.298 49.256.702	70.100 0.000*
Years of experience - **(10-< 20)** - **(20-< 30)** - **(30-< 40)** - **≥40**	26.715.977 28.405.147 25.565.484 28.000.00	**0.815** **0.416**	46.0011.710 46.186.631 48.735.366 46.000.00	23.968 0.000*

Discussion

Patient safety remains one of the most vital issues facing health care now a day. Nurses are the health care professionals most liable to persist errors and prevent harm to patient's safety. Assessing the present safety climate in primary care practice is the first step to target improvements; accordingly, assessing health care provider's attitudes about issues relevant to patient safety is the first stage of developing a safety culture [28]. The aim of this study was to assess knowledge, attitudes and practices of nurses toward client safety at maternal and child health care centers. [29]

The current study revealed that all of the studied nurses were females *(table I)*. This findings was in agreement with study conducted by **Mamdouh E (2020)** [30] who assess nurses' performance regarding the implementation of patient safety measures in intensive care units in Egypt and reported that, the majority of the studied nurses were female. Also **Mohamed A (2015)** [31] who assess patient safety culture in primary health care services in Alexandria, Egypt and reported that, the majority of the participants were females. This result may be due to that the greater fraction of the nurses in Egypt are females. Also this findings may be due to the dominance of females in the nursing

profession and the recent involvement of males in nursing especially in primary health care centers**,** and may related to the studying of nursing in Egyptian universities were exclusive for females only till few years ago**.** The present study revealed also that the mean duration of years of experience of the studied nurses was **26.416.906 (table 1)**. This results may be due to that nurses worked in MCH centers usually had no transfer to other settings as for hospital settings.

Nurses should be able to define the concept, identify the goals and ways of implementing standards of patient safety. Which   reflects acceptable level of knowledge for nurses in PHC centers regarding patient safety items. **In this concept** the current study showed that, three quarters of the studied nurses gave a correct answers about the instructions that must be followed up by nursing staff to prevent the spread of infection in the clinics of the center **(table2)** .

This result is similar to study conducted by **Brasaitė et.al, (2016)** [32] who studied health care professionals' skills regarding patient safety in Finland and found that, the highest evaluated skill for staff was applying hand washing measure**.** This finding was in contrast with study conducted by **Comunale et.al, (2018)** [33] who studied assessment of basic patient

safety skills in residents entering the first year of clinical training in New York and found that the studied nurses scored poorly regarding adherence with hand hygiene .These results may be due to that the compliance   with   infection   control measures may be due to availability of infection control supplies and awareness of nurses about the important of applying of infection control measures.

The present study demonstrated that more than half of the studied nurses gave incomplete correct answer about guidelines must be followed when acupuncture **(table 2).** This finding contradict with **Abdul-Lateef S. J (2018)** [34] who assess injection safety practice among nurses at primary health care centers in Iraq, and reported that , 95.5% of studied nurses had attend training sessions on safe injection approaches that was reflected clearly on their awareness and performance.   The result of the present study may be related to the studied nurses usually hadn't have training related to injection safety.

Furthermore, the current   study revealed that more than two thirds of the studied nurses gave a correct answer about nursing practices to prevent recipient from falling risks in the center **(table 2)**. This finding was contradicting with   **Smith et.al, (2015)** [35] who assess healthcare provider's perceptions   and   self-reported   fall

prevention practices in New York and mentioned that the majority (84%)   of primary care providers didn't know how to conduct fall-risk assessments and weren't conducting multifactorial risk evaluation on every patient/ client activity.   He regains this result due to the workload as well as shortage of nurses in most of his studied settings and because there isn't an educational and training program me about falling risks and there isn't managerial commitment. So, an important step is to make fall prevention a routine part of clinical care.

The current study found that the mean and standard deviation of total knowledge score were 27.09+5.489 with rang (17-40). The current study also revealed that more than one third of the studied nurses had good total knowledge score and nearly one third had poor knowledge score **(table 3)**. This may due to lack of patient safety courses or   training in additional to inactivation of in service education program me in primary health care centers about patient safety measures.

This result was similar to the finding of a study conducted by **Al-Rafay S. Set .al, (2018)** [36] who evaluate   nurses' skills regarding international patient safety goals at primary health care centers   in Giza governorate, Egypt and found that, more than two-fifths of studied the nurses had

good knowledge regarding patient/ client safety issues and near to one-third had poor knowledge, while the rest of them had average knowledge.

Patient safety is critical to health care quality and remains new field of patient safety culture in primary health care are limited compared to secondary care. An important first strategy to improve all aspects of health care quality is creating a culture of safety within health care organizations. An understanding of the safety culture is vital to improve the problematic practices or attitudes such as miscommunication, unwanted events and a non-punitive response to errors, which can lead to an improvement in the safety culture (climate) of primary health care [37].

A notable finding in the study was that the participants working in the antenatal and family planning service clinic had a more positive patient safety attitude than those working in pediatrics. In this regard the current study illustrated that safety climate domain had the highest score, followed by team work, job satisfaction, perception of management and working conditions. Furthermore, the current study also revealed that the majority of the studied nurses had a total positive attitude toward patient safety in maternal and child health centers **(table 4)**. The current study result

was in the same line of the study conducted by **Brasaite I et al (2017)** [32] who studied healthcare professionals' knowledge, attitudes and skills regarding patient safety: a systematic literature review In Finland and reported that overall, the safety attitudes of health care professionals were positive. The professional contributions of nurses will be effective in enhancing the patient safety attitude of institutions by making the training program me continuous, revising the current training programs, preparing and carrying out the programs.

On the other hand, the current study revealed that the minority of the studied nurses had negative attitude. This finding was supported by a study conducted by **Saberi M, (2017)** [38] who found that the attitude of nurses toward the patient safety culture was poor in the five items of SAQ. Moreover, it may be attributed that the nurses' negative attitude may be related to the misunderstanding of the concept of the safety, but the understanding of the safety-related attitudes and perceptions are very important for the protection of the patient and others.

Patient safety practice is a process, or structure which diminish the chance of adverse events resulting from directly contact to the healthcare system over a range of diseases and procedures. It

includes the following; identify patients/ clients correctly, improve effective communication, ensure medication safety, reduce the risk of health care-associated infections, reduce the risk of patient/ client harm resulting from falls, and ensure safe surgery [39 - 40] .

In relation to studied nurses practices related to patient safety, the present study found that majority of studied nurses done washing hands before procedure and wear gloves incompletely. More than one third of studied nurses in antenatal clinic didn't perform practices related to uses hand rub for hand washing with water and soap/alcohol and checking cleanliness of the examination room **(table 5) .** These findings corresponding to study conducted by **Salama O et al (2017)** [41] who studied attitudes and compliance with hand hygiene practices among health care workers in Alexandria Main University Hospital who found that the level of non-compliance was much higher, as only 4% of Health Care Workers (HCWs) washed or rub their hands before touching the patient. This may be attributed to overload of cases in antenatal clinic that nurses haven't time to hand washing before, between cases and wear gloves.

Concerning to assessment of the studied nurses according to their nursing practice toward maintaining patient safety in family planning counseling clinic **(table 6)**. The current study revealed that most of the studied nurses uses disposable syringes during IM\IV injection and more than three quarters of the studied nurses use client record, explains methods of family planning about how to use it and sterilizes family planning equipment. This results was similar to the study conducted by **Nasr EL et al (2016)** [42] who studied association between quality of family planning services and client's satisfaction level in maternal and child health centers in Port Said city, Egypt and reported that all nurses perform infection control measures in family planning room and follow up counseling instructions by explaining methods of family planning . These results may be justified by supervisory visits, from infection control unit in the ministry of health especially, on the family planning clinics.

Regarding assessment of the studied nurses according to their nursing practice toward maintaining patient safety in vaccination clinics ,the current study reported that all of the studied nurses perform practice completely regarding checking age indications for the vaccines and administering vaccines to the correct age groups , and put used needles and syringes immediately in a sharps container following administration **(table 7)** .This

finding was supported by the study done by **El Shazly H (2015)** [43] who studied assessment knowledge and practice of healthcare providers as regards routine children vaccination in primary healthcare facilities of Quewisna District, Menoufia Governorate in Egypt, and found that availability of equipment needed for the session and disposal boxes in vaccination clinic. This result may be due to nurses strive to carried out MCH protocols and guidelines of nursing care according to vaccination clinical items.

The current study also illustrated that, more than half of the studied nurses perform practices incompletely regarding the nurse was using proper hygienic techniques to clean hands before vaccine administration, between clients and anytime when hands become soiled *(table 7)* . This findings was in agreement with study conducted by **Metwali F (2019)** [44] who assess nurse's role in vaccination sessions in primary health care units in El-Hossain City at Sharkia Governorate, Egypt and found that about 89.5% of them not washing their hands after vaccination session. This may be attributed to lack of knowledge about infection control precaution and importance for hand washing or due to shortage in nursing staff and increase work overload and their responsibilities.

The studied nurses regain the cause of not wash hands and wear gloves to the lack of information about the efficacy of these two measures, they think that gloves are not required for intramuscular, subcutaneous and intradermal injection in emergency clinic. Also this may be due to misconceptions among nurses regarding wearing gloves and washing hands or alcohol based hand rubbing.

The present study revealed that, the majority of studied nurses' practice score was satisfactory in vaccination clinic as the practice level of this study was high **(table 11)**. However, this findings contradicted with study findings of **Metwali1 F (2019)** [44] who reported that more than half 60.5% from studied nurses had not adequate practice in vaccination session. He mentioned that may be due to lack of their knowledge about vaccination. It may be justified to that process of cold chain was being made perfect and this result in high scoring of observing items in vaccination clinics.

Furthermore, the current study findings showed that there was non-significant correlation between total knowledge, practice and total attitude score of the studied nurses regarding patient safety (**table 12)**. However, more than one third of studied nurses who had good knowledge score had positive attitude and

satisfactory practices. This result contradicted with, the study conducted by **El-Azzab S et al (2019)** [46] who studied nurses' knowledge, attitudes, and skills towards patients' safety in Assiut , Egypt and reported that, there was positive relationships between knowledge, attitudes, and skills, and a highly statistically significant difference was detected between studied nurses' skills and attitudes regarding patients safety, This results may be attributed to it seems that having nurses experience and clinical experience in addition to participating in workshops improves the level of knowledge and practice of nurses from the principles of infection control, patient safety in primary health care centers .

Regarding effect of sociodemographic characteristic on studied nurses total knowledge score, the present study also found that there was a statistically significantrelationbetween total knowledge score and all items of the studied nurses sociodemographic characteristics (**table 13**). The current study indicated that there was statistically significant relation between nurses' knowledge and their age that most of the nurses were at age group of (40-< 50) years). This finding contradicted with a study conducted with **Abdel-latif R (2018)** [47] who evaluated nurse's adherence to the national standards

of patient in Egypt and reported that there was no statistical significant correlation between nurses' compliance to national levels of patient safety and nurses average age during afternoon and night shift, while there is a negative correlation during morning shift. And he mentioned that these results could be due to the distribution of nurses with different ages among all working shifts but sometimes the younger nurses worked at morning shift because of the routine rooster which make the morning shift with increased number of young nurses. Also in the present study, there was no significant relation between knowledge and years of experience. However those who had more years of experience had better knowledge.

Concerning effect of socio demographic characteristics of the studied nurses on their total attitude score about maintaining patient safety. The current study revealed that there was a statistically significantrelationbetween total attitude score and all items of the studied nurses sociodemographic characteristics including residence of studied nurses, their qualification and years of experience (**table 13)** . This finding may be due to health care professionals who received no information about patient safety during their initial professional education had more negative attitudes to teamwork

climate, safety climate, job satisfaction, perceptions of management and working conditions than those who had. Also, this result may be due to culture or perception differences between urban and rural residence. These   results are consistent with **Abdi Z et al 2015** [48] who studied the climate of patient safety in an Iranian intensive care unit and correlated the working duration with both managers' perception and positive attitudes towards safety climate. Generally, higher working experiences, increases the individuals belonging to his work as well as increases his tolerance to changeable working condition and maintain job satisfaction, Additionally, new practitioners may be less sensitive to safety issues.

Finally, it's obviously that patient safety in primary health care settings affected more by nurse's knowledge, attitude and practices. Although there is no statistically significant relation found between this three domain in the present study but each domain has its separately important effect on providing and maintaining patient safety and safety climate in primary health care settings.

Conclusion:

 Based on the findings of the present study, it can be concluded that, more than one third of the studied nurses had good total knowledge score regarding patient / client

safety. The highest rate of positive attitudes toward the patient safety culture/ climate belonged to the dimension of 'the safety climate followed by team work. The stress recognition domain had the lowest score. The majority of studied nurses' total practice levels were satisfactory in vaccination clinic and family planning clinic.   The more knowledge health care professionals have about patient safety, the more positive their attitudes and the better their skills regarding patient safety. There is statistically significantrelationfound between total knowledge and   attitude scores and the studied nurse's sociodemographic characteristics (P<0.05).

 Recommendations:

 Based on the results of the present study it was recommended that:

- All nurses working in primary health care settings should complete regular periodic in-services training programs to keep them up to date regarding patients' safety culture and safety practices.

- Written guidelines regarding patients' safety should be available in all primary health care settings, and the patients should be closely monitored for potential errors.

- Primary health care infrastructure has to be financially supported, equipped and positioned to enhance patient safety

management implementation as well as adoption and use.

- It is finally recommended to conduct further surveys and studies that contribute to quality improvement associated with nurses' perception of safety culture /climate in primary healthcare centers.

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Perfectionism and Eating Disorder among Nursing Students of Technical Institute at Benha University

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Abstract

Background: Perfectionism has increased dramatically among young people, leading to negative effects such as eating disorders. **Aim of the study:** This study aimed to investigate the relation between perfectionism and eating disorder among nursing students of Technical Institute at Benha University. **Research question:** Is there a relation between perfectionism and eating disorder for nursing students of Technical Institute at Benha University. **Design:** A descriptive correlational design was utilized to achieve the aim of study. **Setting:** The study was carried out at the Technical Institute of Nursing at Benha University which affiliated to the Ministry of High Education. **Sample:** A convenient sample of second year nursing students (300) enrolled in first term, academic year 2019-2020 from the above mentioned setting. **Tools:** Tool (I):- A structured Interviewing Questionnaire, Tool (II):- Multidimensional Perfectionism Scale and Tool (III): Eating Disorder Scale. **Results:** Less than two-thirds of the studied students have normal body mass index, moderate perfectionism and more than half of them have moderate eating disorders. **Conclusion:** There was a highly positive correlation between total eating disorder and total perfectionism. **Recommendations**: Expand public awareness through mass media about perfectionism and its effect on eating disorder among university students.

Keywords: Perfectionism, Eating Disorder, Nursing Students.

Introduction

Perfectionism is a complex personality characteristic with no universally accepted definition. It is sometimes viewed as a personality trait or symptom. It can also be understood as a process. Perfectionism can have positive and negative aspects. Having high standards can be an asset and in many cases, it can be helpful in attaining goals. However, perfectionism also exacts a cost and in the wrong situations, too much of it can be an impediment. The perfectionism associated with psychological problems is problematic and has been referred to as clinical (or dysfunctional) perfectionism.[1]

Perfectionism is a broad personality style characterized by a person's concern with striving for flawlessness and perfection and is accompanied by critical self-evaluations and concerns regarding others' evaluations. It is best conceptualized as a multidimensional and multilayered personality characteristic, Perfectionism drives people to be concerned with achieving unattainable ideals or unrealistic goals, often leading to many forms of adjustment problems such as depression, low self-esteem, suicidal thoughts and tendencies and a host of other psychological, physical, relationship, and achievement problems,. Recent data show that perfectionistic tendencies are on the rise among recent generations of young people. [2]

Eating disorders are serious illnesses that are associated with severe medical complications and have significant psychiatric co-morbidity that could be life threatening. Include anorexia nervosa, bulimia nervosa, binge eating disorders, rumination disorders, avoidant/restrictive food intake disorders, and night-eating syndrome. [3] These disorders are more common in societies with excessive concern about appearance and weight. [4]

Anorexia nervosa is characterized by extreme food restriction and excessive weight loss, accompanied by the fear of being fat. The extreme weight loss often causes women and girls who have begun menstruating to stop having menstrual periods, a condition known as amenorrhea. [5] Bulimia nervosa is a disorder characterized by binge eating and purging, as well as excessive evaluation of one's self-worth in terms of body weight or shape , characterized by recurrent binge eating followed by compensatory behaviors such as purging (self-induced vomiting, eating to the point of vomiting, excessive use of laxatives/diuretics, or excessive exercise). Fasting and over-exercising may also be used as a method of purging following a binge. [6]

The cause of eating disorders is not clear. Both biological and environmental factors appear to play a role. Cultural idealization of thinness is believed to contribute. Eating disorders affect about 12 percent of dancers. [7] Those have experienced sexual abuse are also more likely to develop eating disorders. Some disorders such as pica and rumination disorder occur more often in people with intellectual disabilities. [8]

Eating disorders typically begin between 18 and 21 years of age, according to the National Eating Disorders Association (NEDA). The association estimates that between 10 and 20% of women and 4 to 10% of men in college suffer from an eating disorder, and rates are on the rise. Eating disorders in college students are serious, and can be life-threatening in some cases. [9]

College students can be a time of a lot of excitement and stimulation and also a lot of stress. The stress of a college schedule, managing a new social context, and dealing with independent living can trigger re-emergent anxiety or, in some cases a new mental illness. Anxiety, social environment, and constantly exposed to the thin body ideal, that's a perfect storm convergence of factors that can drive a vulnerable individual into an eating disorder. Students in college are inundated with advertising, media messages, and misguided information about food, bodies, and health. Magazines targeted at college students showcase models with Body Mass Index well below healthy standards and extol the virtues of dieting [10]

The media shows models are society's standard of perfection, but the images are not even real; they are airbrushed. Competition and perfection, weight obsession, and poor coping skills through disordered eating take their toll on women of all ages, but those at the college student's level face an additional challenge: that of identity. College students create the space for individuals to experiment with who they are, what they want to do, and what it means to be an adult. It is typically a time of activated thought, critical thinking, challenging preconceived notions, freedom, and trial and error. [11]

Many college students especially with eating disorders do not like themselves. This is made worse with perfectionism. Today there are so many students who think they are not good enough, hating themselves and living a life of negativity. Perfectionism and eating disorders seem to be correlated, but the causality is not clear and don't know if one leads to the other or which comes first. Some research indicates that students with eating disorders and perfectionism often displayed perfectionist

traits before their eating disorders began[12].

Significance

In developed world, binge eating disorder affects about 1.6% of women and 0.8% of men in a given year [13]. Anorexia affects about 0.4% and bulimia affects about 1.3% of young women in a given year. Up to 4% of women have anorexia, 2% have bulimia, and 2% have binge eating disorder at some point in time [14].College students are most affected by eating disorders. The university age is a time of complete change, change in environment, change of friends [15]. Perfectionism tendencies have increased substantially among young people can cause maladaptive behavior that interfere with student's education and work in future [16]. So, there is an important need for the researcher to conduct the study to investigate the perfectionism and eating disorder among nursing students of Technical Institute at Benha University.

Aim of the study

The present study aimed to investigate the relation between perfectionism and eating disorder among nursing students of Technical Institute at Benha University.

Research questions

1- What is the students ' level of perfectionism?

2- What is the students ' level of eating disorder?

3- Is there a relation between perfectionism and eating disorder among nursing students of Technical Institute at Benha University?

Subject and methods

Research Design

A descriptive correlational design will be utilized to achieve the aim of this study.

Study Setting:-

The study was carried out at the Technical Institute of Nursing at Benha University which affiliated to the Ministry of High Education.

Subjects

A convenient sample of second year nursing students (300) enrolled in first term academic year 2019-2020, at the Technical Institute of Nursing, at Benha University and agree to participate after clarification purpose of the study .

Tools of the data collection

The aim of study was achieved through the use of the following three tools:

Tool (I):- A structured Interviewing Questionnaire Sheet

It was designed by the researchers after reviewing related literature which consist of

(age, sex, height, weight, favorite sport, place of living, occupation, economical, marital status and family system).

Tool (II):- Multi-dimensional Perfectionism Scale

It was developed by **Hewitt et al., (1991)** [17] to assess student ' level of perfectionism. It consists of 44 statements from 4 dimensions:-

First dimension: High standards of performance

which consist of 3 sub dimensions:

1- Self –oriented: consist of items 1, 5, 7,9,14,16,19,20 and22.

2- Other –oriented: consist of items 34, 37, 39 and 41.

3- Socially prescribed: consist of items 4, 8, 11,31,35,38 and40.

Second dimension: Fear from failure

which consists of items 3,10,12,24,33,42 and 44.

Third dimension: General dissatisfaction which consists of items 17, 23, 26, 28 and 36.

Fourth dimension: Feeling of low self-esteem which consists of items 2, 6, 13, 15, 18, 21, 25, 27, 29, 30, 32 and 43.

The scoring system: Student's responses were ranged from yes (3 point), sometimes(2 point), no (1 point) and the total score range from 44-132. A lower score means lower levels of perfectionism to students, while the higher score means higher levels of perfectionism to students. Level of perfectionism is considered high perception if the percent ≥ 75% (score ≥ 99), moderate if the percent 60 % - < 75% (score 79 - < 99) and low if the percent < 60% (score < 79).

Tool (III): Eating Disorder Scale:-

It was developed by **Mohammad, (2015)** [18] to assess student ' type of eating disorder. It consisted of consist of 28 statements from 2 dimensions:-

First dimension: Anorexia nervosa which consists of items 1,2,4, 5,7,9,10,13, 14,16,19,20,21,22,24,25,26 and 28

Second dimension: Bulimia nervosa which consists of items 3, 6,8,11,12,15,17,18,23 and 27

The scoring system:

Student's responses were ranged from yes (3 point), sometimes (2 point), no (1 point) and the total score range from 28-84. A lower score means lower levels of eating disorder to students, while the higher score means higher levels of eating disorder to students.

Total score of anorexia nervosa range from 18-54.

Total score of bulimia nervosa range from 10-30.

Level of eating disorders high perception if the percent ≥ 75% (score ≥ 63), moderate if the percent 60 % - < 75% (score 50- < 63) and low if the percent < 60% (score < 50).

Operational Design

The operational design includes preparatory phase, validity, reliability, pilot study and field work.

Preparatory phase

An extensive literature related to the study area will be done including electronic dissertation, available books, and articles, doctoral dissertation, research and peer interaction and idea from external sources and periodicals to formulate knowledge base relevant to the study area and to get a clear picture of all aspect related to the research topic.

Content Validity

Before starting the data collection tools were translated into Arabic language and tested for its content validity by group of expertise in the psychiatric field to check the relevancy, clarity, comprehensiveness, and applicability of the questions. As a result of the jury, required modifications were done and the final form was developed.

Reliability of tools

Test-retest was repeated to the same sample of nursing students on two occasions and then compares the scores. The Cronbach's coefficient alpha of Multi-dimensional perfectionism scale is 0.68for total score and eating disorder scale is 0.68 for total score

Standardized tools	Cronbach's Alpha	No of Items
Multi-dimensional perfectionism scale	(0.68)	44 items
Eating disorder scale	(0.68)	28 items

Pilot study

After the tools have been designed, they were tested through a pilot study, which was done before embarking on the field work to check the clarity and feasibility of designed tools and to estimate the time needed to complete its items. a pilot study was carried out on 10% of the studied subjects (30) students who were excluded from the main study sample,. The purpose of the pilot study were to ascertain the clarity, applicability relevance and content validity of the tools, estimate the time needed to complete the sheet, and the necessary changes were undertaken.

The results of the pilot study

After conducting the pilot study, it was found that:

- The tools were clear and applicable; however, few modifications were made in rephrasing of some sentences in both Multi-dimensional perfectionism scale and eating disorder scale to be easier and more understandable.

- Tools were relevant and valid.

- No problem that interferes with the process of data collection was detected.

- Following this pilot study the tools were made ready for use.

Field work:-

- Preparation of data collection was carried out through (10 weeks) two and half months from (beginning of October2019 to the half of December2019).

- The researchers were obtained permissions from the Director of Technical Institute of Nursing at Benha University to conduct the study.

- The field work included students, undergoing second year, first term in academic year 2019-2020 they consisted of 300 students.

- The researcher explained the purpose of the study, collected all students to be acquainted with them, and explained to them the objectives of the study and its expected outcomes.

- The time required to fill the questionnaires sheet was range from 25 to 30 minutes for Multi-dimensional perfectionism scale and from 20-25 minutes for eating disorder scale The filled forms were collected in time and revised to check their completeness to avoid any missing data

- The researchers filled in the questionnaire through two days/week(Wednesday & Thursday), The average number of gathering questionnaires was between 14-15students per day and for 2 days/week (30 students /week/10 weeks).

Administrative Design:

A written letter was issued from the Dean of Faculty of Nursing, Benha University to the Director of Technical Institute of Nursing at Benha University to obtain the approval for data collection. The objectives and the nature of the study were explained and then it was possible to carry out the study with minimum resistance.

Ethical consideration:

- Approvals of students were obtained before data collection and after explaining the purpose of the study.

- Anonymity was assured as the filled questionnaire sheets were given a code number (not by names).

- The students were ensured that questionnaire sheet will be used only for the purpose of the study and will be discarded at the end of the study.

- The study maneuvers do not entail any harmful effects on participation.

- The students who participated in the study were informed about having the right to withdraw at any time without giving any reason.

Statistical analysis

Analysis of the data was carried out and the collected data was organized, coded, computerized and tabulated and analyzed

by using (SSPS) programs version (20). Data analysis was accomplished by the use of number, percentage distribution chi-square (x2) test, to test the significance of some variance, significant p = < 0.05

Results

Table (1) shows that, socio-demographic data of the studied students. It clarified that two thirds (66.7%) of the studied students, their age ranged from 20to less than 21 years. As regard to gender and residence (79.0%, 86.3% respectively) the majority of the students were females and lives in rural area. Moreover majority of them were not working, have sufficient income, single and stable family status (96.0%, 92.7%, 76.7% and 85.6%) respectively.

Figure (1): illustrates that distribution of the studied students regarding their favorite sport. It reflects that that nearly half (48.7%) of the studied students were walking, While, the minority (6.0%)of them were swimming   as the favorite sport.

Table (2): reveals that, mean and standard deviation of the studied students regarding height, weight and body mass index were (163.1±8.88, 63.4±11.68 and 23.9±3.43) respectively.

Figure (2): demonstrates that distribution of the studied students regarding body mass index. It clarified that less than two-thirds (61.0%) of the studied students have

normal body mass index while 4.7% only have obese.

Figure (3): shows that distribution of the studied students regarding total perfectionism. It reflects that less than two-thirds (61.3%) of the studied students have moderate perfectionism.

Table (3): reveals that, more than half (56.0%) of the studied students have moderate anorexia nervous while two thirds (66.7%) of them have bulimia nervosa.

Figure (4): shows that, more than half (54.7%) of the studied students have moderate eating disorders, while the minority (5.3%) of them has high eating disorders.

Table (4): reflects relation between total body mass index, total perfectionism and total eating disorders .It shows that, there were a statistical significant difference between total body mass index, total perfectionism and total eating disorders.

Table (5): represents relation between total perfectionism and socio-demographic characteristics of the studied students. It illustrates that, there was highly statistical significant difference between total perfectionism and socio-demographic characteristics such as sex, residence , family income and marital status while no statistical difference between total perfectionism and age, family status.

Table (6): reports relation between total eating disorder and socio-demographic characteristics of the studied students. It reflects that, there was statistical significant difference between total eating disorders and socio-demographic characteristics such as sex and marital status while no statistical difference between total eating disorders and age, residence, family income and family status.

Figure (5): represents correlation between total eating disorder and total perfectionism of the studied students .It illustrates that, there was highly positive correlation between total eating disorder and total perfectionism.

Table (1): Frequency distribution of studied students regarding socio-demographic characteristics (n=300)

socio-demographic characteristics	No	%
Age/years		
19-	86	28.7
20-	200	66.7
21+	14	4.6
Gender		
Male	63	21.0
Female	237	79.0
Residence		
Rural	259	86.3
City	41	13.7
Occupation		
Working	12	4.0
Not working	288	96.0
Family income		
Sufficient	278	92.7
Not sufficient	6	2.0
Sufficient and more	16	5.3
Marital status		
Married	18	6.0
Single	230	76.7
Engaged	52	17.3
Family status		
Un-stable	2	0.7
Stable to somewhat	41	13.7
Stable	257	85.6
Total	300	100.0
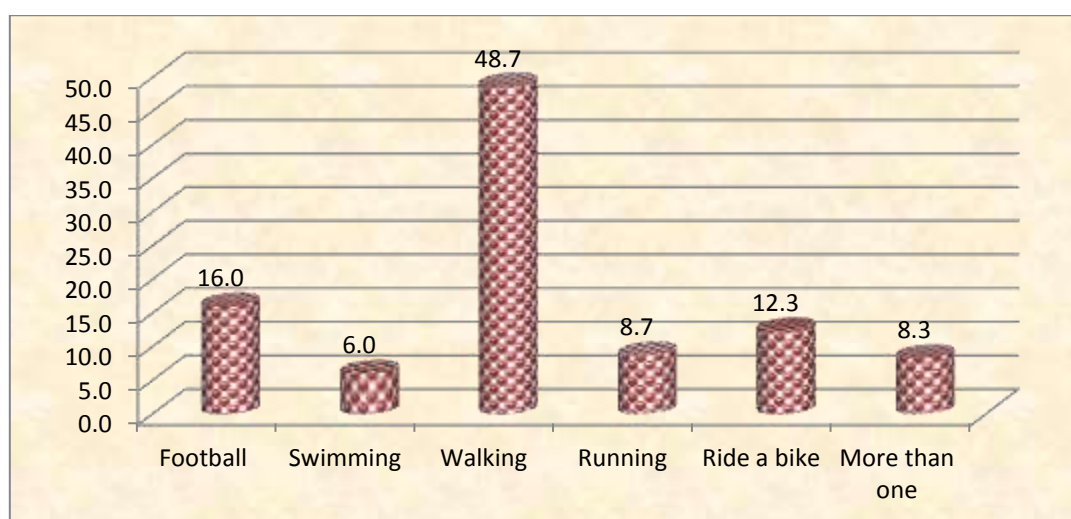
Figure (1): Frequency distribution of studied students regarding favorite sport (n=300).

Table (2): Mean and standard deviation of the studied students regarding height, weight and body mass index(n=300)

	Minimum	**Maximum**	**Mean ± SD**
Height	138.00	186.00	163.1±8.88
Weight	8.00	93.00	63.4±11.68
Body mass index	16.40	34.90	23.9±3.43
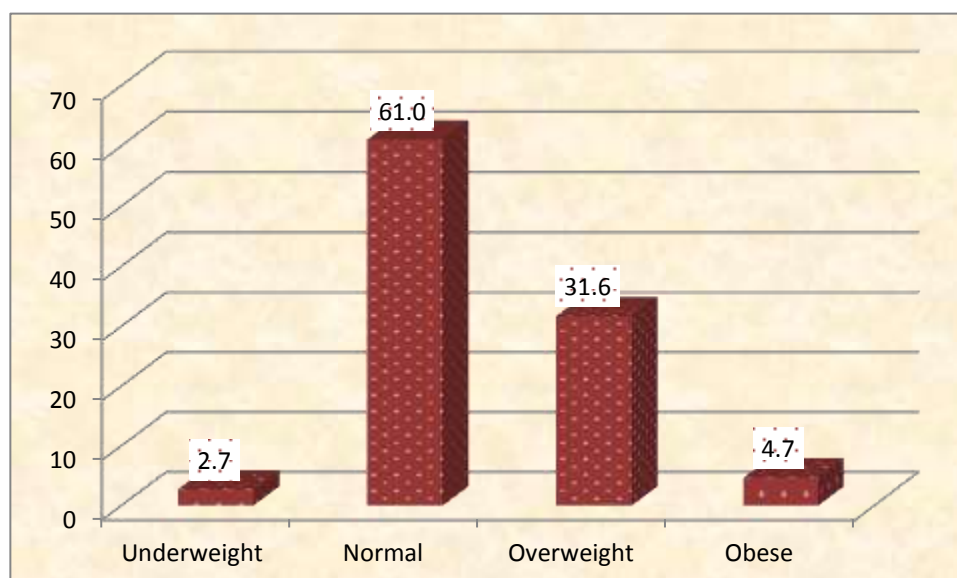
Figure (2): Frequency distribution of studied students regarding body mass index (n=300)
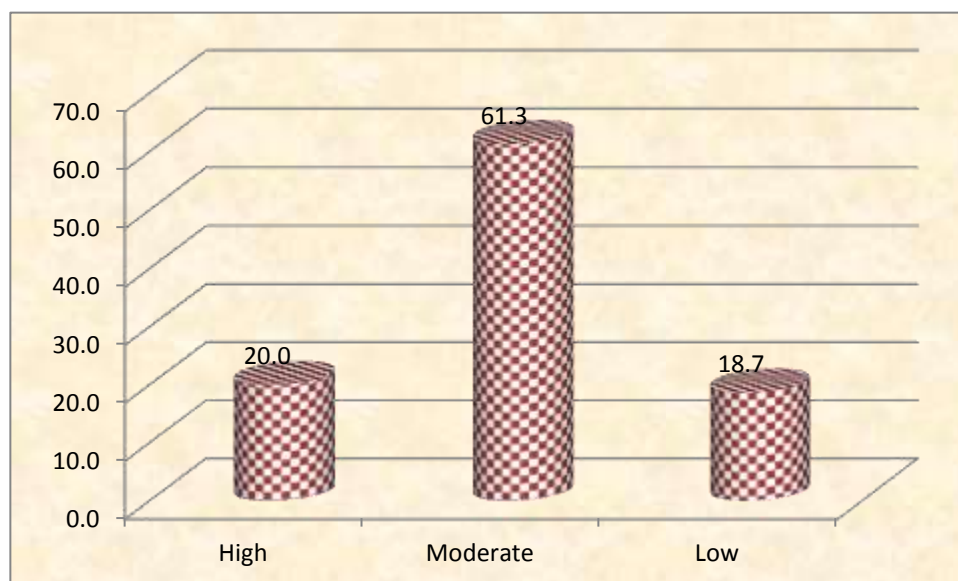
Figure (3): Frequency distribution of studied students regarding total perfectionism(n=300).

Table (3): Frequency distributions of studied students regarding anorexia nervous and bulimia nervosa (n=300).

	High		Moderate		Low	
	No	%	No	%	No	%
Anorexia nervosa	14	4.7	168	56.0	118	39.3
Bulimia nervosa	20	6.7	200	66.7	80	26.6
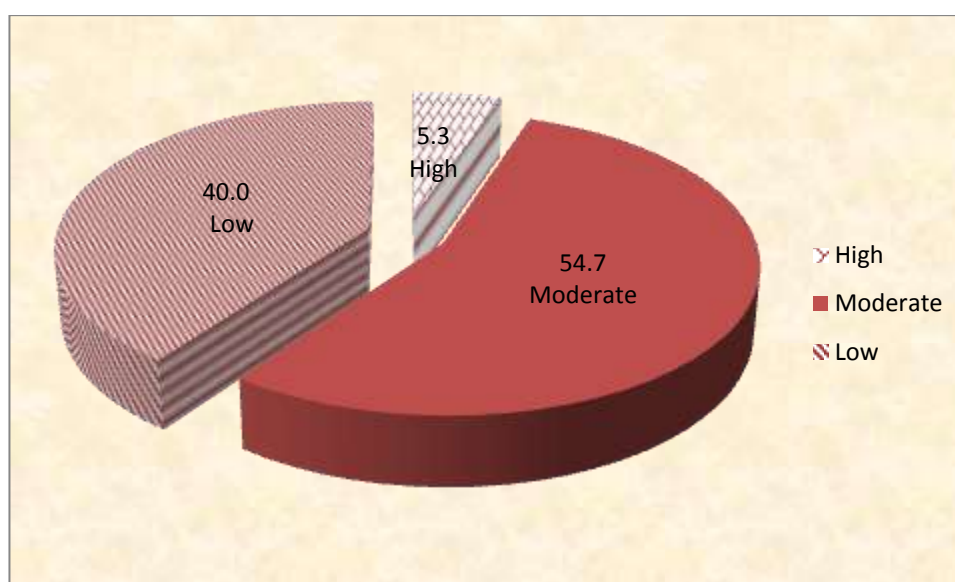
Figure (4): Frequency distribution of studied students regarding total eating disorders (n=300).

Table (4): Relation between total body mass index, total perfectionism and total eating disorders(n=300).

	Body mass index								X^2	p-value
	Underweight		Normal		Overweight		Obese			
Total Perfectionism										
	No	%	No	%	No	%	No	%	15.82	0.015*
Low	0	0.0	32	17.5	20	21.1	4	28.6		
Moderate	8	100.0	103	56.3	65	68.4	8	57.1		
High	0	0.0	48	26.2	10	10.5	2	14.3		
Total Eating disorders										
Low	5	62.5	82	44.8	31	32.6	2	14.3	16.33	0.012*
Moderate	3	37.5	95	51.9	54	56.8	12	85.7		
High	0	0.0	6	3.3	10	10.6	0	0.0		

(*) significant at p ‹ 0.05.

Table (5): Relation between total perfectionism and socio-demographic characteristics of studied students (n=300).

socio-demographic characteristics	Total perfectionism						X^2	p-value
	Low (n=56)		Moderate (n=184)		High (n=60)			
Age	No	%	No	%	No	%		
19-	14	25.0	48	26.1	24	40.0		
20-	42	75.0	124	67.4	34	56.7	9.07	0.59n.s
21+	0	0.0	12	6.5	2	3.3		
Sex								
Male	2	3.6	35	19.0	26	43.3	28.7	<0.001**
Female	54	96.4	149	81.0	34	56.7		
Residence								
Rural	48	85.7	151	82.1	60	100.0	12.35	0.002*
City	8	14.3	33	17.9	0	0.0		
Family income								
Sufficient	54	96.4	172	93.4	52	86.7		
Not sufficient	0	0.0	6	3.3	0	0.0	13.12	0.011*
Sufficient and more	2	3.6	6	3.3	8	13.3		
Marital status								
Married	6	10.7	10	5.4	2	3.3	9.91	0.042*
Single	38	67.8	138	75.0	54	90.0		
Engaged	12	21.5	36	19.6	4	6.7		
Family status								
Un-stable	0	0.0	2	1.1	0	0.0		
stable to somewhat	6	10.7	31	16.8	4	6.7	5.9	0.20n.s
stable	50	89.3	151	82.1	56	93.3		

(n.s) Not Statistically Significant (*) Statistically Significant at ≤0.05   (**) Highly Statistically Significant at ≤0.001

Table (6): Relation between total eating disorder and socio-demographic characteristics of studied students (n=300).

socio-demographic characteristics	Total eating disorder						X^2	p-value
	Low (n=120)		Moderate (n=164)		High (n=16)			
Age	No	%	No	%	No	%		
19-	36	30.0	44	26.8	6	37.5	4.01	0.40n.s
20-	80	66.7	112	68.3	8	50.0		
21+	4	3.3	8	4.9	2	12.5		
sex								
Male	26	21.7	30	18.3	7	43.8	5.74	0.056*
Female	94	78.3	134	81.7	9	56.2		
Residence								
Rural	104	86.7	140	85.4	15	93.8	0.88	0.64n.s
City	16	13.3	24	14.6	1	6.2		
Family income								
Sufficient	108	90.0	156	95.2	14	87.5		
Not sufficient	2	1.7	4	2.4	0	0.0	6.93	0.14n.s
Sufficient and more	10	8.3	4	2.4	2	12.5		
Marital status								
Married	12	10.0	6	3.6	0	0.0	12.23	0.016*
Single	96	80.0	122	74.4	12	75.0		
Engaged	12	10.0	36	22.0	4	25.0		
Family status								
Un-stable	0	0.0	2	1.2	0	0.0		
Stable to somewhat	10	8.3	28	17.1	3	18.8	6.69	0.15n.s
Stable	110	91.7	134	81.7	13	81.2		

(n.s) Not Statistically Significant (*) Statistically Significant at ≤0.05
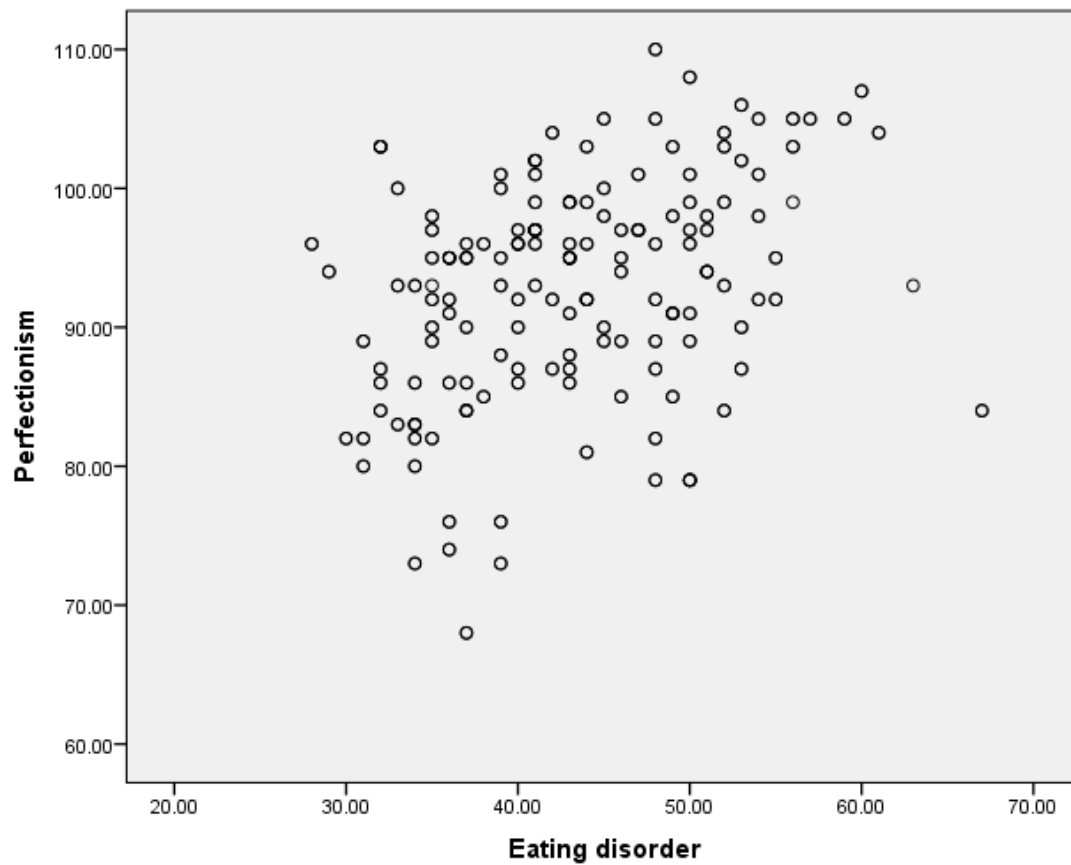
Figure (5): Correlation between total eating disorder and total perfectionism of the studied students (n=300).

Discussion

Perfectionism has been linked both conceptually and empirically to eating disorders. Hilde Bruch, a pioneer in the field of eating disorders, noted that eating disorder patients demonstrate "superperfection," and perfectionism related to the body is implied in a criterion common to both anorexia nervosa and bulimia nervosa, namely, that self-evaluation is overly reliant on [perfect] weight/shape. Empirically, there is evidence that perfectionism is elevated among those with eating disorders compared to healthy controls. Furthermore, recent intervention work in the area of eating disorders has focused on reducing perfectionism given its conceptualization as a maintenance factor. Thus, perfectionism appears to play a role in the etiology, maintenance, and treatment of eating disorders Fairburn etal. (2018) [19]. So, the present study aimed at investigate the relations between perfectionism and eating disorder for Nursing students.

The result of the present study revealed that two-thirds of the studied student's ages were from 20to less than 21 years. Highest percentages of the students were female. This is because it is the normal age for entering nursing institutions on Egypt and most of them are female .These findings were similar to the study done by Eric et al. (2017) [20]who found that majority of study sample were female and the mean age of participants was 21.6 years.

The result of the current study revealed that majority of them were live in rural area, not working, have sufficient income, single and stable family status. This is might be due to the geographical location of Benha university it is near from the rural areas and the rural community maintains its children by living close to their families and responsible for them. This result similar with Bizri et al.(2021) [21]who found that The majority of respondents living at home with their parents and only one student was married. On the contrary, this finding inconsistent with Maria et al. (2018) [22] found that that majority of them were live in urban and working.

Regarding to studied students favorite sport, the result of the present study illustrated that nearly half of the students were walking as the favorite sport. This may be due to they are in rural areas and they do not have clubs to exercise, so the available to them is walking. This result inconsistent with Hewes (2018) [23] who found that the studied female were asked to participate: basketball, crew, cross country, golf, lacrosse, soccer, swimming and diving, tennis, track and field, and volleyball.

Concerning to mean and standard deviation of the students regarding height, weight and body mass index were (163.1±8.88, 63.4±11.68 and 23.9±3.43) respectively. This result agreement with Akesode and Ajibode (2018) [24] who found that the height of the study sample were 160 ±5.8 and weight were 60.61±4.1 and similar with Bardone-Coneet al. (2019) [25] who found that the mean body mass index of participants was 22.3 ± 3.8). Also, this finding congruent with Atanasova et al.(2018) [26] who found that mean height of the students males - 181,33 ±8,31,females-168,45±8,22; mean weight of the students males - 76,93±11,81, females- 60,95±10,22; mean of the students body mass index (BMI) males- 23,4 ± 2 ,95, females- 21,4 ± 2,62.

Regarding to studied students body mass index, the result of the current study demonstrated that, less than two-thirds of the students have normal body mass index while minority of them have obese. This may be due to students have intense fear of gaining weight of becoming fat and, recurrent inappropriate compensatory behavior in order to prevent weight gain. In addition, eating pathology increases the risk for future onset of obesity, anxiety disorders and health problems.. This finding was consistent with Hasseet al. (2019)[27] who found that majority of students have normal body mass index while minority of them have obesity. Furthermore, this result was consistent with Cunjian et al. (2019) [28] who revealed that Children and adolescents in China's Xinjiang Uyghur Autonomous Region with a normal body mass index demonstrated good physical fitness.

Concerning to studied students total perfectionism, the result of the present study showed that, less than two-thirds of the students have moderate perfectionism perfectionism has increased dramatically among young people, leading to negative. This may be due to Perfectionism can be general, which is when someone has the broad tendency to have unrealistically high standards, or it can occur in specific aspects of life, such as in work or school performance, relationships, writing, speaking, athletics, health, personal cleanliness, or physical appearance. also, This may be due to side effects such as eating disorders and depression. This finding inconsistent with Katherine et al. (2018) [29] noted that the healthy comparison subjects had slightly lower scores on all subscales of the Multidimensional Perfectionism Scale than previously reported normative data from a female college population.

Regarding to studied students for anorexia nervous and bulimia nervosa, the present

study revealed that, more than half of the students have moderate anorexia nervous while two thirds of them have bulimia nervosa. This may be due to anorexia nervous (AN) is characterized by a refusal to maintain a minimally normal body weight, an intense fear of gaining weight or becoming fat, and a disturbance in the experience of body shape or weight. Also, Overweight girls are more likely to engage in unhealthy dieting behaviors, express concern about their weight, restrain their eating, and to have greater dissatisfaction regarding their physical appearance than their average-weight peers. This result similar to the study done by Godart et al. (2020) [30]who found that most of subjects with Anorexia nervosa and two thirds of those with Bulimia nervosa had at least one lifetime diagnosis of an anxiety disorder. On the contrary, this result is incongruent with Smink et al. (2020) [31]who found that Anorexia nervosa is relatively common among young women; there has been an increase in the high risk-group of 15-19 year old girls. The occurrence of bulimia nervosa might have decreased since the early nineties of the last century.

The current study showed that, more than half of the students have moderate eating disorders. This may be due to nursing students are subjected to high levels of stress and have a high risk of developing mental health problems, including eating disorders., it is plausible that disordered eating behaviors among students may go unrecognized and under-reported. This result similar with Kobeissy &Talih(2021) [32]who found that the study subjects seems to be a high level of under recognized and under-treated disordered eating behaviors among female medical students at American University of Beirut.

Concerning to relation between total body mass index, total perfectionism and total eating disorders, the result of the current study showed that there were a statistically significant difference between total body mass index, total perfectionism and total eating disorders. This may be due to Perfectionism can cause a person to become obsessed with their weight, diet, food, body image, exercise or portraying the "perfect" image to the world . Also, Eating disorders are characterized by severe disturbances in eating behavior and body weight. Eating disorders are frequent in adolescents and even more in young adults. This finding in the line with Marianaet al. (2018) [33]who found that, dysfunctional eating behaviors appeared to correlate strongly and significantly with body mass index, perfectionism dimensions, and self-esteem. Also, this result congruent with Hudson et al. (2018) [34]who stated that   Lifetime anorexia

nervosa is significantly associated with low current weight (body-mass index <18.5), whereas lifetime binge eating disorder is associated with current severe obesity (body-mass index > or =40).

Regarding to relation between total perfectionism and socio-demographic characteristics of studied students, the result of the current study illustrated that, there was statistical and highly statistical significant difference between total perfectionism and socio-demographic characteristics such as sex, residence , family income and marital status while no statistical difference between total perfectionism and age, family status. This may be due to perfectionism interferes with close, interpersonal relationships and perfectionists have been described as people who want to be perfect in all domains of their lives. Moreover, perfectionists selected the type of work they liked best and were best fitted to do and as this group of people was all thrifty and industrious, they became comparatively wealthy. This result in the line with Cemrenur and Füsun, (2019) [35] who found that there were statistically significant difference among participants according to sex, major residence ,financial statuses and perceived parental attitudes. On the contrary, this finding was disagreement with Fusun, (2018) [36] As a

result of research, perfectionism scores of the preschool teachers are significantly different according to their demographic characteristics such as age, graduation degree, school type and professional experience at the present institution.

Concerning to relation between total eating disorder and socio-demographic characteristics of studied students, the present result illustrated that, there was statistical significant difference between total eating disorders and socio-demographic characteristics such as sex and marital status while no statistical difference between total eating disorders and age, residence, family income and family status. This may be due to, Eating disorders are an increasingly prevalent public health problem among adolescents and young women. Also, images of women in the media and popular culture apply considerable pressure to be thin on vulnerable young girls and women, for whom it is difficult to live up to these expectations, regardless of their natural body shape. This result similar with Galmiche et al. (2019) [37]concluded that despite the complexity of integrating all eating disorder prevalence data, the most recent studies confirm that eating disorders are highly prevalent worldwide, especially in women.

Finally an important finding from the current study revealed that there was highly positive Correlation between total eating disorder and total perfectionism. This may be due to eating disorders are characterized by high-level perfectionism which endures after recovery and appears to be familial in nature and to have pre dispositional significance for the development of eating disorders. And due tothe emergence of perfectionism may be a consequence of an eating disorder. This result agreement with Cynthia et al. (2018) [38] we found that elevated scores on a perfectionism scale—especially the aspects of perfectionism captured by the subscale for concern over mistakes—were significantly associated with the presence of eating disorder such as anorexia nervosa and bulimia nervosa. Also, this result in the same line with Canals et al. (2019) [39] found that in their study the father's perfectionism were related to long-term Eating Disorder. Moreover, these findings were similar to the study done by Vacca et al. (2021) [40] we found that there were highly statistically significant relation between perfectionism and eating related symptoms in adolescents .

Conclusion

The highest percentage of the studied students have moderate perfectionism, while more than half of the studied students have moderate eating disorders. Also, there were a statistical significant difference between total body mass index, total perfectionism and total eating disorders. In addition there was highly positive correlation between total eating disorder and total perfectionism.

Recommendations

Based on the findings of the current research, the following recommendations are suggested:

- Expand public awareness through mass media about perfectionism and its effect on eating disorder among university students.
- Designing program focused on unrealistic standards of beauty to reduce adolescent's criticism body weight and shape.
- Further studies are needed on large sample of students in different geographical areas to generalize the results.

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Educational Program about Organizational Preparedness for Crisis Management: It's Effect on Organizational Commitment and Occupational Stress in the Time of Covid19

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Abstract

Background: The pandemic of the Coronavirus has already had a huge impact on practically every aspect of human life, particularly the health-care sector. As a result, organizations must be well-prepared for crisis management while preserving a healthy workforce's sincere commitment. **Aim of the study:** To determine the effect of an educational program about organizational preparedness for crisis management on organizational commitment and occupational stress in the time of Covid19. **Study design:** Quasi-experimental design with one group pre and post-test assessment was utilized. **Study setting:** The study was carried out at Benha Teaching Hospital in benha city at Qalubia governorate affiliated to the Ministry of Health. **Study Subjects:** A convenient sample of all available head nurses from the above-mentioned study setting (60) head nurses within inclusion criteria **Tools:** Four tools were used to collect the data as follows; (I): Knowledge about Crisis Management Questionnaire, (II): Perceived organizational preparedness for Crisis Management Scale, (III): Organizational Commitment Questionnaire and (IIII): Nurses Occupational Stress Scale. **Results:** There was an improvement in Mean scores and St-deviations of head nurses' total level of knowledge and perception regarding hospital preparedness for crisis management, organizational commitment, and occupational stress immediately after program implementation **Conclusion:** Providing an educational program about "organizational preparedness for crisis management" was effective in improving head nurses' knowledge and perception levels regarding hospital preparedness for crisis management and improved head nurses' commitment and occupational stress **Recommendations**: Hospital managers have to arrange awareness programs about "Preparedness for crises management" for all hospital staff, and make sure that all staff members know their roles, and responsibilities during facing crisis.

Keywords: Crisis Management, Organizational Preparedness, Organizational   Commitment, Occupational Stress

Introduction

At the end of 2019, the health-care sector was hit by an uncontrollable unknown disaster dubbed (COVID-19). This unique coronavirus pneumonia first appeared in Wuhan, Hubei Province, China, and has since gotten a lot of interest around the world [1]. Because of the extremely infectious nature of COVID-19, all nursing personnel has worked under great physical and psychiatric stress [2].

Any occurrence that leads to an unstable and dangerous situation affecting an individual, a group, or the entire society is referred to as a crisis. Crises are un favorable changes in human or environmental situations, particularly when they come suddenly and without preparation. A crisis, in a broader sense, is a challenging moment or an emergency. A crisis is a scenario in which a "complex system" for family, economy, and society is in confusion [3].

Due to the unpredictability of global events, many modern organizations try to forecast future crises ahead of time so that strategies can be made to deal with them. In order to survive a crisis, the organization must be able to significantly alter its course of action. As a result, the crisis management approach is primarily concerned with recognizing dangers to a company and its stakeholders [4].

Crisis management is a set of targeted activities carried out by managers in charge of a specific domain in order to deal with emergencies or crises. It's used to deal with issues including prevention (planning), emergency management (announce alert), and emergency scenarios [5]. Preparation of health care organizations, especially hospitals is necessary before the occurrence of the crisis to provide better health services and reducing losses and waste [6]. Therefore, hospital preparation for crises locates at the top of crisis management at national and international levels [7].

Organizational crisis management preparation is a continual, dynamic, and progressive process that identifies changes in crisis and risk. If head nurses can complete their jobs on time, coordinate their efforts, and deliver adequate results in emergencies or crises, hospitals will be better prepared. In hospitals, the formation of a crisis team capable of providing timely health services in emergency situations has been approved as a policy. Hospitals, notably head nurses, should be able to deliver services in a timely manner in a severe circumstance that harms society [8].

Hospitals, as the initial responders to injuries, must keep up with and expand their activities in emergency and crisis

situations. The objective of hospital preparation is to provide immediate reaction mechanisms, self-staff training, and eventually respond to the demands when a crisis happens. Managers should concentrate on internal programming to improve hospitals' crisis preparation. When an unpredictable incident occurs, hospitals that have a preparedness plan and practices have experienced less damage [9].

Organizational commitment is described as an individual's identification with, and involvement in, a specific work organization, and includes an individual's acceptance of the organization's aims and ideals, as well as a strong desire to continue working for that organization [10]. Understanding the organizational behaviors of staff nurses in the workplace requires an understanding of organizational commitment. It reflects how dedicated nurses are to the organization's goals and the work they do. As a result, devoted nurses are more consistent in their actions. Organizational commitment can lead to feelings of fulfilment, belonging, affiliation, and attachment among hospital staff, as well as improved job performance and motivation [11].

The nursing profession is usually regarded as one of the most stressful jobs in the world. Many studies have been conducted to identify the contributing factors of stress among nurses, and it has been reported that stress occurs when perceived demands exceed individuals' coping abilities; stress occurs as a result of interaction between external and internal components, involving the individual's perception and taking into account the ongoingrelationbetween the individual and the environment; stress occurs as a result of interaction between the external and internal components, involving the individual's perception and taking into consideration the ongoingrelationbetween the individual and the environment; stress occurs as a result of interaction between [12].

Occupational stress is frequently described as a sensation of being overworked, anxious, and worried. It's a disruptive situation that occurs as a result of negative influences from the inside or outside world [13]. Occupational stress can be caused by four different elements: the environment, social stressors, physiological stressors, and thoughts. Furthermore, one of the most significant sources of stress is the workplace [14].

Occupational stress has been linked to a variety of detrimental outcomes for both the individual and the workplace in several studies. Job stress is associated with higher job dissatisfaction, absenteeism, increased drinking and smoking frequency, increased

negative psychological symptoms, and lower goals and self-esteem [15]. Occupational stress should not be viewed primarily as a personal issue, but as a serious consideration in the healthcare sector. As a result, management must take many steps to assist their staff in overcoming the negative consequences [16].

As manager and psychiatrist, the head nurse is in charge of developing an action plan that includes goals and methods for crisis management, as well as training and preparing nursing team members for crisis management. Within that context, it is critical for the head nurse to clarify and define roles and responsibilities, to exercise fair judgement, to treat others with respect, and to appreciate and encourage accomplishments and positive behaviors. The head nurse, on the other hand, is responsible for enforcing discipline, pointing out shortcomings, and providing constructive feedback to team members [17].

Significance of the study

The COVID-19 pandemic has triggered worldwide devastation. Egypt is still dealing with a difficult situation, as the number of infected/positive patients continues to climb. As a result, health-care organizations have faced difficulties enforcing COVID 19 regulations within their operations, as well as pandemic-

related stress, which has increased tensions and stress among nursing staff [18].

As a natural outcome, there was a necessary need for organizations to find out ways to reduce occupational stress levels among their staff and in the same time increasing their organizational commitment levels that proved to have a great impact on productivity of the work. Depending on the fact that "education enlighten minds and relieving stress" we conduct this study to find out "Whether enhancing head nurses' knowledge and perception regarding organizational preparedness for crisis management through providing an educational program will improve their organizational commitment and occupational stress levels or not.

Research Aim

Determine the effect of educational program about organizational preparedness for crisis management on organizational commitment and occupational stress in the time of Covid19.

Research Hypothesis:

- There will be significant improvement of head nurses' knowledge and perception regarding organizational preparedness for crisis management after implementation of the program than before.

- There will be significant improvement of head nurses' organizational commitment and occupational stress after implementation of the program.

- There will be positive correlation among head nurses' knowledge and perception regarding organizational preparedness for crisis management and their organizational commitment levels after implementation of the program

- There will be negative correlations among head nurses' knowledge and perception regarding organizational preparedness for crisis management, organizational commitment and occupational stress after implementation of the program.

Subjects and Methods

- **Research design**

Quasi-experimental design with one group pre and post-test assessment was utilized to conduct the current research

- **Research Setting:**

This research was conducted in all units at Benha Teaching Hospital in benha city at Qalubyia governorate affiliated to the Ministry of Health. There are two buildings (medical and surgical), it contains 30 units. Total bed capacity is about (650) beds. The hospital works 7days / week / 24hrs/ day.

Research Subjects:

A convenient sample of all available head nurses from the above-mentioned study setting who met the inclusion criteria; Having Bachelor degree of nursing science, two years of experience, accept to participate in the study and available at the time of the study. The total final number was 60 head nurses.

Tools for data collection:

Four tools were used for data collection namely;

Tool I: Knowledge about Crisis Management Questionnaire:

A structured questionnaire developed by Khalil, (2019) [19] and modified by the researchers to assess head nurses' knowledge regarding organizational preparedness for crisis management. It consisted of two parts as follows;

Part I: Personal data of Head nurses

It concerned with personal data of head nurses such as (age, sex, educational qualifications, and experience years and etc………)

Part II: Knowledge about Crisis Management Questionnaire

It composed of 15 questions in the form of multiple-choice questions (MCQ) such as; Definition of crisis (1 item), Types of crises (2 items), Causes of crisis (3 items), Management of crisis (3 items) and Role of hospital and head nurse during crisis (6)items. Study subjects were instructed to

select the best correct answer. It was utilized during different phases of assessment (pre-program, immediately after program and 3 months follow- up of the program).

Scoring System:

The responses of head nurses were given (1) for the right answer and (0) for the wrong answer. The total score is ranging from (1 to 15), and cut point was done at 60%=9. In this respect the level of head nurses' knowledge regarding organizational preparedness for crisis management was categorized as the following; " satisfactory level" if the percent ≥ 75% that equals ≥ 11 points, " fair level" from 60% to less than 75% equal to 9 - < 11 points and " unsatisfactory level" < 60 % those equal to < 9 points.

Tool II: Perceived Organizational preparedness for Crisis Management Scale:

It was developed by Fowler et al. (2007) [20] and was modified by the researchers to assess head nurses' perception regarding organizational preparedness for crisis management. It comprised of 30-items such as; "I am very familiar with our hospital crisis plan, as part of our emergency plan, customers and suppliers would be able to contact us for information". It was utilized during different phases of assessment (pre-program, immediately after program and 3 months follow up of the program).

Scoring system:

Using a five-point Likert- scale ranging from (1-5) strongly disagree (1), disagree (2), neutral (3), agree (4) and strongly agree (5). The total score is ranging from (30 to 150), and cut point was done at 60% = 90. In this respect the level of head nurses' perception regarding organizational preparedness for crisis management was categorized as the following;

- "High level" if the percent ≥ 75% that equal ≥ 112.5 points,

- "moderate level" from 60% to less than 75% equal to 90 - < 112.5 points &

- "low level" < 60 % those equal to < 90 points.

Tool III: Organizational Commitment Questionnaire:

A structured questionnaire developed by Meyer & Allen, (1991) [21] and modified by the researchers to assess head nurses' organizational commitment level. It consisted of (3) domains covering (18) items as follows; affective (6 items), normative (6 items) and continuance (6 items). It was utilized during different phases of assessment (pre-program, immediately after program and 3 months follow up of the program).

Scoring system:

Using a five-point Likert- scale ranging from (1-5) strongly disagree (1), disagree (2), neutral (3), agree (4) and strongly agree (5). The total score is ranging from 18 to 90, and cut point was done at 60% =54, Accordingly, scores that reflect the level of head nurses' organizational commitment was categorized as the following;

- "High level" if the percent $\geq$ 75% that equal $\geq$ 67.5 points,

- "moderate level" from 60% to less than 75% equal to 54 - < 67.5 points &

- "low level" < 60 % those equal to < 54 points.

Tool IV: Nurses' Occupational Stress Scale (NOSS):

A structured questionnaire adapted from Chin, et al., (2020)[22]. It aimed to assess head nurses' occupational stress level. It consisted of (12) factors covering (53) items as follows; work demands (6 items), work–family conflict (5 items), insufficient support from coworkers or caregivers (5 items), organizational issues (5 items), occupational hazards(5 items), difficulty taking leave(2 items), powerlessness(3 items),, interpersonal relationships(5 items), and unmet basic physiological needs(3 items), Uncertainty concerning treatment(5items),Inadequate preparation (3 items),Work load(6 items). It was utilized during different phases of assessment (pre-program, immediately after program and 3 months follow- up of the program).

Scoring system:

Using a five-point Likert- scale ranging from (1-5) strongly disagree (1), disagree (2), neutral (3), agree (4) and strongly agree (5). The total score is ranging from (53 to 265), and cut point was done at 60% = 159. In this respect the level of head nurses' occupational stress was categorized as the following;

- "High level" if the percent $\geq$ 75% that equal $\geq$ 198points,

- "moderate level" from 60% to less than 75% equal to 159 - < 198 points &

- "low level" < 60 % those equal to < 159 points.

Data Collection Procedure

Administrative Approval:

An official permission was obtained from the Dean of Faculty of Nursing and director of Benha Teaching Hospital and from all participants in the study through official letters explaining the aim of the study. Also, the researchers assured complete confidentiality of the obtained information, the study would not affect the work, in addition, and the results of the study along with the recommendations will be forwarded to the hospital administration

for possible application to obtain their permission and their help in data collection process.

The researchers met the head nurses of units at Benha Teaching Hospital. The aim of the study was discussed with them. The time for data collection and program implementation were also determined based on their views and workload to gain their acceptance for participation and complete cooperation.

Tools validity and reliability:

The tools were reviewed by expert panel consisted of five expertise from nursing administration department. Based on their recommendations the necessary modifications were made for clarity of sentences and appropriateness of content. The panel ascertained the face and content validity of the tools. The reliability was done by Cronbach's Alpha coefficient test were as follows; (r= 0.94, 0.85 & 0.89) for Organizational preparedness for crisis management scale, organizational commitment questionnaire, and Occupational stress scale, respectively.

Pilot study:

Before starting data collection, the revised tools 'clarity, objectivity and feasibility were tested through pilot study on 10% of the total number of head nurses (6), in addition to estimating the time needed for

filling the them. No modifications were done and head nurses included in the pilot study were included in the main study subjects.

Field work:

This research was carried out for (9 months) from the start of Sept 2020 to the end of May 2021 throughout the following phases;

Phase 1 (assessment phase): Data collected during September2020.This phase was designed to allow the researchers to collect a baseline assessment of study subjects' learning needs regarding knowledge and perception of "organizational preparedness for crisis management" to be considered during preparation of the program. In addition to, assessing study subjects' organizational commitment and occupational stress levels to compare it with immediate post and follow-up program. The data collected in two days per week in the morning and afternoon shifts.

Phase 2 (planning phase): During October 2020, according to the results of the pretest and extensive review of literature, the educational program on "organizational preparedness for crisis management" was designed. The educational materials were designed after reviewing the related literature as the

program booklet and the power point presentations.

-The program booklet contained the program specification, objectives, timetable, and contents. This program was designed to improve head nurses' knowledge and perception regarding organizational preparedness for crisis management which supposed to improve their organizational commitment and occupational stress levels. The program booklet content was organized as follows;

Phase 3 (implementing phase): The program was conducted by the researchers throughout two months, from the beginning of November 2020 till the end of December 2020. The subjects were divided into (6) groups according to their units, each group includes (10) head nurses. The program implemented in about (18) hours distributed as follows; (9) sessions, 2hours/session, 3days/week in morning and afternoon shifts. Each researcher implemented the program with one group on the same day or different days according to unit workload. Program sessions were organized as the following;

Introduction about the aim of the current study, objectives and content of the program. , Theoretical background about concept of crisis and crisis management, Crisis communication challenges and resources, Organizational preparation of crisis management (principle, strategies and steps).,Psychological preparedness for dealing with crisis, Organizational planning for crisis management., Role of head nurse in crisis management., Psychological management of individuals during crisis time and Summary about the program sessions, open discussion with the study subjects was done to answer any questions or explain any difficulties and.

Phase 4 (evaluation phase): after conducting the program, the post-program questionnaire sheet was distributed to examine to-what extent the program improved head nurses' knowledge and perception regarding organizational preparedness for crisis management, their organizational commitment and occupational stress levels, this phase took about (3) weeks during January 2021. After three months (May 2021), follow up study were done to evaluate the impact of the program using the same tools which were used before the program. The results were analyzed and interpreted and presented in tables and figures.

 Ethical Considerations:

- An interview with head nurses was constructed to inform them about the purpose and benefits of the study, and

they were informed that their participation is voluntary and they have the right to refuse to participate or withdraw from the study without giving any reason. In addition, confidentially and anonymity of the subjects were assured by coding all the data.

Limitations of the Study

-The problem which faced most of the time during the completing the questionnaire was limitation of time. The study was conducted in a limited time period of 3 months.

Results

Table (1) shows that less than two-thirds (61.7%) of nurses were aged between 30-45 years. And more than half (56.7%) of them had more than 15 years of experience. also, 45% of the studied nurses had bachelor degree of nursing science. Additionally, more than half of them (53.3%) did not attend crisis management training courses previously; also, majority of them (86.7%) had not participate in formulating crisis management plan.

Table (2) illustrates that there was an improvement in mean-scores and standard deviations of head nurses' total level of knowledge regarding hospital preparedness for crisis management after program implementation than pre- program implementation (3.35±1.47, 12.88±2.99, 8.11±6.27 respectively).

Figure (1) reveals that the highest percent of head nurses (78.3%) have inadequate level of knowledge regarding hospital preparedness to crisis management at pre-program phase while the highest percent of head nurses (83.3%, 75% respectively) have adequate level of knowledge after implementation of the program.

Table (3)illustrates that there was an improvement in mean-scores and standard deviations of head nurses' total level of perception regarding hospital preparedness for crisis management immediately at post program implementation and follow- up phases than pre- program implementation (77.48±, ±4.83, 71.25±, ±4.14, 56.43±, ±14.49 respectively).

Figure (2) reveals that more than half of head nurses (51.7%) have low level of perception regarding head nurses' perception hospital preparedness to crisis management at pre-program phase while the half, less than half of head nurses (50%, 46.7% respectively) have high level of perception after implementation of the program.

Table (4) illustrates that there was an improvement in mean-scores and standard deviations of head nurses' total level of commitment immediately at post program implementation and follow- up phases than pre- program implementation (52.68

±5.22,   50.75±7.03,   41.13±10.59 respectively)

Figure (3) reveals that half of head nurses (50%) have high level of commitment at pre-program phase while about two thirds of head nurses (65%, 61.7% respectively) have a high level of commitment after implementation of the program and follow-up phases.

Table (5) indicates that there was an improvement in mean scores and standard deviations of head nurses' total level of stress immediately at post program implementation and follow- up phases than pre- program implementation (119.76±17.28, 174.83±8.97, 167.50±17.58 respectively)

Figure (4) reveals that more than two thirds of head nurses (68.3%) have moderate level of stress at pre-program phase while about two thirds of head nurses (60%, 65% respectively) have low level of stress after implementation of the program.

Table (6) shows that there was a statistically significant correlation between head nurses' total level of knowledge and commitment with their age, qualifications, experience years, training and participation in formulation of crisis management plan. In addition, there was statistically significant correlation between head nurses' total level of perception with their age, experience years, training and participation in formulation of crisis management plan. Regarding total stress level, there was statistically significant negative correlation with all personal data of studied subjects after implementation of the program

Table (7) indicates that, regarding head nurses' total level of knowledge, the current result clarified that there was a highly positive statistical correlation with commitment levels, and there was a positive statistical correlation with head nurses' total perception level at post-program and follow- up phases. On the other side, there was a highly negative statistical correlation with total stress level after program implementation and at follow- up phase. Regarding head nurses' total perception level, there was a positive statistical correlation with their total commitment levels immediately post-program implementation and a highly positive statistical correlation at follow- up phase. On the other side, there was a highly negative statistical correlation between head nurses' total perception and stress levels at follow- up phase.

Table (1): Frequency distribution of personal data of study subjects (n=60)

Personal characters	No (60)	%
Age		
25-30	14	23.3
30-45	37	61.7
≤45	9	15.0
Experience		
1-5	18	30.0
5-15	34	56.7
15≤30	8	13.3
Qualifications		
Nursing diploma	4	6.7
Nursing institute	25	41.7
Bachelor degree of nursing science	27	45.0
Master or doctorate degree of nursing science	4	6.7
Previously attended crisis management training courses		
Yes	32	53.3
No	28	46.7
Previously participated in formulating crisis management plan		
Yes	8	13.3
No	52	86.7

Table (2): Mean and St-deviation of head nurses' knowledge about hospital preparedness for crisis management throughout program phases (n=60)

phases / Variables	Min	Max	Pre		Post		Follow-up		t1	p-value	t2	p-value	t3	p-value
			Mean	±SD	Mean	±SD	Mean	±SD	21.21	.000**	1.98	0.649	5.84	.000**
Total knowledge	2	15	3.35	±1.47	12.88	±2.99	8.11	±6.27						
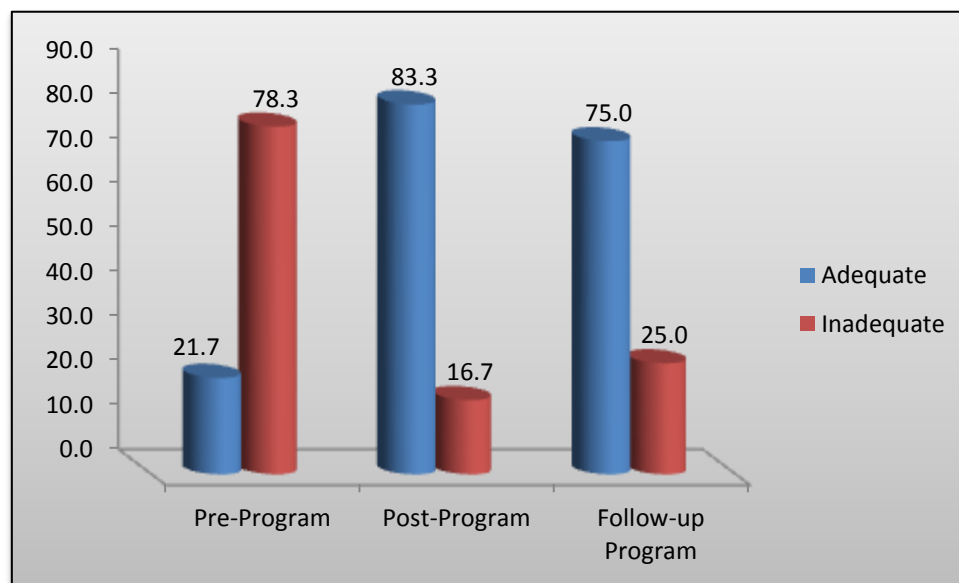
Figure (1): Head nurses' knowledge regarding hospital preparedness for crisis management throughout the program phases (n=60)

Table (3): Mean and St-deviation of head nurses' perception regarding hospital preparedness for crisis management throughout the program phases (n=60)

Variables	Pre		Post		Follow -up		t1	p value	t2	P value	t3	p-value
	Mean	±SD	Mean	±SD	Mean	±SD						
Total planning	12.90	±3.46	18.80	±1.86	17.20	±1.56	11.298	.000**	0.98	0.49	7.055	.000**
Total training	8.88	±2.65	13.36	±1.26	12.81	±1.06	11.183	.000**	1.15	0.52	9.028	.000**
Total awareness	15.03	±4.08	20.68	±1.95	19.90	±1.41	10.729	.000**	0.97	0.48	5.821	.000**
Total safety	3.98	±1.30	4.95	±0.96	3.70	±0.64	5.166	.000**	1.599	.115	3.54	.000**
Total rights	10.08	±2.56	12.31	±1.04	11.70	±1.31	6.099	.000**	1.632	.108	4.85	.000**
Total resources	5.55	±1.87	7.36	±1.08	6.93	±1.02	6.272	.000**	1.542	.175	4.798	.000**
Total	56.43	±14.49	77.48	±4.83	71.25	±4.14	10.815	.000**	1.25	.241	5.899	.000**

**0.000 a highly statistically significant.
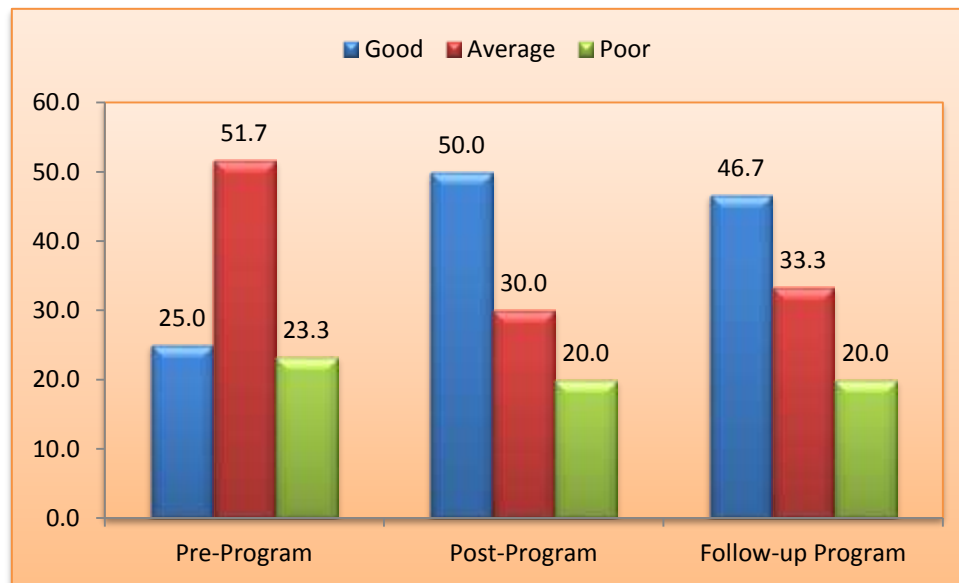
Figure (2): Head nurses' perception regarding hospital preparedness for crisis management throughout the program phases (n=60)

Table (4): Mean and standard deviation of head nurses' organizational commitment levels throughout the program phases (n=60)

Variables	Pre		Post		Follow-up		t1	p-value	t2	p-value	t3	p-value
	Mean	±SD	Mean	±SD	Mean	±SD						
Affective commitment	12.50	±3.03	14.38	±2.41	13.63	±2.30	3.643	.001**	1.21	0.07	2.267	.027*
Normative commitment	13.20	±5.37	20.13	±2.22	18.86	±4.07	8.832	.000**	0.98	0.12	3.164	.002*
Continuance commitment	15.43	±4.01	18.16	±2.90	17.25	±3.28	4.350	.000**	0.64	0.54	3.273	.003*
Total commitment level	41.13	±10.59	52.68	±5.22	50.75	±7.03	7.219	.000**	1.24	0.09	2.219	.030*

**0.000 a highly statistically significant.
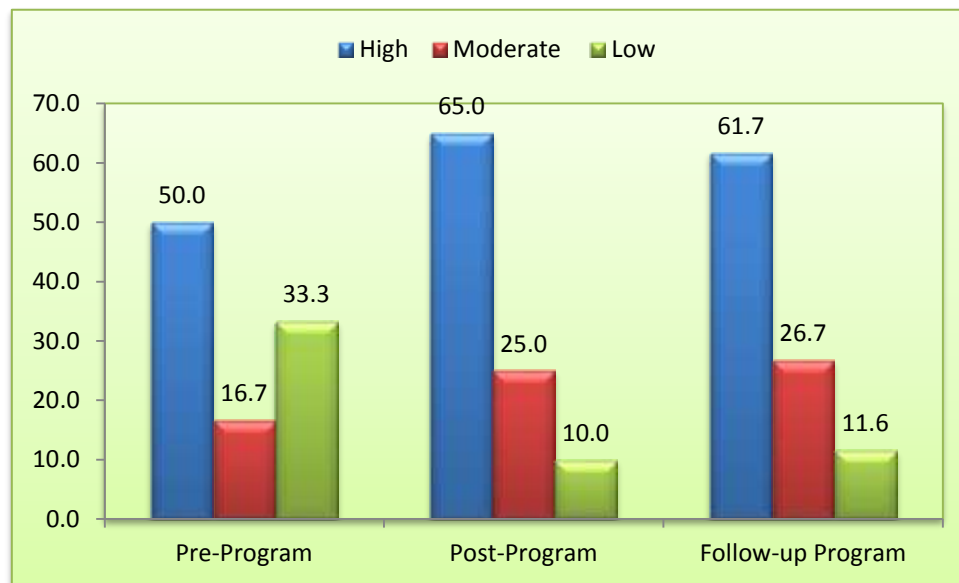
Figure (3): Head nurses' commitment levels throughout the program phases (n=60)

Table (5): Mean and St-deviation of head nurses' occupational stress levels throughout the program phases (n=60)

Dimensions	Min	Max	Pre		Post		Follow up		t1	p-value	t2	p-value	t3	p-value
			Mean	±SD	Mean	±SD	Mean	±SD						
Work Demands	6	24	9.75	±2.58	20.61	±2.79	19.88	±4.27	24.080	.000**	0.837	.54	7.538	.000**
Work–Family Conflict	5	17	11.76	±3.56	16.55	±1.60	15.57	±4.03	8.596	.000**	0.559	.13	5.526	.000**
Insufficient Support From Coworkers Or Caregivers	5	20	9.15	±3.25	15.66	±4.60	14.76	±5.73	9.672	.000**	1.394	.62	4.913	.000**
Organizational Issues	5	19	13.95	±3.38	17.70	±2.67	16.20	±4.12	6.258	.000**	1.501	.15	9.278	.000**
occupational hazards	4	20	10.65	±5.18	17.63	±3.26	16.03	±4.81	8.204	.000**	1.403	.41	5.899	.000**
Difficulty Taking Leave	0	7	4.06	±2.42	6.31	±1.24	5.81	±1.78	6.316	.000**	0.880	.54	3.435	.001**
Powerlessness	3	12	4.70	±2.55	8.70	±2.57	7.89	±2.42	8.301	.000**	1.483	.14	3.542	.001**
Interpersonal Relationships	5	19	12.88	±4.57	16.38	±1.93	15.42	±2.80	5.141	.000**	1.577	.31	3.527	.001**
Unmet Basic Physiological Needs	3	10	7.31	±2.13	9.35	±1.93	9.33	±1.95	5.068	.000**	1.068	.53	7.631	.000**
Uncertainty concerning treatment	5	18	11.10	±5.36	17.56	±3.15	16.03	±2.79	9.259	.000**	0.835	.41	4.761	.000**
Inadequate preparation	3	12	8.40	±1.75	9.13	±1.34	8.13	±1.78	2.504	.015*	.764	.44	7.285	.000**
Work load	6	23	16.03	±4.50	19.21	±2.79	18.40	±4.04	4.441	.000**	.612	.54	8.668	.000**
Total stress	53	168	119.76	±17.28	174.83	±8.97	167.50	±17.58	23.000	.000**	1.51	.47	14.819	.000**
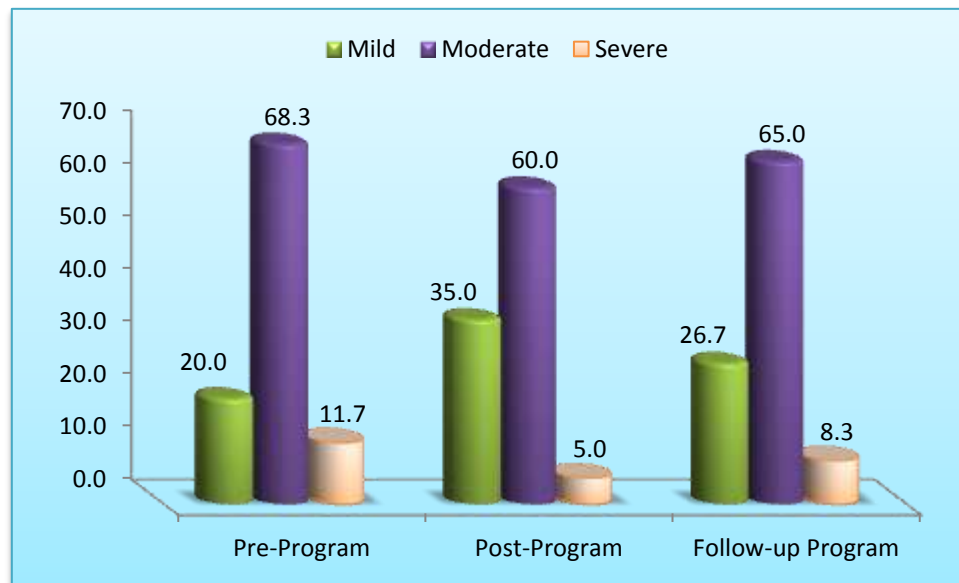
Figure (4): Head nurses' occupational stress levels throughout the program phases (n=60)

Table (6): Correlations among study variables and personal data of study subjects after implementation of the program (n=60)

Variables		Program phases									
		Post					Follow-up				
		Age	Experience	Qualifications	Training	Participation	Age	Experience	Qualifications	Training	Participation
Total knowledge level	r	0.731	0.541	0.417	0.681	0.571	0.621	0.351	0.517	0.571	0.629
	p-value	0.014*	0.021*	0.005*	0.041*	0.031*	0.023*	0.031*	0.015*	0.043*	0.050*
Total perception level	r	0.681	0.727	0.645	0.732	0.532	0.710	0.513	0.982	0.813	0.613
	p-value	0.029*	0.047*	0.061	0.045*	0.021*	0.015*	0.086	0.003*	0.038*	0.008*
Total commitment level	r	0.565	0.282	0.631	0.592	0.629	0.388	0.813	0.275	0.513	0.852
	p-value	0.002*	0.029*	0.032*	0.046*	0.050*	0.002*	0.038*	0.033*	0.008*	0.001*
Total stress level	r	-0.809	-0.798	-0.873	-0.879	0.629	-0.596	-0.348	-0.354	-0.962	0.713
	p-value	0.032*	0.012*	0.021*	0.020*	0.050*	0.022*	0.007*	0.005*	0.009*	0.001*

* *0.000 highly statistically significant.

Table (7): Correlations among study variables after implementation of the program (n=60)

Variables		Program phases							
		Post				Follow-up			
		Total knowledge	Total perception	Total stress	Total commitment	Total knowledge	Total perception	Total stress	Total commitment
Total knowledge level	r	------	0.562	-.720	.653	------	0.612	-.720	.643
	p-value	------	0.001*	.001*	.000**	------	0.001*	.003*	.000**
Total Perception level	r	0.562	------	-.188	.330	0.612	------	-.533-	.621
	p-value	0.001*	------	.151	.010*	0.001*	------	.000**	.000**
Total stress level	r	-.720	-.188	------	-.132-	-.720	-.533-	------	.185-
	p-value	.001*	.151	------	.315	.003*	.000**	------	.156
Total commitment level	r	.653	.330	-.132-	------	.643	.621	.185-	------
	p-value	.000**	.010*	.315	------	.000**	.000**	.156	------

Discussion

Crisis Management provides a management framework for the prevention and reduction of harmful effects using available facilities and equipment to preparation at the time of natural events. Organizational preparation in the crisis management means providing response policy; determine response capabilities and standard practical guide for emergency activities of hospital. Disturbed sections when accidents and crisis occur and internal or external event that can affect hospital staff, patients, visitors and community Amerion et al, (2019) [23].

The present study aimed to determine the effect of educational program about organizational preparedness for crisis management on organizational commitment and occupational stress in the time of Covid19.

It hypothesized that "There will be significant improvement of head nurses' knowledge and perception regarding organizational preparedness for crisis management, organizational commitment and occupational stress after implementation of the program and "There will be positive correlations among head nurses' knowledge and perception regarding organizational preparedness for crisis management and their organizational commitment levels after implementation of the program". Moreover, the researchers hypothesized that there will be negative correlations among head nurses' knowledge and perception regarding organizational preparedness for crisis management, organizational commitment levels and occupational stress after implementation of the program.

So, the researchers assessed head nurses' knowledge and perception regarding preparation for crisis management, developed the educational program, implemented this program and evaluated the effect of this program on head nurses' knowledge, perception, organizational commitment and occupational stress for the studied head nurses.

The result of the present study revealed that the highest percent of head nurses have adequate level of knowledge after implementation of the program. This may be due to the ability of the professional head nurses to gain knowledge easily and they are interested in the research topics. Also, this improvement in knowledge can be influenced by the rate of memorization, ability of knowledge acquisition, the accumulation of learned knowledge of life, and the refreshing information using different approach of active learning during implementation of educational program which include group discussion, brain storming, group activities, ... etc. This study finding is similar with Ahayalimudin et al

(2019) [24] whose study indicated that the majority of the studied sample had an adequate knowledge about crisis management after crisis management program implementation.

Regarding head nurses' perception about hospital preparedness for crisis management, the present study indicated that there was improvement of head nurses' total level of perception after program implementation. This may be due to the training diminishes barriers and struggle to cope with crisis; ongoing educational program for head nurses can profitably have an effect on nursing perception and performance. Also head nurse's desire and ability to keep their knowledge up to date to be able to improve their coping with crisis and improve perception toward crisis. This agrees with Grant et al, (2019) [25] who indicated that the majority of head nurses have an improvement of perception regarding hospital preparedness to crisis management and indicates the significance of education about nurses' preparedness for crisis situation.

Concerning head nurses' organizational commitment, the findings of the current study showed that there was an improvement in head nurses' total level of commitment immediately after program implementation. From researcher's opinion, these results of the current study may be due to impact of implementing the educational program about hospital preparedness for crisis management which provides baseline information about crisis management and guides head nurses to hospital policies designed for crisis management which indicates how cares for and support their employees which affect the level of commitment. On the same line, Kang et al, (2020) [26] found that there was an improvement in commitment level of head nurses after providing an educational program about crisis management.

Regarding head nurses' occupational stress levels, the findings of the current study illustrated that there was an improvement in mean scores and standard deviations of head nurses' total level of stress and two-thirds of head nurses have low level of stress after implementation of the program. This may be due to the head nurses perceived that the hospital can be prepared to deal with any crisis whenever happens, this reassured them and decreased their stress level. This finding was similar to the study that was done by Jacob (2015), [27] he found that head nurses during crisis were experiencing severe stress but after sessions of crisis management program were experiencing mild stress and showed a significant difference in stress score before and after practicing the program.

Concerning correlations among study variables and personal data of head-nurses. The present study revealed that there was a statistically significant correlation between head nurses' total level of knowledge and commitment with all their personal data; age, qualifications, experience years, training and participation in formulation of crisis management plan. This result is similar with results of Nogueras et al, (2018) [28] who found that nurses who had high educational degrees and more years of experience in nursing were more committed to their hospital. On the other side, this result is dissimilar with Teng et al, (2020) [29] who found no significantrelationbetween years of nursing experience and commitment. Also, LeDuc &Kotzer (2019) [30] found norelationbetween the professional commitment and years of expertise.

Furthermore, the present study results showed that there was statistically significant correlation between head nurses' total level of perception with their age, experience years, training and participation in formulation of crisis management plan. This result goes in the same line with the study was done by Sökmen & Şimşek (2018) [31] they reported that there is a highly statistically significant correlation between items of socio-demographic characteristics and total level of perception.

However, the present results contradicted with the study carried out by Serinikli (2018) [32] who showed that there is no statistically significant differences was found between socio-demographic characteristics and head nurses' total level of perception.

Regarding total stress level, there was statistically significant negative correlation with all personal data of studied subjects after implementation of the program. The current result goes in the same line with the study done by Suyog et al (2019) [33] who mentioned that there is a highly statistically significantrelationwas found between socio-demographic data and stress. On other hand, the result of the study was done by Daneshpazhooh et al, (2017) [34] that illustrated that there is no statistically difference was noted between items of socio-demographic characteristics and total stress level.

Regarding correlations among study variables after implementation of the program the current study results revealed that there was a highly positive statistical correlation between head nurses' total level of knowledge and their commitment levels, and there was a positive statistical correlation with head nurses' total perception level at post-program and follow- up phases. This finding was in agreement with LeDuc et al, (2019) [35] who

found that nurses' professional commitment was significantly and positively correlated with head nurse knowledge and perception. On the other side, there was a highly negative statistical correlation between head nurses' total level of knowledge and total stress level after program implementation and at follow- up phase. This finding was in agreement with Al-Hamdan et al, (2020) [36] who reported that negative correlation between nurses` total knowledge about crisis management abilities and their stress score post-the program.

With regard to head nurses' total perception level, the current study results revealed that there was a positive statistical correlation with their total commitment levels immediately post-program implementation and a highly positive statistical correlation at follow- up phase. The result of the present study was supported with a study done by Sarıdede & Doyuran (2017) [37] they reported that there is a positive statistically significant difference between head nurses' total perception level and total commitment levels

On the other side, there was a highly negative statistical correlation between head nurses' total perception and stress levels at follow- up phase. The present study results were consistent with the study carried out by Tekingündüz & Kurtuld (2018) [38] who found that there is a negative statistical

correlation between head nurses' total perception and stress levels. While, the present study results disagree with the study results carried out by Ünsal (2018) [39] who showed that there is no statistically significant differences was found between head nurses' total perception and stress levels

The result of the present study showed that there was a no statistically significant correlation between head nurses' total perception and stress levels after program. The present study results were consistent with the study carried out by Khatibi et al. (2019) [40] who showed that there is no statistically significant correlation between head nurses' total commitment perception and stress levels. This result is contradicted with the study done by Akhtar (2017) [41] who found that there is a highly positive statistical correlation between head nurses' total commitment and stress levels after program. Also the study done by Ahmed & Ramzan (2018) [42] found that there was a highly negative statistical correlation between head nurses' total commitment and stress levels.

Conclusion

According to the results of the current study we can conclude that "Providing an educational program about "organizational preparedness for crisis management" was effective in improving head nurses'

knowledge and perception levels regarding hospital preparedness for crisis management after implementation of the program.   Moreover, the program was effective in improving head nurses' total levels of commitment and stress. Moreover, when head nurses have a good knowledge and perception about their hospital preparedness for managing crises, they will be more committed and less stressful toward their hospital.

Recommendations:

Based on the findings of the current study, the following recommendations can be suggested;

Regarding organizational preparedness for crisis management

- The crisis management committee should maintain pre-prepared plan for overcoming crisis and make sure that all nursing staff know their roles, responsibilities and tasks during a crisis
- Hospital managers have to arrange awareness programs about" preparedness for crises management" for all hospital staff
- Publishing posters containing tips about crisis management at each department.
- Academic staff at nursing institutions should educate the future generation of nurses about the possible course of actions to be followed in crisis circumstances.
- Further research to assess the correlation among the level of preparedness and

performance of the hospital and the impact of the preparation of the hospital

Regarding organizational commitment

- Nurse Managers should empower head nurses to improve organizational commitment

Regarding occupational stress

- Psycho educational program to all hospital staff to decrease stress
- Hospital management support to create conducive environment and provide socializing opportunities for head nurses
- Expand public awareness about strategies for coping with crisis.

Further studies about;

- Investigating factors affecting head nurses' participation in crises management
- Effectiveness of designing an online application for "stress control assistance" during crises.

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Relation between Head Nurses' Talent Management and Their Emotional Intelligence with Organizational Effectiveness

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Abstract

Background: Organizations that need to continue, develop, sustain their competitive advantage and become more effective will exert effort to attract, hire, develop, improve, as well as retain nurses, particularly those with extraordinary talents and more emotionally intelligent able to manage one's own emotions and to handle others. **Aim of the study:** Investigate relation of head nurses' talent management and their emotional intelligence with organizational effectiveness at Medical Specialty Hospital **Subject and Method: Design:** Descriptive correlational design was used. **Subject:** The study was conducted at Specialty Medical Hospital and the study included all available head nurses (n=95) at the time of data collection. **Tools**: There are three tools were used which are talent management questionnaire, emotional intelligence self - assessment tool and organizational effectiveness questionnaire. **Results:** The study results showed that more than half of head nurses showed high level of talent management, emotional intelligence, and level of organizational effectiveness as perceived by head nurses. Talent development was the highest dimension of talent management while talent attraction was the lowest. Regarding emotional intelligence dimensions, the highest mean score was related to self-awareness while, the lowest was social awareness. Finally, according to the mean score of organizational effectiveness dimensions, the highest was related to job satisfaction while, the lowest mean score related to personal relationship. **Conclusion:** There was statistically significant positive relation between organizational effectiveness and both head nurses talent management and emotional intelligence. **Recommendations:** To maintain high organizational effectiveness, it is necessary for organization to give more attention and consideration to manage who talents. Equip supervisors and managers with talent attraction innovative strategies to be better at attracting, motivating, and maintaining best talents. Encourage head nurses to enhance social awareness and for continuous personal growth and development.

*Keyword***:** Emotional Intelligence, Head Nurses, Organizational Effectiveness, Talent Management.

Introduction

The success of an organization relies on its staffs, as they are considered essential for the presentation as well as effectiveness of an organization. So, it is significant to attract, incorporate and teach, in addition to preserve experienced as well as highly emotional intelligent nurses that able to cope with dynamic changes in the workplace environment. The method of developing such nurses is defined as talent management[1].

Talent is an individual who owns extraordinary expertise, which are difficult to imitate or reproduce, who is an upper actor with capabilities of strategic significance which cannot be willingly developed. Organizations are progressively searching for talent as a distinctive strength that can deliver maintainable competitive advantage as well as higher performance either through their direct participation or in the extended term through representing the maximum degrees of possible [2]. Talent management is the organized attraction, documentation, development, appointment, retention, and distribution of those persons who are of specific worth to an association to create strategic sustainable success which includes the perspective of both the employee and the organization [3].

There are three elements that shape the talent management; talent attraction, talent development and talent retention. Talent attraction; is composed of recruitment as well as choice, owner marking, worker worth preposition in addition to company of select. Talent development is the process of promoting the capabilities as well as attitudes of nurses, to accomplish as well as preserve a competitive benefit used for the institution [4]. Talent retention purposes to take actions to motivate nurses to stay in the institution for the longest period of time and it can be organized through performance-established pay, stimulating effort, training, inherent incentives, job growth in addition to offering advantages previously request [5].

Talent attraction, retention and development are affected by emotional intelligence, as they will sense trusted, appreciated, valued, as well as respected if they are correctly emotionally treated. And intelligence is a key measure of talent nurses and emotionally intelligent nurses exhibit better skills [6]. Thus, Nakato, et al. [7] defined talent as the totality of an individual's capabilities- his or her basic donations, expertise, awareness, skills, attitude, choices, intelligence,

charisma, in addition to energy, it also contains his or her capability to educate as well as develop. Intelligence is the ability to educate, think, compassionate, in addition to alike types of mental actions; ability in grasping facts, relations, meanings, realities, etc. Emotional intelligence is a group of talents as well as capabilities that cover a wide gathering of personal qualities as well as characters, typically referred to as soft skills or inter and intra-individual aptitudes, that are external to the usual regions of precise knowledge, overall intelligence as well as practical or professional capabilities[8].

Emotional intelligence is one's capability to be aware of their own emotions as well as the emotions of others and to utilize that awareness in order to assist manage the appearance of emotions. It is also the ability to deal with   interpersonal relations reasonably as well as kindly. Emotional intelligence can generate an active cooperation atmosphere since wholly nurses can governor all selves, wishes, as well as recognize other nurses [9].

Emotional intelligence comprises of four attributes which are: self-awareness, self-management, social awareness, andrelationmanagement. Self-awareness is one's aptitude to notice their own sensations,

physical feelings, responses, routines, actions, in addition to beliefs [10]. Self-management is one's capability to governor as well as manage their own feelings, responses, and perceptions specifically in periods of strain. Social awareness refers to one's aptitude to understand, perform as well as respond properly to a societal condition. Finally,relationmanagement which is the capability to recognize diverse communication styles in others in addition to speech them in their favored manner [11].

Implementing talent management strategies for the health facilities institutions improves nurses' practical abilities, rises their job gratification, improve positive emotions that help them to obtain favorable outcomes including achievement and higher quality as well as achieve organizational strategic goals and increase its efficiency and effectiveness. Effectiveness is a significant indicator to show the direction, position, and future of the organization [12].

Organizational effectiveness (OE) as an idea is central to organizational conduct as well as management. It is a complex and ambiguous concept which it means diverse things to diverse people. Organizational effectiveness is the ability of an organization to elevate its capitals as well as competencies in order to accomplish

consistently its strategic and long-standing operational objectives [13]. Organizational effectiveness aids to evaluate the movement in the direction of mission achievement and goal accomplishment. To enhance organizational effectiveness administration must struggle for better communication, relations, management, guidance, adaptableness, in addition to optimistic environs [14].

Numerous aspects have been utilized in order to express organizational effectiveness comprising quality, production, competence, competitiveness, gratification, growth, in addition to existence [15]. There are chiefly three facets which are probably influence organizational effectiveness: the first is the capability to realize as well as react to the outside environs; the second is the aptitude to react to interior consumers. Lastly, responding to either interior or outside customers' needs the capability to reorganize as well as re-institutionalize a set of behaviors as well as procedures that permit the organization to adjust [16].

The four most popular models of organizational effectiveness that have arisen are the goal model, the system resource model, the process model, and the participant satisfaction model. Every model of organizational effectiveness denotes a diverse viewpoint. In relation to the goal model, OE is the degree to which an organization accomplishes its goals [17]. The system resource model sees OE as the organization's capability to obtain rare as well as valued assets. The process model highlights OE in terms of the efficacy of an organization's interior procedures as well as practices. Finally, the participant satisfaction model defines OE as the level to which an organization gratifies the necessities of its main investors as consumers, staffs, public or community in addition to monitoring organizations [18]. Organizational effectiveness contains four dimensions which are organization, decision-making, personnel relations and job satisfaction [19].

Significance of the study:

Improving organizational effectiveness is the central consideration of any organization, and nurses are one of the most important assets that contribute to its growth and success, so these organizations need to manage their talents especially who more emotionally intelligent. Talents play a critical role in attaining organizational strategic objectives in addition to an elevated level of effectiveness in the healthcare manufacturing [20]. Organizations that need

to stay alive, develop, and continue their competitive advantage will exert effort to attract, employ, nurture, advance, as well as maintain nurses, especially those with unusual talents and more emotionally intelligent able to manage one's own emotions and to handle others. So, this study aims to determine to investigate relation of head nurses' talent management and their emotional intelligence with organizational effectiveness at Medical Specialty Hospital.

Aim of the study

This study aims to investigate relation of head nurses' talent management and their emotional intelligence with organizational effectiveness at Medical Specialty Hospital.

Subject and Method

Design:

Descriptive correlational design was utilized.

Setting:

This study was conducted at all inpatient units at Specialty Medical Hospital. Which affiliated to Mansoura University. Occupied with (194) beds. It consists of four floors. The ground floor includes the emergency department and twelve clinics. The first floor includes Endoscopic department, Laboratory department and Radiology department. The second floor includes Cardiology Intensive Care, Cardiology ward, Cardiology immediate care unit and Catheterization

department .The third floor includes Haplology immediate care unit, Haplology ward, and Economic department. Finally the four floor includes Intensive care unit, Endocrine immediate care unit, Endocrine ward and Economic department. Each of these departments has separate sections for male and female clients.

Subjects:

Convenience sample will be utilized which includes all head nurses (n=95) working in the previous mention units, who fulfills the criteria of having a minimum of one-year experience, and existing at period of data gathering includes in the study to express their opinion about study variables.

Data collection tool

Tool I: Talent Management

Questionnaire: Which is adopted by El Nakhala (2013) [21] . It is consists of two parts:

First part: Personnel characteristics. It was utilized to recognizing personnel characteristics of head nurses as age, marital status and years of experience.

Second part: Talent Management Questionnaire: It aimed to assess nurses' perceptions of accessibility of talent management constituents in the place of work. The questionnaire involves three dimensions which are talent attraction (10

items), talent development (10 items) and talent retention (11 items) dimensions were calculated using a 5-point Likert Scale. The possible responses ranged from 1 (never satisfied) to 5 (highly satisfied) on all talent management subscales. (<50%) low level of talent management, (50-75%) moderate talent management and (> 75%) high level of talent management based on cut of point 50%.

Tool II: Emotional Intelligence Self-assessment Tool:

Adapted from Sterrett (2000) [22] this tool aimed to measure perception of emotional intelligence among head nurses. This tool consists of 20 items classified into four dimension every dimension consists of five items. The first dimension was concerned with self-awareness. The second dimension was concerned with self-management. The third dimension was concerned with social awareness. And finally, the fourth dimension was concerned withrelationmanagement.

Scoring system

The responses according to Likert Scale, the answers for the items were on 5 point extending from strongly agree to strongly disagree. These were scored respectively from 5 to 1. (<50%) low level of emotional intelligence, (50-75%) moderate emotional

intelligence and (> 75%) high level of emotional intelligence based on cut of point 50%.

Tool III: Organizational Effectiveness Questionnaire: This tool adopted by Hsien Hsu (2002) [19] to measure organizational effectiveness as perceived by head nurses. This questionnaire consists of 19 items classified into four dimensions which are organization (5 items), decision-making (5 items), personnel relations (3items), and job satisfaction (6items)

Scoring system

According to Likert Scale, the answers for the items were on 5 points extending from strongly agree to strongly disagree. These were scored respectively from 5 to 1. (<50%) low level of organizational effectiveness, (50-75%) moderate organizational effectiveness and (> 75%) high level of organizational effectiveness based on cut of point 50%.

Work Field:

Before beginning the study, ethical approval was granted from the research ethics committee in which the study occurs. The investigators make sure that the accurate processes were carried out regarding informed consent autonomy, anonymity as well as keeping of the participants' privacy.

A formal permission to carry out the study was attained from the hospital supervisor.

Tools of data gathering were translated into Arabic, as well as verified for its content validity and relevance by a five jury and consequently the required modification was done. The reliability for the tools was completed utilizing alpha coefficient to assess the internal constancy reliability of the tools. It was (0.91) for talent management, (0.88) for emotional intelligence, and (0.90) for organizational effectiveness.

A pilot study was carried out on (10%) of head nurses from different units at Medical Specialty Hospital, to appraise the clearness as well as applicability of the tools and required alterations were completed based on their reactions and excepted from the whole sample.

An informed consent for sharing in the study was secured from the whole study sample. Sharing in the study is volunteer. Every contributor can select to end carrying out the study and take away at any time without consequence.

The actual field work started from April to June 2021. Data collected through meeting with the head nurses, and explains the purpose of the study to them. The questionnaire sheets were allocated to participants discretely in their job places, and the time required to complete the sheets ranged from 20-25 minutes.

Data analysis:

The gathered data were arranged, tabularized as well as statistically analyzed utilizing SPSS software, version 26. The categorical variables were represented as frequency and percentage. Continuous variables were represented as mean, and standard deviation. Independent t-test was used to test the differences between two means of continuous variables. ANOVA test was utilized to test the differences between two means of continuous variables. Pearson correlation coefficient test was conducted to test the association between two continuous variables. Statistically significant was considered as (p-value < 0.01 &0.05).

Results

Table (1) Illustrated personnel characteristics of studied head nurses at Medical Specialty Hospital. Regarding to age about half (45.3 %) of head nurses were 31-40 years. Also regarding to marital status, most (91.6%) of head nurses were married. Finally, more than two third (68.4%) of them were above ten-year experience.

Table (2) Illustrated mean scores of talent management, emotional intelligence and

organizational effectiveness as reported by the studied head nurses at Medical Specialty Hospital. Regarding talent management, total mean score was (116.73±26.45) represented the highest mean as perceived by study subjects and followed by total emotional intelligence and organizational effectiveness (77.62 ±16.88 and71.20±16.06) respectively. Talent development was the highest dimension of talent management (41.47±8.28) while the lowest was (34.72±9.35) related to talent attraction. Regarding emotional intelligence dimensions, the highest mean score was related to self-awareness (21.61±3.36) while the lowest was social awareness (18.42±4.62). Finally, mean score of organizational effectiveness dimensions, the highest was related to job satisfaction (22.06±5.44) while the lowest mean score related to personalrelationwas (12.46±2.42)

Figure (1) Showed levels of talent management, emotional intelligence, as well as organizational effectiveness among the studied head nurses. Levels of head nurses' talent management, emotional intelligence as well as organizational effectiveness were high (56.8 %, 58.9% and 51.6 %) respectively. respectively. While the lowest level was (8.4%) for emotional intelligence.

Table (4) Showedrelationbetween talent management, emotional intelligence, and organizational effectiveness among the studied head nurses at Medical Specialty Hospital. There was highly statistically significantrelationamong talent management, emotional intelligence, and organizational effectiveness (r = 0.98 and 0.96) and (p <0.01) respectively.

Figure (2) Showedrelationbetween talent management and organizational effectiveness among the studied head nurses at Medical Specialty Hospital. There was highly statistically significantrelationamong talent management, emotional intelligence, and organizational effectiveness (p <0.01)

Figure (3) Showedrelationbetween emotional intelligence, and organizational effectiveness among the studied head nurses at Medical Specialty Hospital. There was highly statistically significantrelationamong talent management, emotional intelligence, and organizational effectiveness (p <0.01)

Table (1): Personal characteristics as reported by studied head nurses at Medical Specialty Hospital (n=95)

Variables	No.	%
Age		
- 20-30	28	29.5
- 31-40	43	45.3
- > 40	24	25.3
Mean ±SD	36.43±7.91	
Marital status		
- Single	8	8.4
- Married	87	91.6
Experience years		
- 1-5	12	12.6
- 6-10	18	18.9
- >10	65	68.4
Mean ±SD	14.45±6.87	

Table (2) Mean scores of talent management, emotional intelligence and organizational effectiveness as reported by the studied head nurses at Medical Specialty Hospital (n=95)

Talent management dimensions	No of items	Min - Max	Mean ± SD
- Talent attraction	10	10.0-48.0	34.72±9.35
- Talent development	10	20.0-50.0	41.47±8.28
- Talent retention	11	15.0-55.0	40.53±985
Total talent management	31	49.0-152.0	116.73±26.45
Emotional intelligence dimensions			
- Self-awareness	5	14.0-25.0	21.61±3.36
- Self-management	5	5.0-25.0	18.90±4.45
- Social awareness	5	9.0-25.0	18.42±4.62
-relationmanagement	5	5.0-25.0	18.68±5.23
Total emotional intelligence	20	35.0-100.0	77.62±16.88
Organizational effectiveness dimensions			
- Decision making	5	8.0-25.0	18.54±4.42
- Organization	5	7.0-25.0	18.12±4.53
- Job satisfaction	6	6.0-30.0	22.06±5.44
- Personalrelation	3	6.0-15.0	12.46±2.42
Total organizational effectiveness	19	29.0-95.0	71.20±16.06
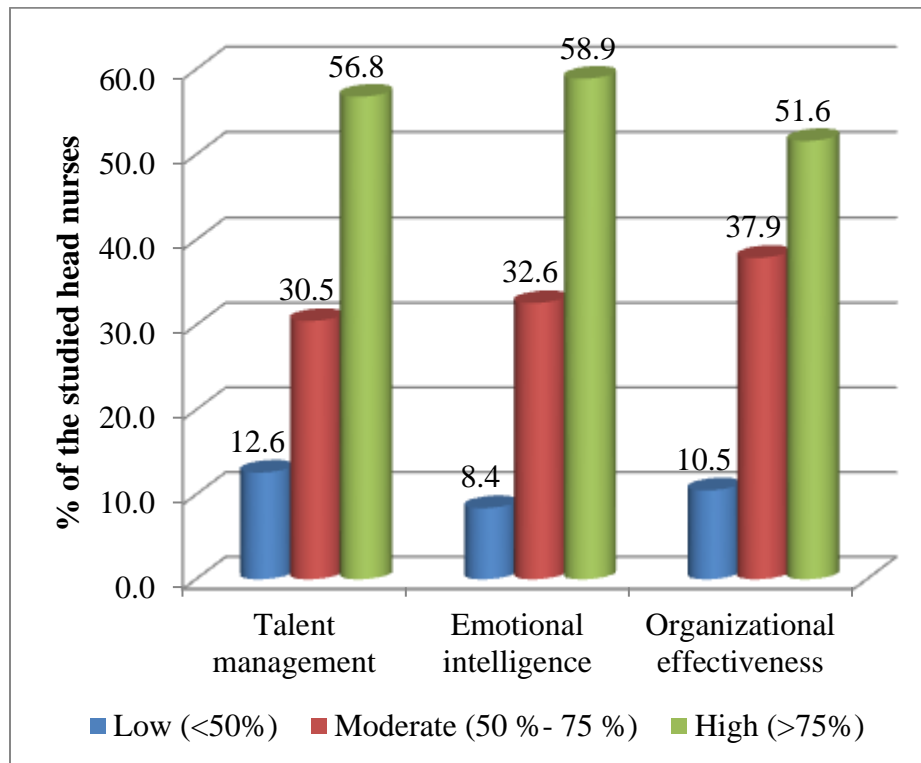
Figure (1): Levels of talent management, emotional intelligence and organizational effectiveness among the studied head nurses at Medical Specialty Hospital (n=95)

Table (3):relationbetween talent management, emotional intelligence and organizational effectiveness among the studied head nurses at Medical Specialty Hospital (n=95)

Variable	Talent management		Emotional intelligence		Organizational effectiveness	
	r	p	r	p	r	p
Talent management	1		0.97	0.000**	0.98	0.000**
Emotional intelligence	0.97	0.000**	1	---	0.96	0.000**
Organizational effectiveness	0.98	0.000**	0.96	0.000**	1	---

** Highly statistically significant (p <0.01)
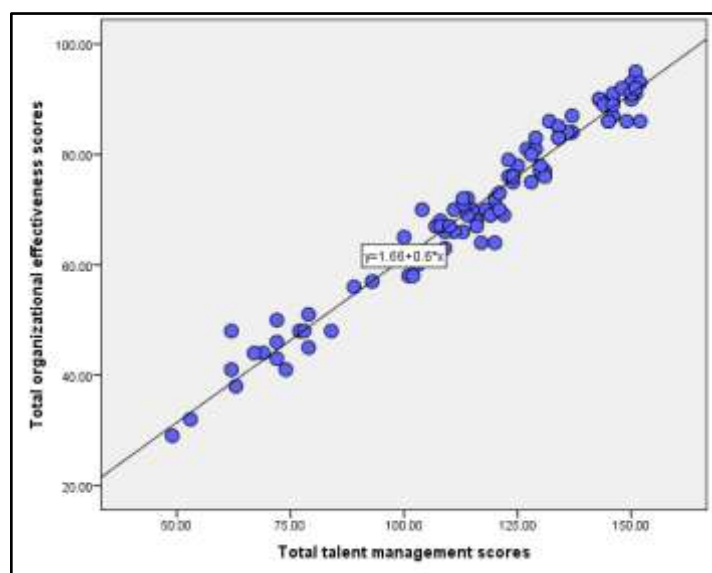
Figure (2):relationbetween talent management and organizational effectiveness among the studied head nurses at Medical Specialty Hospital (n=95)
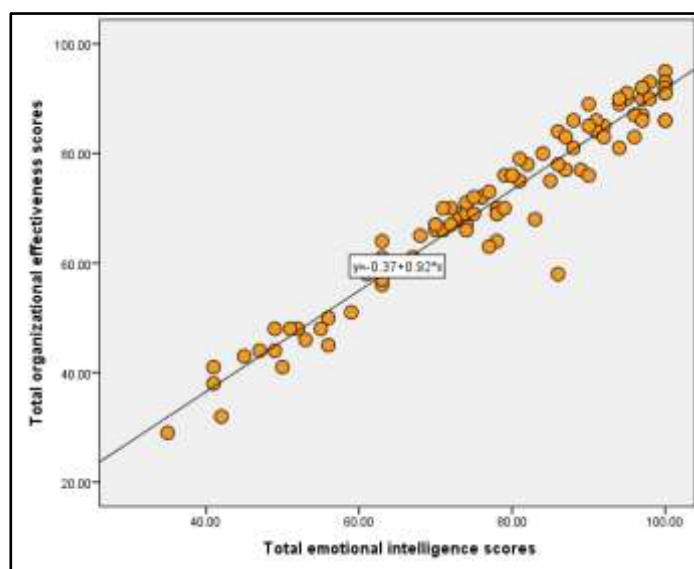
Figure (3):relationbetween emotional intelligence and organizational effectiveness among the studied head nurses at Medical Specialty Hospital (n=95)

Discussion

In a competitive marketplace, talent management is a main factor for organizational effectiveness. Organizations are beginning to realize that emotionally intelligent talents are an essential competitive advantage as well as a basic element of organizations´ effectiveness, they are more skilled, able to cope with emotions and control them, and contribute to a positive work environment which makes them feel valued and motivated to do better for the benefit of the organization and themselves [23].

The findings of the present study indicated that talent management was at the high level. This may be due to that the hospital specifies objectively training needs, defines its staffs in terms of educational qualifications as well as experience, there are chances for education as well as growth in the hospital, the department monitors and advises the performance of the staff, and the hospital offers honest reference feed about staff performance. This was in the same line with Tetik and Zaim (2021) [24] who reported that the dimensions of the talent management are practiced at high level, and declared that it assists institutions to compete efficiently in a multifaceted as well as energetic environs in order to accomplish maintainable development.

In agreement of the current study, Mitosis et al. (2020) [25] illustrated that head nurses' talent management scores were good and concluded that the hospitals are alert to the enormous significance of their staffs, utilizing multiple methods in order to attract the possible talented persons, as well as deliberating them as a stable strength to help their institutions to win a competitive advantage, as they try to grow the competencies of talented staffs for the advantage of the two. This was confirmed by Tyskbo (2019) [3] who indicated that the participants display a moderate level of agreement around talent management. On the contrast, Dzimbiri and Molefi (2021) [26] revealed that the overall mean score of nurses' perceptions of talent management was low.

Regarding talent management dimensions, the results of the present study showed that talent development was the highest mean scores of talent management dimensions. This may be due to that hospital has educational and development programs for talent development, determines objectively training needs, monitors and advises the performance of the staff. This was in congruent with Gallardo et al. (2020)[5] who reported that the highest mean score was related to talent development dimension, confirming that the institution enhances the

ongoing education on the occupation, stimulate their personnel to nourish their information either by holding advanced scientific grades, or attending associated training courses, workshops, evolve their skills as well as abilities in order to remain updated with the nursing field. In the same respect, Elhaddad et al. (2020)[1] exhibited that the highest dimension was for talent development, and mentioned that talent management which concentrate on developing talents has an important constructive influence on worker action as occupational gratification, enthusiasm as well as loyalty. On the contrast, El Dahshan et al. (2018) [27] revealed that talent development was the lowest dimension.

Findings of the present study discovered that talent attraction dimension was the lowest mean score of talent management dimensions. This may due to that the hospital recruitment process not succeeds in choosing the best talent and hospital managers don't have sufficient competencies to attract and appoint employees. This was in the same line with Ansar and Baloch (2018) [2] who reported that most of respondents scored talent attraction as the lowest mean score. Additionally, Theys and Schultz (2020) [28] mentioned that further than half of staff nurses had a low perception level towards talent attraction. On the contrast, Hongal and Kinange (2020) [29] stated that most of participants demonstrate a moderate level of agreement around talent attraction dimension.

The results of the present study indicated that the head nurses' total emotional intelligence was at the high level. This may be due to high self-awareness of head nurses and their self-management, ability of them to identify the emotions that they feeling at any given moment, can effectually convince others to accept their opinion without forcing them, capable of truthfully say how they sense without causing others troubles and have a correct notion of how another individual observes them through a specific dealings. This agreed with Ugoani (2019) [30] who found that nurses scored their total emotional intelligence as high, confirming that high emotional intelligence is suitable during stressful periods in order to assess their own sensations as well as feelings in addition to create novel strategies to deal with each other, either separately or in team.

In the same line, Ingram et al. (2019) [31] stated that the majority of respondents perceived high level of emotional intelligence, and mentioned that high EI is connected with an elevated propensity to create constructive assessments of one's

labor with patients, they certainly generate respectable relations with nurses as well as improve the ability to cope with emotions in the place of work, demonstrated good behavior, improved emotional health, enhance the work-related health of personnel. This was supported by Supriyanto et al. (2019) [32] who reported that middle management employees enjoy a moderate level of emotional intelligence and concluded that EI influences of all feature of performance as well as how we receptively reason as well as behave.

Regarding emotional intelligence dimensions, the findings of the present study indicated that head nurses' self-awareness was the highest mean scores of emotional intelligence dimensions. This may because of that the head nurses aware of their physical reactions, consider their emotional temperature before making important decisions, think about the emotions behind their actions and identify the emotions they are feeling at any given moment. This is consistent with the results of Gomez and Breso (2020) [33] who found that the highest value is measured in self-awareness, and confirming that self-awareness assists in the capability to understand, that in turn aids staffs in enhancing team action, and also affects their behavior and mood.

In this respect, Lubbadeh (2020) [34] said that emotional intelligence is considered as a collection of self-awareness and self-management skills, self-awareness makes us to realize our own emotions as well as how they influence our beliefs and behavior. It helps us in understanding our own strengths and weaknesses and helps us in developing self-confidence and better emotional adjustment at workplace.

Findings of the present study revealed that head nurses' social awareness was the lowest mean scores of emotional intelligence dimensions. This may be due to that it is difficult to recognize why other persons sense the manner they behave, they can't display understanding as well as match their sensations with those of another individual in a contact and didn't have an accurate idea of how another person perceives them during a particular interaction. This was in congruent with Jha and Bhattacharya (2021) [35] who found that more than half of nurses perceived their social awareness as the lowest dimension, adding that nurses with low scores show emotional disorder as well as be sensitive to the clear conditions. On the contrast, Obeidat et al. (2018) [36] found that social awareness among nurses was moderate, and this has a constructive as well as an important influence on their work gratification.

Regarding head nurses' perception of their organizational effectiveness, the finding of the current study revealed that head nurses' perception of their organizational effectiveness was at the high level. This may be due to that head nurses perceive that their organizational goals and objectives are clearly defined and are realistic, tries to improve their working conditions, is very productive, distributes the responsibilities in reasonable way, successfully acquired human and financial resources, and they are clearly aware of the demands of their jobs and can complete tasks and achieve goals successfully. This finding supported by Kivipold and Turk (2021) [37] who reported that the mean score of organizational effectiveness was high and mentioned that the majority of workers see their organization to be high effective and place their efforts in that way.

Raoof (2019) [18] specified that the organizational effectiveness level is good, confirming that their hospital is committed to achieve its goals with a healthier work gratification for them for the advantage of the two sides, the nurses as well as the hospital, that improve nurses' level of connection with their present place of work. On the contrast, Hatta and Abdullah (2020)[38] found that organizational effectiveness level is inadequate.

Regarding organizational effectiveness dimensions, the findings of the present study indicated that job satisfaction was the highest mean scores of organizational effectiveness dimensions. This may be due to that the goals and objectives of the organization are clearly defined and are reasonable, they can complete tasks and achieve goals successfully, and can deal with irregular work requirements efficiently. This was supported by Onyebuchi et al. [39] who reported that job satisfaction was high among nurses and it has a positive impact on all organizational outcomes, concluded that pleased employees are further excited as well as ready to demonstrate novel information as well as innovation to their work action and this constantly assist institutions to grow well competitive benefits.

Findings of the present study revealed that head nurses' personalrelationwas the lowest mean scores of organizational effectiveness dimensions. This may be due to that the organization not concerned enough about head nurses happiness and welfare, and they feel that they can't trust each other. This was in the similar line with Monux et al. (2014) [40] who stated that personalrelationamong nurses was bad, and the absence of adequate communication among them due to high workload which causingrelationproblems,

and concluding that communication among staff nurses as well as colleagues, in combination with respectable relational interactions as well as societal relationships are considered necessary circumstances to sense comfort with one's labor. On the contrast, Velmurugan (2016) [41] stated that personalrelationamong nurses was acceptable.

The findings of the present study revealed that talent management was positively correlated with organizational effectiveness. This was in agreement with Ali et al. (2019) [20] who discovered that talent management is positively associated with the total organizational effectiveness, adding that a talented person has expertise and specific skills, and contributes to the benefit of organization with creative work. In the same respect, Dzimbiri and Molefi (2020) [26] stated that there was a positiverelationbetween talent management elements and organizational effectiveness, confirming that talented individuals are frequently exhibit extraordinary capability in addition to reaching above a range of actions and moveable high competency. Moreover, they are high influence persons who can cope with difficulty and are two to three times extra creative than the normal employee.

This was supported by Obeidat et al. (2018)[36] who concluded that institutions

that consider talent management as a strategic human resource, in the finale achieve greater sustainability as well as effectiveness. Additionally, Yassin and Jaradat (2020) [8] mentioned that talent group development has the maximum effect on organizational effectiveness as they providing the organization with a competitive benefits as well as a future position. In the same line, Tetik and Zaim (2021) [24] reported the talent management three dimensions are extremely important, and all of them display an optimistic influence on the organizational effectiveness.

The findings of the current study revealed that emotional intelligence was positively correlated with organizational effectiveness. This is constant with the findings of Dimitrov (2020) [16] who discovered a significant positive correlation between emotional intelligence and organizational effectiveness, confirming that individuals with advanced grades of emotional intelligence have well work act, robust personal relations, and additional successful management abilities and are better than those with lesser emotional intelligence. In the same respect, Murugan (2019)[15] stated that emotional intelligence enhance one's capability to cope with everyday environs challenges, assists in predicting one's success in life,

significant in forming one's character, performance, manner as well as aptitudes in current time of competition in addition to enhance the organizational effectiveness.

This was in agreement with Masa'deh (2016)[42] who found that there is a statistically significant effect of awareness of other's emotion on organizational effectiveness, concluding that those employees with advanced emotional intelligence be liable to be extra fruitful, extra creative, as well as fewer vulnerable to do counterproductive labor conducts. Additionally, Ugoani (2019) [30] stated that awareness and management of other's emotion were the robust predictors of organizational effectiveness. Also, this finding is constant with the findings of Supramaniam and Singaravelloo (2021) [43] who reported that emotional intelligence plays a vital part in the management and organizational effectiveness, the elevated level of awareness of coworkers' emotion, the extra constructive effect on their act, comprehending when coworkers don't mean what they say, saying exactly the method they are sense, and reading their accurate emotional state; help supervisors in their decision makings, and make them exceptional difficult solvers, also increasing their capability to rapidly adjust to the organizational goals and objectives.

Conclusion

More than half of head nurses showed high level of talent management, emotional intelligence, and organizational effectiveness. There was statistically significant positive relation among organizational effectiveness and both talent management and emotional intelligence. So, we can conclude that organizational effectiveness is affected by talent management and emotional intelligence.

Recommendations

- To maintain high organizational effectiveness, it is necessary for organization to give more attention and consideration to manage their employees' talents.

- Health care institutions should adding talent management strategy in their strategic planning in order to stay competitive in today's healthcare market.

- Provide managers and supervisors with talent attraction innovative strategies to be better at attracting, motivating, and maintaining best talents.

- Managers should encourage head nurses for continuous personal growth and development and giving them opportunity to learn new things and remaining updated.

- Encourage head nurses to enhance social awareness through paying close

attention to dealings with other persons, and improve their communication skills.

- Additional research must be conducted about talent management among different levels of nursing personnel.

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Nursing Educational Intervention to Control COVID-19 Vaccine Hesitancy among School Team Members at Beni-Suef City and Benha City, Egypt

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Abstract

Background: Vaccine hesitancy recognized as a major challenge to the effectiveness of public health strategy aimed at eradicating infectious disease. The current study aimed to assess the effect of the nursing educational intervention to control COVID-19 vaccine hesitancy among school team members. Design: Quasi experimental design was used (pre-post educational intervention). **Subjects and method: Setting:** The study was implemented in Beni-suef city and Benha city, Egypt. **Subjects:** Simple random sample was used to select one school from each city then all participants were included according to the inclusion criteria. Sample size was 50 participants. **Tools** of data collection: two tools were used; Tool (1) was an interviewing questionnaire composed of two parts; the first part was personal data questionnaire to assess personal data of the participants, part two was knowledge questionnaire to assess their knowledge regarding COVID-19 vaccine and included 9 items. Tool (2) Scale composed of two parts: the first part was attitude scale to assess the attitude of participants towards the vaccine. The second part was willing scale to assess the willing of participants to take the vaccine. **Results:** The results indicated that; there were significant improvements regarding total level of knowledge and attitude of studied sample post the educational intervention and the average of their willing toward the COVID-19 vaccination improved significantly from 6.4±1.1 to 8.9±.8 post the intervention. **Conclusion:** the willing to take the vaccine of the studied sample improved post the educational intervention. **Recommendations:** further studies needed to increase people awareness regarding COVID-19 vaccination to build and maintain public trust in COVID-19 vaccines.

Keywords: Vaccine hesitancy, Nursing education intervention, COVID-19 vaccine.

Introduction

According to World Health Organization (WHO), it was observed several cases of pneumonia of unknown cause detected in China at the end of 2019. On the first month of 2020, it was stated that a novel Corona Virus had been discovered in samples of cases and that preliminary examination of virus genetic sequences suggested that this was the source of the outbreak. SARS-CoV-2 is the name of the virus, and COVID-19 is the name of the sickness it causes. About 100 million patients diagnosed around the world at the second month of 2020, with about 2.4 million deaths [1,2]. COVID-19 is the world's most serious public health threat, and the worldwide community's sickness, and fatality rates are steadily rising. Strong cross-sector collaboration and the development of effective preventative and control techniques, such as avoid crowding areas, social/physical separation, quarantine, early detection, isolation, and case management were recommended. As a result, all governments should develop major COVID-19 preventive and control initiatives at the community level as soon as possible [3]. Over 30 million patients in the United States alone, SARS-CoV-2 transmission has tested health systems' capabilities and was considered responsible about more than half million deaths. The United States Food and Drug Administration has approved the use of two-dose SARS-CoV-2 vaccinations and one single-dose vaccine against SARS-CoV-2 with equivalent efficacy to avoid symptoms of new coronavirus illness (COVID-19) and hospitalization [4].

Vaccination is the most effective tool to break the infection cycle. Depending on the disease being targeted, each vaccination will have somewhat different chemicals. A vaccine's active ingredient is a very small amount of the killed or drastically weakening it [5]. The University of Oxford/AstraZeneca vaccine utilizes an unrelated harmless virus (the viral vector) to deliver SARS-CoV-2 genetic material. COVID-19 from Moderna and Pfizer/BioNTech comprises a portion of the SARS-CoV-2 virus, which causes the disease. Also, COVID-19 inactivated vaccines contain the deceased SARS-CoV-2 virus, and COVID-19 attenuated vaccines as Sinopharm include a weakened SARS-CoV-2 virus, which the immune system recognizes and responds to without causing COVID-19 sickness. This response helps the body remember how to combat SARS-CoV-2 in the future [6].

Vaccine hesitancy is a major health challenge because it related to how many individuals are exposed to illnesses that could have been avoided. Vaccine

hesitancy is characterized as a reluctance or refusal to vaccinate despite the availability of vaccines. It has been named one of the ten most serious current health hazards. Vaccination apprehension can be motivated by a variety of factors, including unpleasant medical family experiences associated to immunizations, vaccine safety concerns, awareness, perceived susceptibility to sickness, perceived low severity of illness, and religious or ethical issues [7]. Determining the factors leading to vaccine hesitancy is a base for developing and implementing effective strategies to improve vaccine intake and ensure a rapid, equitable distribution to the doses of the vaccines [8]. About 3.51 billion doses have been administered across 180 countries, according to data collected by Bloomberg. The latest rate was about 900 million doses per month. About one quarter of global population were fully vaccinated after administering about 3.51 billion doses [9]. In Egypt, from 3 January 2020 to 9 months later, there have been about 300,000 confirmed cases of COVID-19 with 16,811 deaths, reported by WHO. As of 5 September 2021, a total of 10,418,988 vaccine doses have been administered and this still low vaccination rate [10].

Vaccination decisions are still influenced and advised by health care experts, who are the most trusted consultants and influencers. Patients are more likely to consent to vaccination if a healthcare expert encourages it or takes the time to answer their issues, according to numerous researches. Nurses' participation in all areas of immunizations, particularly in providing vaccine information, is critical in raising vaccination rates and lowering predicted vaccine reluctance. They have the potential to boost public trust in vaccines. For having a skilled dialogue with vaccine apprehensive consumers, motivational interviewing is recommended. It has been around for a while and has shown to be a useful tool in the production process [11].

Aim of the study

The current study aims to assess the effect of the nursing educational intervention to control COVID-19 vaccine hesitancy among school team members through achieving the following objectives:

1. Increase the knowledge of the studied sample regarding COVID-19 vaccines.

2. Improve the attitude of studied sample toward COVID-19 vaccines.

3. Increase the willingness of the studied sample to take the COVID-19 vaccine

Study hypothesis

1. The knowledge of the studied participants regarding COVID-19 vaccine increase significantly at the

post intervention more than pre-intervention.

2. The attitude level of the studied participants regarding COVID-19 vaccine improves significantly at the post intervention more than pre-intervention

3. The studied participants' willing to take the vaccine increases significantly at the post intervention more than pre-intervention

Subjects and Method

The research design:

Quasi experimental design was used (pre-post educational intervention) to achieve the aim of the current study.

Setting:

The study was implemented in Beni-suef city and Benha city in Egypt.

Study subjects:

A simple random sample was used to select one school from 8 secondary schools in Beni-Suef city and one school from 7 secondary schools in Benha city. The researchers included all school team members to the study according to the inclusion criteria. The sample was 50 participants(23 from Beni-Suef city school and 27 from Benha City school) the schools team was selected in the study according to the following inclusion criteria:

1. Accept to participate.

2. Not vaccinated yet.

3. Not registered to take the vaccine.

Tools of data collection:

Two tools were developed by the researchers to achieve the aim of the study after reviewing the literature [12, 13]

The first tool was an interviewing questionnaire that composed of two parts:

Part one: Personal data:

It was designed to assess personal characteristics of the participants as (age, gender, level of education and residence)

Part two: Knowledge questionnaire:

Questionnaire was designed to determine level of knowledge of participants regarding COVID-19 vaccine, consisted of 9 items; overview about COVID-19, vaccines, mechanism of COVID-19 vaccine, differences between all types, rationales to take the vaccine, the eligible population, side effects, and preparations before vaccination and intervention after being vaccinated.

Scoring system:

The answers of participants scored as (three) points if correct and complete answer, (two) if incomplete response and (one) if don't know. The total points are converted to percentage and divided to three categories, unsatisfactory (<50%), average ($\geq$ 50% to 74%) and satisfactory ($\geq$75%).

The second tool is a scale composed of two parts:

Part one: Attitude scale:

The scale was designed by the researchers to assess the attitude of participants towards the vaccine and consisted of 8 items, each item was given (three) points for sure, (two) points for may be and (one) point for not sure. The total points are converted to percentage and classified to three levels, negative (<50%), average (≥ 50% to 74%) and positive attitude (≥ 75%).

Part two: Willing scale:

The scale was designed by the researchers to assess the willing of participants to take the vaccine. It composed of 4 items, each items was scored three for agree, two for not sure and one for disagree. All scores were summed and converted to mean and standard deviation to be used statistically for comparison after the intervention.

Validity and reliability:

The validity was done through five expertise from community health nursing and medical surgical nursing at Beni-suef and Benha University. According to their opinion, minor modifications were done. Additionally, the reliability of the questionnaire to assess knowledge of the participant regarding the COVID-19 was 0.89 and the reliability of the scale which used to assess the attitude towards the vaccine was 0.85. Final the reliability of the scale to assess the willing to take the vaccine was 0.91by Cronbach's alpha coefficient.

Approval:

The researchers get the acceptance from the educational administration to collect the data from the two schools at both cities Beni-Suef and Benha city. The aim and the nature of the study were explained.

Ethical consideration:

The researchers give careful attention to the ethical consideration and human rights of the studied sample. The aim of the study and the procedures were explained then verbal consent was taken from each participant. The participants were assured regarding their rights to refuse and regarding the confidentiality of their information and additionally they assured that there are no costs to participate in the study and the study is voluntary and they can refuse to complete the study without any rational.

Pilot study:

A pilot study was carried out on 10 participants to evaluate the content of the tools and measure the time needed to collect data. The researchers made the necessary modifications and exclude the participants in the pilot study.

Procedure of data collection:

- Data collection of the study was started at the beginning of May 2021 and completed by the end of July 2021.
- Official permission was obtained from the directors of the two schools after explanation the aims of the study.

Assessment phase:

- The first session: the researcher explained the aim of the study to the participants and reassures them that information collected will be treated confidentiality and that it will be used only for the purpose of the research.

- The participants divided into small groups according their suitable time, then the researchers collect the pre-test data first by using the interviewing questionnaire to assess the participant knowledge about COVID-19 vaccine. The time of this session ranged from 30 to 35 minutes.

- The second session, the researcher assess the participant' attitude and willing toward taking the vaccine using tool two, and accordingly the researcher prepared the educational intervention including knowledge about COVID-19 and vaccines. The time of this session ranged from 30 to 35 minutes.

Implementation phase:

- The third session: the researchers give health education about the current pandemic, immune system, vaccination process. (The time taken was 45 to 50 minutes). The fourth session: included health education about COVID-19 vaccine; mechanism of action, types, benefits, side effect, eligible population, preparation to take the vaccine and precaution after vaccination. (45 to 50 minutes).

- The researchers at the fifth session carry out an open discussion with the participants to assess their fears and myths regarding the vaccine then inform them the facts about the vaccine. Then a summary of the essential parts was made and answer the questions of the participants. The time of this session ranged from 45 to 50 minutes.

Evaluation phase:

At the fifth session the post test was performed by using the same pre-test tools.

Statistical Design:

The researchers organized, tabulated, and analyzed the collected data by using SPSS version 19 that created by IBM, Illinois, Chicago, USA. The number and percentage distribution was calculated. Chi square test was used to detect the statistical differences between variables. The level of significant was adopted at $p<0.05$. The mean and standard deviations were calculated regarding the willing to take the vaccine and. Paired T test was used to detect the statistical differences between

pre and post intervention. Pearson test was used to assess correlation between variables.

Results

Table 1 shows the distribution of personal characteristics of studied participants. The data reveals that 64% of studied sample are females and 34 % their ages ranged from 30 to 40 years old, 26% are less than 30 years and   Regarding to the level of education 58 % of the studied sample have high education and 42 % has secondary education. As to the residence74% of them are living in rural area.

Table 2 reveals the frequency distribution of studied sample regarding their knowledge about the vaccination process of COVID-19. The table shows that 42% of the studied sample has complete and correct answer regarding COVID-19 and 38% have correct answer about the definition of vaccines while regarding mechanism of COVID-19 vaccine and differences between all types of the vaccine only 24% and 22% respectively have complete and correct answer. Regarding rationales to take the vaccine, who are the eligible population, side effects, preparation before vaccination and intervention after being vaccinated (36%, 58%, 52%, 34% and 24% respectively) have correct and complete answer.

Figur1 reveals the myths around the vaccine that being perceived by the studied sample. The figure shows that 76% perceived that the side effects of the vaccine is very dangerous followed by 70% of the studied sample perceived that the COVID-19 isn't effective and 66% reported the vaccine affect the fertility. Moreover 48% reported that the vaccine may cause the infection by COVID-19 and finally 38% for altering the immune system.

Table 3 shows the frequency distribution of studied sample regarding their attitude toward the vaccine (pre- the educational intervention). The table reveals that 30% of studied sample are sure that no harm from taking the vaccine, 34% sure about the contribution of the vaccine in protection from the disease, 42% are sure about the effectively of the vaccine and that the vaccine is the best way to avoid the complication of COVID-19, and only 28% are sure about the benefits of the vaccine out weight the risks. The table also clarifies that 32% of the studied sample think that taking the vaccine is a societal responsibility and sure about the vaccination process not directed for commercial gain for pharmaceutical companies while only 26% are sure that vaccine is developed and approved at the suitable time.

Table (4) reveals the comparison of the studied sample regarding the total level of knowledge about COVID-19 vaccine pre and post the educational intervention. The table shows that there are significant improvements regarding total level of knowledge of studied sample post the educational intervention where 74% of studied sample has satisfactory knowledge post intervention compared to 42% pre the intervention and P value is 0.005.

Table (5) reveals the comparison of the studied sample regarding the total level of attitude toward COVID-19 vaccine pre and post the educational intervention. The table shows that there are significant improvements regarding total level of attitude of studied sample after the intervention where 66% of studied sample has positive attitude after the educational intervention compared to 38% before intervention and P value is 0.01.

Table (6) shows the frequency distribution of studied sample regarding their willing to take the vaccine pre and post - the educational intervention. The table shows that 58% are agree to take the vaccine even they have to pay post the educational intervention compared to 32% pre - the intervention and two third of the participants will take the vaccine when their turn of taking vaccine come compared to only 28% pre– the

intervention, in addition to more than half of them will encourage their family to take the vaccine compared to 34% pre the intervention and 48% are agree to take the vaccine even its protection last for short period of time at post- test compared to only 26% are agree pre -intervention. To summarize the data the table clarifies that the mean scores of the studied sample significantly improved from 6.4±1.1 to 8.9±.8 and p value is 0.00001.

Table (7) shows the correlation between total levels of willing of studied sample to take the vaccine with level of knowledge and attitude post- the educational intervention. The table summarized that there are significance relation between the willingness of the studied sample to take the vaccine with the level of knowledge and attitude toward the vaccine after the educational intervention.

Figure (2) shows that 76% of the studied sample registered to take the vaccine after implementing the educational program while 24% of them delayed the registration.

Table (1) Frequency distribution of studied sample according to their personal characteristics. (N=50)

Items	N	%
Gender		
Male	18	36
Female	32	64
Age		
Less 30 years	13	26
30-40 years	17	34
41-50	12	24
>50	8	16
Education		
Secondary	21	42
High education	29	58
Residence		
Rural	37	74
Urban	13	26

Table (2) Frequency distribution of studied sample regarding their knowledge about the vaccination process of COVID-19 (pre the educational intervention). (N=50)

Items	Complete answer		Not complete answer		Don't know	
	N	%	N	%	N	%
Over view about COVID-19.	21	42	22	44	7	14
Definition of the vaccine.	19	38	17	34	14	28
Mechanism of work of COVID-19 vaccines.	12	24	8	16	30	60
Motives to get the COVID-19 vaccine.	18	36	16	32	16	32
Eligible population to take the vaccine.	29	58	11	22	20	40
Side effects for the vaccine.	26	52	11	22	13	26
Differences between all types of the vaccine.	11	22	7	14	32	64
Preparation for before taking the vaccine.	17	34	14	28	19	38
Precaution after being vaccinated.	12	24	18	36	20	40
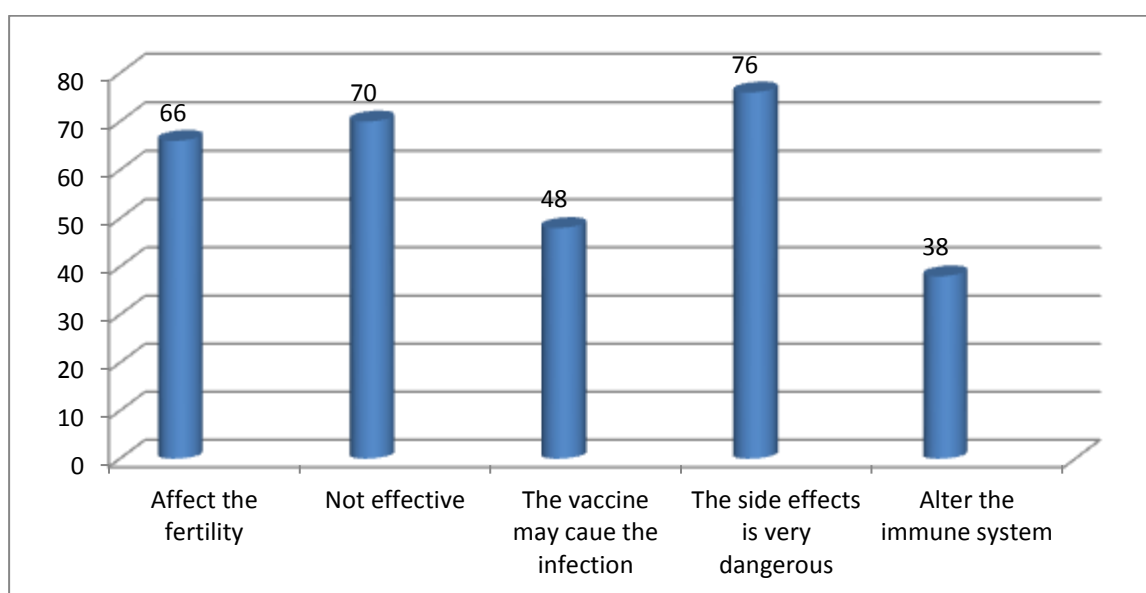
Figure (1) frequency distribution of the studied sample regarding their myths about the vaccine. (N=50)

Table (3) Frequency distribution of studied sample regarding their attitude toward the vaccine (pre- the educational intervention). (N=50)

Items	Sure		May be		No	
	N	%	N	%	N	%
I think there is no harm from taking the vaccine?	15	30	13	26	22	44
I believe covid -19 vaccine will be useful in protecting me from the infection?	17	34	15	30	18	36
I think that the best way to avoid the complications of COVID-19 is by being vaccinated	21	42	11	22	18	36
I feel the benefits are outweighs the the risks of taking the vaccine	14	28	14	28	22	44
The vaccine is highly effective to control the outbreak	21	42	10	20	19	38
I think taking the vaccine is a societal responsibility	16	32	12	24	22	44
I think the vaccination process not directed for commercial gain for pharmaceutical companies	16	32	20	40	14	28
I think the vaccine is developed and approved after the suitable time	13	26	12	24	25	50

Table (4) Comparison of the studied sample regarding the total level of knowledge about COVID-19 vaccine pre and post the educational intervention. (N=50)

Items	Pre the educational intervention		post the educational intervention		X^2	P
	N	%	N	%		
Satisfactory	21	42	37	74	10.8	0.005
Average	14	28	5	10		
Unsatisfactory	15	30	8	16		

Table (5) Comparison of the studied sample regarding the total level of attitude toward COVID-19 vaccine pre and post the educational intervention. (N=50)

Items	Pre the educational		Post the educational		X^2	P
	N	%	N	%		
Positive	19	38	33	66	8.09	0.01
Average	14	28	9	18		
Negative	17	34	8	16		

Table (6) Comparison between the mean score willing to take the vaccine among studies sample pre and post the educational intervention. (N=50)

Items		Pre the educational intervention		Post the educational intervention	
		N	%	N	%
I'm willing to take the vaccine even I have to pay to get it	Agree	16	32	29	58
	Not sure	22	44	8	16
	Disagree	12	24	13	26
When my turn of taking vaccine come I will take the vaccine	Agree	14	28	33	66
	Not sure	25	50	9	18
	Disagree	11	22	8	16
I will encourage my family to take the vaccine	Agree	17	34	26	52
	Not sure	21	42	14	28
	Disagree	12	24	10	20
I will take the vaccine even if its protection last for short time	Agree	13	26	24	48
	Not sure	17	34	18	36
	Disagree	20	40	8	16
Mean		6.4±1.1		8.9±.8	
T		8.09			
P		0.00001			

Table (7) correlation between total levels of willing of studied sample to take the vaccine with level of knowledge and attitude post the educational intervention.

Items	Willing to take the vaccine	
	R	P
Knowledge	0.72	0.006
Attitude	0.83	0.001
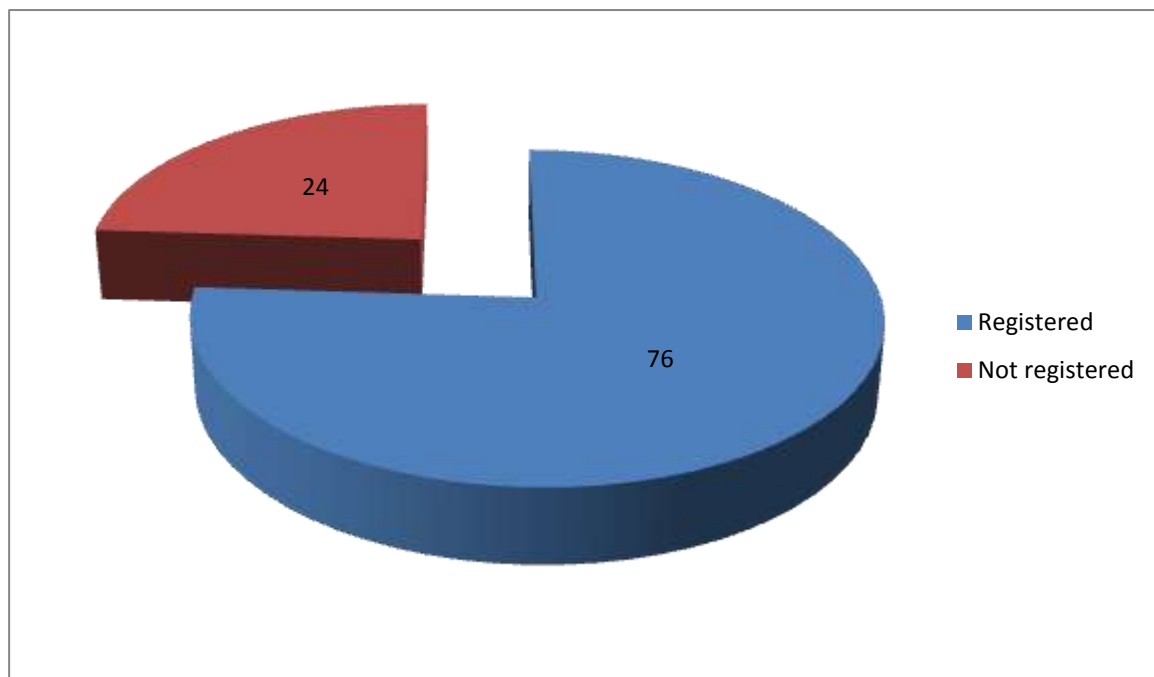
Figure (2) frequency distribution of studied sample who registered to take the vaccine after the educational intervention

Discussion

While the creation of COVID-19 vaccinations has been a huge achievement, vaccinating the majority of the world's population is a huge task. Gaining – and sustaining – public trust in COVID-19 vaccines and immunization will be just as important as the vaccines' effectiveness [14]. Therefore the aim of this study was to assess the effect of the nursing educational intervention to control COVID-19 vaccine hesitancy among school team members. The data revealed that about two thirds of studied sample were females and one third of them their ages ranged from 30 to 40 years old, about one quarter were less than 30 years and regarding to the level of education more than half of the studied sample had high education and less than half had secondary education. As regards to the residence about three quarters of them were living in rural area.

The results of current study revealed that about one half of the studied sample had not complete answer regarding overview about COVID-19 and no answer about the vaccine and two thirds didn't know about the mechanism of COVID-19 vaccine and differences between all types of the vaccine. In general about one third only of sample had satisfactory knowledge pre intervention and this indicated that the studied sample lacked knowledge regarding COVID-19 vaccines which suggests the need for increasing their awareness through programs for dissemination of correct knowledge. These results were consistent with **Mohamed et al. (2021)** [15] who reported that the knowledge of their sample about COVID-19 vaccines was inadequate. On the other hand, the current results were contradicted with **Abebe et al. (2021)** [16] who found that about three quarters of their sample had good knowledge about the vaccine.

The results of current study revealed that there were significant improvements regarding total level of knowledge of studied sample post-the educational intervention where three quarter of the sample had satisfactory knowledge after the intervention compared to less than the half before the intervention and P value is 0.005. The results were supported by **Elashri et al. (2021)** [17] who reported that the COVID-19 knowledge, attitude, and precautionary practices of the studied sample improved statistically significantly after the implementation of the COVID-19 educational bag compared to before it, and that the improvement was still visible across the entire studied sample regardless of their demographic characteristics and clinical data**.** In the same line **Islam et al. (2021)** [18] reported that immediate health education programs were effective strategy

to improve knowledge initiated before mass vaccination schedule.

The current study revealed that there were several individual differences that could make participants hesitant towards the vaccines, where half of the studied sample was not sure that the vaccine was developed and approved at the suitable time and about the half were not sure about the safety of taking the vaccine. In general there were about one third of the studied sample had negative attitude regarding the vaccine. The results of current study were in harmony with **Issanov et al. (2021)** [19] who found that there was high COVID-19 vaccine hesitancy among the participants with several associated factors as safety, effectively and vaccines' country of origin. In the same line **Pogue et al. (2020)** [20] reported that about one third of the participants were not supportive of being vaccinated because they had some concerns regarding side effects, efficacy and length of testing. On the other hand **Acharya et al. (2021)** [21] revealed that the average attitude toward the COVID-19 vaccination increased after the intervention indicating generally positive attitudes. These differences might be due to the fact that the participants in the Korean study were immigrants.

Moreover the results of the current study revealed that there were significant improvements regarding total level of attitude of studied sample toward COVID-19 vaccine after the intervention where about two thirds of them had positive attitude after the educational intervention compared to about one third before the intervention. The results were supported by **AL Halabi et al. (2021)** [22] who reported that targeted efforts necessary to increase acceptance of a COVID-19 vaccine among the Lebanese population to control the COVID-19 pandemic. In the same line **Rutten et al. (2021)** [23] reported that using of educational interventions within clinical organizations was useful to address this critical gap and improve population trust in COVID-19 vaccination.

The results of current study indicated that on a scale of 4–12, the average willing toward the COVID-19 vaccination of the studied sample improved significantly from 6.4 ± 1.1 to $8.9\pm.8$ after the educational intervention and this improvement is significantly associated with improved their knowledge and attitude regarding the vaccines, more than two thirds of the studied sample registered to take the vaccine after implementing the educational program while about one quarter of them delayed the registration. The results were supported by **Abebe et al. (2021)** [16] who reported that health education programs were very crucial

methods to alleviate the negative attitude of the COVID-19 vaccine and added that good knowledge and attitude about COVID-19 vaccine were significantly associated with COVID-19 vaccine acceptance, and increased the willing to take vaccine. In the same line **Mesele (2021)** [24] reported that the prevalence of COVID-19 vaccination acceptance was law and public education is effective strategy to enhance the acceptance of COVID-19 vaccine.

Conclusion

The current study results concluded that the average willing of the studied sample to take the COVID-19 vaccine improved significantly after the educational intervention and this improvement is significantly associated with the significant improvement in their knowledge and attitude about the vaccines. There were significant improvement regarding total level of knowledge between the studied samples about COVID-19 vaccine post-the educational intervention, where three quarter of them has satisfactory knowledge. Moreover, their attitude toward COVID-19 vaccine significantly improved after the intervention, about two thirds of them has positive attitude compared to about one third before the intervention. The impacts of these results were that more than two thirds of the studied sample registered to take the vaccine after implementing the educational program.

Recommendations

- Further studies are needed to increase people awareness regarding COVID-19 vaccination to build and maintain public trust in COVID-19 vaccines in Egypt.

- Develop other effective instructional methods, and address additional challenges among other settings in the community with regards to vaccine hesitancy.

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Effect of Progressive Muscle Relaxation Exercises during Pregnancy on Low Back Pain and Quality of Woman's Life

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Abstract

Background: Many women during pregnancy suffer from low back pain (LBP). This pain has a significant effect on women's quality of life. Fifty percent of women during pregnancy have low back pain. According to the related literature, LBP may be a weakening condition that influences on women's daily activities and their productivity and affecting women's quality of life. LBP must not be neglected and great attention should be given to this complaint. **The aim of the study** was to assess the effect of progressive muscle relaxation exercises during pregnancy on low back pain and quality of woman's life. **Subjects and Method: Design:** A quasi-experimental research design was carried out at Salah Abd-Rabo obstetric and gynecological clinic and Sahala obstetric and gynecologic center, Alexandria, Egypt. **Subjects:** A convenient sample of 40 pregnant women were assigned randomly to a muscle relaxation group or a control group (20 participants in each group) according to certain criteria. **Tools**: Three tools of data collection were used: A questionnaire sheet, a visual analog pain intensity scale (VAS) and health related quality of life (HRQOL) questionnaire. **Results:** There is a significant decrease in pain intensity at 2 months, ($p < 0.05$) among participants in the study group while, pain intensity increased among control group participants after the same period. In addition, there is a significant improvement in all quality of life aspects after two months among the study group than control group, ($p < 0.05$). **Conclusion and recommendations:** PMR can reduce low back pain among pregnant women and improve their quality of life. Pregnant women who wish to stop pharmacological pain relief should be taught about PMR.

*Key Words***:** Progressive muscle relaxation, back pain, quality of life.

Introduction:

Pregnancy alters the physiology of a woman's body. It has an obvious changes on different systems in the body. Among these systems is the musculoskeletal especially the axial skeleton [1,2]. Large percent of women suffer from low back pain (LBP) during pregnancy which may have adverse effect on women's quality of life. In this regard, around 50% of women will suffer from low back pain [3, 4].

There are different factors which are responsible for LBP. It occurs more frequently later in the pregnancy due to increase in the baby' weight and uterine expansion. Hormones are one of the most common cause of pregnancy-related low back pain. The progesterone and relax in hormones alleviate muscles tension and relax joints and ligaments, particularly in the area of pelvis [5,6]. The additional weight and changes occurring during pregnancy alongside these loosened joints and ligaments may lead to discomfort [7- 9].

Low back pain occurs in the lumbar region, above the sacrum, and it can radiate to the leg. The pain is usually dull and aggravated by flexion [10]. The gradual weight gain and the change in the body's center of gravity combined with the stretching of weak abdominal muscles often lead to a hollowing of the lumbar spine. There is a tendency of back muscles to shorten as the abdominal muscles stretch and extra strain is put on the ligaments. This leads to backache, usually in the sacroiliac or lumbar origin [10, 11].

Some women suffer from mild discomfort after prolonged standing while others have debilitating pain that affects on their daily life negatively. The prevalence of low back pain during pregnancy can be considered as a normal change that occurs during this period but it can lead to physical inactivity during pregnancy [12, 13]. Symptoms of LBP during pregnancy affect the daily living activities and decrease quality of women's life (QOL) leading to periodic bed rest and work absenteeism. Some studies showed that LBP increases as pregnancy advances and interferes with their daily activities. It can prevent pregnant women from going to work and to have disturbing sleep. It is also noticed that more than 80% of women who have low back pain during pregnancy experience difficulties with childcare, housework, and job performance [14, 15].

Pregnancy related low back pain can affect women's lives dramatically. So, early detection and safe intervention will lead to better outcome. Non-pharmacological intervention such as physiotherapy, massage and relaxation exercises may be beneficial to relieve low back pain that occurs during pregnancy [16- 18].

Relaxation exercises are called behavioral aspirin. Muscle relaxation and breathing exercises are examples of physiological processes that connect the mind and body, and can be used as a non-medicinal practice. Relaxation exercises have many benefits, such as reducing stress and anxiety, relieving muscle strain and contractions, diverting women's attention from pain and making it easier to sleep as well as relieving pregnant women's fatigue and discomforts [19-22].

Progressive muscle relaxation or active relaxation is a technique during it, women can achieve relaxation by active contraction of a group of certain muscles and then releasing them in a progressive manner while taking deep breathing. It provides physiological and psychological relaxation by decreasing the response to stress, muscle contractions, and pain [23].

During pregnancy, woman usually has less energy, but regular exercise can provide her with the required energy during the day. Exercises stimulate the blood flow to shift away from the internal organs (including uterus) to give the lungs, heart and muscles more oxygen. It can reduce lower back pain and increase flexibility. Relaxation therapy has a positive effect on the fetus [24, 25].

According to the findings of some researches, women who exercise regularly during pregnancy have higher self-esteem than those who do not. When comparing an exercising group of pregnant women to a non-exercising group of pregnant women, the association between exercise and high self-esteem was linked to a reduction in the number of symptoms of backache, headache, and exhaustion [26].

The nurse has a pivotal role in providing guidance and education for the pregnant women who are based on the understanding that the maternal health is the lifeline to the fetus and her quality of life and any alteration can affect growth and survival of the fetus. Current health and fitness lifestyles recommend the inclusion of information concerning exercise during pregnancy in prenatal education programs [27]. Thus, it was crucial to find out the effect of progressive muscle relaxation exercises during pregnancy on low back pain and quality of woman's life

Significance of the study:

Low back pain (LBP) is a significant complaint of pregnant women. Literature clearly indicates that LBP should not be neglected and good intervention must be provided, because it may be disabling, limiting everyday activities and affecting women's quality of life. In addition, QOL decreases as pregnancy advances because women may suffer from physical,

psychological and / or social problems with their consequent negative impact on their health [28]. As documented that progressive muscle relaxation exercises can decrease pain and mobility difficulties related to osteoarthritis but there are no adequate evidences regarding pregnancy-related LBP [29].

Aim of the Study

The aim of this study was to assess the effect of progressive muscle relaxation exercises during pregnancy on low back pain and quality of woman's life

Research Hypotheses:

1. Participants who perform the progressive muscle relaxation exercises for two months during pregnancy will experience low back pain intensity than those who do not.

2. Participants who perform the progressive muscle relaxation exercises for two months during pregnancy will experience higher quality of life scores than those who do not.

Subjects and Method

Research Design:

A Quasi experimental research design.

Research Setting:

The study was carried out at Salah abd-Rabo obstetric and gynecological clinic and Sahala obstetric and gynecologic center,Alexandria, Egypt.

Research subjects:

A convenient sample of 40 pregnant women were recruited. They were randomly divided into two groups, the study and control group with 20 women in each group.

Inclusion criteria:

1. Women suffer from LBP
2. Women can read and write
3. During the second trimester
4. No history of lumbar problem before pregnancy
5. Not receiving any pain relief medication for LBP.
6. Singleton pregnancy.
7. Free from any medical or gynecological problems
8. Free from past history of abortion or premature labour.

Tools of data collection:

Tool 1: A questionnaire sheet was used to collect socio-demographic data such as age, education and occupation. Obstetric history such as gravidity, parity was also collected, in addition to woman 'life style data such as performing exercises, types of exercises and her information about exercises.

Tool 2: The low back pain intensity was measured using a visual analogue scale. This tool depicts pain on a two-

dimensional scale, with a score of zero indicating no pain, a score of 1-3 indicating mild pain, 4-6 indicating moderate pain, and 7-10 indicating intense pain. It is valid and reliable tool [30]. The VAS was self-completed by the women. The women were instructed to draw a line perpendicular to the VAS line at the point where their pain level was the highest. The pain scores were registered three times, before intervention, after one month and again after two months from the intervention.

Tool 3: The Short Form-36 scale was used to evaluate health-related Quality of Life (HRQOL) [31]. It consists of 36 statements which assess eight main domains: physical functioning (ten statements), role–physical (four statements), bodily pain (two statements), general health (six statements), social functioning (two statements), and role emotional (three statements), and vitality (four statements), and mental health (five statements). The Turkish version of the SF-36 was used in this research. A Likert Scale is used to grade the responses. For each domain, the participants provided acceptable responses to the questions on the SF-36 scale of 0 to 100. The high scores on the scale indicate that HRQOL is improving in a positive way. This method

is available in two languages: English and Arabic [31].

The validity and reliability:

Three academic Obstetric nursing experts evaluated the face and content validity of tool 1 and recommended modifications were done. Tool reliability was examined by (Alpha Cronbach test). Its result was 0.73. Tool (II) & (III) were adopted by the researchers and used for data collection.

Method:

-An approval from Ethical Research Committee of the Faculty of Nursing / University of Alexandria was obtained

-An official letter from the Faculty of Nursing, Alexandria University was taken and directed to the responsible managers of the study settings to take their permission to conduct the study.

-A pilot study was carried out on a sample of 4 women. These women were excluded from the total sample size.

-Women who had the inclusion criteria were recruited randomly to the study and control groups.

-Every woman was interviewed individually to maintain privacy during the collection of the socio-demographic, obstetric and life style data using tool (1).

-For the study group (n=20): during the first session, participants completed the

questionnaire sheet, SF-36 scale, and VAS. Then, the study group received educational session about technique of the progressive muscle relaxation exercises with the aid of educational video in a quiet room. After that, the researchers performed the exercises in front of the participants and women were asked to re-demonstrate it. Every participant was asked to lie back on the examination bed with performing contraction and releasing of different muscle groups. During tightening of the muscles, the woman was asked to hold for 15 seconds until feeling the muscles tighter and tenser. Then, she slowly released the tension while counting for 30 seconds. Practice progressed in the same technique, beginning with the muscles in the forehead, face, neck, shoulders, forearms, hands, chest, abdomen, gluteal muscles, thigh, calf and finally the feet. The session lasts about 20 minutes. Participants were asked to breathe slowly and evenly. Each woman was given a handbook with photos and was asked to perform the exercises at home, two times per day (at the morning and at the evening), 20 minutes for two months. After one month from the first session, women came to the clinic for pregnancy follow up. Participants were asked to complete the SF-36 and VAS scale. The researchers confirmed with the participants about the continuity of the exercises. After another one month, women came again to the clinic and filled out the SF-36 and VAS scale again.

As regarding control group (n=20), women also were asked to complete the questionnaire sheet, SF-36 scale and VAS at the first session. Then, the researcher educated the women to lie back and do nothing at the morning and at the evening for 20 minutes. Then, they came to the clinic after one month and after two months for pregnancy follow up and marked their pain and QOL on the VAS and SF-36 scale.

For both study and control groups, the researchers followed the women through phone to ensure that they adhered to the instructions and to get sure that they will come at the date of follow up.

Ethical consideration and data collection:

Before participating in the study, each woman gave her written consent after informing them about the study's goals. The women were assured of the confidentiality of their personal details by the researchers, who also gave them the option to withdraw from the study at any time. Data collection was done from April to December 2019.

Statistical Analysis:

The statistical software package SPSS 21.0 was used to analyze the results.

Descriptive statistics were used to explain the data. By using the Chi square and ANOVA tests, the researchers calculated the statistical significance of variations between the variables. Statistical significance was considered at p < 0.05

Results:

As illustrated in **table (1),** the majority of the participants in the study group (90%) were between 21-35 years old compared to (85%) of the control group. Moreover, the education of most of the study group (80%) was higher education compared to (35%) among the control group. Most of the participants in every group (95%) were housewives.

Table (2) reveals participants' obstetric history. It can be observed that, the gestational age of 70% of the study group was between 17-20 weeks compared to 80% of the control group. In addition. Three quarters of the participants (75%) in the study group were multipara compared to 85% of the control group. Moreover, the beginning of pain among 60% in the study group was in the second trimester compared to (50%) of the control group. Prolonged standing and continuous movement were the most common pain aggravating factors among 40% and 20% respectively of the study group compared

to 40% and 35% respectively among the control group. Pain was relieved by bed rest among 50% of women in the study group compared to 80 % of control group.

As shown in **table (3),** 70% of women in the study group did not perform exercises before implementation of the progressive muscle relaxation exercises compared to 75% in the control group. Moreover, 50% and 80% of women among both study and control group respectively performed walking exercises. In addition, (50%) from study group performed exercises once every week compared to 20% of control group. About two thirds (66.67%) of women among the study group felt well after performing exercises compared to 80% of the control group. Among the factors that prevent women from performing exercises were ignorance as mentioned by 40% of the study group compared to 30% of the control group. In addition, fear of abortion was mentioned by 30% of the study group compared to 45% of the control group. There were no significant differences in life style between the two groups.

Table (4) and figure (1), illustrate the effect of progressive muscle relaxation exercises on low back pain intensity among the study and control group

according to VAS at the beginning of the study (baseline) and then again after one month and after two months. Participants in the study group reported significant decrease in pain intensity after two months, than women in the control group, Mean ± SD = 3.25 ± 0.72 and Mean ± SD=5.05 ± 1.05 respectively and p =0.042*

As regards to the impact of muscle relaxation exercises on the participants' quality of life, **table (5)** shows that there is a significant improvement in all quality of life aspects after 2 months among the study group than control group, p < 0.05.

Table (1): Socio- demographic characteristics of the participants (n = 40)

characteristic	Intervention Group		Control Group	
	N=20	%	N=20	%
Age:				
<20	0	0	1	5
21-35	18	90	17	85
36-40	2	10	1	5
>40	0	0	1	5
X^2 , P - value	2.36 , 0.500			
Educational level:				
Primary school	0	0	3	15
Preparatory school	3	15	1	5
Secondary school	1	5	9	45
University	16	80	7	35
X^2 , P - value	13.92 , 0.003			
Residence:				
Village	2	10	1	5
City	18	90	19	95
X^2 , P - value	0.36 , 0.548			
Economic status:				
Low	11	55	2	10
good	9	45	18	90
X^2 , P - value	9.23 , 0.002			
Occupational status:				
Work	1	5	1	5
housewife	19	95	19	95
X^2 , P - value	0.00 , 1.000			

Table (2): Participants' obstetric history (n=40)

Items	Study		Control	
	(N=20)	(%)	(N=20)	%
Gestational weeks at the entry of the study :				
13-16	3	15	2	10
17-20	14	70	16	80
21-24	3	15	2	10
X^2 , P - value	0.30 , 0.86			
Gravity:				
1	5	25	3	15
$\geq$ 2	15	75	17	85
X^2 , P - value	0.63 , 0.422			
Medication intake during pregnancy:				
No	5	25	6	30
Vitamins	8	40	10	50
Analgesic	4	20	3	15
Antibiotic	3	15	1	5
X^2 , P - value	1.46 , 0.692			
Beginning of pain :				
First trimester	8	40	10	50
Second trimester	12	60	10	50
X^2 , P - value	0.40 , 0.52			
Pain aggravating factors :				
Prolonged standing	8	40	8	40
Continuous movement	4	20	7	35
Prolonged sitting	8	40	5	25
X^2 , P - value	1.51 , 0.469			
Period of pain :				
Continuous	2	10	3	15
Intermittent	18	90	17	85
X^2 , P - value	0.23 , 0.632			
Measures to relieve pain:				
Bed rest	10	50	16	80
Relaxation	2	10	3	15
None	1	5	1	5
Topical ointment	1	5	0	0
Warm shower	1	5	0	0
Analgesic	5	25	0	0
X^2 , P - value	8.58 , 0.126			

Table (3): Participants' life style during pregnancy (n=40)

Items	Intervention Group		Control Group	
	(N=20)	(%)	(N=20)	(%)
Exercise during the current pregnancy.				
Yes	6	30	5	25
No	14	70	15	75
X^2, P - value	0.13 , 0.72			
Type of exercise	**n=6**		**n=5**	
Walking	3	50	4	80
Relaxation	0	0	1	20
Hands and legs exercises	2	33.33	0	0
Breathing exercise	1	16.67	0	0
X^2, P - value	5.62 , 0.131			
Times of exercises	**n=6**		**n=5**	
Every day	1	16.67	0	0
3 times / week	0	0	1	20
Once every week	3	50	1	20
Once every month	2	33.33	3	60
X^2, P - value	0.92 , 0.821			
Do you feel well after doing the Exercise:	**n=6**		**n=5**	
Yes	4	66.67	4	80
No	2	33.33	1	20
X^2, P - value	0.24 , 0.621			
Factors preventing pregnant women from performing exercises				
Do not know about exercise.	8	40	6	30
House work	6	30	3	15
No physical ability	0	0	2	10
Afraid of abortion	6	30	9	45
X^2, P - value	3.89 , 0.27			

Table (4): Effect of progressive muscle relaxation exercises on low back pain among the study and the control groups

Pain	Baseline VAS	After 1 month VAS	After 2 months VAS	F	P
	Mean ± SD	Mean ± SD	Mean ± SD		
Study Group	5.50 ± 0.95	4.25 ± 0.72	3.25 ± 0.72	4.05	0.042*
Control Group	4.75 ± 1.02	4.70 ± 1.03	5.05 ± 1.05	1.25	0.254
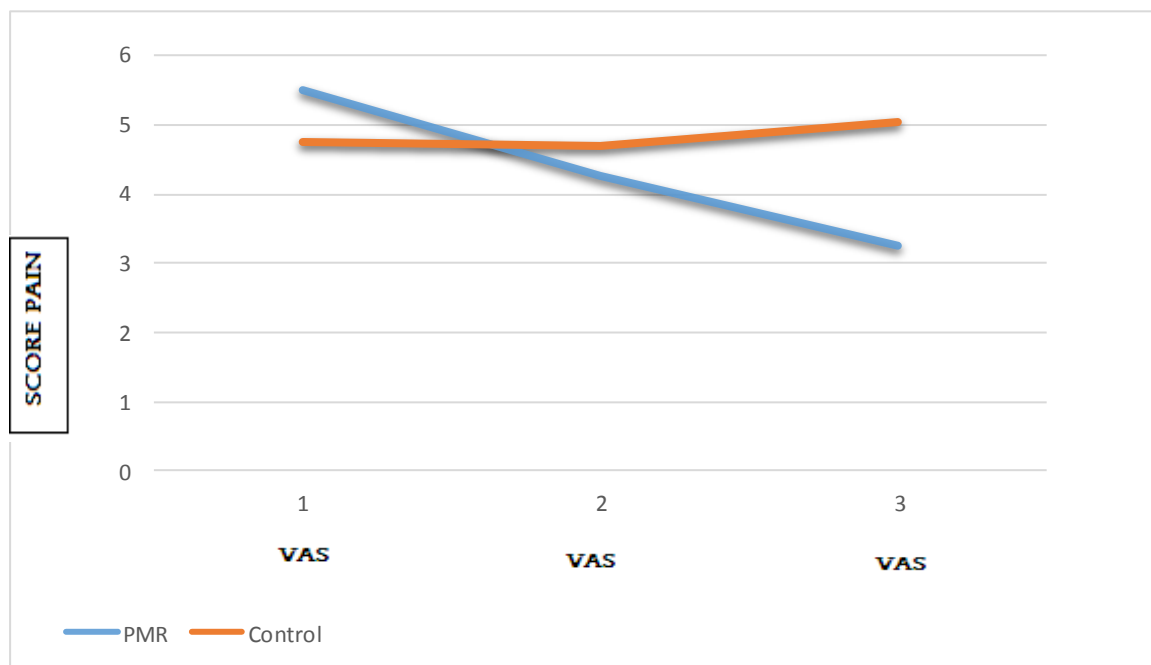
Figure (1): Effect of progressive muscle relaxation exercises on low back pain among the study and the control groups

Table (5): Effect of progressive muscle relaxation exercises on participants' quality of life

Subscale	Time	Study Mean ±SD	Control Mean ±SD	T	P
General health	baseline	55.42 ± 11.48	53.96 ± 6.12	**1.07**	**0.15**
	1-month	60.04 ± 10.16	35.97 ± 4.72	**3.85**	**0.004***
	2-month	70.74 ± 7.29	54.38 ± 9.31	**5.22**	**0.001***
F,P		**8.5, 0.002***	**2.68, 0.107**		
Role physical	baseline	40.25 ± 17.88	46.67 ± 20.87	**1.00**	**0.365**
	1-month	56.25 ± 13.66	38.61 ± 19.54	**4.22**	**0.0021***
	2-month	65.50 ± 13.95	35.61 ± 24.36	**6.98**	**0.001***
F,P		**8.11, 0.005***	**3.01, 0.098**		
Physical function	baseline	26.25 ± 26.25	21.25 ± 33.71	**1.21**	**0.107**
	1-month	37.50 ± 23.65	20.00 ± 27.63	**4.21**	**0.0021***
	2-month	61.25 ± 35.79	18.75 ± 24.16	**24.6**	**0.001***
F,P		**25.6, 0.001***	**2.14, 0.214**		
Mental health	baseline	25.00 ± 26.21	21.67 ± 37.89	**1.08**	**0.152**
	1-month	33.88 ± 26.60	33.88 ± 26.60	**0.11**	**0.785**
	2-month	60.00 ± 39.88	25.00 ± 35.66	**11.85**	**0.001***
F,P		**20.30, 0.001***	**1.25, 0.51**		
Role emotional	baseline	66.25 ± 18.63	51.25 ± 23.61	**2.36**	**0.025***
	1-month	70.00 ± 18.85	40.50 ± 18.32	**8.98**	**0.001***
	2-month	80.00 ± 17.01	30.00 ± 18.85	**9.68**	**0.001***
F,P		**6.98, 0.013***	**3.65, 0.035***		
Body pain	baseline	31.88 ± 15.43	31.86 ± 15.43	**0.106**	**0.896**
	1-month	41.25 ± 11.54	41.25 ± 11.54	**0.052**	**0.985**
	2-month	57.50 ± 17.40	41.88 ± 15.32	**2.45**	**0.012***
F,P		**5.65, 0.013***	**3.05, 0.041***		
Vitality	baseline	53.22 ± 11.77	58.44 ± 11.45	**1.25**	**0.107**
	1-month	60.56 ± 9.60	58.23 ± 13.05	**0.85**	**0.685**
	2-month	63.22 ± 6.21	58.31 ± 13.18	**1.98**	**0.048***
F,P		**6.01, 0.013***	**0.013, 0.987**		
Social function	baseline	43.75 ± 22.76	52.50 ± 21.31	**2.98**	**0.017***
	1-month	52.50 ± 21.31	52.50 ± 21.31	**0.21**	**0.86**
	2-month	67.50 ± 14.28	50.00 ± 19.87	**8.25**	**0.001***
F,P		**17.21, 0.001***	**0.321, 0.748**		

Discussion

During pregnancy, the pregnant woman undergoes many anatomical and physiological changes. These alterations have an effect on her musculoskeletal system, resulting in lower back pain [32]. In the United States of America, Europe, and some parts of Africa, the reported incidence of low back pain during pregnancy ranges from 30% to 78%[33]. The aim of this study was to assess the effect of progressive muscle relaxation exercises during pregnancy on low back pain and quality of woman's life. The study accomplished its proposition in illustrating that progressive muscle relaxation is an efficient way in decreasing low back pain and improving women's quality of life.

The present study revealed that nearly three quarters of the study and control group didn't exercise during the current pregnancy. According to a study conducted in southern Brazil, 14.8 % of women were active prior to pregnancy and only 12.9 % were active during pregnancy [34]. There were different factors preventing them from practicing exercise such as, housework, fear of abortion, lack of physical ability and ignorance about exercises. These results are in accordance with the results of Flannery et al. (2018) and Evenson et al. (2009) who reported that women didn't know about types of exercises they could engage in while pregnant and if it was safe or not [35,36]. Maternity nurses are key source of information to enhance pregnant women's knowledge about the importance of exercises during pregnancy. In the current study, walking was the most reported exercises among participants of the two groups, similar results were reported by Nascimento et al. (2015) [37].

Moreover, the current study showed that, the beginning of low back pain occurred in the second trimester among three fifths of the study group compared with one half of the control group. Other studies illustrated the same results as Carvalho et al. (2017), they mentioned that 43.9% of the participants suffered from low back pain during the second trimester [38]. This observation may explain that low back pain is the result of musculoskeletal system alteration that including postural changes and lordosis resulting from increasing spinal load due to the growing fetus [39].

There are number of methods can be done to treat back pain during pregnancy. The common interventions are medication, ice or heat compresses, sleeping on the left side, massage, and progressive muscles relaxation. In the current study, half of the women in the study group while most of control group tend to take bed rest for relieving back pain. Similar results by

Manyozo et al. (2019) who found that resting of women from the pain aggravating activity was an effective pain alleviating modality among women with LBP. They reported that most of women during pregnancy utilized self-care procedures by using exercises, stretching, and massage [7] However, there are evidence-based management interventions for preventing and treating LBP during pregnancy. Stabilization, manual therapy, and hydrotherapy are examples of these treatments, which are often delivered by physiotherapists [3].

After 2 months of conducting the progressive muscle relaxation exercises, the study group showed a substantial reduction in pain intensity compared to the control group according to the VAS. These findings are consistent with those of Akmes and Oran (2014), who found that women who received PMR training and performed it on a daily basis had a substantial reduction in pain perception [14]. Furthermore, Mohammed and Fattah (2019) discovered that participants with low back pain had a statistically significant increase in functional ability and a statistically significant decrease in pain severity after 4 weeks of exercising compared to the control group [8]. In addition, Relaxation can reduce pain or its perception, increase feeling of control,

energize and improve sleep. It can also help with physical health and interpersonal relationships, so progressive muscular relaxation has long-term benefits that boost quality of life [40].

In the present study, when compared to the control group, the PMR group showed a substantial improvement in all QOL subscales 2 months after the intervention (general health, role physical, physical function, mental health, role emotional, body pain, vitality, and social function). However, these findings are consistent with Akmes and Oran (2014) who reported the same results [14]. On the other hand, Tendais et al. found no connection between exercise and general health, physical and mental HRQOL among pregnant women in a prospective trial using the SF-36 questionnaire in 2011 [41]. When pregnant women from Brazil were studied in an RCT, the same findings were obtained [42]. In addition, Gustafsson et al. (2016) investigated the impact of an exercise regimen during pregnancy on health-related quality of life in pregnant women and discovered no changes in any aspects of psychological well-being or general health [43]. Liu et al. (2019) systematically examine the effect of various forms of exercises on the quality of life of pregnant women. Overall, their findings showed that exercise can improve

women's quality of life during pregnancy and is a feasible, appropriate, and successful intervention which is in agreement with the present study [44].

Therefore, the findings of the present study demonstrated that progressive muscle relaxation exercise is an effective therapy for improving LBP and QOL among pregnant women. There are a lot of causes behind the benefits of progressive muscle relaxation exercises. Tension and relaxation in the autonomic nervous system are caused by the firing of sympathetic and parasympathetic nerve fibers, respectively. Since muscle relaxation is such a large part of PMR, the parasympathetic nervous system takes over during and after it, resulting in a reduction in respiratory rate, heart rate, and blood pressure. Deep somatic restfulness, in combination with parasympathetic dominance, has been shown to alleviate anxiety. The relaxation response decreases tissue oxygen demand, lowers lactic acid levels, and releases endorphins, all of which can help to relieve pain. Therefore, a PMR-induced decrease in anxiety, along with the reduction of pain perception, may improve QOL among the pregnant women[14, 45, 46].

Conclusion

According to the findings of this study, many pregnant women experienced low back pain during their pregnancy. The findings also support the researchers' hypotheses and provide a strong evidence that progressive muscle relaxation exercises can minimize low back pain and enhance women's quality of life during pregnancy.

Recommendations

The following recommendations are made based on the results of this study:

1. Pregnant women who wish to avoid pharmacological pain relief should be taught about progressive muscle relaxation exercises.

2. A comparative study of the efficacy of different non-pharmacological pain management during pregnancy may also be conducted.

Study limitations

The number of the study subjects is limited because the enrolled women from the beginning of the study was 60, then, about 11 women were not able to continue practicing the PMR regularly and /or adhere to the researchers' instructions. The other 9 women didn't come for follow up. The remaining number was 40 women who continued to participate in the study and was divided between the two groups, 20 women in each group. Another limitation of the study is the presence of significant difference among the study and control group in their educational level and

economic status as well as in the baseline data of role emotional and social function aspects of quality of life.

Acknowledgement

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Nurses' Experience towards Caring for Children with Proven Covid-19 Infection at Pediatric Intensive Care Unit

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Abstract

Background: The COVID-19 pandemic has been the talk of the world for several months in 2020, reflecting a new public health challenge that poses a significant threat to nurses' lives and well-being, resulting in a significant impact on their principles or experiences in the treatment of pediatric patients with covid-19. This study **aimed** to investigate nurses' experience towards caring for children with proven covid-19 infection at pediatric intensive care unit. **Subject and Method: Design:** A qualitative descriptive phenomenological study was conducted at Pediatric Intensive Care Units (PICU) affiliated to Mansoura University Children's Hospital (MUCH). **Subject:** It included 14 nurses who were caring for children who had covid-19 infection, either suspected or confirmed. **Tools:** Semi-structured interviews were conducted using the WhatsApp mobile messaging service to obtain data. The data was analyzed using Colaizzi's approach. Lincoln and Guba's criteria were used to determine the study's rigor. **Results:** Mental state, emotional state, and caring context were identified as three primary themes and six subthemes. **Conclusion:** Nurses working at pediatric intensive care unit caring for children with suspected or confirmed covid-19 infection reported a state of mental and emotional anguish, as well as working under insufficient professional circumstances. **Recommendation:** Increasing hospitals' attention on giving psychological support to nurses and training in coping skills, since COVID-19 outbreak has put enormous strain on hospitals, with frontline nurses being the most severely affected.

Keywords: Covid-19 infection, Nurses' experience, Pediatric Intensive Care Units.

Introduction:

COVID-19 (novel corona virus illness) is a respiratory viral disease that has spread fast over the world. Because of its rapid spread, high mortality, and lack of a cure or vaccine, it is considered an international pandemic. Because of the virus's rapid dissemination, nurses in Emergency and Intensive Care Units are likely to come across pediatric patients who have COVID-19 [1].

Acute respiratory distress syndrome (ARDS) is a severe form of acute respiratory distress COVID-19 caused by corona virus 2 (SARSCoV- 2), a positive-sense RNA virus (A virus in which the genetic material is RNA). Corona viruses are a prevalent cause of minor respiratory infections in both infants and adults. Several novel corona virus strains or mutations have emerged in recent decades, including severe acute respiratory syndrome (SARS) in 2003 and Middle Eastern respiratory syndrome in 2012 [2]. These new strains are frequently linked to high levels of mortality and pathogenicity. These earlier strains did not have the same international spread as COVID-19, and as a result, they did not create as much have or achieve pandemic status [3].

Patients with symptoms of COVID-19-related severe illness are referred to a hospital for treatment. COVID-19' patients are treated in designated corona virus units, which provide specialized care and infrastructure. During epidemics, these acute care units are frequently isolated. Isolation due to COVID-19 hospitalization might last up to two weeks [4]. For both patients and healthcare personnel, prolonged isolation is a barrier to genuine care. Nurses are currently in the forefront of caring for COVID-19 patients. Nurses with unique expertise are needed to care for patients in such a medical emergency. In a nutshell, patient care is a complicated procedure [5].

Nurses perform services and have an impact on patient satisfaction by providing ethical care guided by human contact. Patients' treatment and care have been hampered by a lack of data on the threat of severe disease and a scarcity of specific pharmacological and interventional treatments; all treatments are symptomatic and performed on the basis of knowledge[6]. COIVD-19 patients also require special care specifically, supportive care; this demands the availability of adequate equipment and infrastructure, as well as knowledge, attitude, and ability of experienced nurses. Medical facilities and employees are in short supply, treatment' system confusion, the unpredictability of the illness, societal separation, and the virus's widespread distribution all had

serious effects for healthcare systems in more than 200 nations around the world. In this crisis, providing high-quality nursing care to COVID-19 patients is a big issue [7]. While taking care of COVID-19-positive children in the PICU, nurses are exposed to tremendous dangers, including death. Working-related stress, the influx of people into hospitals on a regular basis, inadequate capacity of a hospital, and a low nurse-to-patient ratio have all contributed to the problem of unsatisfactory treatment. Accordingly, it's vital to consider the nurses' previous care' experiences [8]. Care is a complex connection between the patients and the nurse that may be studied in a variety of ways. Qualitative' researches can help nurses better understand lives, procedures, processes, and events as they occur in a natural setting without intercession. Phenomenological technique can give specific details about humans 'communications and the lived experience of nurses, who care the critically ill children with COVID-19, and it can be used to investigate the significance and problems of these encounters [9].

The study's fundamental guiding philosophy was Husserl's descriptive phenomenology which is concerned with the participants' actual experiences. In this rising pandemic and healthcare catastrophe, no qualitative research has studied nurses' experiences taking care of COVID-19-infected children [10].

Aim of the study

This research was carried out to explore nurses' experience towards caring for children with proven covid-19 infection at pediatric intensive care unit.

Design:

A descriptive qualitative' phenomenology study was utilized on the way to understand as well as investigate pediatric intensive care unit nurses' views and experiences with children with suspected or confirmed covid-19 infection. Bracketing, intuiting, analyzing, and interpreting were the four steps of Husserl's descriptive phenomenology [10].

Setting:

This study was conducted at the Pediatric Intensive Care Units (PICU) affiliated to Mansoura University Children's Hospital (MUCH) in Egypt from 29 July–30 August 2020.

Subjects:

The study included a purposeful sample of 14 nurses working at the above-mentioned study setting who met the inclusion criteria, which included participants with a wealth of knowledge about the phenomenon and nurses with experience of caring for hospitalized children who have been diagnosed with COVID-19 as well as

sufficient availability for the interview. Reluctance of engaging in the trial and nurses who have been diagnosed with COVID-19 were among the study's exclusion criteria. In addition, the participants' informed consent was sought before to the interview.

Tool for data collection:

The author created a semi-structured interview questionnaire in Arabic language after examining the literature [11, 12] on the subject. It consists of 30 open-ended questions that the authors gathered from nurses during an interview to collect data about their experiences with experience of caring for hospitalized children who have been diagnosed with COVID-19. It was divided into two sections as follows:

Part (1): Concerned about nurses' characteristics such as age, sex, years of experience in the PICU, and shift work.

Part (2): Concerned about nurse's concepts and experience towards caring of pediatric patient with proven COVID -19 which included the following.

- The high mental demands faced by nurses in the COVID-19 PICU
- Anxiety, stress, and their consequences on pediatric patient care as well as nurse mental health

- Fear and worrying degree among nurses during the current corona virus crisis.

- Emotional participation in the care of critically affected pediatric corona virus patients.
- Nurses' concerns about the suffering and hardships of pediatric patients suffering from COVID-19's severe health effects.
- unconstructive emotional as well as professional effects for nurses as a result of a huge numeral of daily deaths caused by COVID-19
- Requirement of assistance and equipment during care of covid-19 patients by nurses.

Methods:

- After clarifying the study's goal, an official permission was obtained by submitting an official letter to the director of the hospital and the head of the pediatric critical care unit of the indicated setting to perform the study. After analyzing the relevant literature, the researcher created the tools.

- The tool was developed after a review of the relevant literature and was subjected to content validity testing by a jury of three pediatric nursing experts and two qualitative research specialists for clarity, relevancy, applicability, comprehensiveness, understanding, and

ease of implementation. Minor changes were made based on their feedback.

- This study's data was collected over the course of one month, from July 29 to August 30, 2020. To determine the feasibility, application, and clarity of the tool, a pilot research was conducted on two nurses who provide care for children with or suspected of having covid-19 at the indicated setting (10% of the total sample size). And nurses who participated in the pilot study were excluded from the final study sample as minor modifications were applied according to the opinions of qualitative research specialists, as each participant's comment was coded during the analysis process to improve dependability and ease for its analysis.

- The interviewer had prior qualitative interviewing and research experiences therefore the researcher initiates to ask questions and listens carefully to the responses of the participants and the researcher videotaped the interviews with the consent of the participants, which were then re-examined and discussed with two more specialists. Each interview lasted between 30 and 75 minutes, and if necessary, two sessions were held. Due to limitations at the time in the COVID-19 unit, such as complete isolation, with no one permitted to enter or leave the section, high risk of viral transmission to other individuals, and Nurses' workload that is really tough. The interviews were conducted using Whats App mobile software (video calling, voice, and text messages).

Ethical Considerations:

In 2020, the research ethics committee of the Faculty of Nursing at Mansoura University granted ethical permission. After explaining the purpose of the study and reassuring all nurses that their personal information would be kept private and that only the survey' results will be made anonymously published, and nurses had the right to withdraw from the study at any time, oral consent was obtained from each nurse for their participation in this study.

Data Analysis:

The data was analyzed using the descriptive Colaizzi approach. The following are the seven steps in this method: (1) Organizing descriptions, (2) Understanding the meanings of words on a deeper level, (3) Getting the most important sentences out, (4) Developing a conceptual framework for the major issues, (5) Organizing the ideas and subjects into categories, (6) Creating detailed issues' descriptions that are examined, and (7)

making the data' validation according to Linco's and Guba's four criteria **(Table 2)**. Therefore, the study's rigor was determined using Lincoln and Guba's four criteria: credibility, conformability, transferability and reliability [13].The trustworthiness of the researchers was created through their continued involvement with data, result, detection of divergent results, and member' checks.14 nurses with valuable expertise taking care of COVID-19 young children and suspected were enlisted for providing a large and extensive data set for conformability. The researchers also looked into and explained every study' aspect, from data collection to sampling as well as processing, and then they were compared the results. Two qualitative' research experts double-checked that descriptions and coding. The researchers utilized more than two questions to analyze the phenomena in order to corroborate the findings. To boost dependability, coding methods were applied during the analytical process.

Results

Concerning characteristics of the studied nurses, **Table (3)** revealed that, fourteen nurses caring for children with proven covid-19 infection participated in this study.71.4 % were women and 28.6% men. The participants' mean age of was 28.31 years (SD = 3.42) with their mean work experience was 7.21 years (SD = 2.53).In general, the majority of nurses offered ongoing care. Furthermore, 64.3% worked the morning' shifts, 28.6% worked the evening' shifts, and 7.14% worked the night' shifts.7.14% of all participants had a month of work experience in the COVID-19 isolation' unit, while, 78.6% had two months and the remaining, 14.3% had three months of work' experience.

Table (4) clarified that three main themes and six subthemes were identified in relation to the experience of nurses caring for pediatric COVID-19 patients using descriptive phenomenology: mental status (subthemes included "anxiety and stress" and "fear"), emotional' condition (subthemes incorporated "suffering and affliction" and "waiting for death"), and care context (subthemes included "turmoil" and "lack of support and equipment").

Mental Condition

Nurses caring with PICU children with suspected or confirmed covid-19 may have severe mental demands, which may impair the quality of care they can give. Anxiety, worry, and fear, according to nurses, all have a substantial impact on the care of COVID-19 patients (Table 4).

Stress and Anxiety

Stress and anxiety had a severe impact on both patient' care and nurse mental health.

These nurses' accounts show that their mental health is essential for their patient' care, as well as they is fully aware of illnesses' implications on the care amid the present coronavirus outbreak. Nurses cited a variety of reasons for their concern, including a stressful workplace, doubts, the issue's ramifications, and tension due to the emergence of an unfavorable event. When nurses remarked things like, "How anxious I am, there is no moment when I am not anxious, my whole body is shaking...," it was evident that anxiety and stress are key elements in which nurses are dealing throughout the present corona virus pandemic. (A13) My whole body sweats as I come close to the sufferer, making it impossible for me to operate effectively (A2).What good is it for the world to be so involved and then accomplish nothing? (A3) **(Table 4).**

Fear or terror

Usually, anxiety and terror may be distinguished. Fear causes nurses in the COVID-19 pediatric patient care' scenario to be more concerned, particularly when it comes to becoming sick and spreading the disease to others. It can be seen in their expressions, for example: perhaps I'm unwell too; I might infect others if I'm a carrier.; my symptoms imply that I am ill as well; I'm always worried that I'll get sick as well.; I'll easily catch the disease; I'm

not going to be able to stay here much longer; I wish it would come to an end sooner; I'm frightened I'll make a mistake that may harm the patients.; I'm afraid (A1,6). We're all dying these days, how dreadful it is. (A7) **(Table 4).**

Emotional Condition Long shifts and quarantine circumstances at the hospital, including the absence of visits and the separation from relatives, were discussed by the nurses. COVID-19-induced discomfort and misery in individuals with significant health conditions, as well as the feeling of being on the verge of dying, affected nurses emotionally. According to the nurses, emotional participation in the treatment of those harshly damaged patients might have a substantial effect on health' care **(Table 4).**

Affliction and Suffering

Nurses expressed concern for patients who are distress from the serious health implications of COVID-19. The interviewees described how seclusion and quarantine measures impacted family' dynamics and even work' performance. Nurses clarified that, the difficulties and emotional involvement with patients in the COVID-19 PICU have challenged their application of actual nursing care' principles as illustrated in **(Table 4)** such as, "I just want to put an end to these trying days," "No one can live with these

challenges," "I hope God would intervene sooner to help end this tragedy," "Do you believe I can think about the principles of caring now?" Don't mention that; we are unable to see or see our families, and it is awful. (A10). I can't see my family because We've all gathered in the ward; It's excruciatingly difficult to be separated from them; Everything is weighing heavily on my shoulders; it is quite difficult; Now I'm considering returning to consider my care theory; In this disaster, no one can think about these things (A5,9,11). I'm not sure what my kids are up to right now" (A8).I pity the patients; some of them are fairly young, and their deaths pain me; a man dies of simple shortness of breath, and they have dreams about their impoverished family (A12)

Waiting for Death

Nurses have had unpleasant emotional and professional implications as a result of a huge number of daily deaths following COVID-19. In addition to all of the problems and sufferings brought on by the increased strain in the COVID-19 care PICU, the fear of dying among nurses has turned into a problem, distracting them from giving actual patient care:

Nurses have withdrawn from patient care because they are worried with the prospect of losing a life or anticipating death. A few of individuals expressed concerns about

impending death, which they extended to the patients, themselves, families, as well as coworkers, detracting greatly from their concentration on care, as seen in **(Table 4)**: so who cares? This is too much work; the mortality rate is rising; I wish no one was sad; many of our coworkers have died; it's difficult to grasp the number of deaths; and cemeteries are running out of space (A5, A14). I sometimes have the impression that I can't go too close to the patient because I don't want to die, and death is the end of this situation (A12)

Care Contexts

The nurses' remarks about the care context revealed turbulence and a lack of support and equipment. To offer correct care for COVID-19 patients, the care context encompasses a variety of components such as supportive equipment, personal protective equipment, and facilities, as well as appropriate regulations as well as environmental circumstances. The health care center's contextual flaws, according to nurses, are a substantial obstacle to giving quality care.

Turmoil

Concerning the nurses' portrayal of the PICU's questionable management and policies of care for COVID-19 patients, the disruption in care, as well as staffing constraints and COVID-19 unit' limitations that impacted nurse intervention, were

highlighted by participants (Table 4).They clarified that we are unable to face a huge patients' number because the nurses' numbers is limited, and each patient requires the same amount of effort as a few typical patients (A10). I honestly have no idea how to look after them anymore; whatever I do, it's as if I'm not doing anything at all (A6). When our numbers are so little, and there is so much strain on coworkers, you identify how many people come per day, and it's just hospitalization after hospitalization (A2). It would be much better if there was a clear policy on this disease on which we could act; our treatment is based on our prior experiences. They instructed me to come work here and I didn't know what I was doing, therefore I believe a sequence of obvious and scientific intervention as well as management regulations should be supplied (A7)

A Lack of Equipment and Support

According to nurses, the most basic medical services are insufficient for the management of COVID-19 patients. Nurses emphasized the significance of proactive preparedness in the event of an urgent or emergent healthcare emergency, emphasizing the significance of precise policies in addition to appropriately qualified employees as well as the acquisition of the required equipment for care of patients as their key priorities in the environment of intervention.**(Table 4)** shows that: "We don't have enough facilities; there are few basic facilities, therefore we don't have a well-known employment scenario, but we must work." This isn't a typical isolated ward (A3) other people's collaboration isn't particularly good (A4).No one is held responsible (A8). I am confident that if we become infected with Covid-19, our work environment will not allow us to be isolated and treated (A13).

Table 1: An example of a set of interview questions

1- Tell us about your experience of caring for COVID-19 patients first and foremost. What is your educational background?
2- Make clear to us your day-to-day experience of intervening COVID-19 infected individuals
3-Inform us about your worrying degree in caring for children with proven covid-19 infection at pediatric intensive care unit.
4- Describe the emotional and professional consequences of a huge number of daily deaths as a result of COVID-19.

Table 2: Data Analysis Stages Using the Colaizzi Descriptive Method

A brief description (Action)	Stage
Using WhatsApp for video calls, voice calls, and texts, as well as footage the interviews	Organizing descriptions
Transcribing , rereading the text to gain a fundamental and in-depth understanding of the participants' statements	Understanding the meanings of words on a deeper level
Examining the nurses' explanations and highlighting the key lines	Getting the most important sentences out
Taking the most significant explanations and putting them into context by particular concepts (explaining the significance of the key components)	Developing a conceptual framework for the major issues
The concepts that were discovered were categorized (based on conceptual resemblance).	Organizing the ideas and subjects into categories
The phenomenon' description beneath investigation is expressed in a clear and straightforward manner.	Creating detailed issues' descriptions
Lincoln and Guba's criteria were applied (credibility, transferability, reliability, and verification)	making the data' validation

Table 3: Participants' Nurse's Characteristics

ID	Age	Sex		Position			Shift 'Work			Work' Experience	Time to Attend Coronavirus		
A1	24y	Female		Nurse			Evening			4y	Two months		
A2	25y	Female		Nurse			Morning			6y	Two months		
A3	27y	Male		Supervisor			Night			6y	Two months		
A4	29y	female		Nurse			Morning			9y	Three months		
A5	28y	female		Nurse			Morning			7y	Two months		
A6	28y	male		Nurse			Morning			8y	Two months		
A7	30y	female		Head nurse			Morning			12y	One month		
A8	28y	female		Nurse			Morning			8y	Two months		
A9	30y	female		Head nurse			Evening			11y	Three months		
A10	31y	male		Nurse			Morning			7y	Two months		
A11	29y	female		Nurse			Evening			7y	Two months		
A12	32y	female		Supervisor			Morning			5y	Two months		
13	31y	female		Nurse			Morning			7y	Two months		
A14	35y	male		Head nurse			Evening			14y	Two months		
M±SD / Percent	M±SD 28.31±3.4	F	M	Nurse	HN	Supervisors	M	E	N	M±SD 7.21±2.53	One	two	three
		71.4%	28.6%	64.3%	21.4%	14.3%	64.3%	28.6%	7.1 %		7.14 %	78.6%	14.3%
Total	14 PICU nurses												

Table 4: During the data analysis, themes and subthemes emerged as illustrated.

Themes	Subthemes	Cods	Participants' comments
Mental condition	Stress as well as anxiety	Disease' transmission Get yourself into a pickle and get involved Uncertainty Anxiety	"I'm not at all relaxed, and I have no idea what's going on." (A2) "I don't believe anything positive is going to happen." (A4) "Why should the world be so invested in something and then do nothing?" (A3) "Whenever I'm near corona sufferers, I'm worried" (A13)
	Fear	Anxiety. To be prepared horrible situation	"Even if I die, I'll still have a lot of dreams." (A6) "I'm worried about my family and myself." (A1) "How awful it is these days; we're all dying." (A7)
Emotional condition	Suffering and affliction	Trouble, a great deal of difficulty Limited life	"I have no idea what my kids are up to right now." (A8) "These days, everything we do is difficult, and everyone has their own problems." (A5, A11) "All we want is for our lives to improve, but everything is messed up." (A10)
	Waiting for death	Death of others Family separation	"Many people will perish; a catastrophe is unfolding." (A12, A14)

			"It's been a long time since I've seen my family." (A9)
Care contexts	Turmoil	Workplace' stress Inexperience turmoil Staff" personnel shortage	"We put forth a lot of effort." (A2) "They told me to come work here even though I had no experience." (A7) "I have no idea how to care for them; whatever I do, it's as if I'm doing nothing." (A6) "The number of nurses is small, but the workload is enormous." (A10)
	A Lack equipment of and support	Supportive deficiency Inadequate surroundings Non-participation	"No one is responsible." (A8) "Our working status isn't well-known, yet we have to work." (A3) "Other people's collaboration isn't very good." (A4) "I am confident that if we become infected with Covid-19, our workplace will not provide us with the opportunity to seek treatment" (A13)

Discussion

The fight against the corona-virus disease (Covid-19) is becoming more visible and important every day. The COVID-19 outbreak has put a lot of strain on hospitals, and nurses on the front lines are especially hard hit. Nurses need additional help when it comes to COVID-19 care. Policymakers and nursing management, according to the nurses, must assess the need for nursing intervention in the present corona virus' crisis, make a strategy ahead of time, and provide nurses with the necessary training to deal with the unexpected and extraordinary needs of care for COVID-19-infected children. Furthermore, Hospitals should focus on providing nurses with psychological assistance and coping methods to help them cope with the stress and anxiety that comes with caring for infected patients with the Corona virus [14,15].

There is a scarcity of qualitative researches on the COVID-19 era's patient care experience. The experience of pediatric intensive care unit nurses in caring for children with confirmed covid-19 infection was investigated in this study. Mental health, emotional health, and care setting were the main themes that emerged from the nurses' statements. The nurses' most important concerns were anxiety, stress, terror, witnessing the deaths of patients and coworkers, as well as poor treatment conditions and a lack of resources [8].

In terms of the gender of the nurses who took part in the study, less than three-quarters of the nurses were female (Table 3). This conclusion was consistent with Zohreh Karimi1 et al., (2021) [16], who reported that 66.66 percent of participants in their study of Nurses' Lived Experience, who Caring for COVID-19 patients in Iran were female. These findings, according to the researcher, could be related to the fact that girls are admitted to nursing school at a higher rate than boys. The current study's findings revealed that feelings of worry, tension, and dread defined the first theme of nurses' remarks regarding mental health, and that the nurses' concerns and fears were commonly linked to the care context surrounding COVID-19 **table (4).**This finding matched that of Zohreh Karimi1 et al., (2021) [16] , who investigated Nurses' Lived Experience, who Caring for COVID-19 patients in Iran and found that, an uncomfortable surroundings, doubts, the scenario's repercussions, and tension for the emergence of a terrible circumstance were all identified as reasons for their uneasiness. The nurses' claims about their mental health in this study could be related to exceptionally high job challenges, as well as the widespread prevalence of covid-19 and its devastating repercussions.

The second theme of nurses' statements represents their depiction of being emotionally exaggerated by the agony and PICU pediatric patients' affliction among serious health problems caused by COVID-19, as well as the feeling of being on the verge of dying, as shown in the current study table (4).This finding was in an accordance with **Park et al. (2020)** [17] **and Herandez-Platero et al. (2021)** [18], who conducted a study about "Effect of isolation practice on the transmission of middle east respiratory syndrome coronavirus among hemodialysis patients" and discovered that the participants' feelings of being constrained by seclusion and quarantine practices had an impact on their family processes as well as their work performance. This finding could be attributed to the fact that, the large number of daily deaths following COVID-19 has had negative emotional and professional consequences for nurses According to this assessment.

Nurses described confusing treatments and intervention' rules in place for pediatric COVID-19 patients, as well as care interruptions and shortages of personnel and limits on the COVID-19' units, which hindered nursing intervention table (4): This result was disagree with **Schwartz (2020)** [19] **and Lulgjuraj (2021)** [20], who conducted a study about "Protecting health care workers during the COVID-19 coronavirus outbreak–lessons from Taiwan's SARS response" and stated The nurses reported having enough medical protective equipment and developing a wide range of measures to prevent the spread of infectious diseases, but that they require greater psychological support from their workplace. This result could be related to system inefficiencies and a large number of pediatric patients in critical condition, according to the researchers. A notable limitation of this study was that the researchers were denied entrance to the hospital due to the COVID-19 units' poor condition; an alternative method for conducting interviews was to use the mobile messaging network and WhatsApp, which partially addressed this barrier.

Conclusion

Nurses working at pediatric intensive care unit caring for children with suspected or confirmed covid-19 infection reported a state of mental and emotional anguish, as well as working under insufficient professional circumstances.

Recommendation

The study recommended that:

- Increasing hospital' attention on giving psychological support and training in coping skills for nurses to adapt to the sudden and extreme demands of caring for pediatric

patients, as the COVID-19 outbreak has put enormous strain on hospitals, with frontline nurses being the most severely affected.

- It is important for health care systems and nurse leaders to understand the emotional and physical experiences of pediatric nurses, to support and protect their nurses, and to recognize these needs and experiences as they prepare for future public health emergencies, especially when a transition of role is warranted.

Limitations of the study

A qualitative study should be conducted through relatively long face to face interviews in order to obtain a stronger rigor of data, but in this study, the data was collected in a short time. Besides, because of the urgent situation and to reduce the risk of infection for both the interviewee and interviewer, the data was collected via phone interviews.

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Effect of High Fidelity Simulation Based Training Program on Nursing Students' Performance, Self-efficacy and Confidence regarding Prevention of Postpartum Hemorrhage

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Abstract

Background: Postpartum Hemorrhage (PPH) is an obstetric complication that is lead to maternal morbidity and mortality. Training nursing students to prevent and manage PPH is a fundamental principle of risk management. Using high-fidelity simulation at nursing colleges can bridge the gap between theory and practice by using all learning domains. **The aim of this study**: was to determine the effect of high-fidelity simulation-based training program on nursing students' performance, self-efficacy and confidence regarding prevention of PPH. **Subjects and method**: the study was conducted in two **Settings**; **(1)** Clinical obstetric laboratory skills for academic third year at Faculty of Nursing, Tanta University and **(2)** Labor unit in obstetric department at Tanta University Hospital. **Subjects:** A cluster random sample of 60 nursing students in the third academic year who fulfilled the inclusive criteria was included in the study and was divided into two groups; each of them consisted of 30 students. **Four tools** were used for data collection; **Tool (I):** A structured interview schedule, comprised of two parts as follows; **Part I:** Socio-demographic characteristics of nursing students. **Part II:** Students' knowledge regarding PPH. **Tool (II):** Students' performance observational checklist contained two parts as following; **Part I:** Prevention of atonic PPH during the third stage of labor and **Part II:** Prevention and management of PPH of atonic PPH during fourth stage of labor. **Tool (III):** Self-efficacy Scale. **Tool (IV):** Modified self-confidence measurement scale. **Results:** Students' knowledge**,** performance, self-confidence, as well as self-efficacy regarding prevention and management of PPH were higher after using high fidelity simulation-based training program. **Conclusion and recommendations:** The use of high fidelity simulation in teaching improved the nursing students' three domains of learning; knowledge, skills, and attitude for prevention and rapid effective nursing response for managing PPH. Therefore, high-fidelity simulation training programs and refreshing courses should be incorporated in the basic nursing educational curriculum as well as for maternity nurses to improve their knowledge, practice, self-efficacy, and confidence.

Keywords: Postpartum haemorrhage, Simulation, Performance, Self-efficacy, Self-confidence.

Introduction

Childbirth is a life-changing event for most women and families all over the world, but it is associated with great risks, disability and even death for some mothers and newborns. Every year, nearly 600 000 women worldwide between the age of (15-49) die due to complications from pregnancy and childbirth. The four major causes of maternal deaths are obstetric hemorrhage, infections, hypertensive disorders and obstructed labor [1]. Obstetric hemorrhage is the most common and dangerous complication of childbirth. It can be broadly categorized as antepartum hemorrhage and postpartum hemorrhage (PPH). PPH is a potentially life-threatening obstetric emergency associated with both the vaginal birth (2-4%) and the cesarean birth (6-7%) as a consequence of the third stage of labor [2].

According to the World Health Organization (WHO), PPH is the common leading cause of maternal morbidity and mortality worldwide. Globally, 35% of maternal deaths are associated with PPH. In Egypt, the maternal mortality ratio associated with PPH accounts 45 deaths per 100,000 live births in 2014 [3]. Ministry of Health and Population in Egypt reported that PPH is responsible for 19.7% of all maternal deaths [4]. PPH is commonly defined as blood loss exceeding 500 ML

following vaginal birth and 1000 ML following cesarean birth. Definitions vary; however, the diagnosis of PPH is subjective and often based on inaccurate estimates of blood loss [5]. The American College of Obstetricians and Gynecologists (ACOG) defines Primary PPH as accumulative blood loss greater than or equal to 1000 ML or blood loss accompanied by signs or symptoms of hypovolemia within 24 hours after the birth process including the intrapartum loss regardless of the route of birth[6]. On the other hand, secondary PPH is defined as bleeding in excess of normal lochia after 24 hours and up to 6 weeks postpartum. Secondary PPH is less common than primary PPH. It affects 1-3% of all deliveries. The etiologies of primary PPH are classically divided into four different categories, known as the four T's – Tone (70%), Trauma (20%), Tissue (10%), and Thrombin (1%) [5,7-10]. The prevention and treatment of PPH can be a life-saving and considered as the vital steps towards improving the health of women during childbirth. Maternity nurses and obstetricians need to be engaged in ongoing simulation training in developing and maintaining update knowledge, vigilant clinical competencies skills, and proper accurate clinical judgments based on universal guideline protocol for the early detection and critical nursing management

in a timely manner. Consequently, maternity nurses can save the life of women, who are clinically deteriorating as a result of PPH [11-14].

Clinical teaching is a hallmark of nursing education. It provides an opportunity for nursing students to apply, practice, and develop problem solving, critical thinking, decision-making and communication skills, as well as improves their legal and ethical issue [15, 16]. Simulation-based learning is one of the innovative teaching strategies that have increasingly incorporated in clinical nursing education. It is the most important trend in nursing education today as a way to move from learning to doing. It is a teaching and learning strategy aims to replicate real-life experience to develop students' knowledge and skills within a safe environment. Nursing education mandates the use of clinical simulation and facilities to assure that learners have adequate knowledge and skills of clinical background required for transition from student to professional practitioner [17,18]. The level of simulation fidelity is based on the degree to which the simulation imitates reality. High fidelity human patient simulators are computerized full body interactive mannequins that mimics interaction with students to control the simulated clinical setting [19].

The use of high-fidelity simulation in clinical education has many benefits. It provides an opportunity for nursing students to practice nursing skills before engaging in clinical practice, thereby assuring that they have the knowledge to be confident in providing safe and effective care. Self-confidence is conceptually defined as trusting the soundness of one's own judgment and performance. On the other hand, self-efficacy is commonly defined as the belief in one's capabilities to achieve a goal or an outcome. Students with a strong sense of efficacy are more likely to challenge themselves with difficult tasks and be intrinsically motivated. Furthermore, the interactive nature of simulation motivates students and promotes better learning that allows students to understand more, remember longer, be more successful in the evaluation and improve clinical performance of nursing students [17]. Maternity nurses are the frontline health care providers multifaceted with responsibilities to improve women health, decrease morbidity and mortality associated with PPH and save the mother's life. Maternity nursing students are the future maternity nurses who will assume this responsibility [1, 20]. So, the aim of this study is to determine the effect of high fidelity simulation based training program on nursing students' performance, self-

efficacy and confidence regarding prevention of PPH.

Aim of the study

The aim of this study was to determine the effect of high fidelity simulation based training program on nursing students' performance, self-efficacy and confidence regarding prevention of postpartum hemorrhage.

Research Hypothesis

The nursing students who receive high fidelity simulation based training program are expected to have better knowledge, clinical performance and high level of self-efficacy and confidence than those who didn't receive it.

Subjects and Method

Study design:

Experimental study design was used in this study. Such design fits the nature of the study, in which the researcher tried to determine the effect of high fidelity simulation based training program on nursing students' performance, self-efficacy and confidence regarding prevention of PPH. The comparison was done between two groups; study group and control group.

Setting:

The study was conducted in two settings; **(1)** Clinical obstetric laboratory skills for academic third year at Faculty of Nursing, Tanta University which contained high fidelity simulator (SimMom) equipment and symbols. **(2)** Labor unit in obstetric department at Tanta University Hospital where the students' basic obstetrical routine clinical training course was conducted.

Subjects:

According to the equation of power analysis, the study compromised of cluster random sample of 60 nursing students in the third academic year, Faculty of Nursing, Tanta University. Those students whose training were through the period of first semester 2019 at the first previously mentioned setting. The calculation of sample size was by using Epi-Info software statistical package that based on type I error (α) 5% and power of the test 90%. The students were selected randomly from the previously mentioned setting according to the following inclusion criteria:

1. Male or female students.
2. Third academic year nursing students (Obstetric and gynecological semester).
3. Willing to participate in the study.

They were divided into two equal groups; **(1) Study group:** consisted of 30 students who received both theoretical part through powerpoint presentation by the researcher in addition to the students' basic obstetrical routine clinical training course as well as

simulation based training program about prevention of PPH using high fidelity birthing simulator "SimMom". **(2) Control group:** consisted of the other 30 students who received both theoretical part through powerpoint presentation by the researcher as well as the students' basic obstetrical routine clinical training course about prevention of PPH.

Tools of data collection: to achieve the aim of the study the following tools were used:

Tool (I): A structured interview schedule; comprised of two main parts as follows: **Part I: Socio demographic characteristics of nursing students** as age, sex, residence, and previous simulation training program participation.

Part II: Students' knowledge regarding PPH; It included 20 questions related to the following items; definition, causes, risk factors, signs & symptoms, classification, complications, nursing management and evidence based guidelines for prevention and treatment of PPH.

The scoring system of knowledge was developed by the researcher and categorized as follows: Correct and complete answers were scored as (2), Correct and incomplete answers were scored as (1) and Incorrect answers or don't know were scored as zero (0).

The total score was ranged from (0 - 40). The total score of knowledge was summed up and categorized as follows**:**

- **Good knowledge:** 75-100%   (for total score 30 - 40)
- **Fair knowledge**: 50- to less than 75% (for total score 20 - 29).
- **Poor knowledge**: 0- to less than50% (for total score 0 -19).

Tool (II): Students' performance observational checklist: This tool was adapted by the researcher guided by Health Service Executive (2016) [20] and World Health Organization (2018) [21]. It included data related to prevention and management of atonic PPH. It was contained in two parts as following:

Part I: Prevention during third stage of labor that included active management of the third stage of labor (administration of a uterotonic drug, controlled cord traction, and uterine massage); emptying urinary bladder and also avoidance of prolonged labor. In addition, proper bearing down; proper timing for episiotomy; applying perineal support as well as avoidance of fundal pressure; and finally exploration/examination of the birth canal, placenta and membranes.

Part II: Prevention and management of PPH during immediate post-natal period (fourth stage of labor): (a) Prevention of PPH comprised of

careful/close observation in the fourth stage of labor; fundal examination and bladder assessment; in addition routine use of ecbolics after delivery; as well as early breast feeding. (b) Management of PPH included the estimation of the amount of blood loss; assessment of general condition of the parturient woman; good communication/call for help; and resuscitation and drug administration in PPH. In addition, the initial measures to stop/control bleeding (external bimanual uterine massage, internal bimanual uterine compression, and abdominal aortic compression); health education (counseling the woman on self-care); as well as evaluation and documentation.

The total scoring system of performance skills was developed and adapted by the researcher and categorized as follows: Correct and competently done were scored as (3), Correct and incompetently done were scored as (2), and Not done were scored as (1).

The total score was ranged from (114-342). The score of each item of performance skills was summed up and converted into percent score as follows:

- Satisfactory performance: 60 - 100% for total score (251-342).

- Unsatisfactory performance: 0 - to less than 60% for total sore (114-250).

Tool (III): Self-efficacy Scale: This tool was developed and adapted by the researcher from Schwarzer and Jerusalem (1996) [22] and Rimm and Jerusalem (1999) [23] and was used to assess students' sense of perceived self-efficacy in the training program regarding prevention of PPH. Self-efficacy rating scale was as the following: Not at all true were scored as (1), Hardly true were scored as (2), Moderately true were scored as (3) and Exactly true were scored as (4).

The total score of self-efficacy scale was developed by the researcher. It was ranged from (12- 48). The total score of self-efficacy was summed up and categorized as follows:

- Positive perception: 60 - 100% for total score (34-48).

- Negative perception: 0 - to less than 60% for total score (12-33).

Tool (IV): Modified self-confidence measurement scale: This tool was adapted from the National League for Nursing (2012) [24] by AbdElhakm and Elbana 2018 [25] and used by the researcher to measure how confident students feel about their skills when they participate in the training program regarding prevention of PPH.

The self-confidence scale was consisted of 7- items measured on a three-point Likert scale as follows:

Agree answers were scored as (3), Uncertain/or (neither agree nor disagree) answers were scored as (2), and Disagree answers were scored as (1).

The total score was ranged from (7-21). The score of self-confidence measurement scale was summed up and converted into percent score as follows:

- Confident: 60-100% (for total score 16-21).

- Not confident: 0- to less than 60% (for total score 7-15).

Method

Administrative approval:

Official permission for carrying out the study was obtained from the responsible authority before conducting this study through official letters from the Faculty of Nursing Tanta University.

Developing the tools:

Four tools were developed and used in this study after reviewing recent literature; **1)** a structured interview schedule, **2)** Students' performance observational checklist, **3)** General Self-efficacy Scale, and **4)** Modified self-confidence measurement scale. The interview sheet was reviewed by supervisors of thesis. Then, they were translated and tested for content and construct validity by a jury of 5 experts

in the related field and modifications were carried out accordingly. Tool's reliability was tested using appropriate statistical test. The tools were used by the researcher to collect data of the present study.

Ethical consideration:

All students who were approached to participate in the study were informed orally about the purpose of the study, confidentiality of information and the right to withdraw from the study at any time if desired. Students who agreed to participate in the study were asked to give their written informed consent.

The pilot study:

A pilot study to test the clarity, feasibility and applicability of the different items of the study tools was carried out before the actual study on 10% of the sample (6 students), 3 students (study group) and 3 students (control group) in the third academic year, Faculty of Nursing, Tanta University and whose training was through the period of first semester 2019 were selected. The necessary modifications, rephrasing, and some additional terms were done by the researcher before the actual study. Data obtained from the pilot study were excluded from the current study data.

The actual study (field work):

– Data were collected through a cluster random sample of 60 students over a period of six months from the beginning of August 2019 to the end of January 2020 from academic third year at Faculty of Nursing, Tanta University.

– **The study was conducted through four phases***:*

   Assessment phase (Pre-test):

– It was conducted at the start of August 2019 in clinical obstetric laboratory skills for academic third year at Faculty of Nursing, Tanta University which contained high fidelity simulator (Sim Mom) equipment and symbols.

– The researcher introduced herself and explained the aim of the study to all the students (study & control group) who were approached to participate in the study.

– After all students given their informed written consent, the researcher used **(Tool I)** to assess socio-demographic characteristics and knowledge of the study and control groups regarding PPH. It was explained to the students, so they were able to fill it by a self-report on an individual basis in the presence of the researcher prior to the theoretical teaching sessions for both groups. The students recorded the answer in tool I in about 10 minutes and returned it back to the researcher.

– Students were asked to perform clinical skills procedure regarding prevention and management of atonic PPH before program implementation that was assessed and filled by the researcher using **Tool (II)**, time taken to perform steps was about 10-15 minutes for each student.

– Then the researcher used **(Tool III & Tool IV)** for the measurement of perceived self-efficacy and confidentially among students regarding their skills about prevention and management of PPH. It was explained to the students and filled by a self-report on an individual basis. It was conducted for about 10 minutes.

– Depending on the results of pre-test questionnaire of knowledge and performance, contents of simulation based training program were prepared and revised by 5 experts in the related field.

   Planning phase:

– **Program development phase:** High fidelity simulation based training program was developed by the researcher based on results of assessment phase (pre-test) and after a thorough review of literature.

**Program objectives*:* The main objectives of this program were*:*

1. The students' knowledge will be improved regarding PPH.
2. The students would be able to perform/apply active management of the third stage of labor for the prevention of PPH.
3. The students would be able to perform/apply management of atonic PPH.
4. Perceived self-efficacy and confidentially of students would be increased about their skills regarding prevention and management of PPH.

Program content: High fidelity simulation based training program was entailed two main parts:

1. **Theoretical part**: It was planned based on the training program objectives and students assessment needs guided by relevant literature. The theoretical part included general knowledge regarding PPH (definition, causes, risk factors, signs & symptoms, classification (primary and secondary PPH), complications, nursing management, and also evidence based guidelines for prevention and treatment of PPH). It was provided by the researcher for the two groups (study & control group).

2. **Clinical part**: It was included high fidelity simulator (SimMom simulator) and PPH scenarios that prepared by the researcher based on extensive review of recent relevant literature and tested for content validity by a jury of 5 experts in the related field. It was provided by the researcher only for the study group.

Implementation phase:

– **The study group**: The first 30 students were assigned randomly into 5 subgroups; each subgroup contained 6 students for the purpose of demonstration. High fidelity simulation based training program with its two main parts (theoretical and clinical part) was conducted over three consecutive days/week; one day for each subgroup in clinical obstetric laboratory skills for academic third year at Faculty of Nursing by the researcher after completion of basic obstetrical routine clinical training course of the students. The program was implemented through three sessions (one session for the theoretical part and two sessions for the clinical part). The time of each session was ranged between 30 to 45 minutes.

– **The high fidelity simulation based training program sessions** were as the following:

Session (1): Orientation, expectation and an overview of postpartum hemorrhage:

− The aim of this session was to provide a brief orientation to the students of the study group about the educational environment, needed equipment, learning objectives of the high fidelity simulation training program, sessions and also their expectation of each session.

− The theoretical part about PPH also, was offered by the researcher to each subgroup through powerpoint presentation. It provided the students with the basic knowledge about PPH (definition, causes, risk factors, signs & symptoms, classification, complications, nursing management, and also evidence based guidelines for prevention and treatment of PPH). It was followed by the researcher demonstration of nursing assessment of early detection and prevention of PPH (assessment of history, risk factors, and selected laboratory studies that may predispose to PPH and also the clinical /physical examination (general & local exam) to confirm signs & symptoms of PPH by using SimMom simulator.

Session (2): Nursing skills of active management of the third stage of labor:

− **The aim of this session** was to provide students of the study group with performance skills of active management of the third stage of labor for the prevention of PPH that included (step 1: Administration of uterotonic drug, step 2: Controlled cord traction, and step 3: Uterine massage).This was followed by simulation training with the proper scenario through demonstration & re-demonstration of students' performance skills using high fidelity SimMom simulator.

Session (3): Nursing management of atonic PPH:

− The aim of this session was to provide students of the study group with performance skills of management of atonic PPH which included {Careful observation of 4th stage of labor through general and local examination; estimation of the amount of blood loss; good communication between the multi-disciplinary team/call for help; resuscitation and drug administration; initial measures to stop/control bleeding (uterine massage, bimanual uterine compression, and abdominal aortic compression); health education for the woman on self-care as well as

evaluation and documentation of all procedures}. This was followed by demonstration and re-demonstration of students' performance skills using high fidelity SimMom simulator.

Debriefing/feedback: Immediately, following the simulation, the researcher conducted debriefing session by, assessed students' needs, feedback and if there were any more questions.

- **The control group**: The other 30 students were assigned randomly into 5 subgroups; each subgroup contained 6 students. *The theoretical part about PPH*; was given by the researcher to each subgroup through powerpoint presentation. It was conducted over three consecutive days/week; one day for each subgroup in Clinical Obstetric Laboratory Skills.

- On the other hand, students in the control group already had the clinical procedures book (basic clinical course) included the preventive measures of PPH as part of basic obstetrical routine clinical training course.

- Both the control and the study groups were received the basic lectures and clinical training course regarding the preventive measures of PPH of the third year that planned by the obstetric and gynecological nursing department

at the faculty of nursing, Tanta University.

Evaluation phase (Post-test):

 Immediate Follow up:

- It was conducted at August 2019 immediately after implementation of high fidelity simulation based training program for both (study & control) groups.

- The researcher used the same previously mentioned assessment tools (**Tool I**), and (**Tool II**) to evaluate students' knowledge and performance regarding prevention and management of atonic PPH on SimMom simulator at the clinical obstetric laboratory skills for academic third year at Faculty of Nursing.

- Students' perceived self-efficacy was also, assessed using self-efficacy scale (**Tool III**) and self-confidence measurement scale (**Tool IV**) which measures how confident students about the skills they practiced regarding prevention and management of PPH.

After one month follow up:

- It was conducted after one month from implementation of high fidelity simulation based training program (from October 2019 to

January 2020) for both (study & control) groups.

– **Students' knowledge** regarding PPH was assessed using (**Tool I**)**.** It was distributed to be filled by the students. It was conducted for about 10 minutes.

– **Students' performance** regarding prevention of atonic PPH at one month follow up was evaluated by the researcher on real parturient women at labor unit in obstetric department at Tanta University Hospital that was conducted through their daily clinical training course.

– The researcher arranged with the students daily through telephone call the time of the presence and admitted parturient women at the hospital. This was conducted after the end of their daily clinical training at morning/or afternoon shifts until the predetermined sample size were collected.

– The parturient women who were presented at labor unit in obstetric department at Tanta University Hospital at the time of data collection were taken and included in the study.

– The researcher introduced herself and the student to each parturient woman and explained the aim of the study. The parturient woman who agreed to participate in the study was asked to give their consent orally.

– Students' performance was observed and assessed by the researcher two times on each real parturient woman: First, during active management of third stage using (**Tool II**). The time needed for each student to complete the performance observational checklist (**Tool II, Part I**) ranged between 10-30 minutes according to the duration of 3rd stage of labor for each parturient woman. Second, the student assessment during 4th stage of labor two hours after delivery (**Tool II, Part II**; **a**).

– After the student had applied the preventive measures of PPH on real parturient women during active management of third stage of labor at labor unit. The students' performance of management of atonic PPH (**Tool II, Part II; b)** was observed and assessed by the researcher on SimMom birthing simulator at the clinical obstetric laboratory skills for academic third year at Faculty of Nursing due to

lack of atonic PPH cases at hospital.

– **Students' perceived self-efficacy (Tool III**) and **self-confidence (Tool IV**) regarding prevention and management of PPH were also evaluated by self-report on an individual basis in the presence of the researcher. Time taken was about 10 minutes.

– After completion of the evaluation of the effect of simulation on students' knowledge, performance, self-efficacy and confidence regarding prevention and management of PPH, comparison between the control group and the study group has been done.

Data analysis:

– The collected data were organized, tabulated and statistically analyzed using SPSS software (Statistical Package for the Social Sciences, version 19, SPSS Inc. Chicago, IL, USA) [26].

Results

Table (1): Shows distribution of student's socio-demographic characteristics. It was evident that the mean age of the study group was 30.63±0.72 years corresponding to a mean age of 20.80±0.75 years among the control group with a total mean age of 20.80±0.75 between both study and control group. It was also, noticed that three quarters (75%) of the studied students were female. They constitute slightly more than four fifth (83.3 %) in the study group and 66.7% in the control group. The table also reveals that (53.3% and 66.7% respectively) of the study and control group were from rural areas. Moreover, it was observed that the majority (80.0%) and more than three fifth (63.3%) respectively of the study and control groups did not attend any simulation training programs. While 20% of students among the study group had participated in previous simulation training programs compared to 36.7% in the control group. It is also found that nasal suction and mental imagery training program were the most reported simulation program attended by (66.7% and 81.8% respectively) of the study and control group.

Figure (1): Illustrates distribution of student's total score level of knowledge regarding PPH before, immediately, and one month after implementation of the training program (study and control groups). It was noticed that none of students within the study and control groups exhibited good level of knowledge regarding PPH before implementation of training program. While (13.3% and 86.7% respectively) of the study group had fair and poor level of knowledge regarding

PPH compared to (6.7% and 93.3% respectively) among the control group. On the other hand, the vast majority (90.0% and 93.3% respectively) of the study group immediately and one month after implementation of the training program had good level of knowledge compared to slightly more than half (53.3%, 56.7% respectively) among the control group.

Table (2): Presents distribution of student's according to their total mean score of performance regarding prevention and management of atonic PPH before, immediately and one month after implementation of the training program (study and control group). It was observed that there was no significant difference between the study and control groups before implementation of the training program in their mean scores of performance of all studied items regarding prevention and management of atonic PPH (3rd stage of labor and immediate post-natal prevention of PPH, as well as management of PPH) (P = 0.427). In contrast, there were statistically significant differences between the two groups immediately and one month after implementation of the training program (P = 0.0001*, and P = 0.0001* respectively). Moreover, this table demonstrate that the mean total score of study group performance regarding prevention and

management of atonic PPH before, immediately, and one month after implementation of the training program were (154.83±34.54, 339.37±3.47, and 340.60±1.19 respectively) with statistically significant difference (P = 0.0001*), compared with (148.50±26.20, 274.57±50.58, and 258.43±43.12 respectively) among the control group with significant difference (P = 0.0001*).

Figure (2): Illustrates distribution of the student's total score level of self-efficacy regarding prevention and management of atonic PPH before, immediately, and one month after implementation of the training program (study and control group). As regard to students' total self-efficacy score level; it was noticed that 100% of both study and control group had negative perception of their self-efficacy before implementation of the training program. On the other hand, the majority (83.3% and 90.0% respectively) of the study group had positive perception of their self-efficacy immediately and one month after implementation of the training program compared to (0.0%, and 3.3% respectively) among the control group.

Figure (3): Exhibits distribution of the student's total score level of self-confidence regarding prevention and management of atonic PPH before, immediately, and one month after

implementation of the training program (study and control group). As regard to students' total score level of self-confidence; it was noticed that 100% of both study and control group were not confident about their skills before implementation of the training program. On the other hand, the majority (80.0% and 96.7% respectively) of the study group revealed self-confidence immediately and one month after implementation of the training program compared to (3.3%, and 10.0% respectively) among the control group.

Figure (4): Demonstrates the **correlation** of students' total knowledge score, and total self-efficacy score regarding prevention and management of PPH immediately after implementation of the training program. A significant positive correlation is observed between the study group total score of knowledge and total score of self-efficacy immediately after implementation of the training program (r = 0.744, P = 0.0001*).

Figure (5): Illustrates the correlation of students' total knowledge score, and total self-confidence score regarding prevention and management of PPH immediately after implementation of the training program. A

significant positive correlation is observed between the study group total score of knowledge and total score of self-confidence immediately after implementation of the training program (r = 0.543, P = 0.0001*).

Figure (6): Exhibits the correlation of students' total performance score, and total self-efficacy score regarding prevention and management of PPH immediately after implementation of the training program. A significant positive correlation is found between study group total score of self-efficacy and total score of performance immediately after implementation of the training program (r = 0.519, P = 0.003*).

Figure (7): Shows the correlation of students' total self-efficacy score, and total self-confidence score regarding prevention and management of atonic PPH immediately after implementation of the training program. A significant positive correlation is found between study group total score of self-confidence and total score of self-efficacy immediately after implementation of the training program (r = 0.498, P = 0.007*).

Table (1): Distribution of the student's socio-demographic characteristics among study and   control group (n=60)

Socio-demographic Characteristics	Students in the third academic year(n=60)						χ^2 P
	Study group (n=30)		Control group (n=30)		Total (n=60)		
	N	%	N	%	N	%	
Age years:							
20-	15	50.0	9	30.0	24	40.0	3.000
21-	11	36.7	13	43.3	24	40.0	0.223
22	4	13.3	8	26.7	12	20.0	
Range	20-22		20-22		20-22		
Mean±SD	30.63±0.72		20.97±0.76		20.80±0.75		
t-test	1.740						
P	0.087						
Sex:							
Female	25	83.3	20	66.7	45	75.0	2.222
Male	5	16.7	10	33.3	15	25.0	0.136
Residence:							
Rural	16	53.3	20	66.7	36	60.0	1.111
Urban	14	46.7	10	33.3	24	40.0	0.292
Previous participation in simulation training program:							
No	24	80.0	19	63.3	43	71.7	2.052
Yes	6	20.0	11	36.7	17	28.3	0.152
If yes, name of training program:							
Nasal suction	*1*	*16.7*	*1*	*11.1*	*2*	*11.8*	*0.500*
Mental imagery	*1*	*16.7*	*1*	*11.1*	*2*	*11.8*	*0.781*
Nasal suction & mental imagery	*4*	*66.7*	*9*	*81.8*	*13*	*76.5*	

Study group = students who received basic obstetrical routine clinical training course as well as simulation based training program using high fidelity simulator "SimMom".
Control group = Students who received only basic obstetrical routine clinical training.
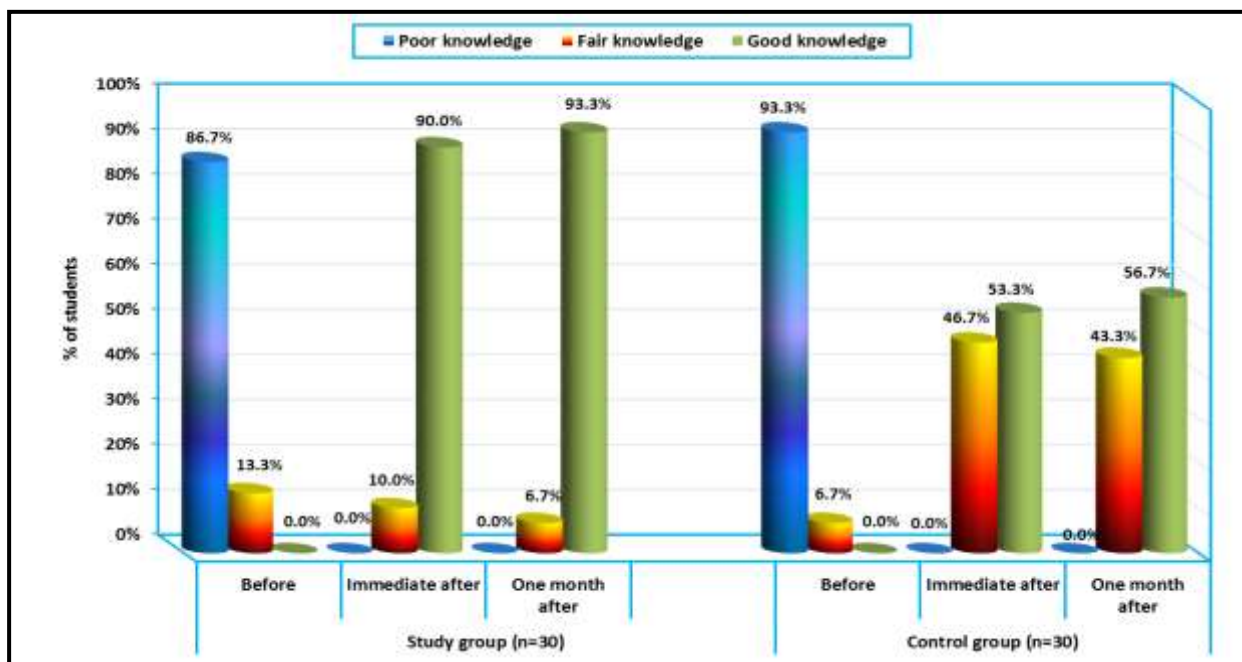
Figure (1): Distribution of student's total score level of knowledge regarding PPH before, immediately, and one month after implementation of the training program among study and control group (n=60).

Table (2): Distribution of student's according to their total mean score of performance regarding prevention and management of atonic PPH before, immediately and one month after implementation of the training program among study and control group (n=60)

Students' performance main sub-items regarding prevention and management atonic PPH (Each item was scored 1-3)	No. of items (Score)	Mean score of students' performance before, immediately and one month after implementation of the training program						Z value P (Study vs Control group)		
		Study group (n=30)			Control group (n=30)					
		Before program	Immediately after program	One month after program	Before Program	Immediately after program	One month after program	Before program	Immediately after program	One month after program
I. Performance score of 3rd stage of labor prevention of PPH	41 (41-123)	43-89 54.7±14.59	115-123 121.43±1.85	121-123 122.43±0.77	42-106 52.33±18.98	54-123 101.07±26.36	65-121 96.30±23.6	0.397 0.693	4.221 0.0001*	5.995 0.0001*
χ^2 value (P)		64.184 (0.0001*)			46.585 (0.0001*)					
I. Performance score of immediate post-natal (4th stage of labor) prevention of PPH	19 (19-57)	20-48 27.60±7.57	52-57 56.53±1.01	55-57 56.70±0.53	20-53 25.63±9.53	30-57 46.50±10.94	32-55 42.73±10.74	0.885 0.380	5.003 0.0001*	7.111 0.0001*
χ^2 value (P)		66.946 (0.0001*)			43.474 (0.0001*)					
III. Performance score of immediate post-natal (4th stage of labor) management of PPH	54 (54-162)	60-101 73.17±13.33	157-162 161.40±1.19	159-162 161.47±0.82	56-128 70.53±21.90	68-162 127.00±35.79	95-160 119.40±29.38	0.563 0.576	5.261 0.0001*	7.839 0.0001*
χ^2 value (P)		65.291 (0.0001*)			35.975 (0.0001*)					
Total mean score of performance regarding prevention and management of PPH	114 (114-342)	128-236 154.83±34.54	324-342 339.37±3.47	338-342 340.60±1.19	121-196 148.50±26.20	166-342 274.57±50.58	198-331 258.43±43.12	0.800 0.427	7.000 0.0001*	10.432 0.0001*
χ^2 value P		60.915 0.0001*			58.476 0.0001*					

*Statistically significant (P<0.05)   Data are presented as range, Mean±SD
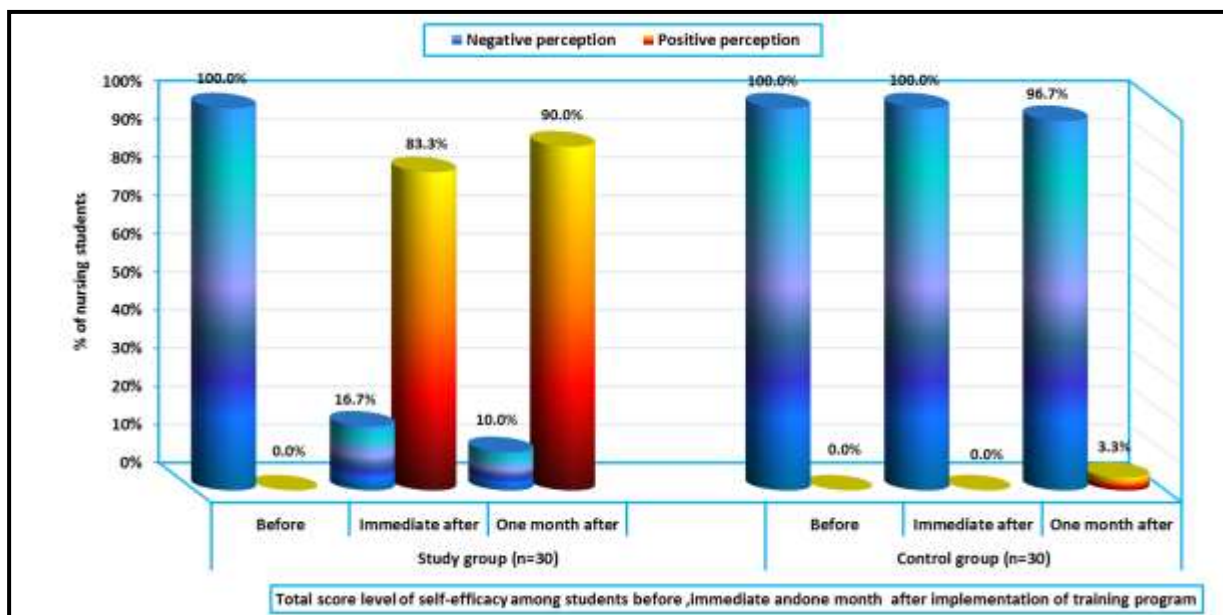
Figure (2): Distribution of the student's total score level of self-efficacy regarding prevention and management of atonic PPH before, immediately, and one month after implementation of the training program among study and control group (n=60)
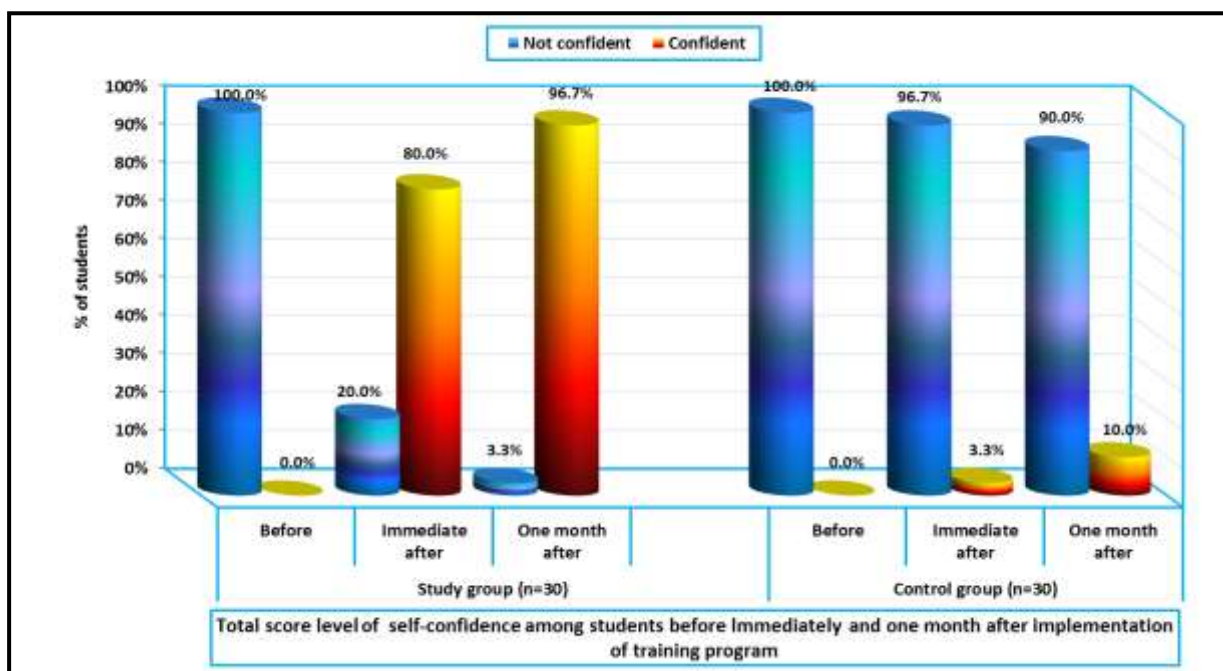
Figure (3): Distribution of the student's total score level of self-confidence regarding prevention and management of atonic PPH before, immediately, and one month after implementation of the training program among study and control group (n=60)
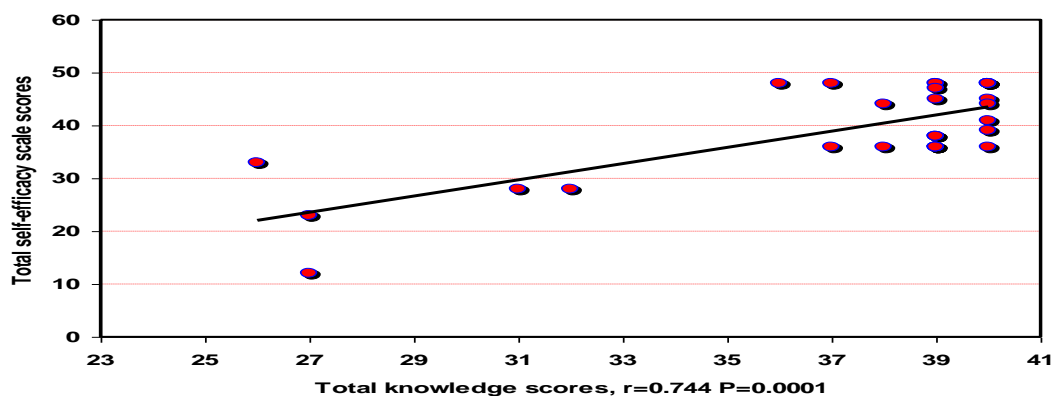
Figure (4): Correlation of students' total knowledge score, and total self-efficacy score regarding prevention and management of PPH immediately after implementation of the training program among study group (n=30)
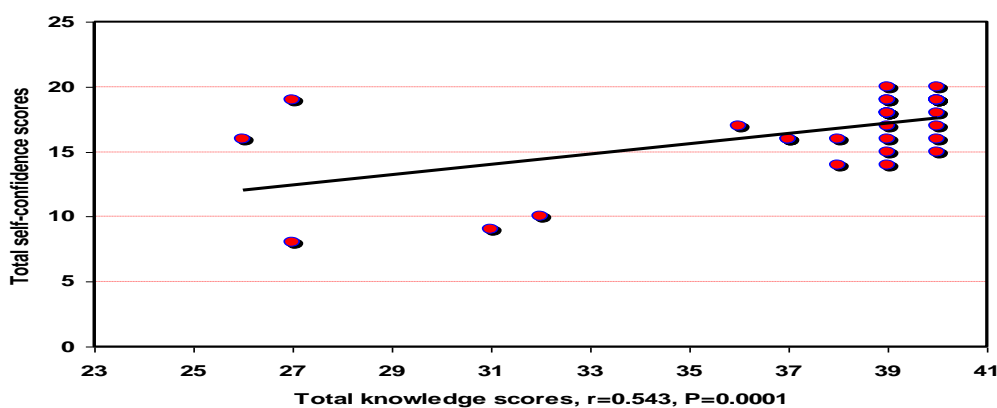
Figure (5): Correlation of students' total knowledge score, and total self-confidence score regarding prevention and management of PPH immediately after implementation of the training program among study group (n=30)
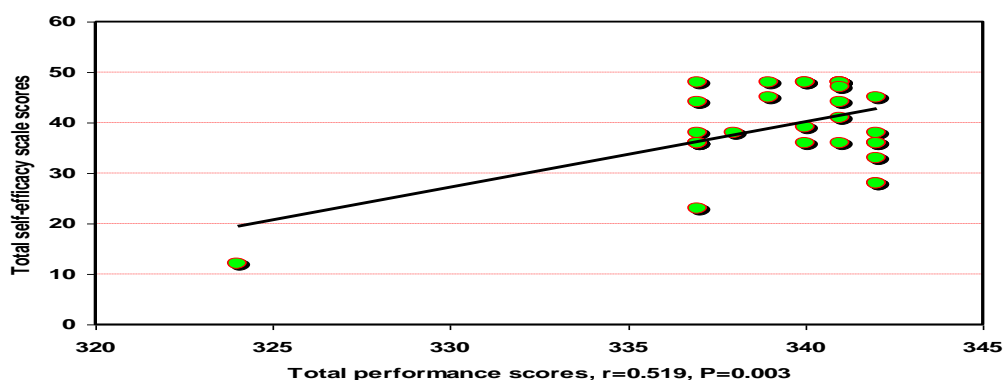
Figure (6): Correlation of students' total performance score, and total self-efficacy score regarding prevention and management of PPH immediately after implementation of the training program among study group (n=30)
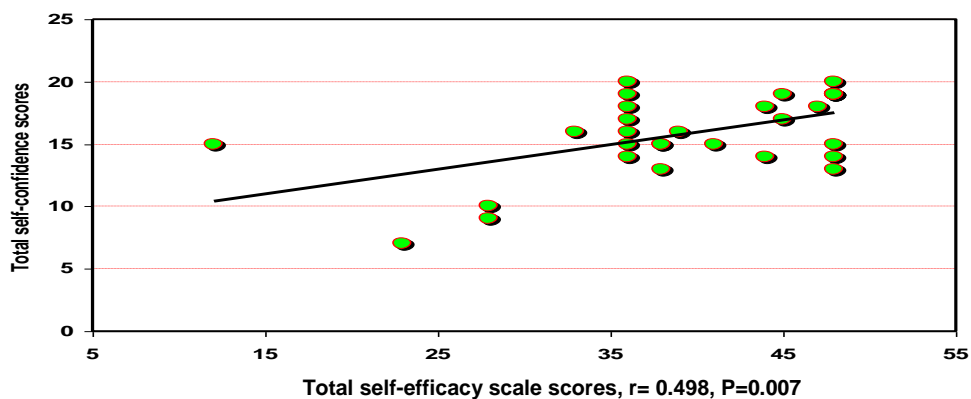
Figure (7): Correlation of students' total self-efficacy score, and total self-confidence score regarding prevention and management of PPH immediately after implementation of the training program among study group (n=30)

Discussion

Training of health professionals including nursing staff and students to prevent and manage PPH is a fundamental principle of risk management. In higher education, students need to be prepared for their future profession by improving their competences of critical thinking, problem solving, communication self-efficacy, self-confidence and collaboration. In addition to the domain-specific knowledge and skills to be able to make professional decisions and implement solutions for obstetrical emergencies including PPH. However, nursing students are unable to acquire high quality experiences because of difficulties to reach cases in real health care setting. So simulation of the actual clinical emergency situation including PPH can be a kind of solution to enhance student nurses' abilities needed for safe and effective women care. Simulation-based learning offers a wide range of opportunities to practice complex skills in higher education and to implement different types of frames to facilitate effective learning [17,27,28]. Therefore this study was conducted to determine the effect of high fidelity simulation based training program on nursing students' performance, self-efficacy and confidence regarding prevention of PPH.

Concerning, the study subjects socio-demographic characteristics; it is found that half of the students in the study group and slightly less than one third in the control group were 20 years old, while nearly two fifth of the students in the study group were 21 years old. In addition, three quarters of studied students (both groups) were females. Slightly more than one half and more than two thirds respectively of students among both the study and control groups were from rural areas. Moreover, it is observed that the majority and nearly two thirds respectively of the students within the study and control groups did not attend any simulation training programs, except nasal suction and mental imagery training programs were attended by slightly more than two thirds of the study group and slightly more than four fifth of the control group. Specifically, all students who participated in this study did not attend any previous PPH simulation training program and there was no significant difference between the study and control group regarding their socio-demographic characteristics. Thus, the two groups are homogenous and the difference between them is not significant and related to the dependent variables.

Concerning students' knowledge regarding prevention and management of PPH, the finding of the present study revealed that **before implementation of**

the training program; the majority of the studied students (both groups) had poor level of knowledge regarding PPH with no significant difference between them (P=0.393). It is not astonishing; it can be attributed to the fact that they did not attend any previous simulation training program regarding PPH. Moreover, the students' first interaction with the obstetrical and gynecological curriculum was in the third year of their academic basic educational years of nursing in which the study was conducted. This result is in agreement with **Abd-Elhakm and Elbana (2018)[25] and Mahmoud (2019)[29]** who found that there was no statistically significant differences between the study and control groups regarding their knowledge level before implementation of the training program (P = > 0.05). On the other hand, these results are in contrast with **Zaky (2017) [30]** who Indeed that around two-thirds of the study subjects (both groups) had fair and good level of general knowledge regarding PPH before implementation of the training program. This dispensary may be attributed to the fact that the participants within the previous study were postgraduate staff nurses and may attended periodic didactic courses of obstetrics emergency including PPH within previous five years of their nursing study.

Pertaining to immediately after implementation of the training program; the current study figured out that there was a significant improvement in the studied students' total score level of knowledge regarding PPH, but the improvement was higher in the study group who received basic obstetrical routine clinical training as well as simulation based training program using high fidelity simulator than the control group who received only the basic obstetrical routine clinical training on static manikin with a statistically significant difference between them (P= 0.002*). These findings were expected, as both groups received a theoretical part for PPH and reviewed the content during their educational interventions and also are consistent with what is found in the literature by **Hayden et al (2014)[31]**. Where the educational intervention should result in an increase in students' knowledge base. Moreover, the study group exposed to life-like simulated experiences using different learning activities during simulation based training sessions such as simulation scenarios, and debriefing instead of memorizing knowledge learned in the classroom.

This finding is supported by **Podlinski (2016)[32]** who showed that the most studied nursing students who completed a

post simulation survey on emergency preparedness, stated that simulation increased their knowledge in both handling and emergency. In addition, **Abd-Elhakm and Elbana (2018)**[25] implied a significant improvement of nurses' knowledge immediately post intervention (P= <0.001*). Again the study finding is also in coherent with the findings of the current study carried out by **Tawalbeh (2020)** [33]. The results clarified that knowledge and confidence in the experimental group are significantly enhanced immediately after implementation of the simulation training program compared to the control group (P= < 0.001*). The similarities between the previous studies and the finding of the present study can be explained by **Ameh et al. (2012)** [34] , **Kumar et al. (2016)**[35] and **Zaky (2017)**[30], who concluded that simulation-based teaching is an effective educational strategy which can further help in improvement of knowledge and skills, as well as increase confidence to recognize and manage obstetric emergencies on live patients and to avoid drawbacks in real life scenario at the working environment.

In relation to students' total score level of knowledge regarding PPH one month after implementation of the training program; the current study clarified that the study group still had higher scores in comparison with the control group who received only

basic routine clinical training with a statistically significant difference (P= 0.001*). This finding matches with the study of **Mahmoud (2019)**[29], who reported that there was a statistically significant difference between the study and control groups in their knowledge level one month after the simulation training (P= 0.000*). The similarity between the previous study and the finding of the present study may stem from the fact that; before exposure to actual clinical areas, the process of simulating a scenario to practice various responses and actions in a safe and real life situation is extremely effective. Thus, the high fidelity simulation helps to improve students' learning and increase the retention of their knowledge through active simulation learning. Moreover, **Roma (2018)** [36] and **Tawalbeh (2020)** [33] mentioned that simulation is an effective way of retaining knowledge and improving skills which affects the cognitive domain of learning by moving the learner beyond the basic memorization to actual application and understanding.

The findings of the present study revealed that the mean total score of students' performance regarding prevention and management PPH was approximately similar in both groups before the intervention with no statistically significant difference (P=0.427). While, there was

significant enhancement in the mean total score of students' performance immediately and one month after implementation of the training program among the study group more than the control group with highly significant difference between them (P=0.0001*). This is in line with **Abusaad and Ebrahem (2015)** [37] study in Mansura, Egypt. They found that the total mean score of clinical performance of the studied nurses in the traditional group (demonstration on a static manikin) was (8.96±4.90) approximately similar to simulated group (demonstration on a high fidelity simulator) (7.10± 4.03) pre the intervention with no statistical difference (P>0.05) and this score improved both immediate and three months after the intervention among both group, especially among the study group than the control group with highly significant difference between them (P=0.0001*).

The results of the current study also in accordance with the findings of Indian study by **kumar et al. (2016)** [35]. Their study results revealed that both groups showed no difference pre-lecture observational checklist. However, a significant improvement was observed post-training compared to pre-training (Group1: 7.60±1.26 & Group2:4.20±1.01), with greater improvement among the

simulation group. This could be attributed to the fact that, simulation environment aids to stimulate visual, auditory and tangible learning methods. It enables students to attain essential skills through trial and error, in a safe/harmless and non-threatening environment as mentioned by **Alanazi et al. (2017)** [38] and **Roma (2018)** [36] . On contrast with the present study, a quasi-experimental research study was done by **Bowling and Underwood (2016)** [39]**.** They revealed significant increase in students' skill performance between the pre-test and post-test for both groups, but not between the groups. The dispensary with the finding of the present study may be due to different educational program, different educational environment infrastructure, and/or different socio-demographic factors of the study subjects.

Regarding students' total self-efficacy score level; the findings of the current study donated that approximately all students among both study and control groups had negative perception of self-efficacy regarding prevention and management of atonic PPH before implementation of training program. On the other hand, almost all of study group had positive perception of self-efficacy immediately and one month after implementation of the training program in comparison with the control group with a

statistically significant difference (P =0.0001*). This finding is consistent with **Demirel et al. (2020)** [40] in their study which conducted at the midwifery department of a state university in Turkey. Significant difference in the self-efficacy scores was observed before and after the program among the study subjects, as the students exhibited improved self-efficacy levels after the program (P = <0.05). Again, **Kimhi et al. (2016)** [41] instituted that simulation increased self-confidence/self-efficacy equivalently if placed either before or after clinical experience. Additionally, **Lee et al. (2016)** [42] found that, simulation-based training has a positive impact on improving self-efficacy. Specifically, high-fidelity simulation is more effective than medium-fidelity simulation in improving nursing students' self-efficacy.

Moreover, the study conducted by **Gamal El-deen (2015)** [43] on nursing students at Tanta University revealed that the study group reported increased self-efficacy after simulation based training than traditional teaching. The harmony with the previous studies may be attributed to categories that may affects and contributes individual's self-efficacy development. These categories include; students' previous experience; academic self-efficacy; as well as students' emotional responses after

completion their task. All the previously mentioned categories were incorporated/enhanced through high fidelity training program during simulation and debriefing sessions [44]. On the contrary, **Saied (2017)** [45] findings indicated that the total self-efficacy of the students was lower after the simulation session. The dispensary with the finding of the present study may be due to the use of different self-efficacy tool not specific to prevention/management of PPH simulation.

As regards students' total score level of self-confidence; the findings of the current study reported that before the implementation of training program, all students among both study and control groups were approximately not confident about their skills regarding prevention and management of PPH. On the other hand, immediately and one month after implementation of the training program there was a significant difference (P =0.0001*) between the study and control groups as almost all of students among the study group become more confident about their skills.

These findings match with **Thomas and Mackey (2012)** [46] and **Leila et al. (2013)** [47]. They pointed out that a significant increase was observed in the level of nursing students' confidence, who were

trained using simulation compared to the traditional training group. Additionally, the findings of the present study are identical with studies conducted by **Tawalbeh (2020)** [33]**, Kim et al. (2016)** [48]**, Karacay and Kaya (2020)** [49]**,** and **Stoodley et al. (2020)** [50]. They reported that simulation significantly improved confidence applying critical care nursing practices. Moreover, **Haddeland (2020)** [51] results declared that self-confidence level increased among undergraduate nursing students who receive a tailored educational program that includes high-fidelity simulations compared to other students who did not attend them. The harmony of previous studies with the current study may stem from that the supervised simulation experiences served to decrease associated fears of failure with live patients. Furthermore, **Ayed and Khalaf (2018)** [52] mentioned that high fidelity simulation in nursing education provides diverse learning experiences, promotes decision-making and clinical judgment, self-satisfaction and self-confidence for conducting safe practice.

On the other hand, these results are in contrast with a study conducted by **Oliveira et al. (2021)** [53]. They concluded that both the traditional teaching strategies (lecture classes and skill training) and the simulation promote student satisfaction and self-confidence in learning with no statistical significance in the learning satisfaction subscale (P= $\geq$ 0.05) and learning self-confidence (P= $\geq$ 0.05). They generate that, simulation and traditional strategies can be mutually and cumulatively used in nursing education to enhance satisfaction and self-confidence. This dispensary with the findings of the current study may be due to- that the type of simulation models used in the previous studies ranged from low- to mid-fidelity. These simulators missed to imitates reality when compared with the high fidelity simulator used in the present study.

Concerning the correlation of total scores of students' knowledge, performance, self-efficacy and self-confidence regarding prevention and management of PPH; the present study documented that significant positive correlation is observed between study group total score of self-efficacy and total score of knowledge regarding prevention and management of PPH immediately implementation of the training program (r = 0.744, P = 0.0001*), as well as between students' total score of self-confidence and total score of knowledge immediately after implementation of the training program in the study group (r = 0.543, P = 0.0001*P = 0.0001*). This finding is supported by **Abd-Elhakm and Elbana (2018)** [25]

whose study showed that there was a positive association between studied nurse's total knowledge, and self-confidence scores at post intervention phase. In the same line **Lindsey and Jenkins (2013)** [54] reported a significant positive association between knowledge and performance and self-confidence. They also revealed that simulation training permits opportunities to capture the essential knowledge and skills for developing self-confidence. Consequently, nurses integrated their knowledge and experience in creating accurate clinical judgments and thus, their self-confidence is increased.

 Additionally, the present study showed a significant positive correlation between study group total score of self-efficacy and total score of performance regarding prevention and management of PPH immediately after implementation of the training program (r= 0.519, P = 0.003*). This finding is in agreement with **Hsin-Hsin (2016)** [55], who reported that students in their study indicated greater self-efficacy in caring for patients after the simulation sessions. The similarity with the present finding could be explained by **Pinar et al. (2015)** [56], who mentioned that according to social cognitive theory, individuals with high self-efficacy have higher performance because self-efficacy plays a mediating role in relation to motivation, learning, and performance of the learner. Where, the approach learned in simulation may then be transferred to the clinical settings where student's practice. Moreover, in the present study; a positive correlation is found between study group total score of self-confidence and total score of self-efficacy regarding prevention and management of PPH immediately after implementation of the training program with a statistically significant relation (r= 0.498, P = 0.007*). This is compatible with a study conducted by **Saied (2017)** [45] who illustrated that the post simulation self-efficacy was positively correlated with self-confidence (r= 0.50, P = 0.001). As nursing students build skill sets during simulation sessions that transferred into clinical environments, and increased their self-efficacy and confidence as mentioned by **Oetker-Black et al. (2014)** [57].

Conclusion

Based on the findings of the present study, it can be concluded that the students' knowledge regarding PPH was higher after using a high fidelity simulation-based training program than the routine clinical training on a static manikin. In addition, there were significant improvements regarding most of the studied items of students' performance

regarding prevention and management of atonic PPH among nursing students immediately and also one month after the implementation of the training program. The progress was higher among students who had training using high fidelity simulation-based training program in comparison with the students who trained only on a static manikin. Moreover, the levels of students' self-confidence and self-efficacy were high after high fidelity simulation-based training program regarding prevention and management of PPH.

Recommendations

Based on the findings of the present study, the following recommendations are suggested:

− The use of high fidelity simulation-based learning in combination with the traditional teaching methods are essential for the enhancement of the students' self-efficacy and self-confidence, knowledge as well as skills acquisition level for prevention, early detection and rapid effective nursing response for management of PPH.

− Replication of this study on various topics related to nursing care provided to women at all branches in maternity and gynecological care.

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Association between Diabetic Nephropathy Grade and Quality of Life among Type II Diabetic Patients

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Abstract

Introduction: One of the most profound long-standing consequences of diabetes mellitus is diabetic nephropathy. In many countries, diabetes is proved to be the most frequent single cause of end-stage renal disease. ***Aim of the work***: analyze the association between diabetic nephropathy grade and quality of life among type II diabetic patients. ***Material and methods***: Quantitative descriptive study design applied on a purposive sample of 41 individuals with type II diabetes attended to the medical outpatient clinic in Menoufia University Hospital. ***Tools:*** Tool I- A structured interviewing questionnaire. Tool II- Assessment of the kidney function. Tool III- Kidney Disease Quality of Life. ***Results***: serum creatinine and blood urea nitrogen were increased, also the estimated glomerular filtration rate (eGFR) was decreased in individuals with type II diabetes as disease duration increase. The prevalence of diabetic nephropathy in the current work was high representing 56.1%. In addition increasing body mass index more than 25. Diabetic nephropathy was associated with all five HRQOL dimensions as patients in stage 3-kidney disease had lower scores than patients in stages 1 and 2. ***Conclusion***: The present data confirm that the most striking risk factors for diabetic nephropathy in the type II diabetes are BMI $\geq$ 25, diabetes duration, hypertension, age $\geq$ 50 years, and family history. ***Recommendation***: The current study recommended that urinalysis should be performed regularly as part of a screening program which is a preventive intervention to preserve the kidneys in diabetic patients and will detect individuals with nephropathy early.

*Key words***:** Diabetes mellitus, eGFR , diabetic nephropathy, kidney functions

Introduction

Diabetes mellitus (DM) and associated consequences have reached pandemic proportions, affecting the economy and health worldwide. Worldwide, the overall number of diabetic persons with is expected to rise from 415 million (8.8 %) in 2015 to 642 million (10.4 %) in 2040, with the most substantial changes likely to happen in the urban population of low- to middle-income countries (LMICs). Of these, type II diabetes accounts for over 90 % of individuals with diabetes. [1, 2]

DM and Diabetic Nephropathy (DN) are both global and public health problems, as Diabetic kidney disease (DKD) developed in 20–40%of diabetic patients. DN is a progressive renal disease that evolves over time, peaking after 10–20 years of diabetes. [3] DM has progressively overtaken chronic glomerulonephritis as the leading reason of kidney function loss. This implies that more individuals will suffer kidney impairment throughout their lives. [4]

The incidence of Diabetic Nephropathy as a cause of ESKD is increasing each year. DKD is characterized by increased urine albumin excretion or decline of a glomerular filtration rate (GFR), or both. The United States National Kidney Foundation 2002 guidelines had pointed that chronic kidney disease is for individuals having a glomerular filtration rate less than 60 ml/min/1.73 m^2 for a period exceeding three months (stage 3 to 5), or GFR more than 60 ml/min/1.73m2 (stage 1 to 2) in case of there is a clue regarding kidney damage. [5]

Moderate albuminuria is more frequent in type II diabetes than type I diabetes. Its prevalence rate affects between 21 and 39 %. Severe albuminuria has been found to occur in 3.0-20.5 % . The frequency of albuminuria has not altered over time but definitely varies among ethnic groups. [6, 7] Because individuals with type II diabetes mellitus often have several comorbidities, such as obesity and hypertension, renal damage may be evident before the initial visit to a doctor. As a result, chronic kidney disease may be present even when diabetes mellitus is diagnosed. [8]

The increasing identification of non-proteinuric diabetic chronic kidney disease may be attributed in part to improved glycaemic, lipid, and blood pressure management, the lower HbA1c levels are linked with lower albuminuria but not improved GFR. [9]

The stimulation of inflammatory promoters, suppression of antioxidant defense systems, and insulin resistance have all been related to the worsening of kidney disease in diabetic persons.

Furthermore, a prior research found that individuals with DN and DM had greater co-morbidities, as well as worse uremia and volume load tolerance. [7] As a consequence, these patients had to deal with greater limitations in their everyday lives and less social participation, and they needed dialysis sooner than non-diabetic patients. As a result of these variables, diabetic individuals with Diabetic Nephropathy have a greater number of unfavorable factors affecting their HRQOL. Detecting and treating early in diabetes can help to improve these patients' HRQOL, although the gradual loss of renal function and problems in other organs. [10]

One of the main objectives of modern medicine is health-related quality of life (HRQOL), which is suitable for Diabetic Nephropathy and patients with DM getting long-term therapy and care for their progressive and complicated diseases. Evaluating health-related quality of life and associated variables in patients with Diabetic Nephropathy and DM is critical for guiding health education and suitable personalized treatment. [11, 12]

At the level of disease prevention, increasing public awareness about diabetes and its associated risk factors as obesity and lack of exercise is essential and can support current institutional efforts. This can be achieved through collaborative work from all stakeholders such as the ministry of health (MOH) and universities in several ways such as including the publication of small Arabic booklets in plain language, Discussions, lectures, etc[13, 14]

Finally, to combat the increasing prevalence of diabetes, there is now an urgent need for a long-term national plan focusing on prevention, education, and a multidisciplinary approach. As well as monitoring the health services and evaluating them to ensure their influential role in reducing the burden of diabetes[10,13] CKD and DM interact, causing damage to the kidney as well as other organs such as the retina, cardiovascular, and neurological systems. [15] Furthermore, there was no reliable data in Egypt on the duration of DKD for patients with diabetes and its association to HRQOL. [13, 16] Therefore, the present research was intended to evaluate HRQOL in patients with Diabetic Nephropathy and DM, as well as to explore therelationbetween DM and HRQOL in patients with CKD stages 1 to 4. Early detection and treatment of glucose metabolism disorders in Diabetic Nephropathy patients by health care professionals will help to their good quality of life.

Significance of the study

Diabetes prevalence and incidence are rising globally, with a fast progression observed in middle- and low-income nations. According to the latest version of the International Diabetes Federation (IDF) about 9.2 % aged 18–99 years (39.9 million people) in the Middle East and North Africa Region (MENA) had diabetes in 2017. The number of diabetics in the Middle East and North Africa area is predicted to be greater than double by 2045 (International Diabetes Federation, 2017). [17]

Egypt is an Arab country with a high incidence of microalbuminuria and one of the nations with the greatest prevalence of macroalbuminuria. The prevalence of diabetes 20% in urban Egypt. Diabetic albuminuria prevalence 21% in Egypt. According to an Egyptian cross-sectional research,42 % of diabetes patients had nephropathy, 22% had peripheral neuropathy, 0.8 % had foot ulcers, and 5% were blind. [18]

DM and its consequences have involved significantly to the burden of death and morbidity globally. [19] The Worldwide burden of disease study 2015 recognized DM as the 9th main reason for decreased life expectancy and revealed that high fasting blood glucose (FBG) level was the third most frequent worldwide risk hazard for morbidity-adjusted life years in 2015[20]

Quality of life (QoL) indices are strong determinants of person's ability to sustain long-term health, well-being, and productivity. Enhancing QoL has been identified as a key objective of all healthcare treatments, including diabetes control regimens. As a result, it is critical to understand the degree of health-related QoL (HRQoL) of diabetes patients in relation to the significant expenditure from the national budget. Identifying variables linked with poor HRQoL may aid policymakers in allocating funding and implementing initiatives to enhance QoL[21]

Diabetes affects patients' QoL, according to research from the Middle East and the rest of the globe, although the degree of impairment varies. All the studies advocated for enhancing diabetes patients' health and HRQoL in order to minimize the social and individual expenses associated with diabetes treatment [22-25]

Despite the fact that diabetes is currently the main cause of CKD, the HRQOL of Egyptian patients with CKD and diabetes is widely unclear. [16] Therefore, the current research was designed to investigate therelationbetween DM and HRQOL in patients with CKD stages 1 to 4.

Aim of the study

This study was intended to analyze the association between diabetic nephropathy grade and quality of life among type II diabetic patients.

Research questions

The following research question was tested

- Is there an association between diabetic nephropathy grade and quality of life among type II diabetic patients?

Material and Methods

Study Design:

Quantitative descriptive study design applied on a purposive sample to achieve the aim of this study

Study setting

 The study conducted at medical outpatient clinic at Menoufia University Hospital, Egypt.

Study period

The study conducted at a specific time (between the dates of 1 January to 30 April 2021).

The study population

Men and Women who have type II (DM) and visited/registered /attending medical outpatient clinic in Menoufia University Hospital at the specified time for the study.

Sampling

In this study a purposive sample was used. According to outlined several criteria for inclusion and exclusion, it was selected to obtain a representative sample .

A total of 41 subjects with type II diabetes were eligible for the study and attended the medical outpatient clinic in Menoufia University Hospital during the period of study were screened.

Inclusion criteria: Ages $\geq$ 30 years old, Men and Women who have type II DM.

Exclusion criteria: Patients with evidence of kidney disease before onset of diabetes.

Data collection tool

The following tools were used to collect data:

Tool I- A structured interviewing questionnaire: It was developed by the researchers and contained socio-demographic and medical data sheet of the patients; it included characteristics of the study participants as gender, age, marital status, level of education, history of medical disease, type of diabetes, duration of diabetes, past history, and family history.

Tool II- Assessment of the kidney function: it was included the following lab investigations as kidney function tests that include (serum creatinine, blood urea nitrogen, and uric acid) were assessed by Cobas c 311 analyzer Operator's Manual from The clinical chemistry analyzer Cobas c 311 5th generation of routine and

dedicated chemistry experiences (cobas® 4000 analyzer series). [26]

Estimation of GFR:

By using The CKD-EPI (Chronic Kidney Disease Epidemiology Collaboration) equation which was developed by Levey et al., (2009) [27] The CKD-EPI equation, expressed as a single equation, is: $eGFR = 141 * min (Scr/\kappa,1)^{\alpha} * max(Scr/\kappa, 1)^{-1.209} * 0.993^{Age} * 1.018$ [if female] $* 1.159$ (if black) Scr is serum creatinine (mg/dL), κ is 0.7 for females and 0.9 for males, α is -0.329 for females and -0.411 for males, min indicates the minimum of Scr/κ or 1, and max indicates the maximum of Scr/κ or 1. The median estimated GFR was 94.5 mL/min per 1.73 m^2.

Staging of kidney disease

Staging of chronic kidney disease was applied according to the National Kidney Foundation's Kidney Disease Quality Outcome Initiative (KDOQI) guidelines for the classification and evaluation of CKD. [28]

Stage 1 kidney disease: eGFR ≥ 90 mL/min/1.73m^2

Stage 2 kidney disease: eGFR= 60-89 mL/min/1.73m^2

Stage 3 kidney disease: eGFR = 30-59 mL/min/1.73m^2

Stage 4 kidney disease: eGFR= 15-29 mL/min/1.73m2

Stage 5 kidney disease (kidney failure): eGFR < 15 mL/min/1.73m^2)

Estimation of BMI according to Nuttall, 2015 [29]

-BMI: Weight (kg)

Height (m2)

- Normal weight = 18.5–24.9   Overweight = 25–29.9   Obesity = 30 or greater

Tool III- Kidney Disease Quality of Life Instrument (KDQOL)

The KDQOL™-36 questionnaire version was applied to evaluate HRQOL in CKD patients; it was found to be a straightforward, effective, and trustworthy tool [30, 31] The scale has five dimensions: symptoms and complaints (S), kidney disease effects (E), renal disease burden (B), SF-12 physical function (PCS), and SF-12 mental function (M) (MCS). PCS is a flexible measure for assessing HRQOL in both patients and healthy people. [32] The original scores were linearly transformed to a 0–100 scale. A higher score indicates greater HRQOL. Scoring System of Kidney Disease Quality of Life Instrument (KDQOL) 5 scores ranging from 0 to 4 are given for Standardized answer options of none, mild, moderate, severe, and extreme, where none equal zero that, meant there was no difficulty to the extreme which meant the worst condition equal 4.

Validity of the tools:

All tools were tested for their content validity by three experts in the field of Medical-Surgical Nursing, Faculty of Nursing, Menoufia University, and two experts in the field of medical laboratories. Modifications were done accordingly.

Validity of Kidney Disease Quality of Life Instrument (KDQOL)

The questionnaire was reviewed for content validity by a five of experts in the field of medical-surgical nursing.

Reliability of tools:

Reliability was estimated among 10 participants by using the test-retest method with two weeks apart between them. Then Cronbach alpha reliability test was done through the SPSS computer package. It was 0.80 for interviewing questionnaire with the following Cronbach alpha reliability values for its parts.

Reliability of Kidney Disease Quality of Life Instrument (KDQOL):

The instruments' internal consistency was verified by the researchers. It is the administration of the same instruments to the same individuals under identical circumstances on one or more times. The Cronbach's alpha for the questionnaire was 0.9. The accuracy of all instruments shows excellent reliability.

Pilot Study:

To assess the stability of the responses, a pilot research was performed on 10% (5 patients) of the study sample that was not included in the sample. It was carried out to evaluate the readability of the questionnaire. It also assisted in estimating the time required to finish the surveys**.**

Ethical considerations:

This study was approved by the Ethical Committee for scientific research review in Menoufia University- faculty of nursing. Official permission was obtained from the hospital manager and head nurse of outpatient clinics.

All participants were given written and verbal information about the research. Participants completed a written permission form and were assured of confidentiality prior to the interviews. They were told that their participation in this research was entirely voluntary and that they may withdraw at any moment without cause. The research's objective was explained to them, and they were reassured that any information collected would be kept private and utilized solely for the purposes of the study.

Data Collection procedure: -

Preparation of data collection tools was carried out over a period of one month after extensive literature of review.

The tools were translated into Arabic format.

An official permission was obtained from the director of Menoufia University Hospital to take the agreement to collect the data.

- Data was collected in every Saturday according the hospital director who detected this day for data collection.

- All the participants were interviewed and assessed individually in the outpatients' clinics.

- The researchers collected all the interviewed participants who existed in this day of interview in groups.

The group was ranged from 3 to 5 participants.

The researchers explained the purpose of the study to the sample at the start of the interview and informed them that participation in the study was voluntary, any data given was confidential and used only for research purposes, and any participant could withdraw from the study at any time without giving a reason.

The interview lasted 15 minutes to fill the first part of the questionnaire (demographic characteristics and assessment them for BMI and Kidney Disease Quality of Life Instrument (KDQOL).

Thereafter, blood samples were taken for the kidney function tests by cobas c 311 and Estimation of GFR.

Other medical data were taken from patient file.

Statistical Analysis: -

The numerical data were collected and computerized using the SPSS program (Statistical Package of Social Science) program, version 22.

The association between (renal function tests) and (duration of diabetes mellitus) were analyzed using the chi-square to detect the significances between variables of the study.

Descriptive analyses and frequency tables were carried out using this program for all variables. The data description was done in the form of mean ± standard deviation (SD) for normally distributed quantitative data.

-Significance difference was considered when the P-value was ≤ 0.05 at a confidence interval of 95.%

- Odds ratio (with 95% confidence interval) and p-value of 0.05 or less were used as a level of significance for evaluating the risk factors of diabetic nephropathy. The association between different variables and the dimensions of HRQOL was assessed by univariate linear analysis. Multivariable regression analysis was carried out to determine factors associated with HRQOL.

Results

A total of 41 subjects with type II diabetes who presented at the outpatient clinic throughout the study period were screened. None of the subjects included had evidence of kidney disease.

Table (1) showed the relation between fasting blood glucose (FBG), socio-demographic data, and risk factors. About 56.1% of patients were female, with no significant difference between males and females in the level of FBG. About 75.6% of patients were more than 50 years old while 24.4% less than 50years with no significant difference in the level of FBG between the two groups. About 87.8% of patients had a body mass index (BMI)more than or equal to 25 while 12.2% had BMI less than25, those with high BMI had a significant increase in FBG more than other groups. About 58.8% of patients were hypertensive and had FBG higher than normotensive patients, representing 41.5% of patients. About 73.2% of patients had a positive family history with a higher level of FBG than other groups with negative family history, representing 26.8% of the study group.

Table (2) showed Kidney function tests in diabetic patients based on the duration of diabetes. It was observed that mean serum creatinine was increased with the duration of diabetes in both males and females, but it still within the normal reference range.

Mean serum creatinine showed a significant increase in male more than female in diabetic patients less than 5 years of diabetes (0.83±0.02 and 0.67±0.12) respectively. Also, there was a significant increase in males more than females in patients with 5-10 years of diabetes (0.99±0.22 and 0.69 ± 0.13) respectively.

Mean serum blood urea was increased with the duration of diabetes in both males and females, but it still within the normal reference range. It showed a significant increase in males more than females in diabetic patients more than 10 years of diabetes (6.30 ±1.02 and 5.30 ± 0.90) respectively.

Mean serum uric acid was increased with the duration of diabetes in both males and females, but it still within the normal reference range. It showed a significant increase in males more than females in diabetic patients less than 5 years diabetes (4.16±1.27 and 3.31±1.11) respectively.

Table (3) showed a negative correlation between estimated glomerular filtration rate (eGFR) and duration of diabetes as eGFR is decreased with increased duration of diabetes. Also, eGFR is decreased with an increase in age in diabetic patients. It was (104.90 ± 11.88) and (103.85 ± 14.07) in patients < 50 years with duration of

diabetes <5years and >10years respectively. In patients ≥ 50 years, it was (92.25 ± 12.90) and (89.51 ± 10.89) with a duration of diabetes <5years and >10years respectively. It was also observed a significant decrease in eGFR in patients of ≥ 50 years compared with patients < 50 years with duration of diabetes less than 5 years and more than 10 years.

Table (4) showed a high rate of diabetic nephropathy (proteinuria) as the calculated prevalence was 56.1%. This study demonstrated staging of kidney disease in diabetic patients with proteinuria based on eGFR according to National Kidney Foundation's Kidney Disease Quality Outcome Initiative (KDOQI) guideline. It was observed that there was a positive correlation between the stage of kidney damage and the duration of diabetes. Diabetic patients with less than 5 years duration were stratified into 50% had stage 1 kidney damage, about one third had stage 2, and 16.7 had stage 3 kidney damage. Those with a duration of 5-10 years of diabetes were stratified into33.33% had stage 1 kidney damage, 33.33% had stage 2, and 33.34%.7 had stage 3 kidney damage. Finally, Diabetic patients with more than 10 years duration had the worst prognosis, being stratified into 20% with stage 1 kidney damage, 20% with stage 2, and 60 with stage 3 kidney damage.

Table (5) showed the presence or absence of proteinuria in diabetic patients based on the duration of diabetes as a risk factor. It was observed a significant positive correlation between the presence of proteinuria and the duration of diabetes. In patients with duration < 5 years, the frequency was 55.6% have no proteinuria while 44.4% had proteinuria. In patients with duration 5-10 years, the frequency was 25% have no proteinuria while 75% had proteinuria. In patients with duration > 10 years, the frequency was 16.7% have no proteinuria while 83.3% had proteinuria.

Table (6): showed the number and frequency of subjects with proteinuria concerning other risk factors. It was observed that proteinuria was highest in diabetic patients with age ≥ 50 years presenting (43.90%) of all diabetic patients. Proteinuria was highest in female diabetic patients presenting (29.30%) of all diabetic patients. It was observed that there was a significant correlation between proteinuria and BMI with increasing frequency in patients with BMI ≥ 25 reaching (56.1%) of all patients. Also, hypertension affected greatly on diabetic patients with a significant correlation between proteinuria and hypertension reaching a frequency of (34%) in diabetic patients. Family history of diabetes had a significant impact on proteinuria as

patients with positive family history presenting (43.9%) had proteinuria of all diabetic patients.

Table (7): demonstrates relative risk (RR) and odds ratio (OR) for risk factors of diabetic nephropathy based on proteinuria.

Figure (1): is the forest plot for odds ratio (OR) and relative risk (RR) for DN in the sample of the study. Patients with BMI $\geq$ 25 was the most significant risk with OR being 7.08 (0.93-14.33). Duration of diabetes was the second significant risk factor with OR of 6.48 (3.26 – 12.2) and 3.75(2.08 – 6.80) for the duration >10 years and 5-10 years respectively. Patients with a positive family history had an OR (95%CI) of 1.8 (0.51 – 7.22) followed by hypertension and Age $\geq$ 50 years with OR (95%CI) of 1.56(0.46 – 5.50) and 1.39 (0.3309 – 5.804), respectively. The female gender showed the lowest risk for proteinuria, with OR (95%CI) of 0.69 (0.19 – 2.30).

Table   (8) indicates that diabetic nephropathy was associated with all five HRQOL dimensions (P < 0.05). For patients in Stage 3-kidney disease, their scores in the "symptoms and problems," "effects of kidney disease," and Burden of kidney disease had higher than patients in the other two stages, indicating more problems and a higher level of symptoms. However, for physical function and Mental Function dimensions, patients in Stage 3-kidney disease had lower scores than patients in the other 2 stages, representing a lower level of functioning and health.

Table   (9) indicates that, diabetic nephropathy was related to with dimensions of Effects of kidney disease and Physical Function in the subgroup of CKD stages 1 to 2, whereas associated with symptoms problems and Physical Function in CKD stage 3. Although multivariable adjustments attenuated the magnitude of the relation, the statistical significance was essentially unchanged. The magnitude of the relation for the dimension of Physical Function was a slightly weaker in CKD stages 1 to 2 than that in CKD stage 3 with the regression coefficients of − 1.80 and − 2. 39, respectively.

Table (1): Relation between fasting blood glucose (FBG), socio-demographic data and risk factors.

Variabeles		Type II Diabetes Patients (41) Fasting Blood Glucose (mg/dl) Reference range (70-99mg/dl)		P-value
Sex		**Male**	**Female**	0.719
	Count (%)	18 (43.9%)	23 (56.1%)	
	Mean FBG	177.95±60.66	185.77±75.79	
Age		**< 50 years**	**≥ 50years**	0.754
	Count (%)	10 (24.4%)	31 (75.6%)	
	Mean FBG	187.33±69.80	179.46±68.22	
BMI		**< 25**	**≥ 25**	0.020*
	Count (%)	5(12.2%)	36(87.8%)	
	Mean FBG	177.31±68.59	210.71±47.43	
Hypertension		**Normotensive**	**Hypertensive**	0.548
	Count (%)	17 (41.5%)	24 (58.5%)	
	Mean FBG	173.70 ± 47.32	186.83±79.8	
Family History		**-ve Family Hx**	**+ve Family Hx**	0.291
	Count (%)	11 (26.8%)	30 (73.2%)	
	Mean FBG	162.69 ± 59.20	188.24± 70.83	

*P value <0.05 (Significant)

Table (2): Kidney function tests in diabetic patients based on duration of diabetes.

Variables		Reference range	< 5 years	5-10 years	> 10 years	Significance between groups (P value)
Mean Serum Creatinine (mg/dl)	**Male**	0.20 – 1.50	0.83±0.02*	0.99±0.22*	1 ± 0.88	0.4
	Female		0.67±0.12	0.69 ± 0.13	0.73±0.30	0.8
Mean Blood Urea Nitrogen (BUN)	**Male**	2.76 – 8.07	4.37 ± 1.07	4.80±1.03	6.30 ±1.02*	0.2
	Female		4.35±1.02	4.48 ± 0.83	5.30 ±0.90	0.1
Mean Uric acid (mg/dl)	**Male**	2.4 – 7.0	4.16±1.27*	4.43±1.07	4.99±1.09	0.2
	Female		3.31±1.11	4.19 ±0.62	4.23±1.24	0.9

*P value <0.05 (Significant)

Table (3): Relation between estimated glomerular filtration rate (eGFR) and duration of diabetes mellitus in different age groups.

Variables	Reference range	< 5 years	5-10 years	> 10 years	Pearson correlation	Significance between groups (P value)
eGFR in patients < 50 years (mL/min/1.73m^2)	99-116	104.90 ± 11.88*	104.45 ±18.60	103.85 ± 14.07*	- 0.037	0.9
eGFR in patients ≥ 50 years (mL/min/1.73m^2)	75-93	92.25 ± 12.90	91.43 ± 8.32	89.51 ± 10.89	- 0.123	0.5

P value <0.05 (significant between age groups)

Table (4):Prevalence of different stages of diabetic nephropathy according to duration of diabetes based on presence of proteinuria

Variables	Total number of patients with proteinuria (23 , (56.1%))					
	Stage 1 kidney disease eGFR ≥ 90 mL/min/1.73m^2	Stage 2 kidney disease eGFR= 60-89 mL/min/1.73m^2	Stage 3 kidney disease eGFR = 30-59 mL/min/1.73m^2	Stage 4 kidney disease eGFR= 15-29 mL/min/1.73m^2	Stage 5 kidney disease (kidney failure) eGFR < 15 mL/min/1.73m^2	Pearson correlation, P value
< 5 years (12) No (%)	6 (50%)	4 (33.33%)	2 (16.67%)	0	0	0.351 0.1
5-10 years (6) No (%)	2 (33.33%)	2 (33.33%)	2 (33.34%)	0	0	
> 10 years (5) No (%)	1(20%)	1 (20%)	3 (60%)	0	0	

Table (5): Number and frequency of subjects with proteinuria according to duration of diabetes

Variable	< 5 years No (%)	5-10 years No (%)	> 10 years No (%)	X^2, P-value
No Proteinuria	15 (55.6%)	2 (25%)	1 (16.7%)	4.08*
Proteinuria	12 (44.4 %)	6 (75%)	5 (83.3%)	< 0.05
Total number	27 (100%)	8 (100%)	6 (100%)	(0.217)

*P value <0.05 (Significant)

Table (6): Number and frequency of subjects with proteinuria in relation to risk factors.

Variable		No Proteinuria 18 (43.9%)	Proteinuria 23 (56.1%)	Pearson correlation	P-value
Age	< 50	5 (12.20%)	5 (12.20%)	0.217	0.66
	≥ 50 years	13 (31.71%)	18 (43.90%)		
Sex	Male	7(17.1%)	11 (26.8%)	0.089	0.58
	Female	11 (26.8%)	12 (29.3%)		
BMI	< 25	4(9.8%)	1 (2.4%)	0.421	0.006 *
	≥ 25	13 (31.7 %)	23 (56.1%)		
Hypertension	Normotensive	9 (22%)	9 (22%)	0.130	0.04 *
	Hypertensive	9 (22%)	14 (34%)		
Family History	-ve family Hx	6 (14.6%)	5 (12.2%)	0.135	0.34
	+ve family Hx	**12 (29.3%)**	**18 (43.9%)**		

*P value <0.05 (Significant)

Table (7): Relative risk, odd ratio & 95% interval for diabetic nephropathy risk based on proteinuria.

Variable	Odds Ratio	Relative Risk	P-value, Fisher's exact test
Age ≥ 50 years	1.39 (0.33 – 5.80)	1.61 (0.65 – 2.57)	0.66
Female sex	0.69 (0.19 – 2.30)	0.85 (0.49 -1.50)	0.75
BMI ≥ 25	7.08 (0.93-14.33)	0.80 (0.54 -1.75)	0.0001*
Hypertension	1.56(0.46 – 5.50)	1.22(0.70 – 2.24)	0.53
+ve family Hx	1.8 (0.51 – 7.22)	1.32 (0.73 – 2.94)	0.34
DM Duration:5-10 yrs**	3.75(2.08 – 6.80)	1.69(1.33 – 2.19)	<0.0001*
DM Duration >10 yrs**	6.48 (3.26 – 12.2)	1.89 (1.51 – 2.42)	<0.0001*

*P value <0.05 (Significant)

** Related to diabetes duration < 5 years.
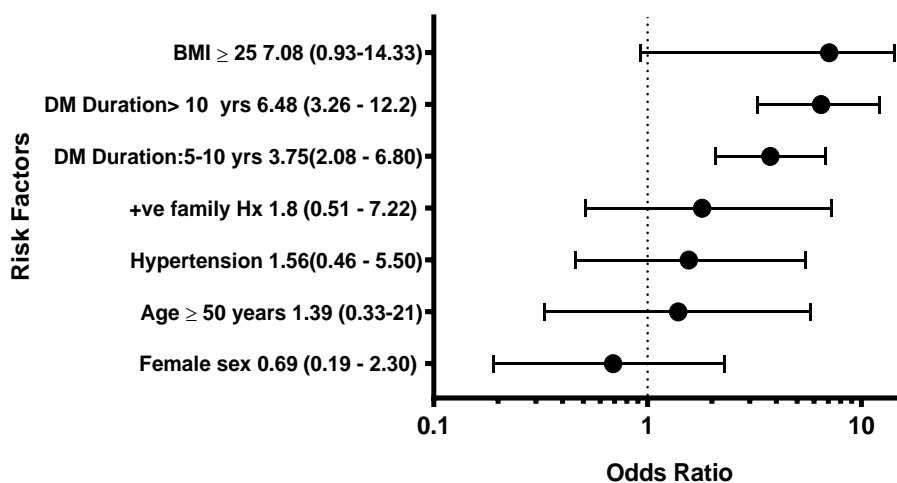
Fig. (1) :Forest plot for odds ratio & 95% confidence interval for diabetic nephropathy risk.

Table (8): Differences of health-related quality of life based on stages of diabetic nephropathy.

Variables	health-related quality of life					
	Stage 1 kidney disease eGFR ≥ 90 mL/min/1.73m²	Stage 2 kidney disease eGFR= 60-89 mL/min/1.73m²	Stage 3 kidney disease eGFR = 30-59 mL/min/1.73m²	Stage 4 kidney disease eGFR= 15-29 mL/min/1.73m²	Stage 5 kidney disease (kidney failure) eGFR < 15 mL/min/1.73m²	Pearson correlation, P value
Symptoms and problems #	85.86± 13.71	88.72 ± 11.53	90.50 ± 10.71	0	0	< 0.001[**]
Effects of kidney disease *	83.77 ± 14.81	85.70 ± 13.04	87.29 ± 12.49	0	0	< 0·001[**]
Burden of kidney disease *	48.85 ± 27.40	50.30 ± 28.20	51.72 ± 28.40	0	0	0·149
SF-12 Physical Function (PCS) *	44.39 ± 8.82	43.50 ± 9.19	40.40 ± 9.77	0	0	< 0·001[**]
SF-12 Mental Function (MCS) *	50.50 ± 9.07	50.12 ± 9.82	50.60 ± 8.85	0	0	0.269

Note 1: [*] The variables are numerical and statistics are Mean (Standard deviation), *P*-value calculated based on *one-way Anova* test.

Note 2: [#] The variables are numerical and statistics are Median (Interquartile range), *P*-value calculated based on Wilcoxon test. Note 3: [**] Statistically significant at 0.05.

Table (9) The linear regression between diabetic nephropathy and KDQOL[TM]-36 scales stratified by CKD stages

KDQOL[TM]-36 scales	CKD stage 1-2		CKD stage 3	
	univariate regression	multivariable regression[**]	univariate regression	multivariable regression[**]
Log transformed symptoms and problems (S)[†]	0.014	-0.0026	0.028[*]	0.015[*]
Effects of kidney disease (E)	-1.94[*]	-2.10[*]	-0.70	-0.52
Burden of kidney disease (B)	-4.63	-4.36	0.070	-0.35
SF-12 Physical Function (PCS)	-3.38[*]	-1.80[*]	-3.52[*]	-2.39[*]
SF-12 Mental Function (MCS)	-1.07	-1.14	0.32	0.42

Abbreviations: CKD=chronic kidney disease.

Note 1: [*]Statistically significant at 0.05.

Note 3: [†] The log transformation was performed by the formula: ln (175-score of symptoms and problems).

Discussion

Nephropathy is the most frequent reason for end-stage renal disease in type II diabetes, although the decrease in renal function varies greatly across people, and the predictors of kidney function loss early in the course of renal disease have not been recognized. Therefore, early identification of patients vulnerable for diabetic nephropathy (DN) is essential to intensify the treatment and modify associated risk factors. [33]

In the current study, It was noticed that female patients constituted a higher percentage than males, with no significant difference between males and females in FBG. Chukwu, Ezebuiro, Samue, and Nwachukwu (2013) [34] documented that females showed a higher incidence of DM than males. Females are more influenced by type II diabetes owing to less muscle, which prevents absorption of a given glucose load, and because they have high estrogen and progesterone levels, which are implicated in the decrease of whole-body insulin sensitivity. [35] In the present study, about 87.8% of patients had body mass index (BMI) ≥ 25 while 12.2% had BMI < 25, those with high BMI had a significant increase in FBG more than other groups. According to a research conducted by Zunt et al. (2018) [36] BMI was one of the causes that increased the

frequency of diabetes in nearly all nations. In the current study, about 41.5% of patients were hypertensive and had FBG higher than normotensive patients, representing 58.8% of patients. About 73.2% of patients had a positive family history with a higher level of FBG than other groups with a negative family history, representing 26.8% of the study group. According to Ein, Armstrong, and Vickers (2019) [37] diabetes individuals received the illness from either of their parents. Bommer et al. (2018) [38] discovered that type II diabetes was induced by a hereditary factor from a close family member and was linked to gene mutations passed down via the family's genetic line.

Results in the present study revealed a positive correlation between renal function tests in diabetics and duration of diabetes as serum creatinine and blood urea levels were increasing with the duration of diabetes. Inassi and Vijayalakshmy (2013) [39] reported similar results.

In the present study, there was a negative correlation between eGFR and duration of diabetes as eGFR is decreased with increased duration of diabetes. Differences in the rate of GFR decrease in individuals with type II diabetes and nephropathy have previously been reported in prior research, ranging from 0.36 mL/min/1.73m /year to

4.7 mL/min/1.73m /year in the Japanese population (Leehey, Kramer, Daoud, Chatha and Isreb, 2005). If hyperglycemia is not adequately managed, a higher baseline GFR is observed in the early stages of diabetes. [40] Furthermore, the majority of observational studies and meta-analyses have shown a substantial association between greater baseline GFR and subsequent accelerated GFR decrease in diabetic individuals. [41] In our study, we showed a decline in eGFR in patients with age more than 50 years compared with those less than 50 years. Lin et al., (2021) [42] found that elderly showed a substantially negative correlation with baseline eGFR; the average baseline eGFR declines by 0.50 ml/min/1.73 m2 when a patient's age increased by 1 year.

The current study presented a high rate of diabetic nephropathy (proteinuria) as the prevalence was 56.1%. Similar results were reported in a research that included participants from three Gulf countries: Bahrain, the United Arab Emirates, and Oman found that the total prevalence of albuminuria was 36%. In Bahrain, the prevalence was 42.5 %, 34.5 % in the UAE, and 29 percent in Oman. [43]

The current study showed a positive correlation between stage of kidney damage and duration of diabetes in which diabetic subjects over 10 years duration had the worst prognosis being stratified into 20% with stage 1 kidney damage, 20% with stage 2, and 60% with stage 3 kidney damage. The role of diabetes duration has been proven by the United Kingdom Prospective Diabetes Study (UKPDS), where about 25% of patients exhibiting microalbuminuria or deteriorating nephropathy after 10 years. [44] Our study revealed a significant positive correlation between proteinuria and the duration of diabetes. Inassi and Vijayalakshmy (2013) [39] stated that the development of low but abnormal proportions of albumin in the urine is the first clinical sign of nephropathy. They also verified that microproteinuria became more common as the duration of diabetes increased.

In the current work, It was noticed that proteinuria was highest in diabetic patients with age group $\geq$ 50 years presenting (43.90%) of all diabetic patients. Jitraknatee, Ruengorn, and Nochaiwong (2020) [45] observed that type II diabetic patients aged 56–65, 66–75, and >75 years had more than 2.8-fold, 5.4-fold, and 27.4fold higher adjusted ORs for CKD, respectively. Previous research found that older age was accompanying with a greater incidence of CKD in type II diabetic patients. [46]

The present study revealed that proteinuria was highest in female diabetic patients

presenting (29.30%) of all diabetic patients. This was in accordance with Yang et al.(2018) [46] who stated that males had a lesser rate of CKD than females. This could be clarified by the fact that female patients in our study were older. This was contradictory with Al-Rubeaan et al.(2014) [47] who claimed that Saudi males with type II diabetes had a greater prevalence of diabetic nephropathy, as has been found in other populations in comparable research. This may be explained by the fact that the estrogen hormone is essential for protection.

It was noticed that there was a significant correlation between proteinuria and BMI with increasing frequency in patients with BMI ≥ 25 reaching (56.1%) of all patients. Obesity was identified as a risk factor in the progress of nephropathy in a Chinese study of 264 individuals with confirmed DKD based on renal biopsy. [48]

Our results demonstrated that hypertension greatly affected diabetic patients, with a significant correlation between proteinuria and hypertension reaching a frequency of (34%) in diabetic patients. A previous meta-analysis shown that hypertension is strongly linked with the development of diabetic nephropathy. [49] Inassi and Vijayalakshmy (2013) [39] documented that the microvascular consequences of diabetes mellitus are responsible for a

significant percentage of the related morbidity and death.

Family history of diabetes had a significant impact on the presence of proteinuria as patients with positive family history presenting (43.9%) had proteinuria of all diabetic patients. Chen, Li, Yang, Zhong, and Zhuang, (2016) [50] highlighted the importance of genetic susceptibility to DN through the substantialrelationbetween positive family history of DN and diabetic nephropathy development. Previous research has shown a link between the genes on the chromosome and type II diabetes-related kidney disease. Furthermore, diabetes family history is polymorphic and strongly associated with NOS3 rs11771443 in DN, which has never been observed previously.

The forest plot showed BMI ≥ 25 to be the most crucial risk factor followed by the duration of diabetes. Al-Rubeaan et al., (2014) [47] showed that diabetes duration to be the most critical hazard factor, particularly more than15 years. This was the same result across ethnic groupings, as shown by research in Korea, India, and Taiwan. [51, 52, 53]

The study findings indicated that diabetic nephropathy was associated with all five HRQOL dimensions (P < 0.05). For patients in Stage 3-kidney disease, their scores in the "symptoms and problems,"

"effects of kidney disease," and Burden of kidney disease had higher than patients in the other two stages, indicating more problems and a higher level of symptoms. However, for physical function and Mental Function dimensions, patients in Stage 3-kidney disease had lower scores than patients in the other 2 stages, representing a lower level of functioning and health. which suggested that diabetic nephropathy patients with CKD suffered a more impaired HRQOL. Also DM was ascertained to be negatively correlated with HRQOL in CKD patients in this study. [11]

According to univariate linear analysis, DM was associated with the "symptoms and problems," "effects of kidney disease," and "SF-12 physical function" dimensions. DM was significantly related to the dimensions of "symptoms and problems" and "SF-12 physical function". The results were consistent with the results of other countries that indicated that DM was related to low HRQOL in North America (P < 0.05). [12] In the study conducted in North America in 2016, their results were similar to our results, regarding the differences in demographic and clinical characteristics between the diabetic and non-diabetic groups. Another study in Japan found that HRQOL was impaired by the presence of DM. [54]

In the stratified analysis, diabetic nephropathy was associated with the effects of kidney disease and Physical Function in the subgroup of CKD stages 1 to 2, while associated with symptoms problems and Physical Function in CKD stage 3. Although multivariable adjustments attenuated the magnitude of association, the statistical significance was largely unchanged. The magnitude of association for the dimension of Physical Function was a little weaker in CKD stages 1 to 2 than that in CKD stage 3 with the regression coefficients of − 1.80 and − 2. 39, respectively.

Inconsistent with these results,(Chen et al., 2020) [11] recorded that DM was negatively correlated with HRQOL scores in both categories, but the magnitude and dimensions and of correlation were diverse. In impaired kidney function stage associated with increased co-morbidities (stages 3 to 4), the association between DM and the quality of life was enhanced in 2 dimensions of "symptoms and problems" and "SF-12 physical Function". In contrast, the association between DM and the quality of life was declining in 1 dimension, "effects of kidney disease," which may attributed to the increasing unfavorable impacts of low eGFR and enhanced or worsened consequences of CKD on the quality of life.

Another research in North America found that HRQOL was lesser in diabetic individuals with CKD stages 3 to 5. Regardless of renal disease stage, DM permanently results in a poor quality of life to this category of patients. As a result, healthcare workers should pay greater attention to the treatment of diabetes to maximize the long-term HRQOL in the course of treatment of patients with CKD. Diabetes control should not be neglected particularly when eGFR decreases substantially. [55]

Conclusion

Diabetic nephropathy manifests clinically in a predictable manner, beginning with proteinuria and progressing to end-stage renal failure. Diabetic nephropathy prevalence in this study was high representing 56.1%, raising concerns among the health professionals and decision-makers to deal with this problem. The current data confirm that the most striking risk factors for diabetic nephropathy in type II diabetes are body mass index BMI $\geq$ 25, diabetes duration, hypertension, age $\geq$ 50 years, and family history. Diabetic nephropathy was associated with all five HRQOL dimensions; patients in Stage 3-kidney disease had lower scores than patients in the other 2 stages, representing a lower level of functioning and health.

Recommendations

The current study recommended that urinalysis should be performed regularly as part of a screening program which is a preventive intervention to preserve the kidneys in diabetic patients and will detect individuals with nephropathy early.

We hope that our findings will raise awareness among health care workers about therelationbetween diabetes and the quality of life in individuals with nephropathy in an attempt to enhance their quality of life by appropriate DM management.

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Effectiveness of Educational Guidelines Adherence on Health Complaints and Anxiety Level among Patients with Coronary Artery Disease

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Abstract

Coronary artery disease is the leading cause of death globally and the most common type of heart disease. Health complaints are subjective in nature; it may afford information on the degree of recovery from coronary artery disease. Educational guidelines play a vital role in increasing knowledge, practice, and modifying health behaviors. This study **aimed** to evaluate the effect of educational guideline adherence on health complaints and anxiety level among patients with coronary artery disease. **Subjects and Method: Design:** Quasi-experimental research design. **Setting:** The study was conducted at cardiology and coronary care unit affiliated with El Hussein University Hospitals. **Subjects**: A Purposive sample of 104 adult patients was selected and equally divided into (52) study and (52) control group. **Three Tools** include Patients' Structured Interview Questionnaire, The Somatic Health Complaints Questionnaire and Beck Anxiety Inventory Questionnaire was used in this study. **Results:** The mean age of the study and control group were (54.21 ± 8.01 & 54.71 ± 10.42, respectively), 59.6% of both groups were males. There was a highly statistically significant difference between study and control group regarding total mean scores of knowledge, all dimensions of health complaints and anxiety level scores ($p < 0.001$) at post and follows up phases throughout implementation. **Conclusion:** There was a highly statistically significant improvement regarding the mean scores of total knowledge, somatic health complaints and anxiety level for the study group at the post and follow up phases of the educational guidelines Adherence implementation. **Recommendation**: Develop Telecommunication interventions in secondary prevention for patients with CAD to promote effective reduction of risk factors.

Key words: Coronary artery disease, Educational guidelines, Health complaints, Anxiety Level, Adherence.

Introduction

Coronary Artery Disease (CAD) has become the largest single cause of death globally. It is responsible for a huge global economic burden and a large percentage of this burden is found in low and middle income countries. Coronary artery disease is the prominent reason for mortality within the United States. It is the third leading cause of mortality worldwide and is attendant with 17.8 million deaths annually. While, CAD is a significant cause of death and disability, it is preventable [1, 2].

Most studies have categorized the risk factors for CAD into non-modifiable (Age, gender, ethnicity, genetic factors and family history) and modifiable risk factors either behavioral (Unhealthy food, physical inactivity, smoking and alcohol intake) or physical factors (Diabetes mellitus, hypertension, dyslipidemia, increased waist circumference, and improper body mass index, with the contribution of psychological /psychosocial factors (Anxiety and stress) [2, 3].

Coronary artery disease could be marked stable ischemic heart disease (SIHD) or acute coronary syndrome (ACS). It can be more advanced into congestive heart failure (CHF) if not controlled. Physical symptoms include chest pain, radiation of the pain in the jaw, neck, left arm, or into the back. Dyspnea should be evaluated at rest and also on the activity, jugular venous distention, palpitations, tachypnea, lower extremity edema and orthopnea. Patient inspected for any acute distress, and peripheral edema, this has a significant influences on health care and nursing practice [4,5,6].

Although, health complaints are subjective in nature, it may afford statistics on the degree of rescue from coronary heart disease (CHD). Obviously, within the weeks from a coronary incident, patients repeatedly complained from somatic health complaints focused on (Chest pain, dyspnea, sleep problems, fatigue). And also, cognitive health complaints concern about (cognitive functional status and anxiety level) [5,7-9].

On the top, patients with CAD are more prospective to suffer from psychological problems like anxiety or depression because they usually tolerate unpleasant symptoms without warning and are required to take numerous categories of medications throughout their whole lifespan, resulting in negative emotions. The percentage of patients concerned by anxiety and depression was recounted to be raised to 15–43% during the first 12 months after an acute cardiac incident [10,11].

Anxiety is accompanying with minor diagnosis in patients with coronary artery

disease (CAD). Moreover, patients with high anxiety level had non-adherence to cardiac medication with non-attendance and non-completion of cardiac rehabilitation programs. Consequently, it has a negative influence of on health performances and adherence to evidence based hazard decreasing guidelines and managements for CAD [12].

European Society of Cardiology (ESC) guidelines for the management of coronary syndromes were designed to achieve optimal disease stabilization or regression and included pharmacological management, developing healthy lifestyle behaviors, and percutaneous coronary interventions. A multidisciplinary team an approach that provides personalized and flexible support to patients can lead to the achievement of optimum management outcomes [13].

Educational guidelines adherence are relevant to the patient's level of understanding and comprehension, delivered at the appropriate time, as well as it can be one of the fundamentals for the patient to raise their knowledge, practice and awareness of the significance of making determinations about medical management and improve the patient's outcomes. Extensive education has the main role in lowering the risk of coronary heart disease. In combination with the

outcomes from other studies, rising education is expected to improve health benefits [14, 15, 16].

Significance of the study

Globally, CAD pretends to have about 126 million individuals and the recent prevalence rate of 1,655 per 100,000 populations is predictable to outstrip 1,845 by the year 2030. Which is approximately 1.72% of the world's population and about 9 million deaths were affected by CAD. Commonly, women were lesser affected than men, and occurrence typically ongoing in the fourth decade and prognosis with age [17]. Concerning to the most recent World Health Organization Rankings data published the coronary heart disease deaths in Egypt reached 271.69 per 100,000 of population ranks which about 29.38% of total deaths rate as well as Egypt is considered number 15 in the world rank [18].

The World Health Organization shared a comprehensive plan of action for the prevention and control of non-communicable diseases and cardiovascular disorders to take actions to empower patients in managing their health conditions, promote education, encouragements and tools for self-care and self-management that are based on

guidelines and patient records, and also a team based on patient management [19,20,21]. Thus, health education for patients with CAD is vital elements that make contributions in the controlling of patients' health condition and secondary prevention of disease. So the aim of this study was to evaluate effect of educational guidelines adherence on health complaints and anxiety level among patients with coronary artery disease

Aim of the Study

The aim of this study was to evaluate the effect of educational guideline adherence on health complaints and anxiety level among patients with coronary artery disease through:

1. Assessing patients' level of knowledge, patients' health complaint and anxiety level.

2. Developing educational guideline according to patients' health complaints and anxiety level.

3. Implementing educational guideline according to patients' health complaints and anxiety level.

4. Evaluating the effect of an educational guideline adherence on patient`s knowledge, patient`s health complaints and anxiety level.

Hypotheses:

The current study hypothesized that:

-Study group will have a statistically significant improvement in knowledge level post educational guideline adherence as compared to control group.

-Study group will have a statistically significant fewer health complaints and anxiety level post educational guideline adherence as compared to control group.

Subjects and methods

Research design: Quasi-experimental research design was utilized to achieve the aim of this study.

Technical Design:

The technical design includes research setting, subjects and tools for data collection.

Setting: The study was conducted in Cardiology Unit and Cardiac Care Unit at El Hussein University Hospital.

Subjects: A Purposive sample of (104) adult patients diagnosed with CAD, was selected and equally divided into the study and control group, (52) patients for each one. The sample size is determined by statistical analysis (power analysis) where it represents the total number of patients who are diagnosed with CAD in the cardiology unit at El Hussein University Hospital. At year 2018 which were (1044) patients.

Inclusion Criteria:

Adult patients above 18 years, from both sexes who agree to participate in the study, not exposed before to any teaching or learning experiences regarding coronary artery diseases.

Exclusion Criteria:

Patients with mental problems were excluded.

Tools for data Collection:

Data for this study were collected using the following tools:

A- **Patient Structured Interview Questionnaire:** An Arabic questionnaire was developed by the researchers, after reviewing the related literature and research studies [3, 22, 23]. It included the following parts:

Part 1: Demographic characteristics: it included age, sex, residence, level of education and occupation.

Part 2: Past Medical History/life style: It included series of questions to elicit patient's past medical history, compliance to medications, and smoking.

Part 3: Patient learning needs assessment sheet: It was developed by the researchers based on relevant and recent literatures [24]. It was used to assess the knowledge level of patients with CAD. It contains true & false and multiple choice questions (23) items including; definition

of disease, causes, risk factors, signs and symptoms, diagnostic tests, management and disease related instructions.

Scoring system:

The answer was evaluated using model key answer prepared by the researcher. The score 2 gave for correct answers, and 1 for an incorrect answer. The total knowledge score was (46).

The level of the patient's knowledge was considered unsatisfactory when less than 60%, while ≥ 60%, the patient level of knowledge was considered as satisfactory level.

Tool II: The Somatic Health Complaints Questionnaire (SHCQ):

- This questionnaire was adapted from **Brink et al. (2007)** [25]. The questionnaire addresses 13 health problems common in cardiac patients: chest pain, chest pain that limits daily activity, shortness of breath, shortness of breath during exertion, sweating, dizziness, headache, and stomach trouble, lack of energy, heart palpitations, tiredness, weakness, and sleep disturbance. The patients were asked to report how often these symptoms had occurred during the past week. Each question was answered using a 6-point Likert scale, Translation and back translation from English to Arabic was done for this tool to assure accuracy for content validity.

- **Scoring system:**

The patient response for each statement was made on a 6-point Likert scale, ranging from (1 to 6) as follows: 1=never, 2=once, 3=sometimes, 4=several times, 5=mostly, 6=always.

Tool III: Beck Anxiety Inventory:

This tool adopted from **Beck and Steer (1990)**[26], it is a 21-items multiple-choice self-report inventory that measures the severity of an anxiety in cardiac patients. Translation and back translation from English to Arabic was done for this tool to assure accuracy for content validity.

Scoring system:

Each symptom item has four possible answer choices: Not at All; Mildly (It did not bother me much); moderately (It was very unpleasant, but I could stand it), and; severely (I could barely stand it). The clinician assigns the following values to each response: Not at All = 0; mildly = 1; moderately = 2, and; severely = 3. The values for each item are summed yielding an overall or total score for all 21 symptoms that can range between 0 and 63 points. A total score of 0 - 7 is interpreted as a "Minimal" level of anxiety; 8 - 25 as "Moderate" and 26 - 63 as "Severe".

Proposed educational guidelines:

These educational guidelines were developed for patients with CAD to enrich them with information related to CAD, and measures to overcome complications, nutritional management and importance of a healthy diet, and measures to improve patient's level of knowledge, health complaints, and anxiety level.

Operational Design:

The operational design includes preparatory phase, pilot study and field work.

Preparatory Phase:

It included appraising of current and past available theoretical knowledge of different features of the study using booklet, articles, internet, periodicals and magazines in order to develop the data collection tools.

Content validity:

Content validity was conducted to test the tool for appropriateness, relevance, correction and clearance through a jury of seven experts, from the medical-surgical nursing staff at the faculty of nursing, Helwan University. Juries were from different academic categories (professors and assistant professors). Their opinions were elicited regarding the tool format, layout and consistency and scoring system.

Pilot Study:

A pilot study was applied to a group of 10 patients (10% of the sample) to test the applicability of the tools and clarity of the designed questionnaire, as well as to estimate the time desirable to answer them. Patients included in the pilot study were

also included in the main study subject, because there were no modifications in the tools.

Reliability:

- It is tested by using Cronbach alpha test the reliability scores of study tools including Arabic version, for tool II, III were (0.82 and 0.81) for the Somatic Health Complaints Questionnaire (SHCQ) and Beck Anxiety Inventory respectively.

Field Work:

- Data collection was started and completed within 6 months from beginning of July 2019 until end of December 2019.

- Purpose of the study was explained by the researchers to patients who agreed to participate in the study prior to any data collection; the study sample divided into the study and control group.

- The study tools were filled in and completed by the researchers three times on 3 stages (pre & post and follow up after three months from guidelines implementation phases).

- The researchers were available at cardiology unit & the cardiac care unit at El Hussein university hospital 3 days/week at morning and afternoon shifts to collect data from the studied patients. Filling in the tools was done according to the patients` understanding and health condition.

The collection of data was done through three phrases:

Assessment phase: In this phase the researchers collected data from both groups (study and control) starting with control group to prevent contamination of the sample. The time needed for completing study tools was about (20-35 minutes) for each patient.

Implementation phase:

In this phase the developed educational guidelines were implemented by the researchers in the study group only. The researchers started to discuss educational guidelines with the patient explaining the aim and objectives of the program as well as distributing booklet and explaining its content .The educational guidelines were delivered in Cardiology Unit for every 3 to 4 patients together according to their education level and understanding. The educational guidelines were supported by using posters, power points, colored booklet and lectures as different strategies for educating patients. Patients were allowed to ask questions in case of misunderstanding, while listening and expressing interest for them. At the end of the program sessions the researchers emphasized the importance of the follow up visits and informed the patients to be in contact with them by telephone in case of questions related to their condition and informed them that they will be followed up by the researchers after three months.

Evaluation phase: This phase was conducted through interviewing patients at the outpatients' clinic post immediately & after three months (follow up) by using the same tools to evaluate the effect of the implemented educational guideline on patient`s knowledge, health complaints and anxiety level. It was tested by comparing the results of the data collected post immediately & after three months from the study and control groups.

Administrative Design:

To carry out the study, the necessary approvals were obtained from the hospital director and nursing director of El Hussein University Hospital. Official letters were issued to them from the Faculty of Nursing explaining the aim of the study to obtain permission for the collection of data.

Ethical Considerations:

A formal consent was taken from patients who agree to participate in the research process after the aim of the study has been simply explained to them prior to data collection. They were assured that anonymity and confidentiality would be guaranteed and the right to withdraw from the study at any time without giving any reason. Values, culture and beliefs would be respected.

Statistical Design: Data collection obtained, they were organized, categorized, tabulated and analyzed. Data were presented in tables, figures and diagram using the Statistical Package for Social Science (SPSS). Statistical significant associations were assessed using percentage (%), mean, standard deviation, t-test, chi square and p-value.

Results

Table (I) Demographic characteristics among the study and control group subjects illustrated that, 53.8% of the study group and 36.5% of the control group had the same age from 50 years to less than 60 years old with mean age (54.21±8.01 and 54.71±10.42, respectively). Regarding sex, 59.6% of study and control groups were males. Concerning the residence, 84.6% of the study group and 67.3% of the control group were living in urban areas. As regards to level of education, 44.2% of the study group and 51.9% of control group can read and write. About patient's occupation, 26.9% of the study group and 34.6% of the control group had muscular work. While, 44.2% and 46.2% of study and control groups, respectively, were not working. The results showed also, that there were no statistically significant differences between study and control group subjects regarding all aspects of demographic characteristics at p < 0.05.

Figure (1) Percentage distribution of the studied group by marital status showed that, marital status, 71.2% and 76.9 of

study and control groups respectively were married.

 Table (2) Percentage distribution among the study and control group subjects as regards health history indicated that 42.3% and 48.1% of study and control groups, respectively had diabetes while, 73.1% and 76.9% of study and control groups, respectively had hypertension. Moreover, 59.6% and 63.5% of the study and control groups, respectively had angina. 26.9% of study group and 51.9% of the control group had IHD. It is obvious from the above table that 25.0% of the study group and 36.5% of the control group had previous history of cardiac catheterization. However, 80.8% and 76.9% of the study and control groups respectively had incomplete compliance with medication. Concerning smoking, 21.2% and 30.8% of the study and control groups respectively were smoker and 32.7 and 26.9% of study and control groups respectively were ex-smoker.

Figure (2) Percentage distribution regarding the total pre-post and follow up satisfactory level of knowledge among study and control group subjects showed that there were no a statistical significant difference between control and study group subjects pre- guidelines implementation regarding patient`s total knowledge. While highly statistically

significant difference was found between both groups post and follow up program implementation in

total knowledge (p <0.001).

Table (3) Percentage distribution of satisfactory level of knowledge among study and control group subjects pre-post and follow up guidelines implementation displayed that, half of study and control group (50.0% and 52.7%, respectively) had knowledge about symptoms of CAD pre-program implementation while majority of study group (90.4%, 88.4%), (82.7%), (90.4%, 84.4%), (84.4%), (90.4%) and (84.4%, 75.8%) respectively had knowledge about risk factors, symptoms, diet, exercise, smoking and sexual relation of CAD post and follow up guidelines intervention implementation with a highly statistically significant difference was found between both groups post and follow up guidelines intervention implementation regarding all items of   knowledge except knowledge about symptoms.

There was improvement through phases of the study (pre to post and follow up implementation phases) regarding all items of knowledge among study group. While concerning the control group there was no improvement.

Table (4) Comparison of mean scores of somatic health complain questionnaire (breathlessness, fatigue, pain and unrest)

between study and control group subjects'
pre- post and follow up guidelines
implementation. Regarding all dimensions
of health complaints scale (Breathlessness,
fatigue, pain and unrest), there were highly
statistically significant differences between
study group subjects as compared to control
group at post and follow up guidelines
implementation at p <0.001,while there was
no a statistically significant differences
between both groups at pre guidelines
implementation at p < 0.05.

Table (5) Comparison between the study
and control group subjects pre- post and
follow up program implementation
regarding Beck anxiety scores.   There was
no statistical significant difference between
study and control group subjects pre
guidelines implementation (p =0.356).
While, there was a highly statistically
significant differences between the study
and control group subjects post and follow
up guidelines implementation regarding
beck anxiety level scores (<0.001) with
very low anxiety level in post and follow up
phases of implementing the educational
guidelines for study group (90.4% and
80.8%, respectively).

Table (6) Relation between demographic
characteristics and difference knowledge
score between study and control group
demonstrated that there was no statistically
significance relation between demographic

characteristics of study sample (study and
control group) and difference knowledge
score except with educational level in
control group.

Table (1): Demographic characteristics among the study and control group subjects

Items	Total No (Tn=104)				Chi square	p value
	Study(n=52)		Control(n=52)			
	No	%	No	%		
Age (in years)						
-20	0	0	1	1.9	0.274	0.78
-30	3	5.8	4	7.7		
-40	9	17.3	10	19.23		
-50	28	53.8	19	36.5		
+60	12	23.07	18	34.6		
(Mean ± SD)	54.21 ± 8.01		54.71 ± 10.42			
Sex						
Female	21	40.4	21	40.4	0.000	1.000
Male	31	59.6	31	59.6		
Residence						
Rural	8	15.4	17	32.7	4.265	0.039
Urban	44	84.6	35	67.3		
Educational level						
Illiterate	15	28.8	15	28.8	1.209	0.751
Read & Write	23	44.2	27	51.9		
Intermediate education	11	21.2	7	13.5		
High education	3	5.8	3	5.8		
Occupation						
Employee	5	9.6	3	5.8	1.209	0.751
Muscular work	14	26.9	18	34.6		
Retired	10	19.2	7	13.5		
No work	23	44.2	24	46.2		

Not significant   (NS)   p > 0.05

Figure (1): Percentage distribution of the studied groups by marital status

Table (2): Percentage distribution among the study and control group subjects as regards health history

Items	Total No (N=104)				Chi square	p value
	Study(n=52)		Control(n=52)			
	No	%	No	%		
Diabetes	22	42.3	25	48.1	0.349	0.554
Hypertension	38	73.1	40	76.9	0.205	0.651
Angina	31	59.6	33	63.5	0.163	0.687
IHD	14	26.9	27	51.9	6.804	0.009
Liver cirrhosis	10	19.0	14	26.9	0.369	0.54
COPD	8	15.4	7	13.5		
Cardiac catheterization	13	25.0	19	36.5	1.625	0.202
Open heart surgery	1	1.9	2	3.8	0.343	0.558
Compliance with medication						
No	1	1.9	5	9.6	2.965	0.227
Incomplete Compliance	42	80.8	40	76.9		
Complete Compliance	9	17.3	7	13.5		
Smoking						
No	24	46.2	22	42.3	1.303 0.521	
Yes	11	21.2	16	30.8		
Ex-smoker	17	32.7	14	26.9		

Not significant   (NS)   p > 0.05

The total pre-post and follow up test of satisfactory scores of knowledge

** Highly Significant (HS) p <0.001   Not significant (NS) p > 0.05
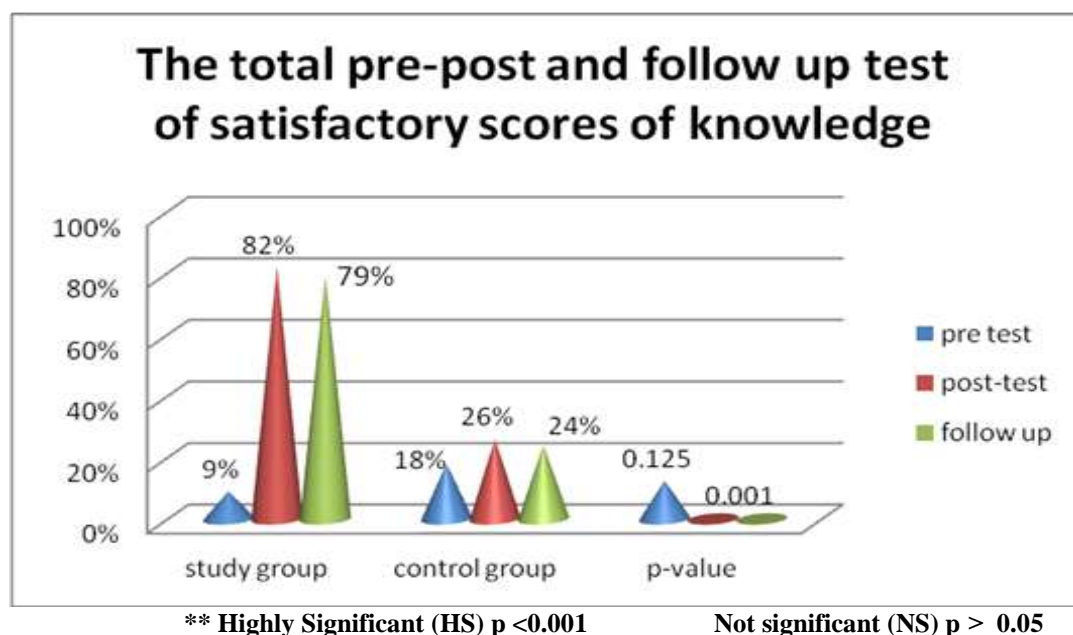
Fig (2): Percentage distribution regarding the total pre-post and follow up satisfactory level of knowledge among study & control group subjects.

Table (3): Percentage distribution of satisfactory level of knowledge among study and control group subjects pre-post and follow up guidelines implementation

Items	Pre- test				Post- test				Follow- test up after three months			
	Study group %	Control group %	Chi square	p value	Study group %	Control group %	Chi square	p value	Study group %	Control group %	Chi square	p value
Definition	5.8	21.2	5.283	0.022	75.0	21.2	30.199	<0.001**	73.0	20.2	30.99	<0.001**
Risk factors	0.0	3.8	2.039	0.153	90.4	3.8	78.145	<0.001**	88.4	3.8	79.845	<0.001**
Symptoms	50.0	52.7	12.446	<0.001**	82.7	64.6	0.07	0.791	82.7	60.6	0.09	0.661
Diagnosis	3.8	3.8	0	1	55.8	3.8	33.502	<0.001**	55.8	3.8	33.502	<0.001**
Treatment	0.0	0.0	0	1	75.0	11.5	35.199	<0.001**	36.5	0.0	23.247	<0.001**
Diet	3.8	0.0	2.039	0.153	90.4	3.8	78.145	<0.001**	84.4	3.8	68.215	<0.001**
Exercise	0.0	0.0	0	1	84.4	3.8	68.215	<0.001**	84.4	0.0	58.335	<0.001**
Smoking	3.8	3.8	0	1	90.4	3.8	78.145	<0.001**	90.4	3.8	78.145	<0.001**
Sexual relation	0.0	0.0	0	1	84.4	3.8	68.215	<0.001**	75.8	0.0	32.022	<0.001**

** Highly Significant (HS) <0.001   Not significant (NS) p > 0.05

Table (4): Comparison of Mean scores of Somatic Health Complain Questionnaire (Breathlessness, Fatigue, Pain and unrest) between study and control group subjects pre- post & follow up guidelines implementation

Items SHCQ	Pre- test				Post- test				Follow- up test after three months			
	Study group Mean ±SD	Control group Mean ±SD	t-test	p value	Study group Mean ±SD	Control group Mean ±SD	t-test	p value	Study group Mean ±SD	Control group Mean ±SD	t-test	p value
Breathlessness	8.87± 1.79	9.12± 2.03	.666	.507	4.85± 1.43	7.87± 1.72	9.740	<0.001**	4.94± 1.30	7.92± 1.71	9.125	<0.001**
Fatigue	15.73 ± 2.13	16.87± 2.59	2.438	.016	8.52 ± 1.97	14.98 ± 2.50	14.649	<0.001**	8.79 ± 1.93	15.46 ± 2.19	15.019	<0.001**
Pain	17.90 ±3.21	17.65± 2.43	-.448	.655	7.17 ± 2.86	15.25 ± 2.06	16.530	<0.001**	7.44 ± 2.86	15.38 ± 2.07	16.120	<0.001**
Unrest	12.56± 1.61	13.87± 1.44	4.357	<0.001**	6.77± 1.79	12.13± 1.68	15.762	< 0.001**	6.77± 1.74	12.15± 1.67	15.662	< 0.001**

** Highly Significant (HS) p <0.001   Not significant (NS) p > 0.05

Table (5): Comparison between the study and control group subjects pre- post & follow up program implementation regarding Beck anxiety scores.

Items	Group				Chi square	p value
	Study		Control			
	No	%	No	%		
Beck anxiety (pre)	0	0.0%	2	3.8%		
Very low anxiety	21	40.4%	21	40.4%		
Moderate anxiety						
Persistent and high anxiety	31	59.6%	29	55.8%	2.067	0.356
Beck anxiety (post)	47	90.4%	7	13.5%		
Very low anxiety	5	9.6%	29	55.8%		
Moderate anxiety						
Persistent and high anxiety	0	0.0%	16	30.8%	62.571	<0.001
Beck anxiety (follow up after three months)	42	80.8%	5	9.6%		
Very low anxiety	8	15.4%	22	42.3%		
Moderate anxiety						
Persistent and high anxiety	2	3.8%	25	48.1%	55.254	<0.001

** Highly Significant (HS) p <0.001   Not significant (NS) p > 0.05

Table (6): Relation between demographic characteristics and difference knowledge score between study and control group

Items	Difference knowledge score							
	Group							
	Study				Control			
	Mean	SD	F ratio	Significance	Mean	SD	F ratio	Significance
Age group								
<50	54.2	9.9	1.152	0.234	1.1	2.2	0.966	0.468
50+	51.1	13.1			.2	2.2		
Educational level								
Illiterate	49.9	8.4			.6	1.5		
Read and write	52.8	10.2	0.941	0.606	.9	1.8	3.145	0.009
High school	62.7	13.2			.8	3.3		
University	56.5	11.5			.0	4.3		

** Highly Significant (HS) p <0.001   Not significant (NS) p > 0.05

Discussion

Coronary artery disease is one of the most common cardiovascular diseases in adults. The disease is one of the most preventable non-communicable diseases and the use of primary and secondary prevention methods are key strategies in prevention of coronary artery disease. Since, teaching today to the patient is recognized as one of the main duties of nurses, training in heart disease and related care is essential. In this regard, the optimal selection educational methods that lead to increased awareness are significant [27].

Regarding demographic characteristics of patients under study, the results of the present study revealed that more than half of study group and about one third of control group subjects were in the same age group from 50 years to less than 60 years old with mean age (54.21±8.01) and (54.71 ±10.42) respectively). This result is in accordance with **Moeini, et al., (2020)**[27], who studied the effect of aromatherapy on the quality of sleep in ischemic heart disease patients and found that the mean and SD of patients' age was 55.7 ± 7.7 in the study group and 52.8 ± 8.5 for the control .In the same context **Roman et al. (2019)**[28], found that more than half of the patients were within the age group of 45 years and above, while only 19% were less 45 years. As well **Nematollahi, et al.,**

(2017)[29], found that the mean age in their study was 50·33±12·14 years. This mean age of the present study may be due to aging which is an un-modifiable risk factor for CAD and the WHO reports that CAD risk increase as age increases.

Concerning sex the present study clarified that more than half of study and control group subjects were males. This result is supported by **Moeini et al. (2020)** [28], who stated that 65.6% and 59.4% in the study and control group respectively were male. However this result is inconsistent with **Farshid el al., (2020)**[30], in a study titled the role of gender in the importance of risk factors for coronary artery disease, that two thirds of study subjects were female and one third were male.

Concerning the residence, the current study results showed that the majority of the study group and slightly more than two thirds of control group were living in urban areas. This is supported by **Mahmood et al., (2017)**[31] in the study of effect of aromatherapy on anxiety in patients with acute coronary syndrome hospitalized in cardiac care unit and concluded that two thirds of study and control group reside in urban area. This result is incongruent with **Abdul-Hasan and Kathim (2018)**[32] who mentioned that the majority of the studied subjects lived in rural area and only one-fourth lived in urban area.

As regard marital status in the current study, the results showed that about two-thirds of the study and control group were married. This finding goes in line with **Abdullah and Baker (2019)** [33], in a paper entitled health beliefs of patients with coronary heart disease toward secondary prevention and mentioned that about nearly all sample (98.4%) were married.

Concerning educational level, the study results revealed that less than half of the study group and about half of control group subjects can read and write. This result was in an agreement with the findings of the study had done by **Al-Abbudi et al. (2018)**[34], to determine the incidence and to estimate the socio-demographical characteristics of CHD patients in Baghdad Teaching Hospital, who reported that about more than two thirds of the patients had low educational level and can't read and write.

While this result is inconsistent with Subramanian **(Ahmed et al., 2019)**[35], in a study of the pattern of risk-factor profile in Egyptian patients with acute coronary syndrome and mentioned that nearly half of their studied subjects had high education, with 17% reporting no education.

Regarding patient's occupation, the present study result indicated that, less than half of study and control group subjects were not working. This may be due increasing age level among the studied subjects and the fact that CAD patients refrained of job due to activity intolerance.   This result in agreement with **Abbasi, et al., (2018)**[36], in a study of designing and manufacturing of educational multimedia software for preventing coronary artery disease whom mentioned that less than fifth of their study were employee .While this result is inconsistent with **Eid (2018)** [37], who mentioned that more than half of the sample was working.

The results showed also, that there were no statistically significant differences between study and control group subjects regarding all aspects of socio-demographic characteristics at $p < 0.05$. This indicated that both study and control groups are compatible.

Considering health history, the present study indicated that less than half of study group and control group subjects had diabetes mellitus. This may be due to that the majority of the patients were within 30-50 years and this age group commonly is high risk for D.M.   This result is in accordance with **Ramadhani et al., (2019)** [36] in a study of investigating the relevance of nursing caring interventions delivered to patients with coronary artery disease and found that diabetes mellitus as comorbidity for CAD existed in almost three-quarter of patients . In the same context **Madonna et al. (2019)**[39], in a study entitled impact of

sex differences and diabetes on coronary atherosclerosis and ischemic heart disease reported that the cardiovascular hazard in people with diabetes is higher from two to three times than those without the disease. On the other hand, this finding is disagreement with **Salari et al. (2018)**[(40)], who stated that the majority of their study subjects had no diabetes.

In the same line, the present study indicated that more than two thirds of study and control group subjects had hypertension. This may be due to that hypertension is considered predisposing factor for CAD. This result is in accordance with **Hassan et al. (2020)**[(41)] in a study of dietary rehabilitation effectiveness on coronary artery diseases patient's outcomes who mentioned that majority of the subjects had a history of hypertension. Also this is congruent with **Roman et al. (2019)** [(29)] who studied the assessment of risk factors for cardiovascular diseases among patients attending cardiac clinic and found that two thirds of the study subjects were clinically diagnosed with hypertension. As well **Farshid et al. (2020)**[(40)], in a study titled the role of gender in the importance of risk factors for coronary artery disease found that hypertension was the most influential risk factor in the study. In the same line **Abdullah and Baker (2019)** [(32)], in a study of health beliefs of patients with coronary

heart disease toward secondary prevention reported that slightly more than half of the studied subjects had suffered from diabetes and hypertension respectively.

Concerning history of angina the present study finding showed that more than half of study and more than two thirds of control groups had angina. This result goes in the same line with **Gecaite-Stonciene et al. (2020)**[(42)], who reported that about half of the sample was diagnosed with stable angina, As well the findings were supported by **Hassan, et al. (2020)**[(41)], who stated that two thirds and slightly more than half of study and control group had angina.

As regards history of cardiac catheterization the present study findings showed that one fourth of the study group and more than one third of control group subjects had previous cardiac catheterization. This may be due to that most CAD patients experience cardiac catheterization as a routine investigation for diagnosis of CAD. In this context **Ghisi et al. (2020)**[(43)], in a study of effectiveness of an education intervention among cardiac rehabilitation patients in Canada and stated that near than half of their study subjects performed cardiac catheterization.

Concerning compliance with medication the majority of study and control group respectively had incomplete compliance with medication, this findings goes in the same line with a study carried out by

Khatib et al. (2019)[44], on a study of adherence to coronary artery disease secondary prevention medicines: exploring modifiable barriers and found that half of study subjects was non-adherence patients with CAD medications.

In the same context **Salari et al. (2018)**[40], in a study of medication adherence and its related factors in patients undergoing coronary artery angioplasty reported that about a third of the participants were non-adherence to medications. This could be due forgetfulness of study subjects, worry that their medicines will do more harm than good and lack of sufficient training. Those were the most common reasons for non-adherence as stated by patients.

Concerning smoking, one fifth and one third of study and control groups respectively were smoker and one third and one fourth of study and control groups respectively were ex-smoker. This result goes in the same line with **Hassan, et al. (2020)**[41], who reported that less than half and around one third of study and control group were smoker. While this result is in disagreement with Egyptian study carried out by **Ahmed et al. (2019)** [35], who mentioned that of majority of men presenting in the study, were smokers and as and ex-smokers (74% were current smokers &12% were ex-smokers. This may

indicate that smoking is considered a major risk factor for coronary artery disease.

Regarding knowledge among study and control group subjects at pre, post and follow up guidelines implementation ,the results of the current study revealed that there were no statistical significant differences between study and control group subjects pre- guidelines implementation regarding patient`s total mean scores of knowledge. Also, the results of the current study supported the current study hypothesis as a highly statistically significant differences were found between study and control groups regarding patient`s total mean scores of knowledge at post and follow up guidelines implementation phases.

The improvement of patient's knowledge may be as a result of guidelines implementation as well as the permissive atmosphere of conduction , also guidelines intervention were appropriate to the individual in terms of gender, age, culture, and socioeconomic factors , as these factors have an important impact on the ability of individuals to learn. In addition, the using of open discussion during the application of the educational guidelines and giving them actual chance to participate as well giving written information may have contributed to the success of the intervention. Such

approaches have been recognized as being important when performing patient education sessions; this explanation is supported by **Ghisi et al., (2020)**[43].

This result goes on line with **Tawalbeh and Ahmad (2015)**[45] in the study of the effect of cardiac education on knowledge and adherence to healthy lifestyle and proved that the coronary heart disease educational program significantly increased knowledge of the patients with heart disease. As well the study result is congruent with **Mohamad et al., (2018)**[46], in a study entitled the effectiveness of health education program on knowledge of coronary heart disease who that revealed there was a statistically significance different between pre and post- knowledge level in the study.

In the same context **Ghisi et al. (2020)**[43], demonstrated similar results in a study of the effectiveness of an Education Intervention among Cardiac Rehabilitation Patients and found that there was a significant improvement in patients' overall knowledge pre- to post cardiac rehabilitation.

When the effect of guidelines implementation on the knowledge items was examined, a highly statistically significant difference was found between both groups post and follow up program implementation regarding almost all items

of knowledge. The result indicated a significant improvement of general knowledge, treatment, diet, exercise, smoking and sexual relation of CAD post and follow up program. These findings are in accordance with **Clark et al. (2015)**[47], which showed that signs and symptoms and treatment were ranked as the most important items learn among patients with cardiac disease .This finding, could be attributed to patients' perceptions of the importance of improving knowledge about treatment and symptoms.

Regarding the effect of the educational guidelines on health complaints, as regard all dimensions of health complaints scale (Breathlessness, fatigue, pain and unrest), there were a highly statistically significant differences between study group subjects as compared to control group at post and follow up guidelines implementation at $p < 0.001$, while there was no statistically significant differences between both groups at pre guidelines implementation at $p < 0.05$, which support the current study hypothesis. This may be due to effect of the educational guidelines implementation in reducing the four dimensions of health complaints in CAD patients. This result is consistent with the results of **Skodova et al. (2010)**[48], who found that there were highly statistically significant differences between study and control group subjects

after program implementation phase regarding four dimensions of SHCQ.

On the same line the study conducted by **Rogers et al., (2021)**[49], about identifying and managing functional cardiac symptoms found that common symptoms include non-cardiac chest pain, fatigue shortness of breath and palpitations and there is substantial variation in presentation and severity of symptoms ranging from persistent symptoms, severe distress to minor distress or concern with resolution of symptoms before and after program implementation. In the same context **Wang et al. (2015)**[50], mentioned that the intervention group exhibited a significantly greater decrease in the level of fatigue compared with the control group, whom exhibited no significant changes. **Bunevicius, et al., (2013)**[51], in a research article titled "Relationship of fatigue and exercise capacity with emotional and physical state in patients with coronary artery disease" that there were highly statistically significant differences between study and control group subjects post program implementation.

Regarding anxiety level, it's noticed from the finding of the current study that most of study group had very low anxiety level in post and follow up phases of implementing the educational program. This could be due to effectiveness of educational program in

reducing anxiety. The results also revealed that there were highly statistically significant differences between study and control group subjects as regard anxiety level scores post program implementation. In the same line a study conducted by **Moghimian, et al., (2019)**[52], stated that there was a significant difference in the mean score between the intervention and the control group after program intervention. This could be explained as enriching patients with knowledge about their disease and managing symptoms as well improving physical condition and modifying health behaviors by different coping strategies having a positive effect in reducing anxiety level of patients.

The study findings are in contrast with **Bendig (2021)**[53], in study about lessons learned from an attempted randomized-controlled feasibility trial for people living with coronary artery disease who revealed that there was no significant change over time in anxiety level (p > 0.05).

As regards relation between knowledge level and demographic characteristics including age and educational level, the study findings showed that there was no statistically significance relation between demographic characteristics of study sample and knowledge level except with educational level in control group. This result is congruent with **Abdullah and**

Baker (2019)[33], in a study of health beliefs of patients with coronary heart disease toward secondary prevention and found a highly significant association between the patients' knowledge with their educational level and there is a no significant association between the patients' knowledge and their age groups. On the same line **Mohamad et al. (2018)**[46] concluded that there was arelationbetween knowledge level and education level.

Conclusion

Based on the findings of the present study, it can be concluded that: There were a highly statistically significant improvement regarding the mean scores of total knowledge, health complaints and anxiety level for the study group at the post and follow up phases of the educational guidelines implementation. As compared to control group, there were no statistically significant differences between total pre-post and follow up test scores of knowledge, health complaints and anxiety level. The results of the current study supported the hypothesis of the study that, there were statistically significant differences between study and control groups in relation to knowledge, health complaints and anxiety level at post and follow up guidelines implementation. These findings concluded that educational guidelines had a positive effect on patient

knowledge, health complaints and anxiety level.

Recommendations

Based on the current study findings;

- Future researches are prerequisite to develop telecommunication interventions (telephone, internet, and videoconference) in secondary prevention for patients with CAD to promote effective reduction of risk factors and may increase survival.

- Future researches are requisite to develop and enhance interventions to improve patient's compliance to treatment and prevent further deterioration.

- Develop and coordinate a multidisciplinary team approach in cardiology unit that contains qualified nurse, cardiology, psychologist and social worker to provide optimal and comprehensive care for patients.

- Develop systematically continuous self-management programs for patients with CAD to help improving health status and maintaining a life style at highest possible level of quality of life.

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Effect of Telenursing Intervention Program on Mothers' Knowledge about Postoperative Care for One Day Surgery Children

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Abstract

Background: In this 21st century, the need for health services continues to experience rapid changes, telemarking is delivering nursing care and conducting nursing practice by using technology. The recovery after one day surgery is often troublesome for mothers often feel insecure regarding optimal post-operative care for their children after discharge from hospital. **Aim**: The present study aimed to evaluate the effect of telenursing program on mothers' knowledge about postoperative care for one day surgery children. A quasi-experimental research design (pretest/post-test design) was utilized in the present study. The study was conducted at three pediatric hospitals affiliated to Cairo University. **Subjects and method**: A purposive sample of 60 mothers and their children from the previously mentioned settings were included in the study and divided equally to study and control group. Tools of data collection included three tools: a structured interview questionnaire sheet to assess mothers and their children's personal characteristics; assessment sheet of mothers' knowledge about one day surgery postoperative care and follow up phone call record form. **Results:** The results of this study indicated highly statistically significant differences concerning mothers' knowledge preimplementation/post implementation of telenursing intervention program **Conclusion:** The study concluded that telenursing intervention program positively improved mother's knowledge in study group after implementation than before. **Recommendation**: Telenursing intervention program should be established to improve mothers' knowledge about post-operative care for one day surgery children.

Key words: children, telenursing, postoperative, mothers' knowledge, one day surgery

Introduction

Pediatric day surgery has become increasingly prevalent in during recent years. Pediatric procedures eligible for day surgery have also been more frequently produced mainly because of the improvement in minimally-invasive surgical techniques, the development of new general anesthetic drugs and the wider use of regional anesthesia[1]. Nowadays, 60% to 80% of operations in a modern pediatric hospital are performed on a day surgery basis. The major advantages of this trend consist in the lessening of psychological stress for children and parents and the reduction in hospital costs, fewer staff required, and reduction frequency of nosocomial infections and length of surgical waiting lists[2].

Some of the pediatric surgical nursing challenges are management of knowledge deficit in parents, monitoring of compliance to drug administration, reported that post-operative care including, pain relief, wound care and prevention of infection[3]. One day surgery for children requires good excellent nursing care that respond to the needs of children and parents. The most frequent complications include nausea and vomiting, sore throat, and discomfort at the surgical site, infection and bleeding[4] as well as postoperative airway clearance and a rapid return to normal fluid and food intake[5,3,6]. Australian Confederation of Pediatric and Child Health Nurses (2016)[7] emphasized that nurses play an important role in supporting parents to care for their children, by facilitating parents' knowledge and skills development through parent education. Parents should receive clear instructions on follow-up and written information on arrangements to deal with any postoperative emergency. Discharge from day surgery is now a common occurrence but requires experience and an understanding of the criteria for each intervention. Discharge planning must embrace needs of the individual child and their family. In order to develop and maintain a high-quality service, discharge planning in day surgery should begin before the child is admitted to the unit[2,8,9]. Technology development can change nursing practice. It can help nurses deliver nursing care for patients, families, and communities. Telenursing (TN) can be an alternative strategy in providing nursing care rather than face to face method. Telenursing is delivering nursing care and conducting nursing practice by using technology. There was some evidence related to application of telenursing in nursing practice and reported that it could

be used for consultation, education, monitoring, and the evaluation of health care outcomes[10, 5].

According to the Pan American Health Organization (PAHO) (2019) [11], telehealth entails the delivery of health services using information and communication technologies (ICT), where distance is a limitation for health services. In developing countries, telehealth is important for improving health systems, since it enhances the supply of services, streamlines diagnoses and treatment, overcomes geographical distances, improves quality, and contributes to professional training [12].

The use of the mobile phone via text messaging is effective in enhancing the knowledge and the adherence of patients on an appropriate program toward health promotion and prevention of complications. The telenursing process and scope of practice are the same as in the traditional way whenever a large physical distance exists between the patient and the nurse. This new field of nurses' activities has expanded in many countries [13].The innovation of telenursing technologies is diverse, such as mobile phones, smart phones, computers, Internet, videoconference, and telemonitoring equipment [14,15].

Kim and Yu[5] studied the effects of a Post Discharge Management Program (PDMP) using Mobile Instant Messenger (MIM) on parents' knowledge and state anxiety about postoperative care, and their children's compliance with care instructions after discharge, frequency of bleeding, and pain intensity. They illustrated that parents in the experimental group reported a significantly higher knowledge about post discharge management and lower state anxiety than the control group. Children in the experimental group showed a significantly greater improvement in compliance with the care instructions at home than the control group. However, bleeding frequency and pain intensity were not significantly lower in the experimental group than that in the control group.

Telenursing offers an access to care and the ability to export nursing care using technology. It is a powerful tool for overall improvement in healthcare. Several measures should be taken for telenursing implementation into practice for all nurses. Telenursing may support general nursing, which is facing a shortage of nurses nowadays, and the demand for telenurses is worldwide. To meet the patients' needs and with the current nursing shortage, many homecare agencies have to look at innovative ways to care for the increasing

numbers of patients [16]. Zhang, Yuxia (2020)[17] reported that telenursing may be the best solution in the COVID-19 situation. Nurses have limited access to meeting children and their families face-to-face. However, regarding It is noteworthy that technology is only a medium to deliver high-quality nursing care in the COVID-19 situation. The key of telenursing practice is Communication. Therefore, therapeutic relation between nurses-families and children is essential.

Significance of the study

The researches using telenursing in pediatric nursing care is very scanty in Egypt; however in as study by Abusaad and Sarhan (2016) [18] to examine the effect of telenursing on depression and fatigue level in b-thalassemia major children. They recommended applying telenursing intervention to facilitate contact of pediatric patients with their physicians and nurses whenever they need. Anyhow, there is a need to shed the light on the use of telenursing as a tool of delivering nursing teaching to the parents who care for their discharged children after one day surgery to overcome the far distance of the children residence from hospital as well as to reduce the need of children to come to hospital during COVID-19 pandemic.

The researchers observed that in the selected setting of the study the routine procedures for the children undergoing one day surgery is to attend the surgical outpatient clinic for diagnosis, where the doctor give them a list of needed laboratory investigation and the nurse take the parent contact number. Then the secretary of the surgical unit call the parents one week before the operation day to inform them to carry out the laboratory investigation in any laboratory near to their home and to come in the morning of the day of the surgery with the child fasting at least 8 hours. After the operation is done the child is admitted to the recovery unit and when fully recovered (in few hours) the doctor give parents the medication sheet with few instruction related to time of feeding as well as the date of follow up in the surgical outpatient clinic one week after the operation. The parents are totally left alone to face the needs of their children post-operative care. Thus, the aim of the present study is to evaluate the effect of telenursing program on mothers' knowledge about postoperative care for children with one day surgery.

Subjects and Method

Operational definition: Mothers' knowledge about post- operative care for the present study is the mothers' knowledge about care of: child position after operation, nutrition, vomiting, bleeding, mobilization and activity, fever,

air way and cough, pain, medication administration, intra-abdominal pressure, wound, urination, prevention of infection, and follow up.

Aim of the study

The aim of the present study is to evaluate the effect of telenursing program on mothers' knowledge about postoperative care for one day surgery children.

Research hypotheses

1- Mothers who will receive telenursing program are expected to be higher total knowledge score in posttest and follow up test than those mothers in control group.

2- Children of mothers who will receive telenursing intervention program will show fewer postoperative complins /complications than those children who their mothers did not receive the program.

Research design

A quasi experimental design is like a true experiment, a quasi-experimental design aims to establish a cause-and-effectrelationbetween an independent and dependent variable. However, unlike a true experiment, a quasi-experiment does not rely on random assignment. Instead, subjects are assigned to groups based on non-random criteria. Quasi-experimental design is a useful tool in situations where true experiments cannot be used for ethical or practical reasons. Quasi-experimental designs that use a control group are used when intervention X is implemented for one group and compared to a second group. The use of a comparison group helps prevent certain threats to validity including the ability to statistically adjust for confounding variables [19].

Setting

The proposed study was conducted at three settings:

1- Surgical out-patient clinic at Cairo University Specialized Pediatric Hospital (CUSPH).

2- One day surgery unit 2nd floor at Cairo University Specialized Pediatric Hospital (CUSPH) Al-Monirah Hospital. It includes one operating room, waiting room for parents during surgery, and recovery room. Operations done per day ranges from 5-to 10 cases.

3- Follow up surgical clinic at Center for Social and Preventive Medicine (CSPM) Affiliated to Cairo University.

Sample

A purposive sample of 60 mothers and their children undergoing one day surgery were included in the study according to the inclusion criteria: Mother (any age, read and write, have a smart phone with internet access and what's app. Child of

any age and diagnosis that its treatment a one day surgery.

The only exclusion criteria of the child have any chronic condition or disability

The first 30 mothers and their children were considered as the control group (received hospital routine care), while the second 30 mothers and their children were considered as the group (who received the telenursing intervention program).

The sample size calculation is based on type 1error 0.05 and power of test 95%[20].

Tools of Data Collection

Three tools used to collect data were developed by the researchers in Arabic language after reviewing the related literature:

(Tool I): A Structured Interview Questionnaire: This tool is composed of the following parts:

Part I a- Mothers' characteristics as age, residence, level of education, marital status, heath status, and number of children,

b- **Children characteristics as** age, sex. (8 questions)

Part II -Medical history of the child which included: diagnosis, previous hospital admissions, and reasons of previous child hospital admission.   (3 questions)

(Tool II): Mothers' Knowledge about One day Surgery Postoperative Care: It

was developed to assess mothers' knowledge about postoperative; it included 45 questions as divided as follow: sleeping position after operation (1 question), child nutrition (3 questions), care of vomiting child (4 questions), activity (3 questions), care of feverish child (8 questions), care of air way and cough (4 questions), care of pain   (4   questions),   medication administration (1 question), prevention of increased intra-abdominal pressure (3 questions), wound care (5 questions), urinary system care (3 questions), infection prevention (4 questions), and follow up (2 questions).

Mother Knowledge about Post-Operative Care Questionnaire:

The questionnaire included 45 questions with multiple choices (wrong and correct choices) total correct choices were 118. Each selected correct choice was scored as (1) point and incorrect as (0) point. The total points (118) were divided into 3 categories: 1) unsatisfactory level of knowledge is below (60%) (0 to less than 70 points), 2) satisfactory level of knowledge from 60% to less than (75%) (70 to less than 88 points), and 3) good level of knowledge from (74-100%) (88-118 points).

The knowledge data collection sheet covered main 13 topics of post-operative care namely: sleeping position after

operation, nutrition, care of vomiting child, activity, care of feverish child, care of air way and cough, care of pain, medication administration, prevention of intra-abdominal pressure, wound care, urinary system care, infection prevention, and follow up.

(Tool III) Follow up phone call record form: used to record on it each phone call date, time, duration, complication/concern discussed and instruction given to the mother. In the form also the researcher documented the follow up of the previously discussed concerns or problems and the progress of it with the mother.

Intervention program

Telenursing program was developed by the researchers after reviewing the literature and related researches. The program was prepared in the form of Arabic booklet about post-operative care for one day surgery children.

Booklet content:

Introduction about one day surgery, postoperative care of child after one day surgery regarding the following: child's position, nutrition, vomiting, child's movement, fever, breathing and cough care, post-operative pain, medication administration, increased intra-abdominal pressure, wound care, urine output, infection prevention, danger signs of infection after the operation and follow-up.

Content validity

Content validity was done to identify the degree to which the tools measure what was supposed to be measured .The tools were examined by a panel of five experts in the field of pediatric surgery and pediatric nursing. 98% of the experts agreed on the tool content and only minor corrections were done to the Arabic language of the tools to make it easily understood to mothers.

Mothers' Knowledge about One day Surgery Postoperative Care reliability:

Internal consistency was measured to identify the extent to which the items of the tool measure the same concept and the extent to which the items are correlated with each other .Internal consistency reliability was estimated by Cronbach's Alpha that was 0.90.

Ethical consideration

An ethical approval was obtained from the research ethical committee in the Faculty of Nursing, Cairo University with approval reference number (2021-18). A written informed consent was obtained from mothers (in both control and intervention groups) after complete description of the purpose and nature of the study to obtain their acceptance as well as to gain their cooperation. They were informed about their voluntary participation and their right to withdrawal from the study at any time.

Moreover, mothers were assured that all gathered information was kept confidential and used only for the purpose of the study.

Procedure

An official permission was secured from the directors of Cairo University Specialized Pediatric University Hospital as well as the head of day surgery unit and head of out-patient and The Director of Center for Social and Preventive Medicine (CSPM) Affiliated to Cairo University where the surgical follow up clinic is located. Researchers met the mothers in both groups in setting (1): the surgical out-patient clinic at Cairo University Specialized Pediatric Hospital (CUSPH) where they come for diagnosis. After simple clear explanation of study and its aim to the mothers who match the inclusion criteria, an informed consent was secured.

A-For the control group (who receives the hospital routine care):

1- The researchers filled tool (I) Structured Interview Questionnaire, and Tool (II) Sheet of Mothers' Knowledge about One day Surgery Postoperative Care (pretest).

2- In the follow up surgical clinic at Center for Social and Preventive Medicine (CSPM). Researchers met the control group mothers and filled up tool (II) Sheet of Mothers'

Knowledge about One day Surgery Postoperative Care (posttest). The researchers recorded using Tool (III) the follow up sheet the presence of any complication or unresolved complaints after surgery.

3- After one month of operation researchers called mothers to fill tool (II) Sheet of Mothers' Knowledge about One day Surgery Postoperative Care (follow up test). Each phone call took 20-30 minutes

For the study group:

Assessment phase:

The researchers filled tool (I) Structured Interview Questionnaire, and Tool (II) Assessment Sheet of Mothers' Knowledge about One day Surgery Postoperative Care. Scores of tool (II) will be considered the pre-test for mothers' knowledge for intervention group. Directly after that, the researchers distributed the program booklet to the mothers; which was developed by the researchers in Arabic language. The researchers collected from the mothers their phone numbers and explained to them that the program booklet will be sent to them thorough What's App. The researchers asked the mothers to read the booklet then the sessions were arranged as per mothers' available time.

Intervention phase:

The researchers made the first phone call for the mothers after two days of the meeting them in the surgical out-patient clinic, then sessions was arranged as per mothers' available time. The program was given in three sessions each session was on each other day and took 45 minutes long as follow:

Session one: included introduction about one day surgery, child sleeping position postoperatively, postoperative nutrition, car of child with vomiting, child mobilization and activities, and care of fever.

Session two: included air way maintenance and care of cough, pain, medication giving, intra-abdominal pressure, and wound care.

Session three: included urine output, infection control, signs of infection, follow up, and conclusion.

After finishing the sessions, the researchers remained available on phone as per mothers' need to explain any unclear content of the program.

On the operation day the researchers met the mother and children in setting (2) One day surgery unit 2nd floor at Cairo University Specialized Pediatric Hospital (CUSPH) Al-Monirah Hospital. The researchers clarified to mothers any needed points regarding the postoperative care for

their children. After surgery the researchers told mothers to call in case their children have any complaints and they need help in care provision to their children.

All phone calls were recorded using Tool (III) phone call record form in terms of date of phone call, duration, concern discussed and management given and follow up of child complaints/complications been discussed. There was an assigned pediatric surgeon from the surgical unit with whom the researchers could communicate regarding child complains.

Evaluation phase 1 (post-test):

After one week of the surgery the researchers met the mothers in setting (3); Follow up surgical clinic at Center for Social and Preventive Medicine (CSPM).The researchers filled tool (II) Sheet of Mothers' Knowledge about One day Surgery Postoperative Care as a posttest to evaluate the effect of the program on mother's knowledge about postoperative care for one day surgery children. The researchers reviewed the patient follow up sheet to document the presence of any post-operative complaints/complications occurred to the child.

Evaluation phase 2 (follow-up):

One month after surgery the researchers called the mothers to fill over the phone tool (II) Sheet of Mothers' Knowledge about One day Surgery Postoperative Care as a follow up to evaluate the effect of the program on mother's knowledge about postoperative care for one day surgery children. Each call for mothers took about 20-30 minutes to fill the tool.

Statistical analysis

The collected data was tabulate and summarized using statistical package for social studies, version 21. Data was computerize and analyzed using appropriate descriptive and inferential statistical tests. Quantitative data was express as frequency and percentage. A comparison between qualitative variables was carried out by using parametric χ2 test., and comparison between quantitative variables was done by using parametric t. test and f. test. Correlation among variables was done using Pearson correlation coefficient. Statistical significance was considered at P value less than 0.05.

Results

Table (1) showed that the mean age of the mothers in study and control group was (24.73±23.108 and 21.82±25.31) while the mean age of their children was (2.74±1.91 and 1.98±2.41) respectively. Concerning education of the mothers in study and control group; 53.3% and 70% had high school education in both groups sequentially. Urban residence was the place of 70% and 56.7% of study and control group. It was clear that majority of the both samples were married (96. 7% and 90%) in study and control group respectively. Regarding number of children half of study group mothers had three or more children while 56.7% of control group had two children. Male gender was dominant in children of study and control group with a corresponding percentage of (80% and 63.3%) sequentially. All Chi-square values were at non-significant P. value which reflect the homogeneity of study and control group.

Table (2) illustrated a homogeneity between study group and control group regarding medical history and current health status of mothers variables with chi square test at P. levels higher than 0.05.; except for diagnosis and causes of previous hospitalization (p. = 0.037 and 0.038 respectively). The same table showed that (63.3 % and 66.7%) of children in both study and control group had experience of hospitalization; while the causes of previous hospitalization was due to bronchial asthma in (47.4%) children in study group it was due to prematurity in (60%) of control group children.

Approximately two thirds of children diagnosis in study group (63.3%) was inguinal hernia while in the control group (43.4% and 33.3%) were with hypospadias and umbilical hernia respectively. However the majority of mothers in both groups (90% and 93.3%) had no disease.

Table (3) reflected that score of mothers' knowledge in the study group about each area of post-operative care were unsatisfactory with percentage ranged between (86.7% and 100%) in pre study group. While mothers knowledge were satisfactory with a percentage ranged between (93.3% -100%) in post study and (40%-100) in the follow up. However, scores of mothers' knowledge in the control group about each area of post-operative care were unsatisfactory with percentage ranged between (86.3%-100%, 80%- 96.7% and90%-100%) pre, post and follow up respectively.

Table (4) displayed that all mothers in study group pre the program had unsatisfactory knowledge level while post the program (80%) of the mothers in study group had satisfactory knowledge level in the follow up (66.7%) of them had satisfactory knowledge score. The same table revealed that the total mean score of knowledge about post-operative care among mothers in the study group before the program was (28.53±11.01) while after

the program and in the follow up had increased to (93.20±17.92 and 73.03±9.59) sequentially. However, all mothers in control group had unsatisfactory knowledge level in the pretest while the percentage lowered to (97.7% and 93.3%) in follow up and posttest sequentially. While the total mean score of knowledge about post-operative care among mothers in the control group was (28.53±11.01, 31.003±3.62 and 30.03±1.59) in pre, post and follow up successfully.

Table (5) revealed that there were positive highly statistical significant differences between the total mean scores of mothers' knowledge post and following the program of control and study groups with (P. = 0.000). While there was no statistical significant difference between the control and study group pretest total mean scores (t. = 1.370 and P. = 0.176). Meanwhile; there were positive highly statistical significant differences between pre, post and follow up of study group mothers' total mean scores of knowledge about post-operative care with (P.= 0.000).

Table (6) displayed that the study group mothers' scores in each area of the post-operative care: pre, post and follow up the program. It is very clear that the post scores of knowledge in each area of the thirteen areas had improved from pre scores except for medication

administration which did not. This Change is clearly reflected by f. test that is P. value that of highly significant difference (P. ≤ 0.004 and 0.000).

Table (7) clarified the presence of highly statistical difference between posttest level of knowledge about post-operative care in all the (13) area of care between control and study groups with p. value varied between (≤ 0.006 and ≤ 0.000).

Table (8) highlighted the presence of highly statistical difference between follow up level of knowledge about post-operative care in all the (13) area of care between control and study groups with p. value varied between (≤ 0.002 and ≤ 0.000).

Table (9) clarified that the most frequent complain of children in control group were fever, bleeding, and vomiting (43.3%, 26.6%, and 23.3% sequentially) while in study group it was respiratory problems and pain (26.6% and 23.3 respectively). Regarding complications (10% & 6.7%) in control group children had abscess formation and urinary catheter removal respectively while the study group showed no complications. All children in the study group was managed by the researchers and the surgeon on phone while all the control group children presented to the surgical follow up clinic with the complaints.

Table (10) projected that total phone calls for mothers in the study group was (98) call. The minimum call phone duration was two minutes and the maximum was 20 minutes with a mean duration of 6.7755± 4.33288 minutes.

Table (11) showed highly significance positive correlation between mother pre and post intervention knowledge scores; mothers' post and follow up knowledge scores (r. 0.430, 0.484, and 0.483) with p. value at (≤0.01). The same table demonstrated a strong statistical negative correlation between mother age and follow up knowledge scores (r. - 0.459 and P≤ 0.01). However, the rest of child and mother socio-demographic variables had no significant relation to the knowledge test in both groups.

Table (1): Socio-Demographic Data of Children and Their Mothers For Study and Control Group.

Item	Study Group (N=30)		Control Group (N=30)		Chi square test	P. value
	No	**%**	**No**	**%**		
-Mother age (years):						
- 20->30	17	56.7	16	53.3		
- 30>40	12	40	12	40		
- <40	1	3.3	2	6.7	0.364	0.834
-Mean± S.D.	24.73±23.108		21.82±25.31			
-Mother education:						
- Primary education	4	13.3	1	3.3		
- Prep-education	4	13.3	5	16.7	6.356	0.273
- High school education	16	53.3	21	70		
- University education	6	20.1	3	10		
-Place of residence:						
- Urban	21	70	17	56.7	0.284	0.211
- Rural	9	30	13	43.3		
-Social status:						
- Married	29	96.7	27	90	1.405	0.495
- Divorced	1	3.3	3	10		
-Number of children:						
- One	3	10	7	23.3		
- Two	12	40	17	56.7	8.462	0.037
- Three or more	15	50	6	20		
-Child sex:						
- Male	24	80	19	63.3	2.052	0.152
- Female	6	20	11	36.7		
-Child age in years:						
- < 1	13	43.3	18	60		
- 1< 5	14	46.7	10	33.3		
- > 5	3	10	2	6.7	2.24	0.299
-Mean +S. D.	2.74±1.91		1.98±2.41			

*P≤0.05

Table (2): Medical History and Current Health Status of Children and their Mothers For Study and Control Group.

Item	Study Group (n=30)		Control Group (n=30)		Chi-Square	P. Value
	No	%	No	%		
-Previous hospitalization of Child:						
- Yes	19	63.3	20	66.7	0.73	0.787
- No	11	36.7	10	33.3		
- Causes of child previous hospitalization:						
- Bronchial asthma	9	47.4	8	40	4.356	0.037
- Prematurity	5	26.3	12	60		
- Abdominal complains	5	26.3	00			
	(n=19)		(n=20)			
-Child current diagnosis:						
- Inguinal hernia	19	63.3	7	23.3		
- Umbilical Hernia	1	3.3	10	33.3	14.204	0.038
- Double inguinal hernia	5	16.7	00	00		
- Hypospadias	5	16.7	13	43.4		
-Mother medical status:						
- No disease	27	90	28	93.3	0.218	0.640
- Had disease	3	10	2	6.7		

*P≤0.05

Table (3): Knowledge Level of Mothers about Post-Operative Care in the Study and Control Groups in Percentage Distribution.

Item	Study Group (n=30)						Control Group (n=30)					
	Pre		Post		Follow Up		Pre		Post		Follow up	
	No	%	No	%	No	%	No	%	No	%	No	%
Sleeping position after operation: - Unsatisfactory - Satisfactory	26 4	86.7 13.3	1 29	3.3 96.7	18 12	60 40	26 4	86.7 13.3	25 5	83.3 16.7	27 3	90 10
- Nutrition: - Unsatisfactory - Satisfactory	30 00	100 00	2 28	6.7 93.3	1 29	3.3 96.7	30 00	100 00	29 1	96.7 3.3	30 00	100 00
- Care of vomiting child: - Unsatisfactory - Satisfactory	29 1	96.7 3.3	00 30	00 100	00 30	00 100	29 1	96.7 3.3	28 2	93.7 6.6	30 00	100 00
- Activities: - Unsatisfactory - Satisfactory	30 00	100 00	00 30	00 100	00 30	00 100	30 00	100 00	27 3	90 10	28 2	93.3 6.7
- Care of fever: - Unsatisfactory - Satisfactory	30 00	100 00	00 30	00 100	00 30	00 100	30 00	100 00	29 1	96.7 3.3	30 00	100 00
- Care of air way and cough: - Unsatisfactory - Satisfactory	30 00	100 00	00 30	00 100	00 30	00 100	30 00	100 00	27 3	90 10	28 2	93.3 6.7
- Care of pain: - Unsatisfactory - Satisfactory	30 00	100 00	00 30	00 100	00 30	00 100	30 00	100 00	25 5	83.3 16.7	27 3	90 10
- Medication administration: - Unsatisfactory - Satisfactory	30 00	100 00	00 30	00 100	00 30	00 100	30 00	100 00	28 2	93.3 6.7	28 2	93.3 6.6
9- Prevention of increased intar-abdominal pressure: - Unsatisfactory - Satisfactory	30 00	100 00	1 29	3.3 96.7	00 30	00 100	30 00	100 00	28 2	93.3 6.7	27 3	90 10
- Wound care: - Unsatisfactory - Satisfactory	26 4	86.7 13.3	00 30	00 100	00 30	00 100	26 4	86.7 13.3	25 5	83.3 16.7	27 3	90 10
Urinary system care: - Unsatisfactory - Satisfactory	30 00	100 00	00 30	00 100	00 30	00 100	30 00	100 00	24 6	80 20	28 2	93.3 6.7
- Infection prevention: - Unsatisfactory - Satisfactory	27 3	90 10	00 30	00 100	00 30	00 100	27 3	90 10	27 3	90 10	27 3	90 10
- Follow up care: - Unsatisfactory - Satisfactory	30 00	100 00	00 30	00 100	00 30	00 100	30 00	100 00	27 3	90 10	30 00	100 00

Table (4): Level and Total Mean Scores of Knowledge about Post-Operative Care Pre, Post and Follow up of Study and Control Groups.

Item	Study Group (n=30)						Control Group (n=30)					
	Pre		Post		Follow up		Pre		Post		Follow up	
Level:	No	%	No	%	No	%	No	%	No	%	No	%
Unsatisfactory	30	100	6	20	10	33.3	30	100	28	93.3	29	96.7
Satisfactory	00	00	24	80	20	66.7	00	00	2	6.7	1	3.3
Mean & S. D.	28.53±11.1		93.20±17.9		73.03±9.5		28.53±11.0		31.003±3.6		30.03±1.5	

Table (5): Comparison of Total Mean Scores of Knowledge about Post-Operative Care Pre, Follow up of Study and Control Groups.

Item	Mean &S.D	t. test	P. value
Pretest: Control group. Study group.	28.53±11.0 28.53±11.1	1.370	0.176
Posttest: Control group. Study group.	31.003±3.6 93.20±17.9	16. 843	**0.000**
Follow up: Control group Study group.	30.03±1.5 73.03±9.5	13.165	**0.000**
Study group: Pretest. Posttest.	28.53±11.1 93.20±17.9	18.348	**0.000**
Study group: Pretest. Follow up.	28.53±11.1 73.03±9.5	14. 343	**0.000**
Study group: Posttest. Follow up.	93.20±17.9 73.03±9.5	13.965	**0.000**

 P≤0.000

Table (6): Comparison of Mean Scores of Total Knowledge of Mothers about Post-Operative Care in the Study Group (Pre, Post and Follow up the Intervention).

Item	Study Group (N=30)						f. test	P. Value
	Pre		Post		Follow Up			
	Mean	S. D.	Mean	S .D.	Mean	S .D.		
Sleeping position after operation.	0.133	0.345	0.033	0.1825	0.4000	0.4982	8.0600	**0.001**
Nutrition.	0.700	0.7943	1.5333	0.6288	2.0000	0.8304	22.745	**0.000**
Care of vomiting child.	3.333	2.0228	11.266	3.0730	6.8333	1.3666	92.358	**0.000**
Activities.	0.766	0.7738	1.800	0.4068	1.8333	0.3790	36.452	**0.000**
Care of feverish child.	2.866	1.3321	7.100	1.7090	5.3667	1.5421	57.628	**0.000**
Care of air way and cough.	2.000	1.5536	8.766	2.1444	6.4667	1.6760	108.47	**0.000**
Care of pain.	3.500	1.1962	7.033	1.1885	5.1000	1.0938	69.732	**0.000**
Medication administration.	3.000	0.0000	3.000	0.0000	3.0000	0.0000	----	----
Prevention of increased intarabdominal pressure.	1.666	1.3217	2.233	0.8976	2.5667	0.8172	5.786	**0.000**
Wound care.	5.433	2.7251	17.93	4.1434	10.766	1.9596	124.52	**0.000**
Urinary system care.	1.766	1.2507	6.333	1.0283	4.2667	1.0482	126.49	**0.000**
Infection prevention.	4.933	4.1683	23.03	5.46136	13.7333	2.61209	136.478	**0.000**
Follow up care.	0.733	0.4497	1.000	0.00000	1.0000	0.00000	10.545	**0.000**

P. ≤ 0.001

Table (7): Comparison of Posttest Knowledge of Mothers about Post-Operative Care between Control and Study Groups.

Item	Control		Study		t. test	P. value
	No	%	No	%		
Sleeping position after operation:						
- Unsatisfactory	25	83.3	1	3.3		
- Satisfactory	5	16.7	29	96.7	7.785	**0.000**
Nutrition:						
- Unsatisfactory	29	96.7	2	6.7		
- Satisfactory	1	3.3	28	93.3	11.883	**0.000**
Care of vomiting child:						
- Unsatisfactory	28	93.7	00	00		
- Satisfactory	2	6.6	30	100	10.614	**0.000**
Activities:						
- Unsatisfactory	27	90	00	00		
- Satisfactory	3	10	30	100	13.325	**0.000**
Care of feverish child:						
- Unsatisfactory	29	96.7	00	00		
- Satisfactory	1	3.3	30	100	11.202	**0.000**
Care of air way and cough:						
- Unsatisfactory	27	90	00	00		
- Satisfactory	3	10	30	100	9.642	**0.000**
Care of pain:						
- Unsatisfactory	25	83.3	00	00		
- Satisfactory	5	16.7	30	100	3.377	**0.000**
Medication administration:						
- Unsatisfactory	28	93.3	00	00		
- Satisfactory	2	6.7	30	100	11.646	**0.000**
Prevention of increased intar-abdominal pressure:						
- Unsatisfactory	28	93.3	1	3.3	9.313	**0.000**
- Satisfactory	2	6.7	29	96.7		
Wound care:						
- Unsatisfactory	25	83.3	00	00		
- Satisfactory	5	16.7	30	100	9.172	**0.000**
Urinary system care:						
- Unsatisfactory	24	80	00	00		
- Satisfactory	6	20	30	100	12.446	**0.000**
Infection prevention:						
- Unsatisfactory	27	90	00	00		
- Satisfactory	3	10	30	100	9.041	**0.000**
Follow up care:						
- Unsatisfactory	27	90	00	00		
- Satisfactory	3	10	30	100	2.795	**0.006**

Table (8): Comparison of Follow up Knowledge of Mothers about Post-Operative Care between Control and Study Groups.

Item	Control		Study		t. test	P. value
	No	%	No	%		
Sleeping position after operation:						
- Unsatisfactory	27	90	18	60		
- Satisfactory	3	10	12	40	3.785	**0.000**
Nutrition:						
- Unsatisfactory	30	100	1	3.3		
- Satisfactory	00	00	29	96.7	4.883	**0.000**
Care of vomiting child:						
- Unsatisfactory	30	100	00	00		
- Satisfactory	00	00	30	100	8.614	**0.000**
Activities:						
- Unsatisfactory	28	93.3	00	00		
- Satisfactory	2	6.7	30	100	3.325	**0.002**
Care of feverish child:						
- Unsatisfactory	30	100	00	00		
- Satisfactory	00	00	30	100	10.202	**0.000**
Care of air way and cough:						
- Unsatisfactory	28	93.3	00	00		
- Satisfactory	2	6.7	30	100	7.642	**0.000**
Care of pain:						
- Unsatisfactory	27	90	00	00		
- Satisfactory	3	10	30	100	2.677	**0.000**
Medication administration:						
- Unsatisfactory	28	93.3	00	00		
- Satisfactory	2	6.6	30	100	9.646	**0.000**
Prevention of increased intar-abdominal pressure:						
- Unsatisfactory	27	90	00	00	8.513	**0.000**
- Satisfactory	3	10	30	100		
Wound care:						
- Unsatisfactory	27	90	00	00		
- Satisfactory	3	10	30	100	7.112	**0.000**
Urinary system care:						
- Unsatisfactory	28	93.3	00	00		
- Satisfactory	2	6.7	30	100	11.644	**0.000**
Infection prevention:						
- Unsatisfactory	27	90	00	00		
- Satisfactory	3	10	30	100	8.641	**0.000**
Follow up care:						
- Unsatisfactory	30	100	00	00		
- Satisfactory	00	00	30	100	1.795	**0.078**

Table (9): Comparison of Post-Operative Complains of Children in the Study and Control Group.

Item	Study Group				Control Group			
	Phone follow up complains/ complications		Follow up clinic visit complains/ complications		Phone follow up complains/ Complications		Follow up clinic visit complains/ complications	
	No	%	No	%	No	%	No	%
1- Bleeding	00	00	00	00	00	00	8	26.6
2- Fever	9	30	00	00	00	00	13	43.3
3- Pain	7	23.3	00	00	00	00	6	20
4- Vomiting	6	10	00	00	00	00	7	23.3
5- urinary problems (Catheter removal (hypospadias, dysuria)	00	00	00	00	00	00	3	10
6- Abscess formation (complication)	00	00	00	00	00	00	2	6.7
7- Wound skin inflammation	3	10	00	00	00	00	6	20
8- Respiratory problem (cough and difficulty breathing)	8	26.6	00	00	00	00	3	10

The numbers in the table is not reflecting the number of children as some children had more than one complain.

Table (10): Follow up Phone Calls of Study Group.

Follow up phone calls				
Total number	**Minim duration in minutes**	**Maximum duration in minutes**	**Mean duration in minutes**	**St. Deviation in minutes**
98	2.00	20.00	6.7755	4.33288

Table (11): Correlation Matrix of Mothers' Knowledge Scores about Post-Operative Care and Their Characteristics in the Study Group (N=30).

Item	Pre intervention knowledge score		Post intervention knowledge score		Follow up intervention knowledge score	
	r.	**P. value**	**r.**	**P. value**	**r.**	**P. value**
Pre intervention knowledge score	--	--	0.430	**0.01**	0.022	0.908
Post intervention Knowledge score	0.430	**0.01**	--	--	0.484	**0.007**
Mother age	0.025	0.896	0.141	0.458	-0.459	**0.01**

P.≤0.0 5, P. ≤0.01

Discussion

Telenursing is a technology-based nursing service that was created to provide convenience to health services for patients The existence of telenursing for health services is based on many things, such as: the availability of limited human resources which makes it is unable to reach more patients, the limited capacity of hospitals and infrastructure, the need to minimize the risk of exposure to infection between patients and health workers, and the access to health service[21]. So the aim of the current study is to evaluate the effect of telenursing intervention program on mothers' knowledge about postoperative care for one day surgery children

Regarding socio-demographic data of children and their mothers in study and control group the findings revealed that there was no statistical significant difference, in addition no significant difference between two groups regarding diagnosis which reflect the homogeneity of study sample.

Concerning knowledge level the results illustrated that all mothers in control and study groups' pre the program had unsatisfactory knowledge level and there was no statistical significant difference between the two groups in the total mean score of knowledge about post-operative care. In prospective randomized controlled study by Gerceker, Muslu, and Yardimci (2016) [22], who evaluated children's postoperative symptoms at home after outpatient surgery through nurse-led telephone counseling, they stated that before discharge, it is important to give the parents adequate information about wound healing, changing the dressings, and the signs of infection. Postoperatively, there may be changes in the child's body temperature and blood pressure, nausea, vomiting, bloating, changes in appetite, and stomachache, possibly caused by anesthetic agents. Browne et al (2013) [23], reported that in this short period, it is the nurses' responsibility to reduce the child's pain, address and inform the mother about the child's home care and possible complications that arise in children at home and to manage their children's symptoms during recovery period.

The current study results may be due the time between the operation and the child's discharge is very short in one day surgery. The short time between discharge and surgery may unable parents to ask sufficient questions which also effect on the management of complications.

As regard to the most frequent post-operative complains of children the findings showed that in control group fever, bleeding, and vomiting were the most, while in study group it was

respiratory problems and pain. All children in the study group were managed immediately by the researchers on phone call while all the control group children presented to the surgical follow up clinic with the complaints. Also none in the study group had shown any postoperative complications while (10% and 6.7%) in control group had abscess formation and urinary catheter removal respectively. This difference in current study findings is most likely due to daily follow up by phone call which improved pain management by the mothers in the study group. These findings lead to accept research hypothesis number two and supported by similar studies.

Similarly, Souza-Junior, et al. (2016) [24], who stated that pain at the surgical site is the primary symptom among the postoperative problems experienced by pediatric patients. It is known that families experience difficulties in managing children's pain. The use of analgesics and pain relief methods for effective pain management reduces admissions to hospital due to pain. After one day surgery, patients can experience bleeding, pain, and wound discharge at the surgical site and some parents have difficulties with wound care and dressing changes.

Kassmann, et al. (2012) [25], who emphasized that telephone counseling, is a way to control patients' symptoms by contact with healthcare professionals whenever they need information or have a problem in the postoperative period, and creates a sense of trust in patients and their families. When the parents receive telephone counseling for their child's problems, it reduces unnecessary hospital admissions, anxiety, and undesirable situations, such as the greater use of painkillers [4].

In the same line Gerceker, Muslu, and Yardimci (2016)[22], who reported that the most common postoperative symptom was pain. Intervention group parents were given information related to pain management by nurse-led telephone counseling, including use of analgesics and an explanation of non-pharmacological pain relief methods, while there were no visits to the emergency department for pain symptoms in the intervention group while control group visited emergency services due to pain.

In a prospective study by Xin, et al (2019) [26],who studied efficacy of telephone follow-up in children tonsillectomy with day surgery, the sample consisted of 863 children randomly assigned to receive clinic visit after discharge or 1 to 14 days telephone follow-up after discharge. Compared with clinical visit, children in telephone follow-up group presented with

less pain in early stage after surgery and better food and drink intake telephone follow-up significantly reduces pain intensity, promotes analgesia use and fluid intake and reduces the search for healthcare services. They suggested that a follow-up telephone call is a safe and cost-effective method of postoperative management for pediatric patients who have undergone tonsillectomy.

The present study results revealed that there were positive highly statistical significant differences between the total mean scores of mothers' knowledge pre, post and after one month following the intervention. Regarding this findings, it was evident that the present study results supported the research hypotheses one as the total mean scores knowledge of intervention group in post and follow up phase of implementation of telenursing program were more than before compared with control group with highly statically significant difference. These results are supported by many studies in the same context. In a review by Al Afik, and Pandin (2020)[27] to identify the important role of telenursing in improving nursing services for patients The results of a review of 10 articles found that the form of nursing services with telenursing could prove long-distance service, time efficiency and funding allocation. The 21st

century global nursing paradigm was developed with the help of technology to meet the needs of services that have distance, physical and cost limitations. They add that telenursing is a solution to answer the challenges of the demands of efficient and quality health care services. The summary of 10 articles shows that there are significant benefits to the use of technology to support health services. Nursing has many ways to facilitate the patient's need for nursing care and/or in managing management and conducting distance education that is more efficient and can reduce costs.

Dehkordi, et al (2020) [28] and Rakhmawati (2020)[15] reported that some evidence related to telenursing illustrated that it could be used for consultation, education, monitoring, and the evaluation of health care outcomes. Telenursing is effective with increasing the needs of public health. Finally In a recent systematic review by Gudnadottir, et al (2021) [29] to study what the current literature reports on the effect of post-operative telephone counseling and Internet support on pain and recovery after pediatric tonsil surgery. They highlighted that nursing interventions such as pre-surgical preparations and nurse telephone follow up may have a positive influence on children's postoperative recovery. They also showed the need of further nursing

studies within the area in order to be able to generalize results and thus draw evidence based conclusions.

Conclusion

The current study concluded that telenursing intervention program positively improved mother's knowledge in intervention group after implementation than before compared with control group.

Recommendations

- Applying telenursing intervention in nursing care to facilitate contact of mothers with nurses whenever they need

- Further researches needed to emphasize the effect of telenursing intervention on improving mother's knowledge about post-operative care for a larger sample and a longer period of time.

Acknowledgment

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Adherence of Chronic Renal Failure Patients Undergoing Maintenance Hemodialysis with Their Therapeutic Regimen

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Abstract :

Background: Adherence with the prescribed medical regimen is a crucial factor for achieving good therapeutic results in dialysis patients. **This study aimed to:** Assess adherence of chronic renal failure patients undergoing maintenance hemodialysis with therapeutic regimen. **Subjects and Method: Setting:** In the dialysis Unit at International Educational Hospital, Student Educational Hospital of Tanta University and Health Insurance Hospital. **Subjects**: A convenience sample of 200 adult patients with CRF admitted to Hemodialysis Units at Scheduled. **Three tools were used,** Tool (I) Structured interview schedule.Tool (II) Patient's knowledge assessment questionnaire, Tool (III) GR-Simplified Medication Adherence Questionnaire Hemodialysis. **Results :** It was observed that vast majority (83%) of studied patients had adherence with medication , more than two third (68.5%) of studied patients had adherence with follow up , while more than half (55.5%) had in-adherence with dietary instructions and (44.5%) had adherence .there was a high positive significant correlation between knowledge score and adherence . **Conclusion:** the results revealed that studied patients with good knowledge score appeared adherence with the GR-SMAQ-HD scale, while studied patients who had poor knowledge appeared In-adherence. **Recommendations:** Counseling should be provided for all patients who are undergoing Hemodialysis that helps in preparation of them and give advice in adherence of therapeutic regimen   .

Key words: Hemodialysis   , Adherenc , Therapeutic Regimen .

Introduction

Chronic kidney disease (CKD) is a progressive disease that cannot be reversed and can lead to kidney failure or end-stage renal disease (ESRD), if it is not detected and treated early. Because of its chronic nature and potentially serious complications, individuals suffering from CKD experience poor quality of life, financial burden, and significant life changes that also affect their families. CKD is devastating due to extreme poverty, poor accessibility to health care, and a diverse population that makes standardized health education difficult if not impossible because of differences in culture, values, and beliefs [1,2].

Globally, chronic renal failure is major health issue in various parts of the world. Its problem both at the personal and national level, increased risk of cardiovascular disease and can cause high mortality rate worldwide. It refers to a disorder in which kidney damage or reduced glomerular filtration rate (GFR) occurs for three months or longer [3, 4].

End-stage renal disease is increasing worldwide. Renal replacement therapy (RRT) and kidney transplantation are increasing the burden on health systems. This condition is particularly serious in developing countries where health resources are inadequate [5].

According to 9th Annual Report of the Egyptian Renal Registry provided by Egyptian Society of Nephrology and Transplantation (ESNT), prevalence of ESRD in Egypt raised to 483 patients per million. ESRD is one of the main health problems in Egypt [6]. Hemodialysis represents the main therapeutic modalities for treatment of CKD such as hemodialysis (HD), peritoneal dialysis, or kidney transplantation patients undergo dialysis for at least 18 hours per week. Nurses comprise the main providers of hemodialysis care [7,8].

Hemodialysis treatment is the most common type of renal replacement and alternative way of treatment in chronic renal failure patients. it' lifesaving procedure for patients with end stage kidney disease it gives more chance of living to the patients that filters waste, removes extra fluids and electrolytes [9,10] so the patients need to be adherent to the therapeutic regimen which include adherence to the prescribed medications, diet, fluid restriction, and attendance of hemodialysis sessions. Non-adherence to the prescribed regimen is a common problem in hemodialysis and is associated with increased morbidity and mortality [11,12].

The World Health Organization (WHO)

defines adherence as the extent to which the persons' behavior including medication-taking corresponds with agreed recommendations from a healthcare provider. it includes the initiation of the treatment , implementation of the prescribed regime, and discontinuation of the pharmacotherapy [13,14].

Compliance and adherence are used interchangeably. Unfortunately, poor patient adherence to haemodialysis is a prevalent problem in health care that has considerable medical, social and economic consequences, predominantly among patients undergoing hemodialysis[15].

According to National Kidney Foundation-Kidney Disease Outcomes Quality Initiative (NKF-KDOQI) non-adherence in hemodialysis (HD) includes non-adherence to pharmaceutical treatment, omitting or shortening the time of HD session, excessive intake of fluids and foods containing potassium and phosphorus. ESRD under hemodialysis is a long-term illness that deprives patients of living a normal life .factors, which influence HD patient adherence, vary and may be treatment- related, condition-related, health system-related or socioeconomic[16].

The main types of non-adherence categorization are indisputable and there is a degree of overlap. The firs type is primary non adherence, in which providers write prescription but the medication is never filled or initiated, this type is commonly called non fulfillment adherence [17]. A second type of non-adherence is called non persistence in which patients decide to stop taking a medication after starting it without being advised by a health professional to do. So is rarely intentional and happens when patients and provider 'miscommunication about therapeutic plans [18]. A third type of non-adherence is non-conforming, includes a variety of ways in which medication are not taken as prescribed, this behavior can range from skipping doses to taking medications at incorrect times or at incorrect doses, to even taking more than prescribed [19].

Nurses must respect the beliefs and choices of the patient and must assess the degree of adherence, avoiding judging the patient. Tailoring the therapy to the patients' needs is sometimes necessary. this includes investigating patients' preferences, simplifying dosing regimens, and using adherence aids. No single intervention leads to large improvements in adherence and treatment outcomes, but a combination of interventions, human

behavior's motivations are multiple, complex and sometimes unspecified [20].

Aim of the study

The aim of this study is to assess adherence of chronic renal failure patients undergoing maintenance hemodialysis with therapeutic regimen.

Research questions:

-What was the extent of adherence of hemodialysis patients to therapeutic regimen?

-What were the factors affecting adherence of hemodialysis patients in relation to therapeutic regimen?

Subjects and Method

Study design:

Descriptive cross - sectional design was used achieve the aim of the study and answer the research questions.

Setting of the study:

This study was conducted in dialysis Unit at International Educational Hospital, Student Educational Hospital of Tanta University and Health Insurance Hospital.

Subjects:

A convenience sample of 200 adult patients with CRF admitted to Hemodialysis Units at Tanta University and Health Insurance Hospital and Scheduled for hemodialysis were recruited to the study. The sample size was calculated using a power analysis by using EP – info software package .

The inclusion criteria were as follow:

• Confirmed diagnosis of chronic renal failure.

Adult patients from (21 to 60 year).

- Undergoing hemodialysis for at least 6 months and receive dialysis at least three times weekly .

- Conscious patient able to communicate and accept to participate in the study .

The exclusion criteria were as follow:

- Patients with history of mental illness .

- Malignance carcinoma .

Data collection tools:

Three tools were used at this study after reviewing the relevant literature [21-26]. Those three tools aimed to assess adherence of chronic renal failure patients undergoing maintenance hemodialysis with therapeutic regimen Tool (I): Structured Interview Schedule**.** Tool (II): Patient's Knowledge Assessment Questionnaire (PKAQ)**.** Tool (III): GR-Simplified Medication Adherence Questionnaire Hemodialysis (GR-SMAQ-HD).

Tool (I): Structured Interview Schedule: This tool was developed by the researcher based on relevant literature review for collection of baseline data [27-30], to assess patient's socio demographic data, clinical information and their knowledge about hemodialysis and Clinical and investigation

data. It consisted of four parts as follow:

Part 1: Socio demographic data:

 It was developed to assess patient's socio demographic data that covered the following variables: patient's name, age, sex , marital status, occupation , smoking history , education level ,income , place of residence, socioeconomic status , income , type of medication coverage , telephone number and the daily number of pills taken .

Part 2: **Past medical history:**

 This part was consisted of statements that used to assess patients information about their health history, it was comprise the following areas: past medical history (Diabetes, Kidney disease, Hypertension, Heart disease, Liver diseases, Pulmonary diseases, Cancer, Blood diseases).

History of hospitalization, medical history as (Hypertension, Chest crunch, angina pectoris, heart clot diabetic coma, hepatic coma, anemia) Surgical history as (Finger amputation, incident,   Knee cartilage, Heart catheterization, Hernia process and network installation To make a speculum, arterial vein joint and History of taking any type of medication previously, last laboratory studies, heart rate, respiration rate, blood pressure, associated chronic diseases.

Part 3: hemodialysis data:

This part was developed to assess patients knowledge about hemodialysis such as:

duration of hemodialysis treatment, site of vascular access , complication , number of hemodialysis treatment per week , number of, hours in each session ,   pre – hemodialysis (HD) weight and post HD weight .

Part 4: Clinical and investigation data: this part was developed to assess patient's clinical and blood chemistry, fluid and electrolytes. Such as: Biochemical markers of pre-hemodialysis serum phosphorus and potassium, kidney and liver function tests complete blood picture.

Tool (II):   Patient's knowledge assessment questionnaire: (PKAQ): It was developed by researcher after review the relevant Literature written in Arabic language[27-30,21-23,26] to assess patient's knowledge about renal failure disease process such as: Definition and causes , hemodialysis: definition, purposes , side effect, and investigation. Treatment regimen including diet and fluid restrictions, medication adherence, importance of adhering to hemodialysis sessions, care of blood access site.

 Scoring system: Patient who was responded by correct and complete answer was given a score two, correct and incomplete answer was given a score one and the patients who responded wrong and Incorrect answer was given a

score zero.

Scoring system of patient's knowledge assessment questionnaire was done as follow:

Items of knowledge 30 question so the total scoring system of patients knowledge was (60) and was classified as the following:

Very good level of knowledge was considered when total score of items response was from75% to more (45 - 60).

 - Fair level of knowledge was considered when total score of items response was from 60% to less than 75%   (36 - 44).

- Poor level of knowledge was considered when total score of items response was from less than 60% of total score   (> 36).

Tool (III): GR-Simplified Medication Adherence Questionnaire Hemodialysis (GR-SMAQ-HD)

The original scale was developed by Alikari (2017)[13], to assess level of patient adherence to hemodialysis regimen. It was consists of eight items exploring the three dimensions of adherence in hemodialysis medication adherence include one to fourth items **,** Attendance at Hemodialysis Session include fifth and six items and Diet / Fluid restrictions include seventeen and eight items . Three of the items are dichotomous (Yes /No) While five are scored on a five point Likert – type Scale.

The internal consistency of the scale has been studied (Cronbach's Alpha 0.751) as the following. The score ranges from (0 - 8). Higher scores indicate higher adherence to HD regimen.

Method:

Administrative process:

- Official permission from the faculty of nursing was sent to authorities at the three selected units to conduct the study.

- permission was received from directors of dialysis Units at International Educational Hospital , Student Educational Hospital of Tanta University are affiliated to Tanta university Hospital and Health Insurance Hospital

- A Written approval hospital permission was obtained from the responsible authority of hemodialysis Units at International Educational Hospital, Student Educational Hospital of Tanta University and Health Insurance Hospital before conducting this study through official letters from faculty of nursing explaining the purpose of the study.

Ethical consideration:

- Written consent was obtained from every patient included in the study after explanation of the aim of the study and assuring them of confidentiality of collected data   .

-Confidentiality and anonymity was maintained by the use of code number instead of name and the right of withdrawal is reserved

-Confidentiality was assured to the patient

- Nature of the study will not cause any harm or   pain for the entire sample.

Tools development:

Tool (I) Structured interview schedule and   Tool (II) patient's knowledge assessment questionnaire: (PKAQ): were developed by the researcher to collect the data after extensive review of literature [27-30,21-23,26]

Tool (III): GR-Simplified Medication Adherence Questionnair Hemodialysis (GR-SMAQ-HD). The orginal scale was developed by Alikari (2017) [13] to assess level of patient adherence to hemodialysis regimen.

Content validity:

- All tools of the study were reviewed for content validity by apanel of (5) expertises in the field of Medical Surgical Nursing, Nephrology at the Faculty of Nursing and Medical specialists, and also Biostatistics at the Faculty of Medicine. It was calculated and found to be = (96%).

 - Modifications were done to certain relevance and completeness.

Reliability of the tools:

The reliability for the study tools was calculated by Cronbach's Alpha test; it was 0.786 for Tool I and 0. 853 for Tool II, which consider highly reliable tools.

A pilot study:

It was conduct on 10% (20) hemodialysis patient in Hemodialysis Unit to test the clarity, feasibility and applicability of the different items of the determent tools to detect any obstacles that may be encountered during the period of data collection and needed modification will be done by researcher before study according to the experience gained from this pilot study has been done Subject of pilot study are excluded from the original sample and the subject was selected randomly

Data collection:

 Data collection duration period was 6 months started from first of July to the end of December in 2019. The researcher collected the data through the morning and the afternoon sessions throughout the week to cover the entire patients as they had fixed hemodialysis session time, data was collected by using tool I ، tool II & tool III during the morning and afternoon shift according to each Hospital rules, in the Hemodialysis Units at Health Insurance Hospital during the time after one hour of insertion to hemodialysis. About 5 to 10 patients were interviewed daily from 10:30 Am to 12:30 Am, through two days / week

 Also, in the Hemodialysis Units at Students Educational Hospital of Tanta

University during the time after one hour of insertion to hemodialysis. about 5 to 10 patients were interviewed daily from 2: 30 pm to 4:30 pm, through two days / week, and in the Hemodialysis Units at International Educational Hospital of Tanta University during the time after one hour of insertion to hemodialysis about 5 to 10 patients were interviewed daily from 2: 30 pm to 4:30 pm, through another two days / week.

- The selected patients who met the inclusive criteria were asked to participate in the study after establishing trustingrelationand explaining the aim of the study. After that all patients provided written informed consent for participation in the study. Then data was collected during interview. Each patient were reassured that, they obtained information will be confidential and used only for the purpose of the study.

 - The researcher was available in hemodialysis unit for any expectations and checking each question after complete to be sure that all questions were answered. (Each interview duration ranged from 30 to 40 minutes).

- In the event of no answer, patients were further asked whether or not they wished to receive information about this specific item. On other hand, in the event of positive answer, they were discussed about their knowledge and from whom did they get the knowledge from.

- After data collection, data was coded, analyzed then tabulated under the direction of a statistician to obtain results to answer the research questions.

Finally, most new patients approach a hemodialysis procedure with fear. Moreover, to lessen or even prevent this, providing patients with information about the disease, hemodialysis and important of adherence to therapeutic regimen is essential in order to prepare the patients physically, emotionally and intellectually for the procedure of hemodialysis.

Statistical analysis:

 The following tests used in the study were chi square test to assess therelationbetween knowledge and the GR-Simplified Medication Adherence of patients undergoing hemodialysis.

The data was collected and statistically analyzed using the Statistical Package for Social Sciences (SPSS) version 20 for continuous variables (mean ±SD, Linear Correlation Coefficient and chi-square tests Linear Correlation Coefficient [r]: was used for detection of correlation between two quantitative variables in one group.

10. The level of significance chose in the study was set at 0.05 levels.

-Non significance if P-value > 0.05

-Significance   if P-value < 0.05

-High significance if P-value < 0.001

Results

Table (1) illustrates percent distribution of studied patients according to their socio demographic characteristics. The table revealed that the mean age of studied patients was (46.78±6.52) more than half (56.0%) in the age their age late adult hood ranged from 51 to 60 years old and, majority of them (84.0%) were male, while only (16.0%) were females, and majority (81%) of the studied patients were married and less than half (47.5%) of studied patients had employee. Moreover, it was observed that nearly less than one third of studied patient (46%) were preparatory school.

Table (2): illustrates Percent distribution of studied patients according to their adherence to treatment regimen. It shows that, majority (96%) of studied patients didn't feel bad about their condition deteriorates when they stop taking their medications .In relation to forget to take medicines, nearly four fifth (78%) of studied patients didn't forget to take medicines. Regarding their forgot to take your medications during the time between two dialysis sessions , the result show that nearly more than three quarters (82%) of studied patients didn't forgot to take their medications during the time between two dialysis sessions .

Table (3) illustrate percent distribution of studied patients regarding to level of the GR-Simplified Medication Adherence Questionnair Hemodialysis (GR-SMAQ-HD) scale among studied subjects. This table showed that, less than two third (61%) of studied patients had adherence with the GR-SMAQ-HD scale, while more than one third (39 %) of them had non-adherence with the GR-SMAQ-HD scale.

Table (4) illustrates Correlation between studied patient's total knowledge score and adherence. It can be seen that, there was highly positive significant correlation (r=0.375, 0.427, 0.169, 0.395, 0.427 respectively) between knowledge score and adherence, P value <0.001.

Table (5) illustrates Relation between patient's total knowledge score and the GR-SMAQ-HD scale. It is observed that, majority (89.6%) of studied patients had good knowledge and adherence with medication, while majority (93.8%) had good knowledge, adherence with follow up and majority (89.6%) had good knowledge, adherence with fluid restrictions, Also less

than two third (60.4%) had good knowledge and adherence with dietary instructions .It was found that, majority (93.8%) of studied patients had good knowledge and adherence with the GR-SMAQ-HD scale. Moreover , there was <0.05.

Table (6) illustration Relation between socio of studied subjects and their The GR-SMAQ-HD scale. This table showed that the age of studied patients from 51 to 60 years old, more than half (58.9%) who had Adherence with The GR-SMAQ-HD, (41.1%) had In-adherence, and less than three fourth (73.8%) of studied patients who had adherence were male, while (26.2%) had in-adherence . On other hands more than half (53.1%) of studied patients who had adherence were female , while nearly less than half (46.9%) patients

high a statistical significant difference among studied patients between knowledge and medication , follow up , fluid restriction , dietary instruction and The GR-SMAQ-HD scale , p-value was

had in-adherence. As regards to marital status, more than two third (67.9%) of studied patients who had adherence were married, while (32.1%) had in-adherence. Also, more than half (58.9%) of studied patients who had adherence were employee, while less than half (41.1%) had in-adherence. It was found that, there was a highly statistical significant difference between adherence in relation to age , sex , marital status, occupation, level of education, residence and economical status, p-value was <0.001**

Table (1): Percent distribution of studied patients according to their socio demographic characteristics (n = 200)

Personal information	N=200	%
Age (years)		
21-30	20	10.0
31-40	28	14.0
41-50	40	20.0
51-60	112	56.0
Mean±SD	46.78±6.52	
Sex		
Male	168	84.0
Female	32	16.0
Marital status		
Single	24	12
Married	162	81
Divorced	9	4.5
Widow	5	2.5
Occupation		
Employee	95	47.5
Unemployed	79	39.5
Retired	26	13
Smoking history		
Yes	28	14.0
No	172	86.0
cessation of smoking		
Yes	12	42.9
No	16	57.1
How many cigarette per day		
Mean±SD	1.5±0.43	
Level of education		
Illiterate	40	20.0
Preparatory School	92	46
Secondary school	44	22.0
University	24	12.0
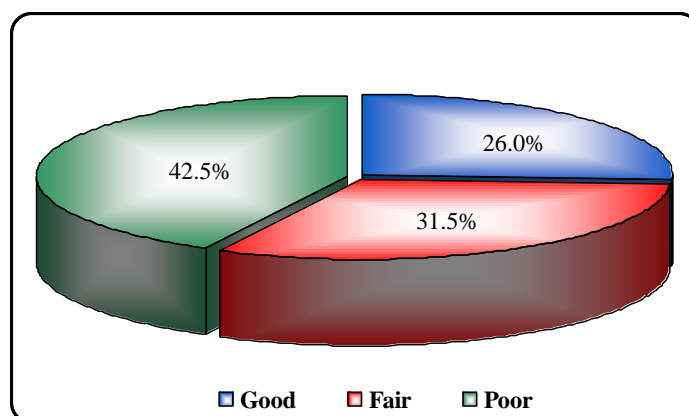
Figure (1): Percentage distribution of studied patients according to their total Level of the knowledge among studied subjects

Table (2): Percent distribution of studied patients according to their adherence to treatment regimen

The GR-SMAQ-HD scale	N	%
feel bad your condition deteriorates, you stop taking your medications		
Yes	8	4
No	192	96
forget to take medicines		
Yes	44	22
No	156	78
forgot to take your medications during the time between two dialysis sessions		
Yes	36	18
No	164	82
not take the medicine during the last week		
3-5	8	4
1-2	52	26
None	140	70
Last month, how many times did you shorten the session by yourself		
4-5	8	4
3	32	16
2	16	8
1	24	12
I never did a shorter session than myself	120	60
Last month, how many minute did you shorten the session by patient		
>30 min.	24	12
21- 30 min.	32	16
11-20 min.	20	10
<=10 min.	8	4
Never	116	58
Over the past week, how often have you followed the instructions for fluid restrictions		
Never	24	12
Rarely	28	14
Sometime	32	16
Often	52	26
+every-time	64	32
During the past week, how many times have you followed the dietary instructions		
Never	28	14
Rarely	48	24
Sometime	20	10
Often	44	22
every-time	60	30
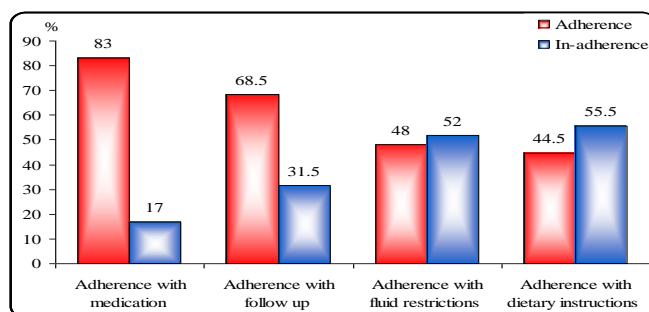
Figure (2): Percent distribution of studied patients according to their adherence to medication

Table (3): Percent distribution of studied patients regarding to level of the GR-Simplified   Medication Adherence Questionnaire –Hemodialysis (GR-SMAQ-HD) scale among studied subjects

The GR-SMAQ HD scale	N	%
Adherence	122	61
non-adherence	78	39
Total	200	100
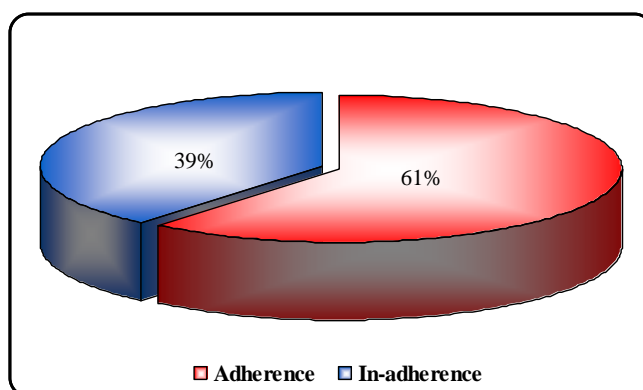
Figure (3) Level of the GR-Simplified Medication Adherence Questionnaire – Hemodialysis scale among studied subjects

Table (4): Correlation between studied patient's total knowledge score and adherence

Items of adherence	Total knowledge	
	R	P-value
Adherence with medication	0.375	0.002*
Adherence with follow up	0.427	<0.001**
Adherence with fluid restrictions	0.169	0.035*
Adherence with dietary instructions	0.395	<0.001**
The GR-SMAQ-HD scale	0.427	<0.001**

>0.05 Non significant   <0.05 significant   <0.001** High significant*

Table (5) : Relation between studied patient's total knowledge score and the GR-SMAQ-HD scale.

|	Total knowledge							
	Poor		Fair		Good		Chi-square	
	N	%	N	%	N	%	X^2	P-value
Adherence with medication								
Adherence	52	66.7	71	95.9	43	89.6	25.011	<0.001**
In-adherence	26	33.3	3	4.1	5	10.4		
Adherence with follow up								
Adherence	35	44.9	57	77.0	45	93.8	36.858	<0.001**
In-adherence	43	55.1	17	23.0	3	6.3		
Adherence with fluid restrictions								
Adherence	15	19.2	38	51.4	43	89.6	59.451	<0.001**
In-adherence	63	80.8	36	48.6	5	10.4		
Adherence with dietary instructions								
Adherence	20	25.6	40	54.1	29	60.4	18.891	<0.001**
In-adherence	58	74.4	34	45.9	19	39.6		
The GR-SMAQ-HD scale								
Adherence	22	28.2	55	74.3	45	93.8	62.425	<0.001**
In-adherence	56	71.8	19	25.7	3	6.3		

>0.05 Non significant   <0.05 significant   <0.001** High significa*

Table (6) : Relation between socio of studied subjects and their adherence

	The GR-SMAQ-HD scale					Chi-square	
	Adherence		In-adherence		Total		
	N	%	N	%		X2	P-value
Age							
21-30	18	90	2	10	20	16.736	<0.001**
31-40	23	82.1	5	17.9	28		
41-50	34	85	6	15	40		
51-60	66	58.9	46	41.1	112		
Sex							
Male	124	73.8	44	26.2	168	5.53	0.019*
Female	17	53.1	15	46.9	32		
Marital status							
Single	20	83.3	4	16.7	24	4.155	0.245
Married	110	67.9	52	32.1	162		
Divorcee	8	88.9	1	11.1	9		
Widowed	3	60	2	40	5		
Occupation							
Employee	56	58.9	39	41.1	95	0.911	0.634
Unemployed	48	60.8	31	39.2	79		
Retired	18	69.2	8	30.8	26		
Level of education							
Illiterate	21	52.5	19	47.5	40	16.24	0.003*
Reads and writes	58	65.9	30	34.1	88		
preparatory School	3	75	1	25	4		
High school	37	84.1	7	15.9	44		
University	22	91.7	2	8.3	24		
Residence							
Urban	58	76.3	18	23.7	76	1.994	0.158
Rural	83	66.9	41	33.1	124		
Economical Status							
Below average	24	66.7	12	33.3	36	3.84	0.147
Average	96	68.6	44	31.4	140		
above average	21	87.5	3	12.5	24		
Hospital name							
Health insurance hospital	71	71	29	29	100	8.449	0.015*
University Hospital	26	52	24	48	50		
Student Hospital	25	50	25	50	50		

>0.05 Non significant   <0.05* significant   <0.001** High significant

Table (6) : Relation between socio of studied subjects and their adherence

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Rural	83	66.9	41	33.1	124		
Economical Status							
Below average	24	66.7	12	33.3	36	3.84	0.147

Discussion

Hemodialysis treatment is the most common type of renal replacement and a lifesaving procedure for patients with end stage kidney disease. Although 3 times 4 hours weekly dialysis equal less than 10% of normal renal clearance, so the patients are exposed to some problems and adverse effects. Also, the patients with ESRD need to be adherent to the therapeutic regimen which include adherence to the prescribed medications, diet, and fluid restriction, and attendance of hemodialysis sessions, non-adherence to the prescribed regimen is a common problem in hemodialysis and is a3sociated with increased morbidity and mortality [31-33].

Adherence to treatment and management recommendations is essential for optimal health and survival of persons with ESRD. It is necessary to educate patients with chronic disease like chronic renal failure in order to improve their quality of life in long-term. Unfortunately, poor patient adherence to haemodialysis is a prevalent problem in health care that has considerable medical, social and economic consequences, predominantly among patients undergoing hemodialysis . it was revealed that non adherence to treatment negatively affects patient outcomes and increases healthcare expenses . Not only patients themselves are affected, but non-adherence behavior influences the normal work-load of the haemodialysis unit [34,35].

Regarding to socio demographic characteristic of the studied patients. According to the current study's findings , more than half of patients having hemodialysis were between the ages of group ranged from 51 to 60 years .This may be attribute to most people in their late 50 or older , their risk for ESRD is increased due to presences of some disease such as hypertension , diabetes mellitus and prostatic enlargement . And ESRD dramatically increases with aging, particularly after the age of 50 year. This result was in the same line with **Arbagy et al. (2015)** [36] in a study Prevalence of end stage renal disease in Menoufia Governorate , in Egypt reported that the mean age of the hemodialysis patient was 52 years.

On other hand, this finding was contradicted with **Elmoghazy et al. (2016)** [37] in a study to Nursing intervention for enhancing hemodialysis patient adherence to therapeutic regimen .Who reported that the present study revealed that less than one half of the study subjects their age was less than 40 years. This finding might be due to that ESRD is more common among the middle adulthood persons.

In relation to gender, the current study results revealed that the majority of studied patients were male this because the load of the working and associated stress and may be related to the life style of most men and Farmers' job among the Egyptian males makes them at risk for interstitial nephritis due to the exposure to agrochemicals, dehydration and consumption of contaminated water. add to that, male older adults are at risk for benign prostatic hypertrophy which may lead to reflux of the urine to the kidney and compromise the kidney functions .This finding was in accordance with **Sharaf et al. (2016)** [38] in a study The impact of educational interventions on hemodialysis patients adherence to fluid and sodium restrictions who reported that more than half of subjects were male and develop ESRD more than females , Also , this result was supported by **Makusidi et al. (2014)** [39] in a studied Hemodialysis performance and outcomes among end stage renal disease patients and mentioned that ESRD predominantly affect males more than females .

On other hand, this finding was contradicted with **Vafaei et al. (2017)** [40] and **Mousavi1 et al. (2015)** [41] they illustrated that majority of studied patients were female .They explain that the women under hemodialysis have lower scores of quality of life and higher risk of death when compared to men. This is associated with the maintenance of the function of providing care to the home and children.

Concerning to their adherence to treatment regimen, the current study result revealed that the majority of studied patients no stop taking your medications if feel bad your condition deteriorates .This finding was consistent with **Tan et al. (2014)** [42] they mentioned that the majority of studied patient. When you feel bad , have you ever discontinued taking your medication ? In the study results from the translation and cultural adaptation of the geek simplified medication adherence questionnaire in patients with lung cancer. **In relation to forget to take medicines**, the current study results revealed that four fifth of studied patients didn't forget to take medicines. This finding was in agreement with **Lam et al. (2015)** [43] in a study medication adherence measures: an overview. Bio Med Research International who ask have you ever forgotten to take your medication? Who reported in the study more than half no forgotten to take your medication? **As regards to forget to take your medications during the time between two dialysis sessions**, **the** study result revealed that nearly more than three quarters of studied patients didn't forgot to take their medications during the time

between two dialysis sessions. This finding in agreement with **Culig et al. (2014)** [44] in a study from Morisky to Hill bone; self-reports scales for measuring adherence to medication. Who ask have you ever forgotten to take your medications during the time interval between two dialysis sessions? Who reported in the study nearly four fifth didn't forgot to take their medications during the time between two dialysis sessions.

Concerning to level of the GR-Simplified Medication Adherence Questionnaire –Hemodialysis (GR-SMAQ-HD) scale among studied subjects. The results of the study revealed that only around less than two third of the patients on Hemodialysis adhered to the Greek simplified medication adherence. This finding in agreement with **Maanen et al. (2015)** [45], in a study Adherence with dosing guideline in patients with impaired renal function at hospital discharge who reported that about less than two third of the studied participants adherence to CKD medications.

Correlation between studied patient's total knowledge score and adherence. The present study demonstrated that there was highly positive significant correlation between knowledge score and adherence. This finding was consistent with study

done by **Sayed et al. (2013)** [46], in study Effect of the Patient's knowledge on peritonitis rates in peritoneal dialysis who demonstrated that knowledge was strongly associated with adherence to the ESKD treatment regimen .

Relation between studied patient's total knowledge score and the GR-SMAQ-HD scale. The study revealed that, the majority of studied patients had good knowledge and adherence with the GR-SMAQ-HD scale these include adherence with medication, follow up, fluid restrictions and dietary instructions. This explain that high significant correlation between the knowledge and adherence p-value was <0.05 .This finding was consistent with study done by **Victoria et al. (2019)** [47], in study the impact of education on knowledge, adherence and quality of life among patients on hemodialysis who demonstrated that significant correlation between the knowledge and adherence.

Also relation between studied patient's total knowledge and adherence with dietary instructions , the study revealed less than two third had good knowledge and adherence with dietary instructions .they explain that adherence to the ESKD treatment regimen was strongly associated with knowledge . This finding was consistent with study done by **Estrella et**

al. (2013) [48], who reported that significant increase in the level of their patients' knowledge in relation to the diet restrictions.

Relation between socio of studied subjects and their adherence. The study revealed that less than three fourth of studied patients who had adherence were male , while nearly less than half patients had in-adherence were female ,The majority of ESRD participants were males rather than females . So gender was significantly associated with adherence to therapeutic regimen .This finding in line with **Naalweh et al. (2017)** [15] in study treatment adherence and perception in patients on maintenance hemodialysis were reported that male patients had significantly higher overall adherence scores than females.

 On other hands contradicted with **Duong et al. (2015)** [49] in study challenges of hemodialysis in Vietnam: Experience from the first standardized district dialysis unit who revealed in the study that female were representing more than the males and who mention that   gender was not associated with adherence to hemodialysis.

Conclusion

Based on the findings of the present study, it can be concluded that: In patients with chronic kidney diseases, dialysis is a critically important treatment that prolongs the survival time and improves the quality of life. Dialysis facilitates the excretion or removal of the toxic and harmful metabolic wastes from the human body·   However, the poor compliance of patients might negatively influence its effects. Patients can be not adherent with different aspects of their treatment, which includes medications, treatment regimens, and dietary restrictions. To minimize non-adherence, assessment needs to focus on both patient factors and the extent to which relationships and system problems compromise the patient's ability to adhere to medication and treatment plans**.**

There was highly positive significant correlation between knowledge and adherence of studied patients, the results revealed that studied patients with good knowledge score appeared adherence with the GR-SMAQ-HD scale, while studied patients who had poor knowledge appeared In-adherence with the GR-SMAQ-HD scale include In-adherence with

 (medication , follow up , fluid restrictions and dietary instructions).

-   The study also revealed that, there were certain factors that influence the

knowledge and adherence of studied patients as in age, sex, marital status, level of education, residence and economical Status.

- Finally, overall findings revealed that good knowledge to the patient Undergoing Hemodialysis, improve adherence with their therapeutic Regimen.

Recommendations

Based upon the findings of this study, the following recommendations are derived and suggested:

Recommendation for patients:

- Counseling should be provided for all patients who are undergoing Hemodialysis that helps in preparation of them and give advice in adherence of therapeutic regimen.

Recommendation for clinical practice:

- Assessment of patient's knowledge about hemodialysis must be done upon patient admission by nurses using (Tool I).

- Assessment of patient's knowledge about renal failure and hemodialysis regarding definition, purposes, side effect, investigation. Treatment regimen including diet and fluid restrictions, medication adherence, importance of adhering to hemodialysis sessions   , care of blood access site must be done in the initial data collection and be documented in patients file by nurses using (Tool II).

- Assessment of patient's level of adherence to hemodialysis regimen by nurses using (Tool III).

Recommendations for administration:

- Written policies and guide lines should be available regarding increasing knowledge and adherence of therapeutic regimen for patients undergoing hemodialysis.

- Provision of colored booklet regarding physical and psychological preparation before Hemodialysis procedure.

- Multi-disciplinary team should be available to provide individualized information and support for each patient.

Recommendation for further research studies:

- Replication of the study on a larger random sample which is acquired from different geographical areas in Egypt to better clarify the main aspects of this problem.

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The Relation between Clinical Competency and Perceived Psychiatric Nurses' Job Stress

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Abstract

Background: Psychiatric nurses' face a variety of stressors as shortage of nurses; lack of autonomy, lack of support from managers and unexpected psychiatric patient behavior like aggression and violence. Clinical competency is used as an index for accreditation in the hospitals**.** Clinical competency is a complicated concept that encompasses different aspects of knowledge, skills and attitudes. Clarifications of psychiatric nursing competency enhance and embrace recovery-oriented frameworks in their daily practice**.** This study was aimed to explore the relation between clinical competency and perceived psychiatric nurses' job stress. **Subjects and method:** A descriptive correlational research design was used. **Setting**: The study was conducted at Benha Hospital for mental health. **Sample**: A convenience sample of 74 psychiatric nurses constituted the study sample. Tools: **Tool** I: The Perceived Psychiatric Nurses Job Stress Scale (PNJSS) and **Tool II:** Clinical competency scale. Results: there was a positive relation between levels of clinical competency and levels of perceived job -related stress among study sample. **Conclusion**: The current study revealed that there was a good level of clinical competency and a moderate level of perceived job stress among study sample. There was also a positive relationbetween levels of clinical competency and levels of perceived job stress among study sample. **Recommendations**: Nurses clinical competency must be assessed regularly because of the changes in therapeutic settings and a replication of similar study with a larger sample size and use of other scales that are approximately close length.

Keywords: Clinical competency, Job stress, Psychiatric Nurses, Psychiatric nursing.

Introduction

Nurses are the biggest component of the health care system around the world [1]. Nursing is a highly stressful job with high complicated demands [2]. Mental illness is a global public health problem and psychiatric patients are a significant group in healthcare system [2-3]. Psychiatric nursing is a special area of nursing profession that focuses on providing mental health needs for psychiatric patients and different consumers, understanding a mentally ill patient is unique to the psychiatric nurse [4].

Psychiatric nurses face with a variety of stressors like shortage of nurses; they received less aid or direct assistance from colleagues, lack of autonomy, under value by the medical staff and nurse managers, lack of support from managers and unexpected psychiatric patient behavior like aggression and violence [5]. The violence from psychiatric patients towards other patients and staff, risk of suicide, and dealing with the unstable behaviors of patients imposes a great deal of stress on psychiatric nurses. They are asked to show patience, good attitude and passion, because the majority of patients are unstable. However, working with mentally ill people increases the negative public image of psychiatric nurses and they may responsible for taking care of several patients in one shift and there was not sufficient time to carry out therapy- related to communication [7].

Psychiatric nurses were described as "different caring" because they believed that the nature of care delivered to patients in psychiatric wards had been a different experience (Zarea et al., 2012). They are the key members who prepare psychiatric patients to deal with their life situation and regain their previous abilities and assist people to regain a sense of coherence in different setting as the hospital, home and community [6].

On the same context, many challenges face psychiatric nursing filed such as, job dissatisfaction, gap between theory and practice, weakness of multidisciplinary team, inappropriate education, high rates of assault and injuries, great volume of administrative duties which performed by psychiatric nurses, lack of support or positive feedback from seniors and poor social position of psychiatric nurses [8, 2, 9].

Job-related stress causes job dissatisfaction, occupational burn out and has a negative impact on nurses' clinical competency [10, 11]. Psychiatric Nurses without clinical competency are unable to give high quality and safety care to psychiatric patient and they must meet the clinical competency requirements for assessing patients with mental illness to

ensure appropriate assessment and so good and safe care based on service takers [3,8].

It is clear that there is a risk of inadequate teaching and training of psychiatric nurses can influence the safety of patients. Besides, the nature of mental health nursing is undergoing profound changes including dealing with an aging population, change in care situation (such from hospital to community), maintaining employment opportunities, providing the essential training for career development, new science and information technology, and increase in variation in cultures and these nurses must be provided by good environment and organizational structure[11,12].

Job stress influences on clinical competency,communication, responsibility and ethical and professional norms [2]. Clinical competency is a complicated concept that encompasses different aspects of knowledge, skills and attitudes. It is a combination of skills and personal attitudes as motivation [13]. In addition, Clinical competency is the application of technical and communication skills, knowledge, clinical reasoning and values wisely in clinical setting [14]. Competency is defined as the ability to apply specific knowledge, skills, attitudes and values to the standard of performance required in a particular

context at an acceptable proficiency level [15, 16 & 17].

Clinical competency is used as an index for accreditation and evaluation in the hospitals. Full access to clinical competency enables the nurses to play their roles and duties with a proper quality and there are several factors as experience, environment, motivation, personal characteristics, rapid change of health monitoring system, and public awareness are affected nurses' clinical competency[14]. Competency is a complex and ambiguous concept and the more controversial issues in the nursing standards. Nursing competency is a holistic and integrated concept, which is constructed from complex activities, and it is required for fulfilling nursing responsibilities [18, 19, 20].

There was a vision to enhance nursing capacity and a mandate requiring all nursing curricula to be competency based [21]. At present the provision of quality and safe care is the primary goal of health system worldwide because nurses, the key members of treatment care, are often the first ones in contacts with patients, their families, and the society [10] therefore, they need high-level clinical competency can assess the patients' needs accurately.   In nursing profession clinical competency is a

central issue for patient care and clarification of psychiatric nursing competency enhance and embrace recovery-oriented frameworks in their daily practice [2, 22].

In the area of mental health nursing, the specific competency is needed for nursing emphasize a unique philosophy of practice to the specialty of psychiatric nursing and needs of assisted populations such as appropriate use of assessment, drug regimens like its efficacy; safety, costs, legally authorized and interaction with other drugs; ability to analyze patient history, ability to communication, exchange experiences, participation, creativity, and be empathic [15, 19]. With the current high pace of changes in the health systems, it is necessary to provide a safe and cost- effective services, so it is essential to pay attention to clinical competency which is necessary for providing safety patient and it is the main concerns of many health systems and the top priorities of nursing programs. There is evidence regarding a paucity of researches of clinical competency among Egyptian psychiatric nurses [8]. So, this study aimed to explore the relation between clinical competency and perceived psychiatric nurses' job stress.

Research Aim:

The current study aimed to explore the relation between clinical competency and perceived psychiatric nurses' job stress.

Research Questions:

1- What are the levels of clinical competency among psychiatric nurses'?

2- Is there a relation between clinical competency and age, educational level, work experience years and income among psychiatric Nurses'?

3- What are the levels of perceived job stress among psychiatric Nurses'?

4- Is there a relation between perceived job stress and age, educational level, work experience years and income?

5- Is there a relation between clinical competency and perceived job stress among psychiatric nurses'?

Methods

Research Design

A descriptive correlational research design was used to explore the relation between clinical competency and job stress among psychiatric nurses.

Setting

The study was conducted at Benha Hospital for mental health which affiliates to the ministry of health and population in the delta of Egypt.

Sample size and power:

This study used Epi website (Open Source Statistics for Public Health)*, in order to calculate the sample size, with the following equation:

Sample size   **n = [DEFF*Np(1-p)]/ [(d²/Z²₁₋α/₂*(N-1)+p*(1-p)]**

$$n = \frac{DEFF*Np(1-p)}{(d^2/Z^2_{1-\alpha/2}*(N-1)+p*(1-p)}$$

Where:

***n* =** Sample size

N=   Population size =225 psychiatric nurses who are working at time of data collection

DEFF = Design Effect =1

$Z^2_{(1-\alpha/2)}$ = reliability coefficient **=1.96**

(*p*) = Percent of outcome in the population (Percent of 24% of nurses had job stress) from pilot study on 20 nurses (not included in the full-scale study) revealed that 24% of them had job stress.

***d* =** Precision = 5%

 95% confidence intervals were used, with a sample size of 125 nurses. After distribution of the study tool on them, only 74 nurses agreed to participate in this research, and completed the questionnaire, with a response rate of 59.2%.

Subjects: A convenience sample of 74 psychiatric nurses constituted the study sample.

Tools of Data Collection

The data of study were collected by using the following tools, a demographic data questionnaire designed by the researcher to collect specific information pertaining to the participants as age, gender, level of education, work years' experience, and work shift.

Tool I: The Perceived Psychiatric Nurses' Job Stress Scale (PNJSS) by Yada (2011)[23] which is a 5 point Likert scale with 22 items, of which 9 statements are positive and remaining 13 statements are negative, negative statements scoring was reversed.

Scoring System Each statement was scored with 0= Never; 1= Rarely; 2= Sometime; 3= Often; 4= Always, that assesses the job stress related to psychiatric nursing ability (9 items), attitude of patients (6 items), attitude toward nursing (5 items) and communication (2 items). The highest possible score of PNJSS is (88) indicating higher Job stress, with psychiatric nursing ability subscale score range of (0–36) that measures feelings of lack of nursing ability due to job stress, attitude of patients subscales score of (0–24), this subscale measures negative emotions from patients, attitude toward nursing subscale score range of (0–20) that measures the perceived incongruity between the respondents' attitudes and the attitudes of other staff, and communication subscale score of (0–4) that measures difficulty in communicating with patients and their families. A total mean score of

(0-29) indicated mild level of job stress, a mean score of (30-58) indicated moderate level of job stress, a mean score of (59-88) indicated severe level of job stress. The original scale's reliability was (0.71).

Tool II: was Clinical competency scale which was developed by Moskoeiet al (2017) [24]. It was developed to assess the clinical competency in nursing students and mental health nurses. **Scoring System** The scale consisted of 45 items. The tool was designed based on a ranking scale in four fields and Likert's five -point scale (never = 0, barely = 1, sometimes = 2, mostly = 3, always = 4). The total point of competency of each case was reported as the sum of the scores of all statements. The obtained scores by the tool were classified at excellent (score 136 -180), good (score 91-135), average (46-90), and weak (score <46) levels. The original scale's reliability was (0.98).

Validity of the two tools:

The two tools validity were done by panels of three expertise; two Professors in the field of Psychiatric Nursing, and one expert has doctorate degree in Community health nursing) who read the two tools for content accuracy and internal validity. Also, professors were asked to judge the items for completeness and clarity (content validity). Suggestions were incorporated into the two tools.

Reliability of the two tools:

Reliability of the two tools was estimated among 10 nurses (10% of total sample) by using test retest method with two weeks apart between them. Then Cronbach alpha reliability test was done through SPSS computer package.   It was 0.85 for "clinical competency evaluation in mental health nurses", 0.84 for "Perceived Psychiatric Nurses Job Stress". It was 0.74 for the subtitle: Psychiatric Nursing Ability (9 Items), 0.88 for Attitude of Patients (6 items), 0.78 for Attitude toward nursing (5 items), and 0.92 for Communication (2 items), and 0.84 for grand total Perceived Psychiatric Nurses' Job Stress, which indicated that the two tools were reliable to detect the objectives of the study.

Data Collection

Data were collected from the beginning of March to the end of May 2021. The researchers collected the data during the three shifts; morning, afternoon and night at two days/week. Subjects were interviewed individually by researchers after explaining the purpose of the study and the average time of each interview was ranged from 30-40 minutes.

Ethical Considerations

An ethical approval to conduct the study was obtained from the Research and Ethics Committee at the Faculty of Nursing at one of the governmental universities in the Delta region of Egypt. Another ethical approval was obtained to collect data from selected healthcare organizations. Verbal informed consent was obtained from psychiatric nurses who participated in the study. Anonymity and voluntary participation in the study were assured to all participants. Utilization of data for research purposes only was also confirmed to all participants.

Data Analysis

Data were coded, entered, and analyzed using the Statistical Package for Social Science (SPSS) software package version 20. Descriptive statistics: e.g. percentage (%), mean (x) and standard deviation (SD) were used to present qualitative data. Analytic statistics: e.g. Chi-square test ($\chi2$) was used to determine the mean difference between two qualitative variables. ANOVA test was used to determine the difference between more than two variables. Pearson's correlation coefficient (r) measured how study variables were correlated. Statistical significance level was considered at ($P \leq 0.05$).

Results

Table (1) illustrated the demographic characteristics of study sample. The table indicated that the highest percentage of study sample were female (54.1), with educational level of diploma in nursing (70.3), had mean age of (27.2 ± 7.9), mean years of experience (16.1 ± 9.2), working morning shift, and had enough income.

Table (2) highlighted the clinical competency levels among studied psychiatric nurses. The majority (62.16%) of studied sample had a good level (123.61±22.77) of studied sample's clinical competency. Most of psychiatric nurses had good level of clinical competency (62.16%c, followed by excellent level (36.49%), and the least was the average level of clinical competency (1.35%).

Table (3) showed the mean scores of job-related stressors subscales among studied sample. The table showed a moderate level of job-related stress with a total mean score of (49.85± 9.64) among studied sample. The highest mean score (22.96 ±5.01) was for lack of nursing ability subscale of job stress. While the lowest mean score (3.95±1.46) was for difficulties in communicating with patients and their families subscale.

Table (4) revealed therelationbetween clinical competency and perceived job - related stress among psychiatric nurses,

there was a positiverelationbetween levels of clinical competency and levels of perceived job -related stress among study sample.

Table (5) showed the mean total clinical competency score distributed by sociodemographic characters of studied nurses, among all demographic characteristics of studied sample, only age that showed significant statistical difference with a higher mean score (131.62±23.48) for psychiatric nurses aged between (44-45), and experience that indicated high significant statistical difference with a higher mean score (135.04±22.98) for psychiatric nurses who had (21-33) years of experience. Shortly, the table indicated that the older and more experienced nurses revealed higher level of competency.

Table (6) showed that among all demographic characteristics of studied sample, only gender that showed significant statistical difference with a higher mean score (52.71±10.59) for male psychiatric nurses who had the highest mean score (54.08±11.61) of experience (21-33). Shortly, the table indicated that male psychiatric nurses with experienced of (21-33) years of experience showed higher level of perceived job stress.

Table 1. Demographic characteristics of studied sample (N= 74).

Demographic Characteristics	Frequency	%
Age in years		
25 - 34 years	32	43.2
35 - 44 year	21	28.4
45 - 55 year	21	28.4
Mean ± SD	27.2 ± 7.9	
Gender		
Female	40	54.1
Male	34	45.9
Education		
Diploma	52	70.3
Bachelor	19	25.7
Postgraduate	3	4.0
Work Experience in years		
≤ 5 years	9	12.2
6 –10 years	12	16.2
11- 20 years	28	37.8
21 – 33 years	25	33.8
Mean ± SD	16.1 ± 9.2 years	
Income		
Enough	41	55.4
Not enough	33	44.6
Work shift		
Morning	59	79.7
Afternoon	12	16.2
Night	3	4.1
Total	74	100 %

Table 2. Clinical Competency' levels among studied sample (n=74)

Levels of CC(clinical competency)	Frequency	%	M	±SD
Average (46 - 90)	1	1.35		
Good (91 - 135)	46	62.16		
Excellent (136 - 180)	27	36.49		
Total	74	100.0	123.61	22.77

Table 3. Mean scores of perceived psychiatric nurses' job stress scale (pnjss) subscales among studied sample (n=74).

Total PNJSS subscales	No. of Items	Min	Max	Mean	± SD
Nursing ability (0-36)	9	12	34	22.96	5.01
Attitude of patients (0-24)	6	5	24	12.97	5.18
Attitude toward nurses (0-20)	5	5	18	9.97	2.62
Communication (0-8)	2	1	8	3.95	1.46
Total job stress (0-88)	22	37	78	49.85	9.64

Table 4. Correlation between levels of clinical competency and levels of perceived job stress among psychiatric nurses' (N=74)

Clinical competency levels (CC)	Perceived Psychiatric Nurses Job Stress levels(PNJSS)						Total			
	Mild		Moderate		Severe					
	n	%	n	%	n	%	N	%	LR	p
Average CC	0	0	1	100	0	0	1	100	12.1	0.008*
Good CC	23	50	23	50	0	0	46	100		
Excellent CC	7	25.9	15	55.6	5	18.5	27	100		
Total	30	40.5	39	52.7	5	6.8	74	100		

Table 5. The difference among total mean score of clinical competency (CC) and demographic characteristics of studied sample (n=74)

Demographic data	Items	n	Total Mean score of clinical competency	
			Mean	**±SD**
Age	25 -34	32	116.03	21.73
	35 – 44	21	127.14	20.92
	45 -55	21	131.62	23.48
	F (P)		3.56 (0.03*)	
Gender	Female	40	121.00	20.53
	Male	34	126.67	25.12
	T (P)		1.1 (0.29)	
Education	Diploma	52	122.65	23.59
	Bachelor	19	127.11	22.49
	Postgraduate	3	118.00	0.00
	F (P)		0.35 (0.70)	
Work Experience in years	≤ 5	9	130.67	26.16
	6-10	12	107.08	21.69
	11-20	28	118.21	15.80
	21 – 33	25	135.04	22.98
	F (P)		6.1 (0.001**)	
Income	Enough	41	126.49	21.18
	Not enough	33	120.03	24.47
	T (P)		1.21 (0.22)	
Total Mean score of clinical competency			123.61	22.77

Table 6. The difference among total mean score of Perceived Psychiatric Nurses' Job Stress levels (PNJSS) and demographic characteristics of studied sample (n=74)

Demographic characteristics		(PNJSS) M	± SD	Test of sig.	P
Age	25 -34 (n=32)	48.12	7.50	F=1.12	0.33
	35 – 44 (n=21	50.31	10.43		
	45 -55 (n=21)	52.13	11.42		
Gender	Female (n=40)	47.43	8.12	t=2.93	0.01*
	Male (n= 34)	52.71	10.59		
Education	Diploma (n=52)	51.13	10.33	F=1.7	0.18
	Bachelor (n=19)	47.26	7.53		
	Postgraduate (n=3)	44.00	0.00		
Work Experience in years	≤ 5 (n=9)	46.67	5.81	F=3.64	0.01*
	6-10 (n=12)	51.58	8.11		
	11-20 (n=28)	46.36	7.79		
	21-33 (n=25)	54.08	11.61		
Income	Enough (n=41)	48.27	9.17	t=1.6	0.09
	Not-enough (n=33)	51.82	9.98		
Work shift	Morning (n=59)	50.3	9.8		
	Afternoon (n=12)	47.2	7.7	F=0.58	0.56
	Night (n=3)	51.7	13.4		

Discussion

In most psychiatric workplaces, nurses work in an extremely stressful work environment where they encounter stressors such as work overload, uncertain patients' behaviors such as hostility and violence. Nevertheless, improving the appropriate skills to interact with such situation in work environment is challenging. Appropriate interactions between nurses, colleagues, patients, and superior are important for the quality of care rendered in psychiatric settings.

The current study revealed that there was a good level of clinical competency and a moderate level of perceived job stress among study sample. The reasons for theses outcomes may be nurses' shortage that affects the availability of effective lengthy in-service training programs that help nurses to develop the required competency to improve care and provide them with the required skills to cope with work related stressors. Additionally, the unexpected patients' behaviors, lack of resources and lengthy working shifts attributed to the moderate level of perceived job stress in the current study.

These outcomes were in congruent with a study conducted to examine the level of job stress among registered psychiatric nurses working in different psychiatric units of a major governmental psychiatric hospital located at the central region of the Kingdom of Saudi Arabia. The study revealed that most psychiatric nurses were experiencing moderate level of job stress[6].

Likewise, a study that conducted by Masa'Deha (2018) [25] to determine the level of perceived stress and identify predictors of stress level for psychiatric nurses in Jordan. The study concluded that there was a high stress level of psychiatric nurses, lack of resources that directly affects the quality of care nurses are able to provide which negatively impacted health system efficiency and capability to deliver quality of care for psychiatric patients.

Furthermore, Adriaenssens (2015)[26] highlighted that internationally nursing is recognized as a hard profession and one of the most stressful jobs and level of stress among nurses in most international researches ranged from moderate to high [27]. Moreover, similar results were found from a study compared work-related stressors among 271 nurses in two psychiatric teaching hospitals in urban and rural region of Taiwan [28]. Both urban and rural nurses reported high stress levels for a higher stress level in rural hospitals than in urban hospitals. Lack of resources was the strongest predictor of high stress for nurses in rural mental health hospitals.

In addition, Hallman (2014) [29] conducted a training program on stress management that determined stress levels before and two months after the implementation of the program. The findings displayed that the training program decreased nurses' stress levels across the two-month after training period. Increased working hours was an indicator of high stress levels for psychiatric nurses, affirming that this result may decreases the quality of nursing care provided to patients [30, 31].

To conclude, it appears that there is a compatibility in the previous researches that improper psychiatric patients behaviors, violence, hostility, work overload, work environment, lack of resources encountered by psychiatric nurses are the major causes of stress levels and decreased quality of care provided for psychiatric patients.

The current study also revealed a positiverelationbetween levels of clinical competency and levels of perceived job stress among study sample. There are many reasons for this result; it might be those clinical nurses' competency was measured using a questionnaire i.e. this was nurses' opinion on their clinical competency. Using an observational method could reflect the actual clinical nurses' competency. Another reason could the different lengths of both scale could

statistically causes the positive relationship. Additionally, these data were collected during the pandemic of COVID-19 which could also increase nurses' stressors. Finally, nurses with good or high level of competency have high level of accountability and feeling of responsibility that may increase job related stressors too.

These results were supported by Amini et al (2017) [2] who investigated the association between clinical competency and occupational stress among Iranian nurses. The study indicated both high clinical competency and stress levels among Iranian nurses. It also showed a positiverelationbetween clinical nurses' competency and nurses' job stress. The authors indicated that when nurses' clinical competency is high, naturally the knowledge, and skills as well as high, so nurses' expectations and accountability will increase and this may increase stress.

Moreover, a study conducted to study therelationbetween job stress and job performance among head nurses. The study revealed a high stress level and poor level of job performance of head nurses. There was also norelationbetween job stress and job performance of head nurses [32].

Furthermore, Ilczak, et al.,(2021) [31] conducted a study to evaluate the predictors of stress that paramedics, nurses

and doctors encountered in the face of the COVID-1 pandemic. During the COVID-19 pandemic, stress among emergency medical personnel has increased considerably due to new factors that did not exist previously. The predictors of stress in the professional environment included fear of contracting COVID-19 patients in emergency unit, the decrease of protective measures. The study concluded that fear of COVID-19 and decreased protective measures for professional healthcare providers were new contributing factors of occupational stress.

Additionally, the study implied that older male psychiatric nurses who had the highest mean score of experiences indicated the highest mean score of clinical competency and perceived the highest mean score of job stress.

These results were in agreement with a study conducted to examine occupational stress for two hundred and forty four psychiatric nurses in China. The study showed high stress level in male nurses than females that was due to physical violence and verbal assault from patients to male nurses [34].

On the contrary, gender was addressed as a demographic variable in a study conducted by Yada [35], who asserted that gender differences might affect job-related stress. The results showed that female nurses had significantly higher stress levels than males.

Limitations of the study

The small sample size of psychiatric nurses participated in the study limited the generalization of results. The difference in the length of the used clinical competency scale and the perceived job stress could be the reason for identified positive relation between levels of clinical competency and perceived job stress.

Conclusion

The current study revealed that there was a good level of clinical competency and a moderate level of perceived job stress among study sample. There was also a positive relation between levels of clinical competency and levels of perceived job stress among study sample.

Therefore, the study recommended a replication of similar study with a larger sample size and use of other scales that are approximately close length. Furthermore, application of an experimental study may imply the cause-effect negative relation between clinical competency and perceived job stress among nurses.

Recommendations

The findings of the present study recommended that:

1- Nursing policy makers set stress management course in nursing curriculum

2- Using experienced nurses to guide the fresh nurses

3- Hiring nurses with higher clinical competency

4- Nurses clinical competency must be assessed regularly because of the changes in therapeutic settings

5- Although the clinical competency level of psychiatric nurses was good, in this study, they had adapt themselves to new ways of delivering nursing services to face political and ideological transformations

6- Continuous competency -based training programs for psychiatric nurses to be dated and improve clinical competency.

7- Empowerment of psychiatric nurses can positively influence clinical competency .

8- Condensed training regarding psychiatric discharge planning.

9- Condensed training regarding effective psychiatric evidence-based practice.

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