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## **Nurses' Educational Program about Professional Shared Governance on Nurses' Structural Empowerment**

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### **Abstract**

**Background:** Professional shared governance allowed nursing staff to engage in shared decision-making that has an effect on practicing nursing and improving quality of care. **Aim:** The study aimed to evaluate the effect of head nurses' educational program about professional shared governance on nurses' structural empowerment.

**Subjects and Method: Design:** Quasi experimental study design was utilized to accomplish aim of the present study. **Setting:** The study was conducted at Tanta International Teaching Hospitals. **Subjects:** All head nurses (n=41) at Tanta International Teaching Hospitals. Also, stratified proportional sampling of nurses (n=250). **Tools:** Four tools were used; I: Head nurses' professional shared governance knowledge questionnaire; II: Head nurses' professional shared governance self-report; III: Nurses' perception of head nurses' professional shared governance structure questionnaire; IV: Nurses' structural empowerment questionnaire. **Results:** Pre-educational program, majority (87.8%) of head nurses had low knowledge level regarding professional shared governance, also 90.2% of them had unsatisfactory level of practice related it. The majority (82.4%, 88.0%) of nurses had low level of perception about head nurses' professional shared governance and structural empowerment. While post-educational program high percent (82.9%) of head nurses had high knowledge level and 85.4% of them had satisfactory level of practice. Also the majority (84.4%, 84.8%) of nurses had high level of perception regarding head nurses' professional shared governance and structural empowerment. **Conclusion:** The study showed a statistically significant correlation between head nurses' professional shared governance and nurses' structural empowerment post- educational program.

**Recommendations:** Hospital administrators implement regular periodical enhancement programs for head nurses to maximize their professional shared governance practices, which empower their nurses.

**Keywords:** Educational program, Head nurses, Knowledge and practice, Professional shared governance, Structural empowerment.

## Introduction

The changing context of society and healthcare setting requires a restructuring of hospital management that highlighted collaboration, a defined knowledge base, autonomous practice, and shared decision *making* (BuljacSamardzic, Doekhie, & van Wijngaarden, 2020). So, healthcare environment and head nurses play a crucial role in encouraging their nursing staff contributions for organizational work and creating a supportive atmosphere for daily professional practice (Abd Elmawla, Shabaan, & Abo Ramdan, 2020). Additionally, head nurses empower them to adapt to a changing workplace and promoting their involvement in decision-making (Abdallah & Mostafa, 2021).

In a hospital circumstance, head nurses are crucial to achieving objectives related to empowerment, problem-solving, creativity, teamwork, and decision-making, they must practice and use a variety of nursing practice professional models, empower nurses and provide high-quality patient care by implementing nursing professional shared governance models and fostering a positive work environment (Mostafa & Mostafa, 2024).

Professional shared governance is perceived as a model that provides nursing staff with the structure to

participate in shared decision-making that impact nursing practice, care quality, professional development, and research across all frameworks and roles (Maged, Bassiouni, & Atalla, 2021). It acts as a coach for establishing, achieving changes and getting ready for a desired future. Furthermore, professional shared governance is considering an approach to build a partnership, create ownership, facilitate equity and accountability between nursing staff and the work environment. It also, changes the organization from a bureaucratic or hierarchy structure to a more relational partnership (Speroni et al., 2021).

Professional shared governance is essential which facilitates decision-making at the point of service and involves all nurses in promoting the organization's mission and vision, by maintaining the balance of power. It also fosters cooperation between nurses and management on matters pertaining to professional nursing practices (Kanninen, 2023). In addition, professional shared governance is considered a significant factor for the magnet recognition program, which offers a means of attaining high quality performance and better patient outcomes, also reflect on improving nursing staff satisfaction and retention. So, professional shared governance is a first step toward professional

nursing excellence (Reitter, 2021).

The professional shared governance consisted of six recognized dimensions that are designated for applying it in healthcare organization specifically; control over personnel which addresses the organizational construction in place related to hire, performance appraisal, punitive actions, and recommendation of salaries and benefits (PorterO'Grady 2019). Moreover, access to information which head nurse has access to data pertinent to governance matters related to budget and costs, goals and objectives of organization, also, opinions of nurses, patients, and physicians (Ahmed, ElSayed & EL Demerdash, 2023).

Also, influence over resources that concerned with those who have an impact asset that facilitate professional practices within hospital. Participation in committee that enables the head nurses to participate in the organizational decision-making and governance activities at various levels (Kanninen, 2023). Furthermore, control over practice; exactly, patient care rules and procedures, quality and care produce, training, and research in practice. Additionally, ability to set goals and conflict resolution which the head nurse's ability to set goals and resolve conflicts through negotiation at different

organizational levels (Jaber et al., 2022).

In order to lead and direct nurses, the head nurses must own a variety of professional skills as application of professional shared governance which leads to retraining head nurses, involving nurses, and creating a decision-and-action model that is appropriately staff-focused (Faubion, 2023). This achieves several advantages as improved team cohesion, communication, and decision-making and increased nurse autonomy. It is also a highly significant innovation and evidence-based strategy to improve nurses' empowerment (Hamdan & Jaafar, 2024; Larsen, 2023).

Empowerment is the process of acquiring the power necessary to make decisions and use of existing expertise to improve healthcare setting performance. Therefore, nurses are cared for by enriching their knowledge and skills and developing their capabilities to make appropriate decisions (Elbab, Abd elrahman, & Abd elbaset, 2020). Powerful head nurses can give nurses a sense of empowerment to lead more effective staff functioning and increase nurses' autonomy as well as being positively linked to professional creativity of nurses and organizational outcomes (Mostafa & Mostafa, 2024).

Structural empowerment is creating organizational conditions

that are necessary for growth and access to power nurses contribution in shared decision making (**Moura et al., 2020**). It described as centered on the idea that head nurse can influence the professional practice of nurses by providing an innovative environment that supports collaboration and professional development, it is the ability of head nurses to influence and motivate their nurses to achieve organizational goals, through motivating its dimensions (**ALGhwary et al., 2024**).

The structural empowerment is based on six dimensions that in conjunction with access to opportunity to learn and grow within the organization as well as the opportunity to increase knowledge and skills. Also, access to information and possessing the formal and informal knowledge required to be effective in the workplace (technical knowledge and expertise needed to accomplish the job and an awareness of organizational policies and decisions). Moreover, Access to support and receiving feedback and guidance from superiors, peers and subordinates (**Saleh, Eshah, & Rayan, 2022**).

Additionally, access to resources and the capacity to acquire the financial means, materials, time, and supplies required to complete the task (**Terkamo Moisio et al., 2022**). Furthermore, formal power is derived from specific job

characteristics, and it has a direct association with processes necessary to achieve the organizational purpose and goals, since formal power is linked to nurses' flexibility and adaptability and may mediate the effect of any variable associated with job performance quality (**ALGhwary et al., 2024**). Also, **informal power** is obtained from social networks and the development of workplace social networks' communication and information channels, it is governed by different processes than formal power such as the personal relationships within organization (**Khatun, Latif, Nesa, & Mallick, 2020**).

#### **Significance of study:**

Nursing staff ability to perform their professional tasks is often significantly impacted by significant changes made to the health care environment. It is challenging to create and maintain a nursing practice model as a professional shared governance approach in order to retain nurses, improve patient care outcome and supply the necessary recourse and support (**Abdel Latif, El-Demerdash, & Hasanin, 2023**). Professional shared governance provides structure and context for the delivery of healthcare and grants nurses authority over their professional practice. These systems increase the accessibility of information and resources, emphasize the value of workforce

empowerment, provide nurses with a fulfilling work environment, and improve patient satisfaction (**Olander, Capitulo, & Nelson, 2020**). Therefore, this study is central in order to assist the head nurse in determining how to better integrate the professional shared governance model into their clinical practices in order to improve nurse empowerment and improve their practice.

### **Aim of the study**

Evaluate the effect of head nurses' educational program about professional shared governance on nurses' structural empowerment.

### **Research hypothesis:**

- **H<sub>1</sub>**: Head nurses' knowledge and professional shared governance practice is expected to be enhanced after implementation of the educational program.
- **H<sub>2</sub>**: Nurses' perception about professional shared governance and structural empowerment is expected to be enhanced after implementation of the educational program.

### **Subjects and method:**

#### **Study design:**

Quasi experimental study design was utilized to accomplish the aim of the present study.

#### **Setting:**

The present study was conducted at Tanta International Teaching Hospitals, which affiliated to Minister of Higher Education and Scientific Research in departments including General Surgery, Neurological, Pediatric,

Orthopedic, Cardiothoracic, Medical, Oncology, Vascular and all Intensive Care Units (Anesthesia, Neonates, Medical, Cardiac, Pediatric, Burn, Renal dialysis and Bone Marrow Transplantation). Bed capacity was 465 beds.

### **Subjects:**

The study subjects were consisted of two groups; all (n=41) head nurses in the previously mentioned setting and nurses (n=250) worked at the previously mentioned setting at time of data collection. The total study sample was calculated using Epi. Info. Microsoft to ensure obtaining an adequate and representative size were N= population size (612), Z= confidence level at 95% (1.96), d= margin of error proportion (0, 05). The total number of sample was be 250 out of 612 nurses who were enrolled during data collection time, the sampling was stratified proportional sampling of nurses in which the stratum was based on the departments.

### **Tools**

Four tools were used to accomplish the aim of this study including:

**Tool 1: Head Nurses' Professional Shared Governance Knowledge questionnaire.** This tool was developed by the researcher guided by related literature (**Maged et al., 2021; Ali, Abdelmegeed & Abood, 2019**); to test head nurses' knowledge

about professional shared governance. It was include the following two parts:

**Part one:** It included head nurses' personal characteristics as age, sex, qualified degree, years of experience, department and attaining training program about shared governance.

**Part two:** It included head nurses' professional shared governance knowledge test. It included 40 questions.

#### **Scoring system:**

Each question was taking score (1) for correct answer and (0) for wrong answer. Levels of head nurses' knowledge were taking scores based on cut-off points as follows:

- High head nurses' knowledge level  $> 75\%$ .
- Moderate head nurses' knowledge level  $60 - 75\%$ .
- Low head nurses' knowledge level  $< 60\%$ .

#### **Tool II: Head Nurses' Professional Shared Governance Self-Report**

This tool was developed by the researcher guided by related literatures (Ali et al. 2019; Abou Hashish & Fargally, 2018; Swihart & Hess, 2019) to assess head nurses' actual practice of their professional shared governance. It included 71 items. It was divided at six dimensions as following; Control over personnel (16 items), access to information (11 items), influences over resources (16 items),

participation in committees (8 items), control over practice (11 items), and the ability to setting goals and conflict resolution (9 items).

#### **The scoring system:**

Head nurses' responses were measured in 5 points Likert Scale ranged from 1-5. Where (1) head nurses' professional governance with nursing management only; (2) primarily nursing management with some nurses input; (3) equally shared by nurses and nursing management; (4) primarily nurses with some nursing management input and (5) with nurses only. The total scores was calculated by summing all categories into levels of head nurses' professional shared governance. Total score was calculated and classified based on cut-off point.

-Satisfactory practice  $\geq 80\%$ .

-Unsatisfactory practice  $< 80\%$ .

#### **Tool III: Nurses' Perception of Head Nurses' Professional Shared Governance Structure Questionnaire.**

This tool developed by the researcher and guided by related literatures (Hess, 2010; Maged et al. 2021; Swihart & Hess; Mohamed & Saad, 2019) to assess nurses' perception regarding head nurses' professional shared governance in clinical practices. It included the following two parts:

**Part one:** It was included nurses' personal characteristics as age, sex, qualified degree, years of

experience and department.

**Part two:** It was included (71) items to assess nurse' perception regarding head nurse' professional shared governance, it was included the same six dimensions as tool II.

#### **Scoring system:**

Responses of nurses were measured in 5 points Likert Scale ranged from 1-5 as tool II. The total scores calculated by summing of all categories of nurses' perception and classified based on cut-off point as following:

-High nurses' perception of professional shared governance > 75%.

-Moderate nurses' perception of professional shared governance 60 - 75%.

-Low nurses' perception of professional shared governance < 60%.

**Tool IV: Nurses' Structural Empowerment Questionnaire.** It was developed by **Laschinger, (2012)** and related literatures (**Wu et al., 2021; MacPhee, SkeltonGreen, Bouthillette, & Suryaprakash, 2012**). It was included (51) items to assess nurses' level of structural empowerment, it was consisted of six dimensions divided as following; access to opportunities to learn and grow (7 items), access to information (8 items), access to support (8 items), access to resources (7 items), formal power (7 items) and informal power (14

items).

#### **Scoring system:**

Responses of nurses were measured in 5 points Likert Scale ranged from 1-5. Where (1) none (2) limited (3) some (4) quite a lot and (5) a lot. The total scores was calculated by summing all categories into levels of nurses 'structural empowerment (**Mahfouz, Ebraheem, & Mahdy, 2019**).

-High structural empowerment level > 75%.

-Moderate structural empowerment level 60 - 75%.

-Low structural empowerment level < 60%.

#### **Method**

1. An official permission clarifying the purpose of the study was obtained from the Faculty of Nursing and was submitted to the responsible authorities of the selected setting for permission to carry out the study.

#### **2. Ethical consideration:**

a) Approval of the Faculty of Nursing scientific research ethical committee was obtained, (**Code. No: 121/11/ 2022**).

b) All participants were informed about the purpose of the study.

c) An informed consent was taken from each participant in the study including the right to withdraw at any time.

d) The researcher ensured that the nature of the study didn't cause any harm for the entire sample.

3. Tools of the study were developed by researcher based on

related literature and translated into Arabic language.

3. Tools were tested for its content validity and relevance by jury of five experts in the area of specialty. The content validity index value for tool II was **96.3 %** and for tool IV was **98.8 %**.

4. A pilot study was carried out on 10% of sample (n=4) of head nurses and (n=25) of nurses for testing clarity and applicability of tools and they weren't excluded from the total study subjects for general benefit. The time taken for completing each questionnaire was 20-30 minutes. Reliability of tools was tested using Cronbach's Alpha Coefficient Factor, its value was **(0.943)** for tool II and **(0.862)** for tool IV.

5. Data collection was done within six months, starting from the beginning of July 2023 to the end of January 2024.

6. The educational program was conducted in four phases as follows: assessment phase, planning of the educational program phase, implementation of the educational program phase, and finally evaluation phases.

**Phase I: Assessment**

Pre-test was conducted to assess head nurse' levels of knowledge regarding professional shared governance through filling tool (I), head nurse' self-report regarding professional shared governance through filling tool (II). Also, assess nurses' perception regarding head nurses'

professional shared governance and level of structural empowerment through filling tool (III, IV).

### **Phase II: Planning of the educational program**

The educational program was developed by the researcher.

### **Aim of the educational program:**

Enhance head nurses' knowledge and practices after educational program about professional shared governance.

### **General objectives of the educational program:**

The educational program enhances the head nurses' knowledge about professional shared governance and practice it effectively in their work as possible.

### **Content of the educational program:**

The nursing intervention program included five sessions for head nurses:

- First session: Definition and importance of professional shared governance.
- Second session: Principles and dimensions of professional shared governance.
- Third session: Types (models) and benefits of professional shared governance.
- Fourth session: Process (implementation) and role of head nurses of professional shared governance.
- Fifth session: Barriers to success professional shared governance

and how to overcome it.

**- Preparation of the educational program:**

The educational program included five sessions and was carried out in the previously mentioned setting. The total number of head nurses are (n=41) divided into six groups. Each group consisted of seven head nurses nearly. The content was presented at five days per group, three day per week. The duration of each session ranged from 45-60 minutes.

**- Teaching - Learning strategies:**

Selection of teaching methods were governed by studying the subject themselves and content of the program. The methods used in teaching the program were interactive lectures, group discussion, scenario and example from work situations.

**Teaching aids**

PowerPoint Presentation (PPT), handouts, and videos were included and utilized as teaching aids in the educational program.

**- Phase III: Implementation of the educational program**

The educational program started by informing the head nurses about objectives of the educational program and building positive relationships to encourage their participation and more involvement in the program.

**Phase IV: Evaluation of the educational program**

- Post- test to assess head nurses' levels of knowledge regarding

professional shared governance immediately after implementation of the educational program through tool (I).

- Head nurses' self-report to assess their levels of actual practice regarding professional shared governance three months later using tool (II).

- Assess nurses' perception regarding head nurses' professional shared governance and level of structural empowerment three months later using tool (III, IV).

**Statistical analysis of the data**

Data was fed to the computer and analyzed using IBM SPSS software package version 20.0. (Armonk, NY: IBM Corp) Qualitative data were described using number and percent. The Kolmogorov-Smirnov and Shapiro-Wilk test was used to verify the normality of distribution Quantitative data were described using range (minimum and maximum), mean and standard deviation. Significance of the obtained results was judged at the 5% level.

The used tests were; Chi-square to compare between different groups, Fisher's Exact or Monte Carlo correction for Correction for chi-square, McNemar and Marginal Homogeneity Test Used to analyze the significance between the different stages, Student t-test for normally distributed quantitative variables, F-test (ANOVA) was used to

compare between more than two groups, Paired t-test was used to compare between two periods, and Pearson coefficient To correlate between two normally distributed quantitative variables

## Results

**Table (1)** represents head nurses' personal characteristics. The table reveals that high percent (75.6%) of head nurses were at age group  $>35$  years, while 24.4% of them were at age group  $\leq 35$  years with mean age  $37.56 \pm 3.53$  and all of head nurses were females. Regarding educational qualification the most (97.6%) of head nurse had Bachelor of Science in Nursing degree. According to years of experience, 90.2% of head nurse had 10- $<20$  years with mean years of experience  $14.02 \pm 3.36$ .

Regarding head nurses' departments, they were distributed in sixteen departments, 9.8% of them were distributed equally at two departments including Orthopedic and Medical departments. All head nurses did not receive any training courses about shared governance.

**Table (2)** shows nurses' personal characteristics. The table reveals that more than half (53.6%) of nurses were at age group  $<30$  years, while 32.0% of them were at age group 30- $<40$  years with mean age  $31.25 \pm 6.07$ . The majority (95.6%) of nurses were females. Regarding educational qualification more than half

(56.0%) of staff nurse had Nursing Technical Institute Diploma, while 28.8% of them had Bachelor of Science in Nursing degree. According to years of experience, around two thirds (62.0%) of nurse had  $<10$  years with mean years of experience  $9.84 \pm 6.63$ . Concerning their departments, nurses were distributed in sixteen departments, 6.8% were distributed equally at eight departments including Orthopedic, Cardiothoracic, Medical department, Oncology, Neonates, Medical (ICU), Cardiac (CCU), and Burn. The majority (87.2%) of nurses did not delegate non-nursing tasks and just 12.8 % of them are delegate to non-nursing tasks.

**Table (3)** reveals total levels and mean scores of head nurses' knowledge about professional shared governance pre and post-educational program. As shown in the table, there was a statistically significant difference between total levels and mean scores of head nurse' knowledge of professional shared governance pre- and post-educational program at  $p=0.001$ . While pre-educational program the majority (87.8%) of head nurses showed low level of knowledge regarding professional shared governance with mean  $\pm$  SD. ( $14.98 \pm 6.07$ ). Whereas post-educational program the majority (82.9%) of head nurse had high level of knowledge regarding

professional shared governance, with Mean  $\pm$  SD. ( $35.66 \pm 3.64$ ). **Table (4)** shows levels of head nurses' practice regarding professional shared governance pre- and post- three months of educational program. It observed that there was statistically significant difference between head nurses' practice levels on all dimensions of professional shared governance pre, and post three months of educational program at  $p=0.001$ . In pre-educational program 90.2% and 87.8% of head nurses had unsatisfactory levels of practice on control over nursing personnel, setting goals and resolving conflict, respectively. While, post three months of educational program the majority (87.8%) of head nurses had satisfactory levels of practice on participation in committees, followed by 85.4% of them had equally satisfactory levels of practice on access to information and control over practices. According to total head nurses' practice 90.2% of them were unsatisfactory practice level pre-educational program, while 85.4 % of them were satisfactory practice level after three months of educational program.

**Table (5)** clarifies nurses' perception regarding head nurses' professional shared governance dimensions pre and post three months educational program. As shown in the table, there was a statistically significant difference

between levels of nurses' perception of all head nurses' professional shared governance dimensions pre- and post- educational program at  $p= 0.001$ . According to pre-educational program 84.8% and 80.8% of nurses had low perception levels on influences over resources and participation in committees, respectively. In comparison with the post three months educational program, the majority 84.8% and 84.0% of them had high levels of perception regarding setting goals and resolving conflict and control over practices respectively, with a statistical significant difference at  $p < 0.001$ . According to total nurses' perception at pre-educational program, the majority (82.4%) of nurses had low level of perception about head nurses' professional shared governance. Otherwise at the post three months of educational program the majority (84.4%) of nurses had high level of perception regarding head nurses' professional shared governance.

**Table (6)** reveals levels of nurses' perception regarding structural empowerment dimensions pre and post three months of educational program. A statistically significant difference was found between nurses' perception levels on all dimensions of structural empowerment pre and post three months of educational program at  $p=0.001$ .

According to pre-educational

program 82.8% and 80.0% of nurses had low levels of access to resources, support, respectively. Whereas 88.4 % and 84.8% of nurses had high levels of informal power, access to support, respectively post three months of educational program. Regarding total nurses' perception, high percent (88.0%) of nurses had low level of structural empowerment pre-educational program, while 84.8% of nurses had high level of structural empowerment post three months of educational program.

**Figure (1)** demonstrates a statistically significant correlation between total head nurses' professional shared governance knowledge and their total professional shared governance practice pre- and post-educational program. ( $r=0.485, 0.684$ ), respectively at ( $p < 0.001$ ).

**Figure (2)** shows a statistically significant correlation between head nurses' professional shared governance practices and nurses' structural empowerment post-educational program ( $r= 0.038$ ) at ( $p = 0.014$ ).

**Table (1): Percentage distribution of head nurses' personal characteristics (n = 41)**

Personal characteristics of head nurse	Head nurses	
	No.	%
<b>Age (years)</b>		
≤35	10	24.4
>35	31	75.6
Min. – Max.	30.0 – 50.0	
Mean ± SD.	37.56 ± 3.53	
<b>Sex</b>		
Male	0	0.0
Female	41	100.0
<b>Qualification degree</b>		
Bachelor of science in nursing	40	97.6
Master degree	1	2.4
<b>Years of experience in nursing (years)</b>		
<10	3	7.3
10-<20	37	90.2
≥20	1	2.4
Min. – Max.	7.0 – 25.0	
Mean ± SD.	14.02 ± 3.36	
<b>Department</b>		
General Surgery	3	7.3
Neurological	2	4.9
Pediatric dep.	2	4.9
Orthopedic	4	9.8
Cardiothoracic	2	4.9
Medical dep.	4	9.8
Oncology	2	4.9
Vascular	2	4.9
Anesthesia	3	7.3
Neonates	3	7.3
Medical (ICU)	2	4.9
Cardiac (CCU)	3	7.3
Pediatric (PCU)	2	4.9
Burn	2	4.9
Renal dialysis	2	4.9
Bone marrow transplantation	3	7.3
<b>Attaining training program about shared governance</b>		
Yes	0	0.0
No	41	100.0
<b>Participation in hospital committees/activities</b>		
Yes	10	24.4
No	31	75.6

SD: Standard deviation

**Table (2): Percentage distribution of nurses' personal characteristics (n = 250)**

Personal characteristics of nurses	Nurses	
	No.	%
<b>Age (years)</b>		
<30	134	53.6
30- <u>&lt;40</u>	80	32.0
<u>≥40</u>	36	14.4
Min. – Max.	22.0 – 45.0	
Mean ± SD.	31.25 ± 6.07	
<b>Sex</b>		
Male	11	4.4
Female	239	95.6
<b>Qualification degree</b>		
Bachelor of Science in Nursing	72	28.8
Nursing Technical Institute	140	56.0
Technical Secondary Nursing School Diploma	38	15.2
<b>Years of experience in nursing</b>		
<10	155	62.0
10- <u>&lt;20</u>	58	23.2
<u>≥20</u>	37	14.8
Min. – Max.	1.0 – 25.0	
Mean ± SD.	9.84 ± 6.63	
<b>Department</b>		
General Surgery	16	6.4
Neurological	16	6.4
Pediatric dep.	16	6.4
Orthopedic	17	6.8
Cardiothoracic	17	6.8
Medical dep.	17	6.8
Oncology	17	6.8
Vascular	16	6.4
Anesthesia	16	6.4
Neonates	17	6.8
Medical (ICU)	17	6.8
Cardiac (CCU)	17	6.8
Pediatric (PCU)	14	5.6
Burn	17	6.8
Renal dialysis	10	4.0
Bone marrow transplantation	10	4.0
<b>Are non-nursing tasks delegated</b>		
Yes	32	12.8
No	218	87.2
<b>What is it (n = 32)</b>		
CUSTODY officer	8	25.0
dietary sheet for all patients	3	9.4
Patients assignment	8	25.0
Receive medication from pharmacy	4	12.5
Responsible for discharge files	9	28.1

SD: Standard deviation

**Table (3): Total levels and mean scores of head nurses' professional shared governance knowledge pre and post-educational program (n = 41)**

Total levels and mean scores of head nurses' professional shared governance knowledge	Head nurses' knowledge				Test of Sig.	p		
	Pre		Post					
	No.	%	No.	%				
High	1	2.4	34	82.9	MH= 77.000*	<0.001*		
Moderate	4	9.8	6	14.6				
Low	36	87.8	1	2.4				
Mean $\pm$ SD. (0 – 40)	$14.98 \pm 6.07$		$35.66 \pm 3.64$		t= 22.143*	<0.001*		
Min. – Max. (0 – 1)	$0.37 \pm 0.15$		$0.89 \pm 0.09$					

SD: Standard deviation

t: Paired t-test

MH: Marginal

Homogeneity Test

p: p value for comparing between Pre and Post

\*: Statistically significant at  $p \leq 0.05$ **Table (4): Head nurses' professional shared governance practice dimensions pre and post three months educational program (n = 41)**

Head nurses' professional shared governance dimensions	Head nurses' practice								McN	p		
	Pre				Post three months							
	Satisfactory practice		Unsatisfactory practice		Satisfactory practice		Unsatisfactory practice					
	No.	%	No.	%	No.	%	No.	%				
Control over nursing personnel	4	9.8	37	90.2	32	78.0	9	22.0	26.036*	<0.001*		
Access to information	7	17.1	34	82.9	35	85.4	6	14.6	26.036*	<0.001*		
Influences over resources	10	24.4	31	75.6	34	82.9	7	17.1	28.249*	<0.001*		
Participation in committees	7	17.1	34	82.9	36	87.8	5	12.2	27.034*	<0.001*		
Control over practices	8	19.5	33	80.5	35	85.4	6	14.6	25.037*	<0.001*		
Setting goals and resolving conflict	5	12.2	36	87.8	34	82.9	7	17.1	27.034*	<0.001*		
<b>Total</b>	<b>4</b>	<b>9.8</b>	<b>37</b>	<b>90.2</b>	<b>35</b>	<b>85.4</b>	<b>6</b>	<b>14.6</b>	<b>29.032*</b>	<b>&lt;0.001*</b>		

McN: McNemar test

p: p value for comparing between Pre and Post

Statistically significant at  $p \leq 0.05$

**Table (5): Nurses' perception regarding head nurses' professional shared governance dimensions pre and post three months educational program (n = 250)**

Nurses' perception of head nurses' professional shared governance dimensions	Levels of nurses' perception												Test of Sig.	p		
	Pre						Post three months									
	High		Moderate		Low		High		Moderate		Low					
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%				
Control over nursing personnel	23	9.2	39	15.6	188	75.2	195	78.0	30	12.0	25	10.0	MH= 394.500*	<0.001*		
Access to information	60	24.0	0	0.0	190	76.0	204	81.6	46	18.4	0	0.0	McN= 357.000*	<0.001*		
Influences over resources	38	15.2	0	0.0	212	84.8	200	80.0	30	12.0	20	8.0	MH= 369.000*	<0.001*		
Participation in committees	15	6.0	33	13.2	202	80.8	196	78.4	43	17.2	11	4.4	MH= 381.000*	<0.001*		
Control over practices	20	8.0	54	21.6	176	70.4	210	84.0	15	6.0	25	10.0	MH= 399.500*	<0.001*		
Setting goals and resolving conflict	4	1.6	60	24.0	186	74.4	212	84.8	28	11.2	10	4.0	MH= 452.000*	<0.001*		
<b>Total</b>	<b>13</b>	<b>5.2</b>	<b>31</b>	<b>12.4</b>	<b>206</b>	<b>82.4</b>	<b>211</b>	<b>84.4</b>	<b>25</b>	<b>10.0</b>	<b>14</b>	<b>5.6</b>	<b>MH= 432.000*</b>	<b>&lt;0.001*</b>		

McN: McNemar test

MH: Marginal Homogeneity Test

p: p value for comparing between Pre and Post

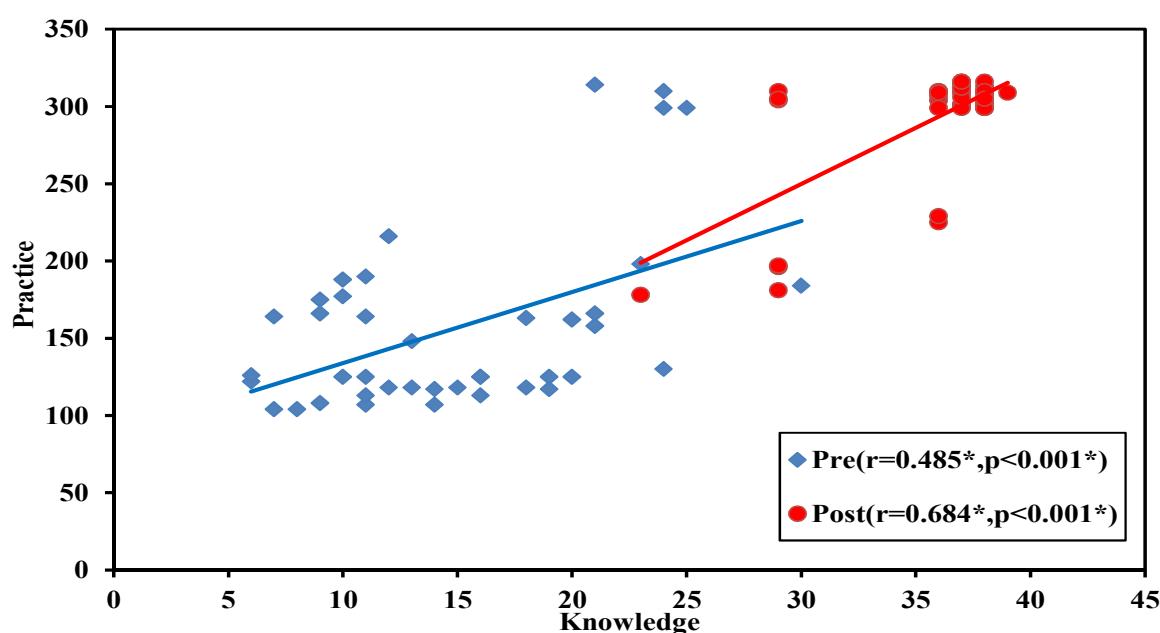
\*: Statistically significant at p ≤ 0.05

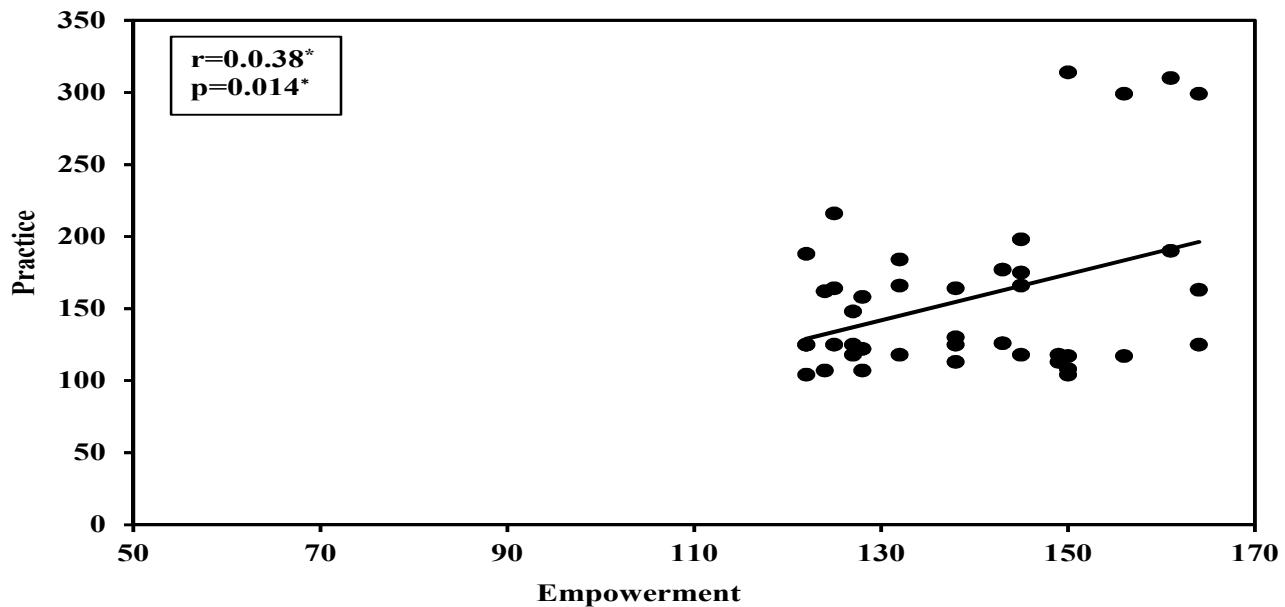
**Table (6): Nurses' perception regarding structural empowerment dimensions pre and post three months educational program (n = 250)**

Nurses' structural empowerment dimensions	Nurses' perception levels												MH	p		
	Pre						Post three months									
	High		Moderate		Low		High		Moderate		Low					
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%				
Access to opportunity to learn and grow	55	22.0	8	3.2	187	74.8	189	75.6	38	15.2	23	9.2	399.000*	<0.001*		
Access to information	55	22.0	0	0.0	195	78.0	205	82.0	35	14.0	10	4.0	370.500*	<0.001*		
Access to support	33	13.2	17	6.8	200	80.0	212	84.8	0	0.0	38	15.2	377.500*	<0.001*		
Access to resources	31	12.4	12	4.8	207	82.8	201	80.4	34	13.6	15	6.0	392.000*	<0.001*		
Formal power	40	16.0	58	23.2	152	60.8	196	78.4	41	16.4	13	5.2	373.500*	<0.001*		
Informal power	47	18.8	16	6.4	187	74.8	221	88.4	20	8.0	9	3.6	404.000*	<0.001*		
<b>Total</b>	<b>10</b>	<b>4.0</b>	<b>20</b>	<b>8.0</b>	<b>220</b>	<b>88.0</b>	<b>212</b>	<b>84.8</b>	<b>26</b>	<b>10.4</b>	<b>12</b>	<b>4.8</b>	<b>451.500</b>	<b>&lt;0.001*</b>		

MH: Marginal Homogeneity Test

p: p value for comparing between Pre and Post

\*: Statistically significant at  $p \leq 0.05$ **Figure (1): Correlation between total head nurses' professional shared governance knowledge and their total professional shared governance practice pre and post-educational program (n = 41)**



**Figure (2): Correlation between head nurses' professional shared governance practices and nurses' structural empowerment post-educational program**

### Discussion

Shared governance has been integrated into nursing structures to provide a transformational framework for direct nursing staff and improve an organization's overall performance, which can be promoted as innovative management design (Brennan & Wendt, 2021).

The pre-program results of the present study showed the majority of head nurses had low level of overall knowledge regarding professional shared governance, while post program they had high knowledge level of it. This result may be due to the head nurses didn't have the opportunity to attend training program or workshops about shared governance or participate in hospital committees/activities to share in decision making. As well as, they didn't work to increase their professional knowledge and advanced study in their specialized field, which majority of them

had only Bachelor degree. Whereby they were engaged in educational program execution and learnt how to use it in their practice and receive assistance in integrating professional shared governance knowledge into their management approach through the use of real situations and scenarios. This result supported with Kanninen, (2023) who found that professional nursing shared governance has not been studied and wasn't well known among head nurses.

Abdel Latif et al., (2023); Hamdan and Jaafar, (2024) reported the majority of head nurses had a poor knowledge regarding professional shared governance at pre- education preprogram phase and that increased at immediate post to good knowledge of it. In the same line, Sanchez et al., (2024) concluded that overall mean of shared governance knowledge of head nurses improved at post-application of

the educational program than pre-application, so the health organizations continued to expand the role of implementing shared governance to increase quality, collaboration and engagement.

Regarding head nurses' professional shared governance practice and their nurses' perception regarding their head nurses' professional shared governance. The high percentage of head nurses had an unsatisfactory level of professional shared governance practice, also most nurses had low level of perception at pre-educational program about their head nurses' professional shared governance. This explained by lack of theoretical knowledge of head nurses and time constraints to implement professional shared governance successfully in their practice, besides it might be related to resistance from head nurses to change in leadership style which, traditional leadership was used by most head nurses.

These findings were supported by **Knight, (2021)** who mentioned that interventions take time to notice that professional shared governance is an ongoing and fluid process that requires continuous assessment and reevaluation to be flexible and adaptive to the environment rather than a one-time implementation procedure. Furthermore, **Kanninen, Häggman, Laitila, Tervo, Heikkilä, and Kvist, (2021)** they discovered that head nurses perceived little shared governance and displayed a traditional management, which top-level managers control on all shared governance practices.

A statistically significant improvement of head nurses' practice and their nurses' perception about head nurses'

professional shared governance and its dimensions were detected post three months of educational program. This indicated that head nurses were willing to take responsibility for acquiring specific skills to apply professional shared governance in their practices and encourage engaging their nurses in the shared governance councils and process.

**ELsayed, Abed, and Abd Elwahab, (2023)** who agreed with the current result and mentioned that overall scores of the professional shared governance for head nurses was at the lower level before educational program, but after receiving the program they noticed improvement of head nurses shared governance practices enrich them with knowledge about it. Also, **AlHammouri, Rababah and Ta'an, (2021); Hamdan and Jaafar, (2024)** revealed that, the overall mean score of professional shared governance practice for nursing staff increased and had satisfactory level of shared governance post-implementation of educational program.

In contrast to this study findings **Mohamed and Saad, (2019)** who found that the minority of nurses perceived a high level of professional shared governance and reported that the decision was primarily taken by head nurses. Also, **Choi, (2021); Choi and Kim, (2019)** who found that the level of shared governance indicated primary involvement from nurse managers in dimensions of shared governance.

According to structural empowerment, a high percentage of nurses had low level of perception regarding structural empowerment pre-educational program about professional shared governance for their head nurses. This may be due to

that head nurses didn't understand how to delegate duties effectively for their nurses, denial in the comments and thoughts of nurses, and not had authority to supply necessary resources for nurses, also didn't have any background about professional shared governance to empower their nurse.

Along with present study, **Hassan, El Sayed, and Eid, (2023)** they revealed that nurses had low level of empowerment due to low level of participation in decision making and autonomy. **Ibrahim, (2023); AlGhwary et al., (2024)** they found that nurses perceived structural empowerment as moderate to low on average.

While, in the post three months of educational program the results of this study revealed that nurses had a high level perception of structural empowerment after head nurses' professional shared governance program. This finding reflects that head nurses acquired the skills of encouraging their nurses to share ideas and ensure that they are well appreciated, also increase of nurses' engagement in decision-making through using delegation and allowing for them to collaborate on patient care with team members and receiving helpful feedback. In this context, **Tan and Conde, (2021); Van Outer, (2024)** observed that score of all structural empowerment increased after the intervention of professional shared governance and noticed that nurses who feel empowered are motivated to be more engaged in their practice leading to better retention rates, and increased structural empowerment foremost better outcomes for patients and the organization. Moreover, **Hassan et al.,**

**(2023)** stated that when head nurses had the capacity to demonstrate empowerment in their practice through providing learning, training and coordination that leads to higher team performance and using effective delegation technique.

#### **Correlation between professional shared governance and structural empowerment**

The present study revealed there was a statistically significant correlation between total head nurses' professional shared governance knowledge and their practice at pre- and post-educational program. This may be due to the willingness of head nurses to know about professional shared governance. Besides, improvement of their knowledge regarding it leading to effective utilization of professional shared governance skills demonstrated higher performance and contributed to their growth as shared leader. So, the head nurses' practice for professional shared governance impact on the clinical practice, encourage nurses to be represented in hospital administration committees, and support their participation. Therefore, the effectiveness of the head nurses' professional shared governance knowledge increased and consequently, their performance level also improved. Those findings were supported by, **Abdel Latif et al., (2023); McPherson, (2022)** who found highly a statistically significant correlation between total head nurses' professional shared governance knowledge and their practice, where increased the mean scores of all the shared governance dimensions among head nurses throughout the program phases.

Also, these results agreed with **Drexler, (2020)** showed positive correlation between head nurses' professional shared governance knowledge and their practice, and concluded that head nurses' knowledge and practice about shared governance improved and it was highly statistically significant.

The current study exposed correlation between head nurses' professional shared governance and nurses' structural empowerment post-educational program. Which can be interpreted by that empowering of head nurses for their nurses in decision-making through a shared governance process that allowed them to make decisions regarding their professional practice.

This finding is supported by **kinann et al., (2021)** who said that the implementation of professional shared governance fosters a more empowered work environment by increasing involvement in decision-making. In the same concern, **Sarıköse, and Çelik, (2023)** they showed a positive correlation between professional shared governance and structural empowerment scores through enhancing the work environment for increasing nurses' participation in decision-making. Furthermore, **Choi, (2021); Quek et al., (2020)** they stated that the practice of successful professional shared governance required adequate structure empowerment from resources, support and information are needed, and personnel must be encouraged to participate through role of head nurse as mentors or supporters. Moreover, **Olender et al., (2020); McPherson, (2022)** who mentioned that implementation of professional shared governance practice by head nurses lead

to increased awareness for their nurses about it and make empowerment scores among nurses increased progressively and significantly

### **Conclusion**

Based on the findings of the current study, it can be concluded that head nurses' knowledge and practice of professional shared governance are enhanced after implementation of the educational program. Also, there are improvements of nurses' perception about their head nurses' professional shared governance and structural empowerment post-educational program for their head nurses compared to pre-program.

### **Recommendations**

On the line of the findings of the current study the following recommendations are suggested for:

#### **Hospitals administrators**

- Arrange an orientation program for preparation of newly appointed head nurses about strategies for implementing professional shared governance.
- Conduct regular periodical enhancement programs and workshops for head nurses to maximize their professional shared governance practices.
- Consider implementing shared governance as a means of empowering and involving the staff members.

#### **Head nurses**

- Make a conscious effort to participate in the mission and vision of the organization and ensure that it aligns with nurses' personal beliefs and intentions.
- Offering empowered behaviors through engagement and sharing nurses in decision-making, offering constructive feedback, giving nurses' autonomy, and enhancing goal accomplishment.

- Having the abilities to coordinate the process of change, innovate, and adapt quickly to nurses' requirements.
- Offering nursing staff chances for professional development and training, particularly in the areas of strategy planning and goal-setting

### Nursing education

-Review and modify nursing curriculum to provide more opportunities for nursing students to be aware of the importance of professional shared governance.

### Further research is needed on:

-Imbedding modern models of leadership as professional shared governance, organizational values and methods to empower staff and interacting with them.

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## Relation between Cultural Intelligence and Academic Communication among Nursing Students

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### Abstract

**Background:** Cultural diversity has become an integral part of educational settings, particularly in the nursing profession, in which cultural intelligence plays a pivotal role in helping nursing students augment their academic communication skills. **Aim of the study:** To assess the relation between cultural intelligence and academic communication among nursing students. **Research design:** A descriptive-correlational design was applied. **Setting:** The study was conducted at the Faculty of Nursing at Tanta University. **Subjects:** The total sample was 1085 nursing students in each academic year of 2023-2024. **Tools:** Three tools were used: nursing students' cultural intelligence questionnaire, nursing students' academic communication skills questionnaire, and nursing students' academic communication obstacles questionnaire. **Results:** More than half (51.2%) of nursing students had a moderate perception level of cultural intelligence. More than half (58.6%) of nursing students had a moderate level of academic communication skills. The students' barriers were the most common obstacles to academic communication. **Conclusion:** There was a highly positive significant correlation between nursing students' cultural intelligence and their academic communication skills. **Recommendations:** The faculty of nursing should integrate cultural intelligence into the nursing curriculum focused on knowledge and skills to develop cultural competence, as well as nursing students should seek learning opportunities to learn about different cultures through reading books and attending cultural events.

**Keywords:** Academic communication, Cultural intelligence, Nursing students.

## Introduction

Every area of life has been revolutionized by digital technologies; this exposes educational organizations and nursing students to culturally diverse workforces that demand efficient management and motivates them to develop more resilient coping strategies for emerging obstacles (Monteiro & Joseph, 2023). Therefore, it is imperative to cultivate nursing students' cultural intelligence to thrive in the modern globalized world (Larsen, Mangrio, & Persson, 2021).

Cultural intelligence (CQ) is defined as one's ability to learn new styles of cultural interaction and respond properly in unfamiliar cultural situations (Rajaram, 2023). Through CQ, nursing students can collaborate to create an effective academic environment (Phanphairoj, 2021). CQ benefits nursing students by refining their academic performance in diverse environments through effective adjustment and augmented personal trust (Li & Middlemiss, 2022).

CQ consists of four interrelated components: metacognitive, cognitive, motivational, and behavioral. Metacognitive cultural intelligence (MCQ) is a set of intellectual processes that enable nursing students to acquire and comprehend cultural knowledge and self-control over their thought patterns to learn about a variety of cross-cultural scenarios (Fietz, Hillmann & Guenther, 2021). Cognitive cultural intelligence (CCQ) refers to general knowledge, frameworks of cultures, and cultural differences. It includes gathering and preserving information about distinct cultures for future use (Senel, 2020).

Motivational cultural intelligence (MoCQ) is the ability of nursing students to focus their attention and energy on understanding and navigating culturally diverse environments (Livermore, Van Dyne & Ang, 2022). Behavioral cultural intelligence (BCQ) reflects nursing students' ability to adapt their conduct to suit various cultural circumstances (Bakhtiari, Hanifi & Varjoshani, 2023).

The faculty of nursing plays a vital role in producing graduates who possess not just the academic credentials but also the skills necessary to compete in the global marketplace. One of the most important abilities of university nursing students is communication (Wawrosz & Jurasek, 2021). Academic communication includes effectively and successfully presenting ideas, thoughts, and knowledge in a scholarly setting (Goyanes & de-Marcos, 2020). Academic communication refers to highly structured communication techniques that are typically limited to use in educational settings, which enable nursing students to overcome concerns and misunderstandings while also sharing their thoughts and experiences (Munna & Kalam, 2021). Furthermore, it is significantly beneficial to nursing students' engagement and success in academic life (Fuchshuber & Greif, 2022).

Academic communication involves verbal and nonverbal forms in addition to listening skills. Nursing students can convey messages to others by speaking and exchanging knowledge verbally (Gottardello & Karabag, 2022). The art of communicating nonverbally involves using body language and gestures in place of spoken words.

These movements may or may not be accompanied by words, which are performed deliberately or involuntarily (Lee, Dastpish, Freemon & Parks, 2023).

However, academic communication obstacles in the classroom can significantly impede nursing students' learning experiences and hinder their academic progress (Eskicumali, Kara, Arslan & Uzun, 2020). Academic communication obstacles may appear in the form of physical, psychological, language, faculty, and student-related barriers. Physical barriers include unsuitable temperatures in the classroom terraces that hinder interactions.

Psychological barriers reflect nursing students' anxiety, stress, illness, and introversion that inhibit their willingness to participate actively in classroom discussions. Faculty barriers indicate their poor self-confidence and ability weakness in scientific material during the teaching process (Hood, Barrickman, Djerdjian, Farr, Magner et al., 2021). Language barriers emerge due to an absence of mutual linguistic competence between educators and nursing students, making it challenging to express ideas accurately (Gaynor, 2020). Student-related barriers point to their unwillingness to lecture and low motivation for students' education (Alenezi, Wardat & Akour, 2023).

### **Significance of study**

The multicultural composition of the community in a university environment obligates the nursing students to meet and interact with individuals from various cultural backgrounds (Cerdin & Akkan, 2023). Therefore, nursing students require special skills, in

particular CQ, because it's essential academic competence for the 21<sup>st</sup> century. It permits nursing students to understand, create good relationships with others, communicate effectively, evaluate their own and others' behaviors, and effectively listen. Actually, demonstrating culturally intelligent behavior is necessary to overcome the challenges posed by cross-cultural exchanges. Thus, this study will be directed at studying cultural intelligence and academic communication among nursing students.

### **Aim of the study**

To assess the relation between cultural intelligence and academic communication among nursing students.

### **Research Questions**

1. What are the levels of cultural intelligence and academic communication among nursing students?
2. What is the relation between cultural intelligence and academic communication among nursing students?

### **Research design:**

A descriptive-correlational design was used in the present study.

### **Study setting:**

The current study was carried out at Tanta University's Faculty of Nursing includes seven departments Medical and Surgical Nursing, Critical Care and Emergency, Nursing Obstetric, Pediatric Nursing, Community Health Nursing, Psychiatric and Mental Health Nursing, and Nursing Administration Department.

### **Subjects:**

The study's subjects were selected by proportionate stratified random

sampling. In this study, each academic year was designated as a distinct stratum, and the selection of the sample was executed in accordance with the relative number of nursing students enrolled in each academic year of 2023/2024. The total study sample was calculated using the Epi. Info. Software statistical package, where  $N=$  population size (3887),  $Z=$  confidence level at 95% (1.96), and  $d=$  margin of error proportion (0.05). The total sample was 1085 out of 3887 nursing students from different academic years enrolled during data collection time.

#### **Tools of data collection:**

The study's data was collected using the following three tools:

#### **Tool I: Nursing Students' Cultural Intelligence Questionnaire (NSCQQ)**

This tool was developed by the investigator guided by relevant literature reviews (Khan & Hasan, 2016; Bucker, Furrer & Lin, 2015) to assess the nursing students' perceptions of CQ. It consisted of two parts as follows:

**Part (1): Nursing students' personal data:** This part included age, gender, academic year, residence, system of studying, and previous academic achievement.

**Part (2): Cultural Intelligence Questionnaire:** It included 17 items divided into four dimensions as follows:

- **Metacognitive cultural intelligence:** It included 4 items.
- **Cognitive cultural intelligence:** It included 5 items.
- **Motivational cultural intelligence:** It included 4 items.
- **Behavioral cultural intelligence:** It included 4 items.

#### **Scoring system:**

Nursing students' responses were measured on a five-point Likert Scale ranging from (5) strongly agree to (1) strongly disagree. The total scores were calculated by cut-off points as follows:

- High cultural intelligence level  $>75\%$ .
- Moderate cultural intelligence level 60% - 75%.
- Low cultural intelligence level  $<60\%$ .

#### **Tool II: Nursing Students' Academic Communication Skills Questionnaire.**

This tool was developed by the investigator guided by related literature reviews (Eskicumali et al., 2020; Alhomari, 2017) to assess nursing students' academic communication skills. It included 32 items divided into three dimensions as follows:

- **Verbal communication skills:** It included 14 items.
- **Nonverbal communication skills:** It included 13 items.
- **Listening communication skills:** It included 5 items.

#### **Scoring system:**

Nursing students' responses were measured on a five-point Likert Scale ranging from 5-1; where (5) Strongly agree to (1) Strongly disagree. The total scores were calculated by cut-off points as follows:

- High level of academic communication skills  $>75\%$ .
- Moderate level of academic communication skills 60% - 75%.
- Low level of academic communication skills  $<60\%$ .

#### **Tool III: Nursing Students' Academic Communication Obstacles Questionnaire.**

This tool was developed by the investigator based on relevant literature

reviews (Bukhari, Kalhoro, Lashari, Soomro, Batool et al., 2023; Gula, 2022) to assess the nursing students' academic communication obstacles. It included 27 items divided into five dimensions as follows:

**Physical barriers** included 6 items.

**Psychological barriers** included 4 items.

**Language barriers** included 4 items.

**Faculty barriers** included 8 items.

**Students' barriers** included 5 items.

#### **Scoring system:**

Nursing students' responses were measured on a five-point Likert Scale ranging from (5) always to (1) never. A sum of scores for each respondent was calculated to determine the most frequent barriers influencing academic communication among nursing students based on the number of participants' responses.

#### **Method:**

1. Official permission was obtained from the Dean of the Faculty of Nursing and all heads of academic departments.

#### **2. Ethical considerations:**

- a) An approval from the Scientific Research Ethical Committee at the faculty of nursing was obtained with the code number (323)-11-2023.
- b) The nature of the study wasn't causing harm to the entire sample.
- c) Informed consent was obtained from nursing students after an explanation of the study's aim.
- d) Confidentiality and anonymity were maintained regarding data collection and participants had the right to withdraw.

3. Tools I, II, and tool III were translated into Arabic and presented to a jury of five experts in the area of specialty to check their content validity and clarity of the questionnaire. The experts were

two professors and three assistant professors of nursing administration from the Faculty of Nursing at Tanta University.

4. The experts' responses were represented in a four-point rating scale ranging from (4) strongly relevant to (1) not relevant. Necessary modifications were made, including clarification, omission of certain items, and adding others, and simplifying work-related words.
- The face validity value of tool (I) was 99.12%, for tool (II) was 100.00% and for tool (III) was 99.26%.
5. A pilot study was carried out on 10% of nursing students (n= 109), who were excluded from the main study's sample. It was carried out after the experts' opinions and before starting the actual data collection to test the clarity, sequence, applicability, and relevance of the questions, as well as determine the needed time to complete the questionnaire.
6. The reliability value of tool (I) was 0.899 and for tool (II) was 0.903, and for tool (III) was 0.896.
7. The estimated time needed to complete the questionnaire from nursing students ranged from 15 to 20 minutes.
8. **Data collection phase:** The data were collected from nursing students by the investigator in different areas during teaching hours to distribute the questionnaire. The subjects recorded the answers in the presence of the investigator to ascertain that all questions were answered. The data was collected from 1/3/2024 until 1/6/2024.

#### **Statistical analysis:**

The data was fed to the computer and analyzed using IBM SPSS software package version 20.0. (Armonk, NY: IBM Corp). The reliability of tools was

tested using the Cronbach Alpha Coefficient test. Qualitative data were described using numbers and percent. The Shapiro-Wilk test was used to verify the normality of distribution. Quantitative data were described using range (minimum and maximum), mean, standard deviation, and median. The Chi-square test was used for categorical variables to compare different groups, while the Student T-test was utilized for normally distributed quantitative variables to compare between two studied groups. The significance of the obtained results was judged at the 5% level.

## Results

**Table 1** shows the frequency and distribution of nursing students' personal data. As noticed in this table, more than half (52.0%) of nursing students were in the age group ranging from 18 to 20 years with a mean score of  $20.33 \pm 1.55$ , and more than two-thirds (66.2%) of them were females. The highest percent (26.7%) of nursing students enrolled in the second academic year and more than half (56.7%) of them were from rural areas. Furthermore, slightly more than half (51.6%) of nursing students registered on the non-credit hours system and more than one-third (40.8%) of them had an excellent grade as the previous academic achievement.

**Figure 1** portrays the overall perception levels of nursing students' cultural intelligence. It is clear that more than half (51.2%) of nursing students had a moderate perception level of CQ, while less than half (46.4%) of them had a low perception level of cultural intelligence. On the other hand, a minority (2.5%) of

nursing students had a high perception level of CQ.

**Table 2** illustrates nursing students' levels of cultural intelligence dimensions. It is observed that the majority (86.5%) of nursing students had a low level of CCQ. While 66.5%, 55.8%, and 48.5% of nursing students had moderate levels in dimensions of behavioral, motivational, and metacognitive CQ, respectively.

**Figure 2** illustrates the overall levels of nursing students' academic communication skills. As shown in this figure, more than half (58.6%) of nursing students had a moderate level of academic communication skills. Moreover, more than one-third (38.6%) of them had a high level and a minority (2.8%) of them had a low level of academic communication skills.

**Table 3** depicts levels of nursing students' dimensions of academic communication skills. The table illustrates that 61.7%, 50.4%, and 43.8% of nursing students had a moderate level of verbal, non-verbal, and listening communication skills, respectively.

**Figure 3** describes the ranking of the mean percent scores for dimensions of academic communication obstacles as perceived by nursing students. As observed from this figure, the students' barriers were ranked as the highest mean percent score (63.39%), followed by the psychological barriers (32.42%), then the language barriers (26.47%), and after that the faculty barriers (25.01%). While physical barriers were ranked as the lowest mean percent score of 20.12%.

**Table 4** displays the relations between nursing students' overall levels of cultural intelligence and their personal

data. There were statistically significant relations between nursing students' overall levels of CQ and their age, academic year, system of studying, and gender.

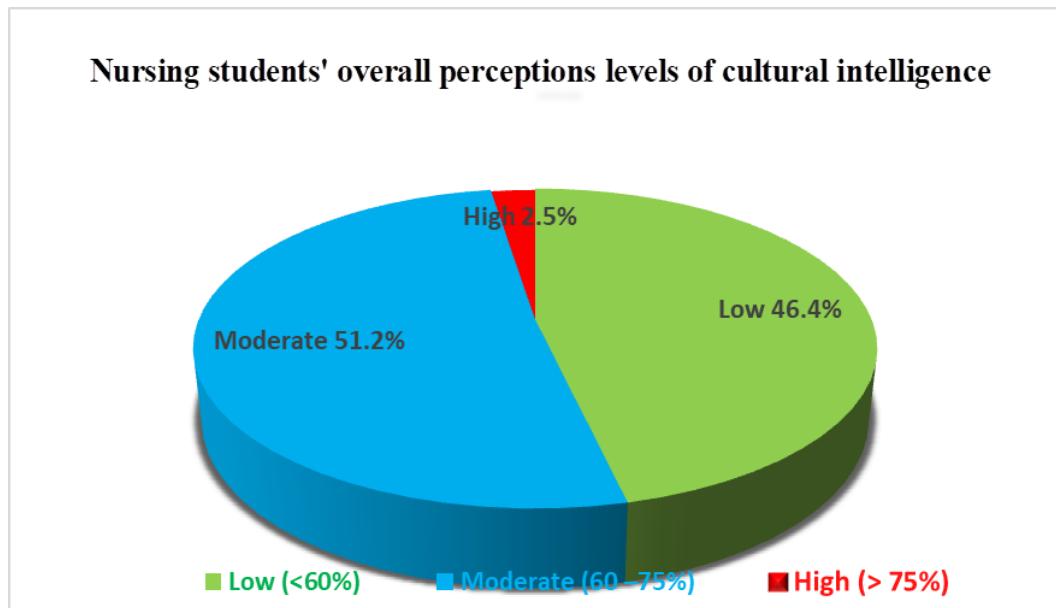
**Table 5** depicts relations between nursing students' overall levels of academic communication skills and their personal data. As clear, there were statistically significant relations between nursing students' overall levels of academic communication skills and their age, academic year, and system of studying.

**Table 6** exhibits relations between nursing students' total scores of academic communication obstacles and their personal data. The table shows statistically significant relations between nursing students' total scores of academic communication obstacles and their age, academic year, and system of studying.

**Table 7** clarifies correlations between cultural intelligence, academic communication skills, and academic communication obstacles. As noticed from this table, there was a highly positive statistically significant correlation between nursing students' CQ and their academic communication skills ( $r=0.341$ ,  $p<0.001$ ). On the other scene, there was a highly negative statistically significant correlation between nursing students' CQ and their perceptions of academic communication obstacles ( $r= -0.264$ ,  $p<0.001$ ). Furthermore, it's obvious that there was a highly negative statistically significant correlation between nursing students' academic communication skills and their perceptions of academic communication obstacles ( $r= -0.258$ ,  $p<0.001$ ).

**Table (1): Frequency and distribution of nursing students' personal data (n = 1085)**

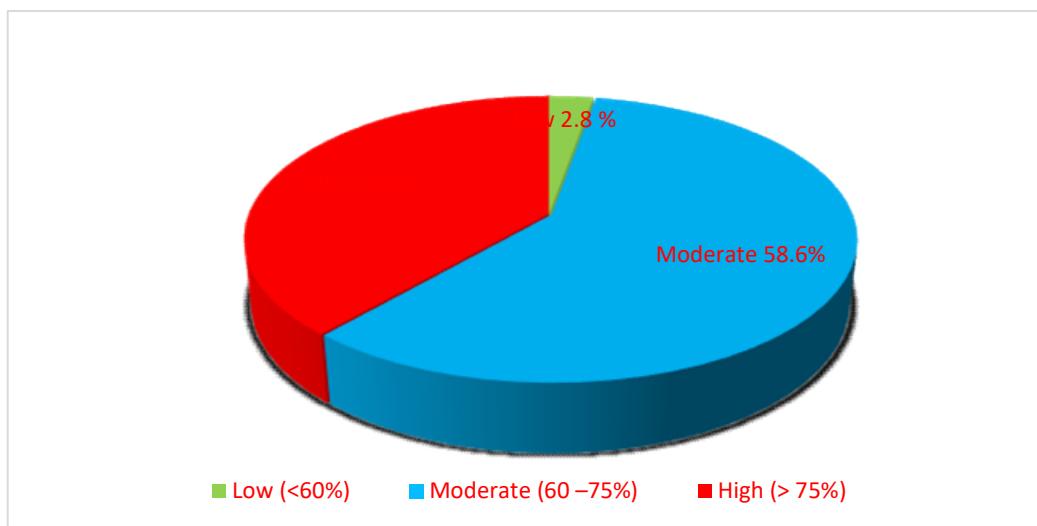
<b>Nursing students' Personal data</b>	<b>No.</b>	<b>%</b>
<b>Age (years)</b>		
18 – 20	564	52.0
20 – 22	452	41.7
>22	69	6.3
Mean ± SD.	<b>20.33 ± 1.55</b>	
<b>Gender</b>		
Male	367	33.8
Female	718	66.2
<b>Academic year</b>		
First	235	21.7
Second	290	26.7
Third	280	25.8
Fourth	280	25.8
<b>Residence</b>		
Urban	470	43.3
Rural	615	56.7
<b>System of studying</b>		
Credit hours	525	48.4
Non-credit hours	560	51.6
<b>Previous academic achievement</b>	<b>(n=850)</b>	
Excellent	347	40.8
Very good	193	22.7
Good	243	28.6
Satisfactory	60	7.1
Fail	7	0.8



**Figure (1): Overall perception levels of nursing students' cultural intelligence**

**Table (2): Nursing students' levels of cultural intelligence dimensions**

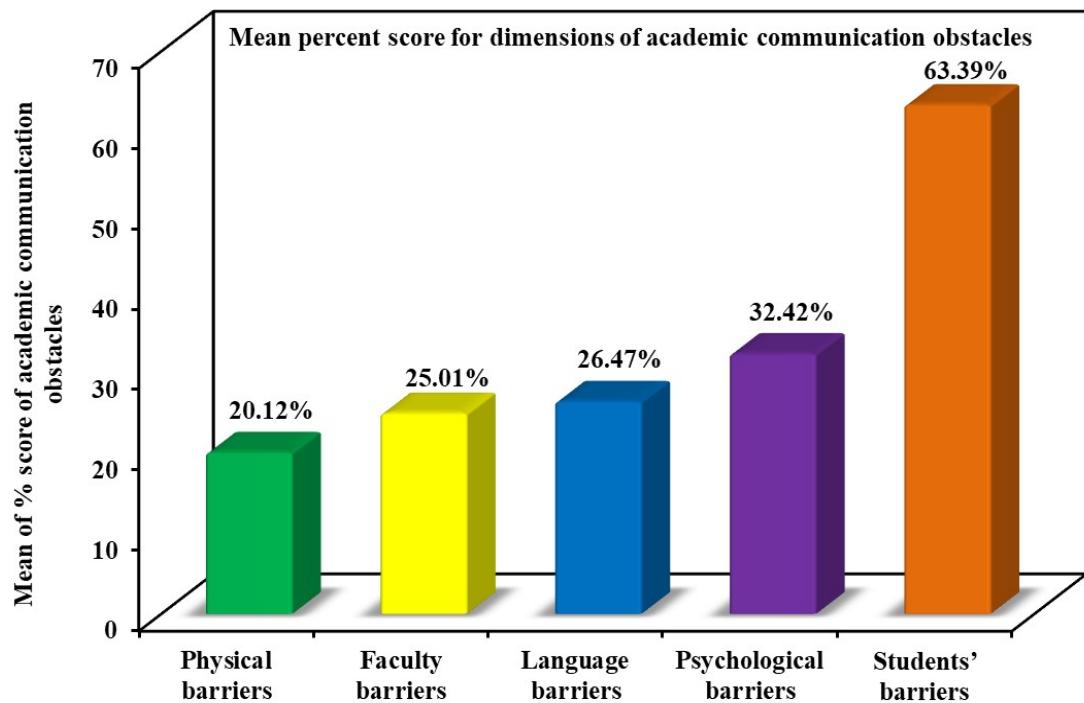
Cultural Intelligence Dimensions	No.	%
<b>Metacognitive cultural intelligence</b>		
High (> 75%)	146	13.5
Moderate (60 –75%)	527	<b>48.5</b>
Low (<60%)	412	38.0
<b>Cognitive cultural intelligence</b>		
High (> 75%)	7	0.7
Moderate (60 –75%)	139	12.8
Low (<60%)	939	<b>86.5</b>
<b>Motivational cultural intelligence</b>		
High (> 75%)	297	27.5
Moderate (60 –75%)	606	<b>55.8</b>
Low (<60%)	182	16.7
<b>Behavioral cultural intelligence</b>		
High (> 75%)	201	18.6
Moderate (60 –75%)	722	<b>66.5</b>
Low (<60%)	162	14.9



**Figure (2): Overall levels of nursing students' academic communication skills**

**Table (3): Levels of nursing students' dimensions of academic communication skills**

Dimensions of academic communication skills	No.	%
<b>Verbal communication skills</b>		
High (> 75%)	384	35.4
Moderate (60 – 75%)	669	<b>61.7</b>
Low (<60%)	32	2.9
<b>Non-verbal communication skills</b>		
High (> 75%)	376	34.7
Moderate (60 – 75%)	547	<b>50.4</b>
Low (<60%)	162	14.9
<b>Listening communication skills</b>		
High (> 75%)	434	40.0
Moderate (60 – 75%)	475	<b>43.8</b>
Low (<60%)	176	16.2



**Figure (3): Ranking of mean percent scores for dimensions of academic communication obstacles as perceived by nursing students**

**Table (4): Relations between nursing students' overall levels of cultural intelligence and their personal data**

Personal data	Overall levels of cultural intelligence						$\chi^2$	p		
	Low (n = 503)		Moderate (n = 555)		High (n = 27)					
	No.	%	No.	%	No.	%				
<b>Age (years)</b>										
18 – 20	310	55.0	240	42.6	14	2.5	41.373*	<0.001*		
20 – 22	174	38.5	269	59.5	9	2.0				
>22	19	27.5	46	66.7	4	5.8				
<b>Gender</b>										
Male	179	48.8	174	47.4	14	3.8	6.134*	0.047*		
Female	324	45.1	381	53.1	13	1.8				
<b>Academic year</b>										
First	125	53.2	108	46.0	2	0.9	55.484*	<0.001*		
Second	168	57.9	110	37.9	12	4.1				
Third	118	42.1	160	57.1	2	0.7				
Fourth	92	32.9	177	63.2	11	3.9				
<b>Residence</b>										
Urban	212	45.1	248	52.8	10	2.1	1.137	0.566		
Rural	291	47.3	307	49.9	17	2.8				
<b>System of studying</b>										
Credit hours	293	55.8	218	41.5	14	2.7	38.159*	<0.001*		
Non-credit hours	210	37.5	337	60.2	13	2.3				

**Table (5): Relations between nursing students' overall levels of academic communication skills and their personal data**

Personal data	Overall level of academic communication skills						$\chi^2$	p		
	Low (n =30)		Moderate (n = 636)		High (n = 419)					
	No.	%	No.	%	No.	%				
<b>Age (years)</b>										
18 – 20	23	4.1	303	53.7	238	42.2	28.060*	<0.001*		
20 – 22	7	1.5	301	66.6	144	31.9				
>22	0	0.0	32	46.4	37	53.6				
<b>Gender</b>										
Male	11	3.0	216	58.9	140	38.1	0.145	0.930		
Female	19	2.6	420	58.5	279	38.9				
<b>Academic year</b>										
First	4	1.7	42	17.9	189	80.4	301.688*	<0.001*		
Second	19	6.6	231	79.7	40	13.8				
Third	4	1.4	214	76.4	62	22.1				
Fourth	3	1.1	149	53.2	128	45.7				
<b>Residence</b>										
Urban	15	3.2	275	58.5	180	38.3	0.569	0.752		
Rural	15	2.4	361	58.7	239	38.9				
<b>System of studying</b>										
Credit hours	23	4.4	273	52.0	229	43.6	23.795*	<0.001*		
Non-credit hours	7	1.3	363	64.8	190	33.9				

**Table (6): Relations between nursing students' total score of academic communication obstacles and their personal data**

Personal data	N	Total score of nursing students' academic communication obstacles	Test of sig.	p
		Mean $\pm$ SD.		
<b>Age (years)</b>				
18 – 20	564	60.47 $\pm$ 9.82	F= 16.625*	<0.001*
20 – 22	452	63.55 $\pm$ 7.43		
>22	69	63.32 $\pm$ 6.19		
<b>Gender</b>				
Male	367	61.70 $\pm$ 8.89	t= 0.623	0.533
Female	718	62.05 $\pm$ 8.79		
<b>Academic year</b>				
First	235	59.77 $\pm$ 8.79	F= 14.479*	<0.001*
Second	290	60.53 $\pm$ 10.76		
Third	280	63.94 $\pm$ 7.37		
Fourth	280	63.20 $\pm$ 7.16		
<b>Residence</b>				
Urban	470	62.36 $\pm$ 8.74	t= 1.377	0.169
Rural	615	61.61 $\pm$ 8.87		
<b>System of studying</b>				
Credit hours	525	60.19 $\pm$ 9.93	t= 6.372*	<0.001*
Non-credit hours	560	63.57 $\pm$ 7.27		

**Table (7): Correlation between cultural intelligence, academic communication skills, and academic communication obstacles**

Study's variables	r	P
<b>Cultural intelligence vs. academic communication skills</b>	0.341*	<0.001*
<b>Cultural intelligence vs. academic communication obstacles</b>	-0.264*	<0.001*
<b>Academic communication skills vs. academic communication obstacles</b>	-0.258*	<0.001*

## Discussion

Nursing practices not only require scientific knowledge but also need technical, intellectual, cultural, and interpersonal skills. This indicates that clinical work, interpersonal communication, and knowledge make up nursing. Therefore, nursing students often struggle to communicate effectively with their mentors, colleagues, and patients owing to various cultures (**Badr & Shehata, 2021**). A culturally intelligent nursing student will be better equipped for effective academic communication, which is crucial for cross-cultural interaction and academic success (**Yue & Wei, 2023**).

### Nursing students' perceptions of cultural intelligence

According to the current study findings, around half of nursing students had a moderate level of overall CQ. This result may be explained by nursing students often having high levels of academic stress due to a rigorous academic burden and a number of assignments, as well as frequent exams that limit their time to explore various knowledge and information about different cultures. Additionally, nursing curricula do not place enough emphasis on cultural competence, focusing more on technical and clinical skills, and leaving a little gap for the development of nursing students' cultural intelligence skills.

Along with the present study findings, many studies of **Sevinc & Ozdemir (2024)**, **Bakhtiari et al. (2023)**, **Atalla and Elseesy (2023)**,

**Osmancevic, Grobschadl & Lohrmann (2023)**, **Erçelik, Çamlıca & Özkan (2022)**, and **Phanphairoj (2021)**, demonstrated that the nursing students had a moderate level of CQ who had encountered others from various cultural backgrounds for any reason. In the same vein, **Göl & Erkin (2019)**, and **Shomoossi, Asor, Kooshan & Rad (2019)** found that nursing students had an acceptable level of cultural intelligence. Contradictory to these results, **Aboelenein & Mohamed (2022)**, **Segev, Mor, Zahav, & Neter (2022)**, **Skwiercz (2022)**, and **Putranto, Nuraeni, Gustomo & Ghazali (2018)** did not support the study's findings and displayed that the nursing students had a high score of CQ.

### Nursing students' perceptions of academic communication

According to the study's findings, more than half of nursing students had a moderate level of academic communication skills. This is clarified by while a significant portion of nursing students possess an initial ability to communicate effectively in academic settings; there is still room for improvement in enhancing these skills to a more advanced level. However, effective academic communication is crucial in nursing education, as it directly impacts nursing students' ability to understand complex concepts, engage in collaborative learning, and deliver high-quality patient care. Nursing students may experience high levels of stress and time constraints due to the intensive

nature of their academic programs, which may limit their abilities to fully engage in opportunities to refine their academic communication skills.

This finding is in line with the studies of **Amir, Alan, Jusoh & Yacob, (2024)**, **Mohammadi, Mohammadi & Hanjani (2023)**, and **Badr & Shehata (2021)**, which revealed that most nursing students had a moderate level of communication skills. In addition, **Jasim and Khalifa (2019)** reported that nursing students had a fair level of communication skills. On the other hand, **Bamoussa (2023)** displayed that the majority of nursing students had low scores regarding their level of communication skills. In this context, **Ahmed & Shalaby (2022)** noted that most of the study's participants had low levels, and no training courses were administered in communication skills. **Aktan & Khorshid (2021)** and **Sancar & Aktas (2019)** contradicted this finding and showed that nursing students had high levels of communication skills.

### **Nursing students' perceptions of academic communication obstacles**

According to the study's findings, the nursing students-related barriers were ranked as the highest one, followed by the psychological barrier, then the language barrier, and after that the faculty barrier. At the same time, the physical barrier was ranked as the lowest. This could be attributed to peer pressure and conflict, which often exaggerate

nursing students' misunderstandings. Additionally, many factors such as motivational levels, varying levels of preparedness, and prior knowledge also create disparities in learning experiences among nursing students. Regarding the psychological barriers, it is observed that this result was attributed to some nursing students' problems such as anxiety, stress, and introversion personality, which could severely impact concentration and motivation levels. Concerning the language barrier, despite issues related to language proficiency, faculty members use unfamiliar vocabulary that is difficult for nursing students to understand, still considered as posing challenges for nursing students in academic settings.

Additionally, the faculty barriers indicated challenges related to teaching methods. Effective communication in the classroom is hindered when a faculty member does not possess the necessary knowledge and skills, as well as uses inappropriate or unattractive teaching styles. Lastly, the physical barriers to academic communication were clarified by the majority of nursing students, who always experience poor internet connection and technical issues that make it difficult for them to access learning materials.

These findings are supported by **Bratchuk and Smith (2023)**, who supposed that laziness, fear of errors, poor communication practice, low knowledge of vocabulary, and fatigue were the most frequent barriers facing the study's students.

**Kakepoto, Laghari & Laghari (2022)** displayed that those students who hesitated, had a lack of knowledge, poor preparation, and poor listening skills might be dissatisfied with the educational process. Moreover, **Shevchenko, Tkachenko, Tkachenko & Nenko (2022)** detect that psychological barriers constituted the apparent type of barriers that hinder academic communication.

Additionally, **Bakar, Shah & Qingyu (2020)** described anxious students struggling with their communication styles and focused on psychological potential problems and issues in the communication process. These study's results were contradicted by those of **Muhajir, Anwar & Latif (2024)**, who explained that external factors, including the surrounding environment and the lecturer's personality, were not ranked as barriers to academic communication.

### **Correlation between nursing students' CQ and their academic communication skills**

According to data analysis of the current study, there was a highly positive statistically significant correlation between nursing students' CQ and their academic communication skills. This might indicate that being culturally competent and sensitive could positively impact nursing students' abilities to effectively communicate in academic settings, in agreement with this finding, **Cieslak, Jaworski, Panczyk, Barzykowski, Majda, et al. (2024)** showed a considerable correlation between CQ

and the integration of formal and informal education. **Bakhtiari et al. (2023)** showed that the total score of CQ had a strong positive relationship with cultural competence. Contrary to this, **Dewi, Wilany, Sidabutar & Ria (2022)** ensured no significant relation between students' CQ and listening ability.

### **Correlation between nursing students' cultural intelligence and their perceptions of academic communication obstacles**

The current study's results displayed a highly negative and strongly statistically significant correlation between nursing students' cultural intelligence and their perceptions of academic communication obstacles. This finding suggested that nursing students who possessed greater cultural awareness and adaptability were better equipped to navigate and overcome challenges in academic communication.

In the same scene, **Zhang and Zhou (2021)** concluded that students with low MCQ are a barrier to cross-cultural communication. These students found themselves struggling with interacting and understanding others. **Joo & Liu (2020)** illustrated that study's subjects with limited ability to act effectively in cross-cultural interactions could face communication barriers and negatively impact their ability to be culturally competent.

### **Conclusion**

It was concluded that more than half of nursing students had a moderate perception level of CQ, and more than half of them had a moderate

level of academic communication skills. Furthermore, students-related barriers were the most common obstacles to academic communication. There was a highly positive and strongly statistically significant correlation between nursing students' CQ and their academic communication skills. Additionally, there was a highly negative and strongly statistically significant correlation between nursing students' CQ and their perceptions of academic communication obstacles, as well as between nursing students' academic communication skills and their perceptions of academic communication obstacles.

#### **Recommendations:**

Based on the current study results, these suggestions were made:

#### **For the Faculty of Nursing**

- Integrate CQ into the nursing curriculum by incorporating modules or topics focused on knowledge and skills to develop cultural competence.
- Promote cross-cultural interactions and facilitate opportunities for nursing students to engage with peers, faculty, and healthcare professionals from diverse cultural backgrounds through exchange programs and collaborative projects.
- Enhance academic communication training programs by offering workshops and training sessions aimed to improve academic communication competencies.
- Integrate assignments and activities that require students to communicate across cultural boundaries, such as group presentations reflective

essays, roleplays, debates, and projects.

#### **For faculty members**

- Demonstrate the application of professional values for education in the classroom and other educational settings using CQ.
- Be aware of and work to mitigate and compensate for the potential cultural bias in the teaching process among nursing students by promoting equitable relationships and encouraging respectful behavior.
- Recognize nursing students' different backgrounds and identify how it may impact their performance and interactions.

#### **For nursing students**

- Seeking self-learning opportunities about different cultures through reading books and articles, as well as attending cultural events.
- Participate in non-curriculum activities that facilitate cross-cultural environments by joining student organizations, or community events to promote intercultural interaction and understanding.
- Seek feedback from peers and instructors on communication effectiveness and work on areas for improvement.

#### **For further research**

- Evaluate the effectiveness of targeted interventions, such as CQ training programs or communication workshops for enhancing nursing students' participation and learning.
- Conduct a longitudinal study to understand how CQ and communication skills manifest in different healthcare-related educational programs.

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## **Effect of Implementing Educational Program regarding Nurse Managers' Performance in Human Resource Management on Nurses' Job Crafting**

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### **Abstract:**

**Background:** The nurse managers' practices of human resource management in healthcare organizations are critical to ensure that nurses are able to provide the best possible care and increase their level of engagement and the ability to craft their jobs.

**Aim:** This study aimed to determine the effect of nurse managers' educational program regarding human resource management practices on nurses' job crafting. **Research design:** Quasi-experimental study design was utilized in the current study. **Setting:** The study was conducted at Tanta University International Teaching Hospital, as well as El-Menshawy General Hospital. **Subjects:** All nurse managers and a stratified proportional sampling of nurses (n= 355). **Tools:** Four tools were used: knowledge questionnaire about human resource management practices, human resource management practices self-report, observational checklist of human resource management practices, and job crafting questionnaire. **Results:** The vast majority (92.6%) of nurse managers had a high knowledge level immediately post-program implementation, which slightly declined post-three months of the program, while the majority (90.7%) of them had a satisfactory level of all human resource management practices immediately and after three months of program implementation. while the majority (87.3%) of nurses had a high perception level of job crafting immediately after implementation of educational program. **Conclusion:** There is a significantly improvement in nurse managers' perceptions and practices regarding human resource management and nurses' perceptions level of job crafting immediately and after three months of program. **Recommendations:** Conduct regular periodical enhancement programs and workshops for nurse managers to maximize their practices of human management.

**Key words:** Human resource management practices, Job crafting, Nurses and Nurse managers.

## Introduction

In recent decades, there has been growing interest in the use of human resource practices (HRPs) in healthcare organizations as a way to enhance healthcare performance and nurses' commitment, job satisfaction, and skills (Anwar & Abdullah, 2021). Among the different groups of workers within the healthcare system, nurses make up the largest share of the workforce, spanning all segments of care, which puts them in the core position in providing healthcare services. Therefore, introducing effective human resource management practices (HRMPs) for nurses is critical to ensure the high quality of health care (Alqudah, Carballo-Penela, & Ruzo-Sanmartín, 2022; Amjad et al. 2021).

Successful health organizational administration is measured by its ability to effectively utilize its HRMPs as a cure of managerial roles to reach the innovative work behaviors desired level (Salas-Vallina, Alegre, & López-Cabral, 2021). HRMPs are activities established for leading collectively and constructively to reach desired organization' goals and objectives. Main HRMPs include recruitment, selection, involvement, training, development, and education, work conditions, and competency-based performance appraisal, as well as compensation and rewards, which lead to superior performance for the

organization (Alsafadi, & Altahat, 2021; Ngoc, et al. 2021).

Recruitment and selection are the first important HRMPs that ensure the availability of nurses who have enough skills, knowledge, and abilities fit for their job tasks (Nisar, et al. 2021). Involvement is the human resource management practice that encourages interaction, acknowledgement, relationship, participation, and good communication among nurses (Alsafadi, & Altahat, 2021). Training, development, and education practices support the innovative performance of nurses that the basic needs of each health organization's competitive environment (Barasteh, Rassouli, Karimirad, & Ebadi, 2021).

Work conditions are to maintain a positive work culture and unblaming environment (Nisar, et al. 2021). Competency-based performance appraisal allows nurses and supervisors to measure and manage performance competencies, as well as establish development plans, which identify knowledge, skills, abilities, and critical behaviors for successful nurses' job roles and specific functions. While compensations and rewards are beneficial for nurses in exchange for their labor, which allows achieving organization's goals and objectives (Barasteh et al. 2021).

The administration of health care organizations, particularly human resources management, will be influenced in various ways by

applying the new concept of job crafting. Professional nurses play a vital role in the provision of health care globally. The performance of health care workers, including professional nurses, links closely to the productivity and quality of care provision within the healthcare organizations. Therefore, it is important to identify factors influencing the performance of professional nurses to enhance the quality of health care delivery (**Kim, 2021; Lee & Kim, 2023**).

Job crafting describes a process in which nurses initiate changes in their jobs to adapt to their own needs and preferences. There are three types of job crafting: task, cognitive, and relational crafting. Task crafting refers to nurses taking the initiative to change the number, scope, and form of job tasks. Cognitive crafting refers to nurses' proactively changing their views on work. Relational crafting refers to nurses changing their interpersonal relationships at work (**Iida et al. 2021; Sheehan et al. 2023**).

Today, it has been increasingly recognized that job crafting is an important proactive organizational behavior for nurse, which leads to various valuable outcomes for both organizations and nurses. Thus, job crafting helps nurses to adjust the work to achieve career competencies, and better attain work goals.

### **Significance of study**

Human resource management practices are the key factor in Egypt's

Vision 2030 that aims to reduce the healthcare workforce suffering at their workplaces and creates a comfortable environment. Nurses play a vital role in determining the efficiency, effectiveness, and sustainability of the healthcare system. Therefore, it is important to identify and comprehend what variables satisfy and motivate them to continue working in hospitals (**Al Aina & Atan, 2020**). Accordingly, proper management of these human resources has a significant role in shaping the healthcare organization's performance and job crafting abilities. Therefore, this study aimed to determine the effect of implementing an educational program regarding nurse managers' practices in human resource management on nurses' job crafting.

### **Aim of study**

Determine the effect of implementing the educational program regarding nurse managers' practices in human resource management on nurses' job crafting.

### **Research hypothesis**

After implementation the educational program; it was expected that:

-Nurse managers' knowledge, perceptions, and practices for human resources management will be improved.

-Nurses' perceptions about job crafting will be improved.

### **Subjects and Method**

**Study design:** Quasi-experimental study design was utilized to accomplish the present study's aim.

**Study setting:**

The study was conducted at Tanta University International Teaching Hospital, which is affiliated to Ministry of Higher Education and Scientific Research in departments of Medical (A,B), Orthopedic, Neurological surgery, Vascular, and Oncology and ICUs of (Cardiac, Medical, Pediatric, and Neonates), as well as El-Menshawy Hospital, which is affiliated to Ministry of Health and Population in departments of Orthopedic, General surgery, Pediatric surgery, Neurological surgery and ICUs of (Medical, Pediatric, and Neonates)

**Subjects:**

The study's subjects included two groups; the first group consisted of all nurse managers who were working in Tanta University International Teaching Hospital (n= 17) and El-Menshawy General Hospital (n= 37). The second group contained a stratified proportional sampling of nurses (n= 355) who were working in the previously mentioned settings. The total study sample was calculated using Epi. Info. Microsoft to ensure obtaining an adequate and representative size, where N= population size (650), Z= confidence level at 95% (1.96), d= margin of error proportion (0.05). A total number of samples was 195 out of 383 nurses from Tanta University International Teaching Hospital and 160 out of 267 nurses from El-Menshawy Hospital who are enrolled during data collection time.

**Tools:**

Four tools were used to accomplish the study's aim, including:

**Tool I: Knowledge Questionnaire about Human Resource Management Practices:**

This tool was developed by the researcher based on relevant literatures (Jaiswal, Arun, & Varma, 2022; Shet, Poddar, Samuel, & Dwivedi, 2021) to test nurse managers' knowledge about human resource management practices.

This tool consisted of two parts as follows:

**Part one: Personal data of nurse managers:** It involved their age, gender, marital status, educational level, hospital name, department, position, years of experience, and an additional question regarding attending a training program about human resource management practice.

**Part two: Nurse managers' knowledge questionnaire regarding human resource management practices:** It included knowledge questionnaire about HRMPs. It included 40 questions in the form of 25 true & false questions and 15 multiple choice questions.

**Scoring system:**

Each question was taken score (1) for a correct answer and (0) for a wrong answer. All the questions scores were summed up and categorized according to cut-off points into:

- High knowledge level > 80%
- Moderate knowledge level 60- 80%
- Low knowledge level < 60%

## Tool II: Human Resource Management Practices Self-Report:

This tool was a self-reported questionnaire, which was developed by the researcher based on relevant literatures (Irani, Kiliç, & Adeshola 2022; Dwivedi, Poddar, Samuel, & Shet, 2021; Hamouche, 2023) to assess nurse managers' and nurses' perceptions regarding HRMPs. It included 66 questions, which were divided into six dimensions involving: recruitment and selection (15 items), involvement (19 items), training, development, and education (8 items), work conditions (13 items), competency-based performance appraisal (7 items), and compensation and reward (4 items).

### Scoring system:

Responses of nurse managers and nurses were measured in a three points Likert Scale: agree (3), neutral (2), and disagree (1). The self-report scores of HRMPs were summed up and classified according to cut-off points into the following levels:

- High perception level  $>75\%$
- Moderate perception level  $60\%-75\%$
- Low perception level  $<60\%$

## Tool III: Observational Checklist of Human Resource Management Practices (HRMPs):

This tool was developed by the researcher based on related literature reviews (Vrontis et al., 2022; Irani et al., 2022) to assess nurse managers' practices of HRM. It involved 38 items concerning dimensions of organizational support and involvement (22 items), training

and development (8 items), and work conditions (8 items).

### Scoring system:

Responses of nurse managers were measured as follows: done = (1), not done = (0). The HRMPs levels among nurse managers were summed up and classified according to cut- off points into the following levels:

- Satisfactory level  $>80\%$
- Unsatisfactory level  $<80\%$

## Tool IV: Job Crafting Questionnaire:

This tool was developed by the researcher based on related literature reviews (Oprea et al., 2022; Melo et al., 2021; Kim, 2021) to assess job crafting among nurses. It consisted of two parts as follows:

**Part 1: Nurses' personal data:** It involved nurses' age, gender, marital status, qualification, hospital name, unit name, years of experience, and an additional question regarding attending a training program about job crafting.

**Part 2: Nurses' job crafting questionnaire:** It was consisted of 34 items divided into three dimensions involving: task crafting (12 items), cognitive crafting (8 items), and relational crafting (14 items).

### Scoring system

Nurses' responses were scored on a three points Likert Scale: agree (3), neutral (2), disagree (1). The total score was summed up and divided according cut-off points into varying levels as follows:

- High level of job crafting  $>80\%$
- Moderate level of job crafting  $60\%-80\%$

- Low level of job crafting <60%

### Method

1. Official permission to carry out the study was obtained from the Faculty of Nursing, as well as from the authoritative personnel in both hospitals.
2. Ethical considerations:
  - a) An approval was obtained from the Scientific Research Ethical Committee before conducting the study with a code number 122/11/2022.
  - b) The researcher introduced herself and provided a full explanation of the aim and the study's method was done to obtain their acceptance and cooperation as well as their informed consent.
  - c) The right to terminate participation at any time was respected.
  - d) Nature of the study did not cause harm to the entire sample.
  - e) Confidentiality and anonymity were maintained regarding data collection that will be used for the study purpose only.
3. Tools were presented to a jury of seven experts in the area of specialty to check the content validity of its items. The experts were five professors and two assistant professors of nursing administration, Faculty of Nursing at Tanta University. Responses of the experts were presented on a four points rating Scale ranging from strongly relevant= 4 to strongly not relevant = 1. Necessary modifications were done, including clarifying and simplifying certain words, excluding certain

questions and adding others. The content validity index value for tool I was 98.5%, for tool II was 96.3%, for tool III was 97.7%, and for tool VI was 96.8%.

4. A pilot study was carried out on a sample of 10% of subjects, including six nurse managers and 36 nurses for testing the clarity and applicability of tools, who were excluded from the total study's subjects because they worked in different workplaces but had the main key features of the study's sample. It was carried out after the experts' opinions and before starting the actual data collection to test the clarity, items' sequence, applicability, and relevance of questions. The estimated time needed to complete the questionnaire items from nurses was 10 – 15 minutes for each sheet (questionnaire).
5. Reliability of tools was tested using Cronbach's Alpha Coefficient Factor; its value was 0.869 for tool I, 0.954 for tool II, 0.901 for tool III, and 0.898 for tool VI.
6. The tools were distributed by the researcher to the subjects in the work settings or in the conference room in small groups. The subjects were answering the questionnaire in the presence of the researcher .
7. Data collection was done in six months, starting from the beginning of July 2023 to the end of January 2024.
8. The educational program will be conducted in four phases, including assessment, planning,

implementation, and finally evaluation.

### **Phase I: Assessment**

Pre-implementation of the instructional program, a pre-test was given to assess nurse managers' levels of knowledge regarding HRMPs through filling tool I. Also, nurse managers' and nurses' perceptions regarding HRMPs through filling tool (II), and nurses' job crafting using tool (IV).

### **Phase II: Planning of the instructional program**

The instructional program construction started with determining the general and specific objectives according to the assessed nurse managers' knowledge and perceptions' levels regarding HRMPs and a review of relevant recent literature.

#### **Aim of the instructional program:**

At the end of the educational program, the nurse managers acquired knowledge of HRMPs and determined their effect on nurses' job crafting.

#### **Content of the instructional program**

The instructional program content was designed, and teaching methods were selected to enable nurse managers to acquire both knowledge and practices about HRMPs. Six sessions were included in the instructional program:

- **First session:** HRM concepts, objectives and its importance.
- **Second session:** Workforce planning and development (staffing).

- **Third session:** Workforce maintenance, satisfaction, and retention, as well as collective bargaining agreements.

- **Fourth session:** Challenges of HRM in healthcare and its models.

- **Fifth session:** Different HRMPs and its applications.

- **Sixth session:** Key dimensions to HRM, its ethics and job crafting.

#### **Teaching and learning strategies**

Interactive lecture, discussion, and brain storming were teaching and learning strategies included and utilized in the instructional program.

#### **Teaching aids**

PowerPoint Presentation (PPT), handouts, and videos were included and utilized as teaching aids in the instructional program.

### **Phase III: Implementation of the instructional program**

- Nurse managers were divided into six groups. The instructional program was implemented in the form of (6) sessions, one session every day, in which each session continued from 30 to 45 minutes for 6 days. The sessions were held out of clinical time in breaks and after ending work time.
- After completing the instructional program sessions, praising and giving full thanks to nurse managers for their participation. Also, encouraging them to start HRMPs implementation in their clinical setting.
- The researcher conducted the observation during clinical practice.

## Phase IV: Evaluation of the instructional program

The instructional program was evaluated to determine the extent to which it improved nurse managers' levels of knowledge regarding HRMPs implementation and helped them to practice it in their clinical areas through:

- Post-test to assess nurse managers' levels of knowledge regarding HRMPs (tool I) immediately post implementation of program and after three months.
- Observational checklist to assess nurse managers' levels of practice regarding HRMPs (tool III) immediately post implementation of program and after three months.
- Assess job crafting among nurses (tool IV) immediately post implementation of program and after three months.

### Statistical analysis of the data

Data were fed to the computer and analyzed using the IBM SPSS software package version 20.0. (Armonk, NY: IBM Corp) Qualitative data were described using number and percent. Quantitative data were described using range (minimum and maximum), mean and standard deviation. Significance of the obtained results was judged at the 5% level. The Marginal Homogeneity Test was used to analyze the significance between the different stages, and paired t-test was utilized for normally distributed quantitative variables, to compare between two periods. Furthermore, the Chi-square

test was used for categorical variables to compare between different groups, and Pearson coefficient was used to correlate between two normally distributed quantitative variables. The statistically significant is stated when a p-value is less than 0.05.

### Results

**Table 1** showed that the majority (79.6%) of nurse managers were in the age group 30–<40 years with a mean score of  $37.19 \pm 3.41$  and all of them were females. The vast majority (94.4%) of nurse managers were married, and less than half (48.1%) of them had 10–<15 years of experience with a mean score of  $13.65 \pm 3.26$ . Furthermore, 92.6% of nurse managers had a bachelor degree of science in nursing and the highest percent (14.8%) of them worked in intensive care units of neonates and medical, as well as department of the neurological surgery. The majority (88.9%) of nurse managers did not attend previous training programs about HRMPs.

**Table 2** displayed that more than two-fifths (44.5%) of nurses were at age group <30 years with a mean score of  $32.32 \pm 5.89$  and the vast majority (91.5%) of them were females. The vast majority (93.2%) of nurses were married, and less than half (44.2%) of them had 5–<10 years of experience with a mean score of  $9.11 \pm 6.05$ . Furthermore, more than half (50.4%) of nurses had a technical nursing diploma and more than half (54.9%) of them worked in Tanta University International Teaching Hospital. The

majority (80%) of nurses did not attend previous training programs about HRMPs.

**Table 3:** presented statistically significant differences between levels of nurse managers' knowledge on HRMPs pre, immediately, and three months after program implementation at  $\leq 0.001$ . Pre- program, a vast majority (98.1%) of nurse managers had a low level of knowledge for HRMPs of challenges and models, which turned to be 83.3% of a high level immediately, then slightly decreased to be 73.1% of a high level after three months of program implementation.

**Table 4** revealed a statistically significant differences between nurse managers' and nurses perceptions levels regarding the dimensions of training, development & education, competency-based performance appraisal, as well as compensation and rewards at  $p<0.001$ . The highest percent of nurse managers' perception ranged from 72.2% to 83.3%, assigned as a low level of perception about HRMPs. The highest percent of nurses' perceptions ranged from 71.0% to 83.8%, assigned as a low level of perceptions about HRMPs.

**Table 5:** showed statistically significant differences among nurse managers' levels in dimensions of organizational support and involvement, as well as in work conditions immediately and after three months of program at  $P\leq 0.05$ . Immediately after program, the satisfactory levels of nurse managers'

human resource management practices ranged from 83.3% to 88.9%, which slightly decreased to 77.8% up 83.3% after three months of program implementation

**Table 6** displayed statistically significant differences between nurses' perceptions in all dimensions of job crafting pre, immediately, and post three months of program implementation at  $\leq 0.001$ . Pre- program, 84.5% of nurses had a low perception level of relational crafting, which increased to 80.3% and 86.5% of high levels immediately and after three months of program implementation, respectively. While 81.7% of nurses had a low perception level of task crafting, which turned into high perception levels (78.9% & 80.6%) immediately and after three months of program implementation, respectively. while, 83.1% of nurse had a low perception level of cognitive crafting, which turned into high perception levels (82.3% & 78.9%) immediately and after three months of program implementation, respectively.

**Figure 1** illustrated the correlation between nurses' perceptions of HRMPs and job crafting. There was a strong statistically significant positive correlation between nurses' perceptions about their nurse managers' practices of HRMPs pre-implementation of program and their job crafting at pre, immediate, and after 3 months of program at  $p<0.001$ .

**Table (1): Frequency and distribution of nurse managers' personal data (n = 54)**

Personal data	No.	%
<b>Age (years)</b>		
<30	0	0.0
30 – <40	43	79.6
≥ 40	11	20.4
Min. – Max.	30.0 – 50.0	
Mean ± SD.	37.19 ± 3.41	
<b>Gender</b>		
Male	0	0.0
Female	54	100.0
<b>Marital status</b>		
Married	51	94.4
Unmarried	3	5.6
<b>Years of experience</b>		
5 – < 10	4	7.4
10 – <15	26	48.1
≥ 15	24	44.4
Min. – Max.	7.0 – 25.0	
Mean ± SD.	13.65 ± 3.26	
<b>Education level</b>		
Post-graduates Studies	4	7.4
Bachelor of Science in Nursing	50	92.6
<b>Hospital name</b>		
Tanta University International Teaching Hospital	17	31.5
El- Menshawy General Hospital	37	68.5
<b>Department names</b>		
Medical	2	3.7
Neurological surgery	8	14.8
Orthopedic	6	11.1
Neonates ICU	8	14.8
Cardiac ICU	2	3.7
Medical ICU	8	14.8
Pediatric ICU	7	13.0
General surgery	6	11.1
Oncology	2	3.7
Pediatric surgery	4	7.4
Vascular	1	1.9
<b>Attend to previous training programs</b>		
Yes	6	11.1
No	48	88.9

SD: Standard deviation

**Table (2): Frequency and distribution of nurses' personal data (n = 355)**

Personal data	Nurse (n = 355)	
	No.	%
<b>Age (years)</b>		
<30	158	44.5
30 – <40	139	39.2
≥ 40	58	16.3
Min. – Max.	20.0 – 45.0	
Mean ± SD.	32.32 ± 5.89	
<b>Gender</b>		
Male	30	8.5
Female	325	91.5
<b>Marital status</b>		
Married	331	93.2
Unmarried	24	6.8
<b>Years of experience</b>		
<5	81	22.8
5 – < 10	157	44.2
10 – <15	49	13.8
≥ 15	68	19.2
Min. – Max.	1.0 – 25.0	
Mean ± SD.	9.11 ± 6.05	
<b>Education level</b>		
Nursing secondary diploma	25	7.0
Technical Nursing diploma	179	50.4
Bachelor of Science in Nursing	150	42.3
Post-graduates Studies	1	0.3
<b>Hospital name</b>		
Tanta University International Teaching Hospital	195	54.9
El- Menshawy General Hospital	160	45.1
<b>Department name</b>		
Medical A, B	27	7.6
Neonates ICU	57	16.1
Orthopedic	31	8.7
Neurological surgery	42	11.8
Cardiac ICU	16	4.5
Medical ICU	64	18.0
Pediatric ICU	39	11.0
General surgery	18	5.1
Oncology	15	4.2
Pediatric surgery	24	6.8
Vascular	22	6.2
<b>Attend to previous training programs</b>		
Yes	71	20.0
No	284	80.0

**D: Standard deviation**

**Table (3):Levels of nurse managers' knowledge regarding human resource management practices pre, immediately, and three months after program implementation.**

Item of human resource management practices	Pre						Post Immediate						After 3 Months						F	p		
	Low		Moderate		High		Low		Moderate		High		Low		Moderate		High					
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%				
Human resource management' concepts, objectives and importance	43	79.6	1	1.9	10	18.5	1	1.9	4	7.4	49	90.7	5	9.3	7	13.0	42	77.8	74.309*	<0.001*		
Workforce planning and development	51	94.4	2	3.7	1	1.9	1	1.9	4	7.4	49	90.7	4	7.4	9	16.7	41	75.9	92.655*	<0.001*		
Workforce maintenance, satisfaction and retention	43	79.6	2	3.7	1	1.9	1	1.9	4	7.4	49	90.7	4	7.4	9	16.7	41	75.9	82.337*	<0.001*		
Challenges and its models	53	98.1	1	1.9	0	0.0	2	3.7	7	13.0	45	83.3	3	5.6	11	20.4	40	74.1	96.812*	<0.001*		
Different human resource management practices and its applications	41	75.9	13	24.1	0	0.0	0	0.0	8	14.8	46	85.5	0	0.0	25	46.3	29	53.7	93.030*	<0.001*		
Key dimensions and ethics in Human resource management	50	92.6	3	5.6	1	1.9	4	7.4	21	38.9	29	53.7	6	11.1	24	44.4	4	44.4	82.605*	<0.001*		

Fr: Friedman test

p: p value for comparing between the different periods

\*: Statistically significant at  $p \leq 0.05$

**Table (4): Levels of nurse managers' and nurses' perception regarding human resource management practices**

Dimensions of Human Resource Management Practices	Nurse managers (n = 54)						Nurses (n = 355)						$\chi^2$	P		
	Low		Moderate		High		Low		Moderate		High					
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%				
<b>Recruitment and Selection</b>	45	83.3	5	9.3	4	7.4	277	78.0	29	8.2	49	13.8	1.714	0.424		
<b>Involvement</b>	39	72.2	6	11.1	9	16.7	294	82.8	20	5.6	41	11.5	3.862	0.145		
<b>Training, Development and Education</b>	39	72.2	3	5.6	12	22.2	252	71.0	42	11.8	61	17.2	18.508*	<0.001*		
<b>Work Conditions</b>	45	83.3	2	3.7	7	13.0	276	77.7	33	9.3	46	13.0	1.899	0.387		
<b>Competency-Based Performance Appraisal</b>	44	81.5	4	7.4	6	11.1	267	75.2	30	8.5	58	16.3	25.548*	<0.001*		
<b>Compensation and Rewards</b>	45	83.3	4	7.4	5	9.3	286	80.6	14	3.9	55	15.5	6.294*	0.043*		

 $\chi^2$ : Chi square test

FE: Fisher Exact test

p: p value for comparing between the studied nurse managers and nurses

**Table (5): Nurse managers' levels regarding dimensions of human resource management practices immediately and after three months of program implementation.**

Dimensions of human resource management practices	Immediate				After 3 months				McN	p		
	Satisfactory level		Unsatisfactory level		Satisfactory level		Unsatisfactory level					
	No.	%	No.	%	No.	%	No.	%				
Organizational support and involvement	45	83.3	9	16.7	42	77.8	12	22.2	17.192*	0.012*		
Training and Development	46	85.2	8	14.8	44	81.5	10	18.5	2.242	0.774		
Work Conditions	48	88.9	6	11.1	45	83.3	9	16.7	18.859*	0.012*		

SD: Standard deviation

McN: McNemar test

p: p value for comparing between the different periods

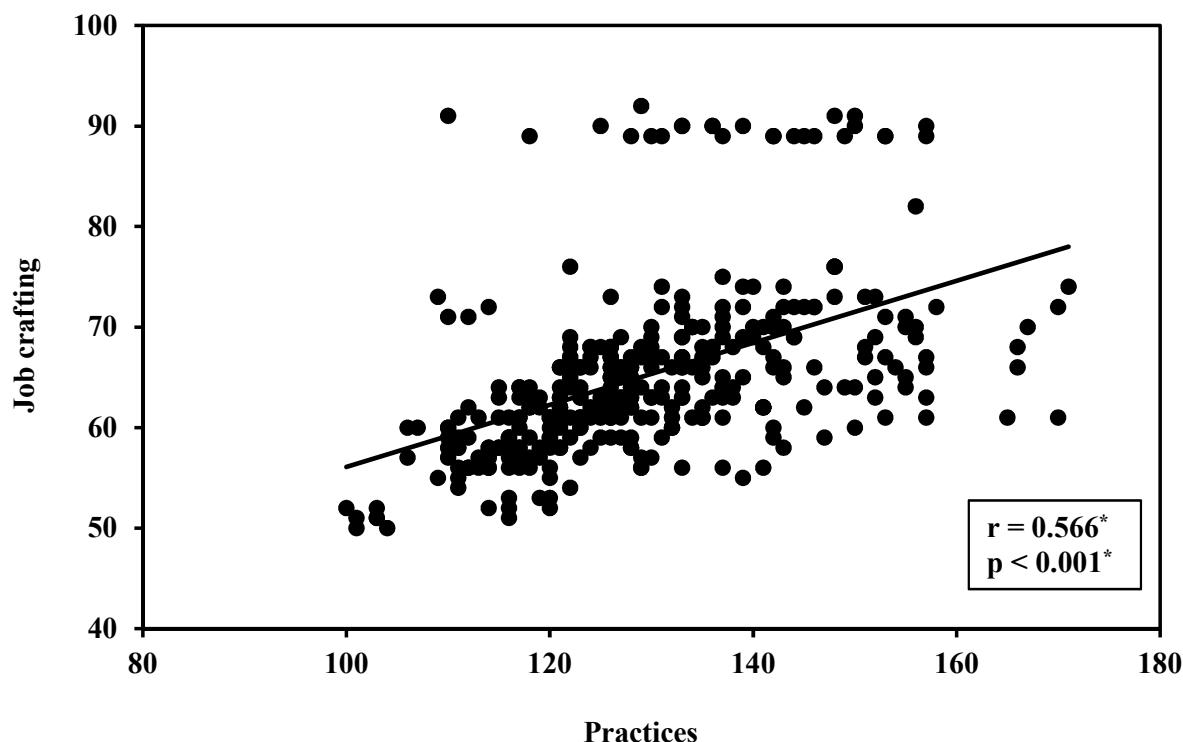
\*: Statistically significant at  $p \leq 0.05$ **Table (6):Nurses' perceptions levels of job crafting dimensions pre, immediately, and post three months of program implementation.**

Job crafting' dimensions	Pre		Immediate		After 3 months		Fr	P
	No.	%	No.	%	No.	%		
<b>Task Crafting</b>								
Low (<60%)	290	81.7	7	2.0	43	10.5	456.137*	<0.001*
Moderate (60 – 80%)	30	8.5	68	19.2	26	6.4		
High (> 80%)	35	9.9	280	78.9	286	80.6		
<b>Cognitive Crafting</b>								
Low (<60%)	295	83.1	26	7.3	41	11.5	505.061*	<0.001*
Moderate (60 – 80%)	54	15.2	37	10.4	34	9.6		
High (> 80%)	6	1.7	292	82.3	280	78.9		
<b>Relational Crafting</b>								
Low (<60%)	300	84.5	10	2.8	27	7.6	538.354*	<0.001*
Moderate (60 – 80%)	33	9.3	60	16.9	21	5.9		
High (> 80%)	22	6.2	285	80.3	307	86.5		

Fr: Friedman test

p: p value for comparing between the different periods

\*: Statistically significant at  $p \leq 0.05$



**Figure (1): Correlation between nurses' perceptions about human resource management practices and job crafting (pre)**

## Discussion

The current study findings showed that in the pre-educational program, the majority of nurse managers had a low level of overall knowledge with a low mean score about HRMPs. This finding may be due to inadequate nurse managers' understanding about HRM concepts, dimensions, models, and challenges of human resource management. Also, the majorities of nurses managers do not attend previous training and workshops on HRMPs due to increased patient acuities and increased workload. The aforementioned finding suggests that nurse managers mostly rely on their experience to acquire teaching

knowledge when beginning their careers.

In this context, **Aburumman, Salleh, Omar, and Abadi (2020)** mentioned that HRMPs is a relatively recent concept and still in the process of analysis and interpretation, so nurse managers didn't have adequate knowledge about it. Also, **Nisar et al. (2021)** revealed a lack of knowledge and unfamiliarity among nurse managers regarding HRMPs and obligated them to know more new human resources policies to develop the organization and enrich nurses' satisfaction. In addition, **Sheehan et al. (2023)** reported that human resource management practices are not easy to apply in clinical

environments, but they require knowledgeable and dedicated nurse managers.

On the other hand, **Alluhidan et al. (2020)** found a high level of HRM knowledge for the majority of nurse managers. Additionally, **Cuskelly, Fredline, Barry, and Kappelides (2021)** findings did not support the current study results, which found that the majority of nurse managers rated themselves as having a high level of HRM knowledge.

The current's study results revealed that the majority of nurse managers had a high knowledge level immediately post-program implementation, which slightly declined post-three months of the program. These results demonstrate how well the current educational program affected nurse managers' comprehension and knowledge, enabling them to do their jobs' duties in a successfully and efficient manner. This can be interpreted by implementing the program, using a variety of instructional techniques; effective booklet helps the nurse managers gain information related to HRMPs and become interested in this valued information that led them to significant improvements in their knowledge, which helped them to carry out their duties successfully.

Along with the present study, **Islam, Jantan, Yusoff, Chong, and Hossain(2023)** revealed improvement in nurse managers' knowledge and understanding regarding HRMs post-program compared to pre-program. At

the same line, **Collins (2020)** concluded that the nurse managers found a positive change of developments when implementing human resource management program, so the healthcare organizations continued to expand the role of implementing educational programs to increase quality, collaboration, and engagement.

Contradictory, **Saridakis, Lai, Muñoz Torres, and Gourlay, S. (2020)** found some nurse managers unmotivated to utilize HRMPs and did not interest in attending any workshops related to workload demands and meeting their role expectations prior to experiencing a HRMPs program. Also, **Irani, Kiliç, and Adeshola (2022)** found that a high percent of the nurse managers reported that they didn't implement workshops about HRM due to limited time and shortage of their number for coverage all departments.

The current study results showed that pre-implementation of educational program, the majority of nurse managers and nurses had a low perception level of overall HRMPs. This may be due to a lack of theoretical knowledge of nurse managers and time constraints to implement it successfully, a long period for preparation and implementation, as well as poor nursing participation in HRMPs. Furthermore, poor motivational organizational environment is a crucial challenge affecting nurse managers perceptions. This is a

worrying finding that highlights the need for more focus on nursing management-related policies, procedures, and systems in relation to human resource practices.

This finding is supported by **Korkmaz, Van Engen, Knappert, and Schalk (2022)**, who found that nurse managers stated that insufficient experience is a challenge to introducing HRMPs within clinical healthcare organizations. Also, **Aboramadan (2022)** found that the majority of nurse managers had a low perception level due to a lack of knowledge as most of the existing literature reviews on HRMPs are not comprehensive and remain fragmented, and fewer nursing reviews provide the latest approaches in a comprehensive way.

Furthermore, the Egyptian study of **Kassem and Ibrahim (2022)** found that nurses who assessed their own job performance as poor had a low perception level of HRMPs, which hindered their ability to achieve excellence performance in hospitals. On disagreement, **Votto, Valecha, Najafirad, and Rao (2021)** revealed that the majority of nurse managers had a high perception level of HRMPs. In addition, **Saks (2022)** found a high perception level and successful HRMPs implementation among nurse managers.

The current study results showed that the majority of nurse managers had a satisfactory level of total HRMPs immediately and after three months of program implementation. This

demonstrated that nurse managers have grown more conscious of human resource management practices and are prepared to assume their duties and be accountable for them alongside nurses.

This finding is supported by **Akdere and Egan (2020)**, who found that nurse managers demonstrated HRMPs at a higher level after the program than preprogram. In addition to **Jose, PM, & Kuriakose (2024)**, who found that educational intervention for unit nurse managers about HRMPs achieves innovative work behavior and well-being, which reflects on the quality of health care services. Also, **Strohmeier (2020)** recommended the essentiality of educational programs related to human resource planning, recruitment and selection methods, training and development, retaining nurses, compensation methods, performance appraisal, and grievance handling mechanisms.

The current study results showed that the majority of nurses had a high perception level of job crafting immediately after implementation of educational program. This finding might be justified because nurse managers after program implementation can set challenging goals for their own work, seek and accept feedback, grow and improve continually, and may engage in more interactions with their staff. They also perceive their jobs as important and meaningful, so they may be intrinsically motivated to craft their jobs to improve the work process

and achieve a desired level of job performance.

Along with the present study findings of **Topa and Aranda-Carmena (2022)**, there were a highest percentage of nurses who had a high level of engagement in job crafting activities after program. **Sook and Ji-Soo (2022)** reported that training courses had a high positive impact on nurses' knowledge regarding job crafting and performance. Moreover, **Han (2023)** reported that after the job crafting program nurses reported improving work meaningfulness and described a willingness to take on other tasks, being enriched by nurse-client and collegial relationships.

### **Correlation between study's variables**

There was a statistically significant positive correlation between nurses' perceptions of their nurse managers of HRMPs and their job crafting pre implementation of educational program. This finding might be due to when nurse managers pre-program did not have adequate knowledge about HRMPs, they perceived a low level of both HRMPs and their job crafting and when nurse managers provide nurses with extensive training, nurses are more able to craft their tasks efficiently and successfully.

Along with the results of the present study, **Sheehan et al. (2023)** confirmed that job crafting was found to mediate the positive relationship between HRMPs and work engagement. This result reflects the

implications of HRMPs on job crafting for nurses who carry out many professional roles simultaneously. Also, **Zahoor, Khan, and Fazili (2023)** demonstrated a direct positive association between HRMPs and job crafting.

### **Conclusion**

Based on the findings of the current study, it can be concluded that nurse managers' knowledge, perceptions, and practices regarding human resource management are improved after implementation of the educational program. There is improvement in studied nurses' perceptions about job crafting after implementation of educational program. In addition to, it was discovered a strong statistically significant positive correlation between nurses' perceptions about their nurse managers' practices of human resource management pre-implementation of educational program and their job crafting at pre, immediate, and after 3 months of educational program.

### **Recommendations**

On the line of the findings of the current study, the following recommendations are suggested to:

#### **For hospitals administrators**

- Set up an orientation program for the preparation of newly appointed nurse managers about strategies for implementing HRMPs.
- Develop policies and strategies that promote nursing managers' HRMPs and link rewards and compensation with their practices.

- Conduct regular periodical enhancement programs and workshops for nurse managers to maximize their HRMPs.
- Promote personal and professional growth for nurse managers in a broad manner (e.g., postgraduate programs, language courses, etc.).
- Ensure the availability of nurses who have enough skills, knowledge and abilities fit for their job tasks.

#### **For nurse managers**

- Create a culture within their organization that seeks opportunities to improve nurses' quality of work life and plan their processes by aiming for both high quality and high value services.
- Foster empowered behaviors through engagement of nurses in decision-making, offering constructive feedback, providing autonomy, and enhancing goal accomplishment.
- Motivate nurses to introduce new work tasks that better suit their skills or interests and make sure that work is mentally less intense.
- Empower nurses' access to chances, information, training, and facilities, regarding job crafting.

#### **Nursing education:**

- Review and modify nursing curriculum to provide more opportunities for nursing students to be aware with the new human resource management practices and job crafting.
- Establishment of an educational program to raise the awareness of nursing interns and educators about HRMPs.

#### **Further research:**

- Conduct further nursing research to identify the nature of relationship between HRMPs and nurses' performance.
- Perform further qualitative research to increase efforts and add to the evidence-base documenting progress and challenges in meeting the HRMPs.
- Study the influence of nurse preceptors' practices of HRM on nursing interns' success in mastering entry-level skills and competencies.

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## The Effect of Stretching Exercises on Improving Pain and Daily Activities of Girls with Primary Dysmenorrhea

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### **Abstract:**

**Background:** Primary dysmenorrhea is prevalent issue among adolescent that may negatively impact their day-to-day activities. Stretching exercises are crucial for easing the symptoms of primary dysmenorrhea.

**Aim:** To evaluate stretching exercises' effect of on improving pain and daily activities of girls with primary dysmenorrhea. **Design:** Quasi-experimental (pre and posttest) design was achieved. **Setting:** study was implemented at Faculty of Nursing, Minia University. **Sample:** purposive sample formed of 120 girl students that included two groups study and control. **Tools:** Two tools were used to collect data: A structured interviewing questionnaire was used in this study and primary dysmenorrhea intensity scale. **Results:** About 86.6% and 90% of the studied girls in both groups had severe level of dysmenorrhea before intervention. While after intervention changed to be 36.7% of them in the study group and 80% in the control group had severe level of dysmenorrhea, with highly statistical significant difference between both groups at p-value 0.001. **Conclusion:** Following the implementation of stretching exercises in the study group, the level of dysmenorrhea and everyday activities among the girls under study significantly improved.

**Recommendations:** Health education programs in universities should prioritize regular stretching exercises performance as a means to reduce primary dysmenorrhea.

**Keywords:** Daily Activities, Improving Pain, Primary Dysmenorrhea Stretching Exercises

**Introduction:**

Menstruation, commonly referred to as a period, is the regular flow of mucous tissue and blood through the vagina that originates from the inner lining of the uterus. Menstruation that is so painful that it interferes with everyday activities is known as dysmenorrhea. One of the most prevalent gynecological issues among young girls and adolescent girls is dysmenorrhea (Saikia, B., Bhavani B. , Logambal K. & Karpagam, 2024).

Globally, it is estimated that more than 50% of women who are menstruating and approximately 90% of female adolescents experience it, and 10%–20% report that their pain is acute, severe, or distressing (Esan et al., 2024). In Egypt, dysmenorrhea was very common (75.0%). Of the cases that were diagnosed, 30.0% were categorized as moderate, 14.8% as severe, and 55.2% as mild (Manjunath et al., 2020).

Distinguishing between primary and secondary dysmenorrhea. Menstrual pain that is not caused by pelvic pathology is referred to as primary dysmenorrhea. Non-pathological cramps are reported by half of girls, which can result in a worse quality of life and higher absenteeism rates. While gross pathology is seen in the pelvic structures in secondary dysmenorrhea, it is typically linked to dyspareunia,

dysmenorrhea, and persistent pelvic pain (Djupri et al., 2022). The most common cause of chronic pelvic pain in girls of reproductive age is primary dysmenorrhea, which affects 60% of girls and 72% of adolescents. 5% to 20% of these girls report that their ability to participate in daily activities is negatively impacted (Itani et al., 2022). Dysmenorrhea has a negative impact on a girl's everyday activities and quality of life. (Agrawal & Ahmed, 2021). It is specified by pain in the lower abdomen that may or may not spread to the back and thighs. The pain may be associated with headache, fatigue, anxiety, nausea, vomiting, mood swings, and in rare and severe cases, syncope. According to reports, primary dysmenorrhea ends on its own after one to three years, though it can occasionally last until childbirth (Irozulike et al., 2023)

Treatment options for dysmenorrhea include paracetamol, medications that block prostaglandins, such as ibuprofen or other anti-inflammatory drugs; regular exercise and focus on overall physical fitness; using a hot water bottle to apply heat to the abdomen; relaxation techniques; the oral combined contraceptive pill, which reduces prostaglandins and thereby pain; and bed rest during the first day or two of the menstrual cycle (Dash et al., 2023).

Numerous studies' findings have demonstrated that frequent exercise reduces the severity of symptoms and pain. Strengthening exercises for the extremities, aerobic exercise, and physiotherapy procedures such as connective tissue massage, aerobic exercise, and the application of hot packs are non-pharmacological treatments for primary dysmenorrhea (**Agrawal & Ahmed, 2021**).

It is not a novel concept that different forms of exercise could help reduce pain in primary dysmenorrhea. Exercise is generally believed to lessen the severity and/or frequency of dysmenorrheal syndrome. Stretching exercises, playing sports, and engaging in regular exercise are among the recommended treatments and preventative measures for primary dysmenorrhea. In general, it appears that exercise therapy could ease dysmenorrhea-related discomfort (**Wijaya et al., 2024**).

Because they help girls and young girls maintain and improve their health, nurses emphasize the significance of wellness-enhancing tactics, illness prevention initiatives, and health promotion as healthcare modalities. She plays a significant role in running the school health program and teaching teenage girls and the community about various non-medical ways to manage

menstrual pain perception (**Priscilla & Priyanka, 2023**)

#### **Significant of the study:**

Painful menstruation without significant pelvic pathology is known as primary dysmenorrhea. Usually, it appears after the first two years of menarche (**Gandhi, 2022**). One of the most prevalent issues affecting teenagers, primary dysmenorrhea typically manifests between the ages of 17 and 22. The prevalence of dysmenorrhea was high in Egypt, at 24.3% and 13.3% for moderate and severe pain respectively (**Godar et al., 2020**). Adolescents with dysmenorrhea often experience decreased academic performance, a decrease in physical and social activities, and illness absences (**Donayeva et al., 2023**).

Recent work by a Hong Kong research team demonstrated that raising the progesterone level can reduce prostaglandin and pro-inflammatory cytokine production, which in turn reduces pain perception. It is well known that engaging in physical activity raises blood levels of endocannabinoids and endorphins. Exercise for a brief period of time lowers cortisol production and has a general analgesic effect (**Kovács et al., 2024**). So, the researcher interesting in evaluating the effect of stretching exercises on improving pain and daily activities of girls with primary dysmenorrhea.

**Aim of the study:**

Evaluate the effect of stretching exercises on improving pain and daily activities of girls with primary dysmenorrhea

**Research hypothesis:**

**H (1):** Girls with primary dysmenorrhea who apply stretching exercises expected to reduced their level of pain.

**H (2):** Girls with primary dysmenorrhea who apply stretching exercises expected to enhance their daily activities.

**Subjects & Methods:**

Four designs were used to present the study's subjects and methodology: technical, operational, administrative, and statistical.

**Technical Design:** which included the study sample, setting, research design, and data collection instruments.

**Study design:**

Quasi- experimental (pre and posttest) research design was utilized to implement the aim of this study.

**Setting:** The study was achieved at Faculty of Nursing, Minia University. This faculty consists of eight main nursing department.

**Sample size:** - a purposive sample formed of 120 girl students. The sample involved criteria of girl students, unmarried, regular menstruation, have moderate or severe level of dysmenorrhea, and not received any analgesics during the study period. And girl students who have any cardiac problem or

receive treatment for medical disease prevent practicing exercise, have poly cystic ovarian or endometriosis were excluded.

The Epi info program was used to determine the sample size, which had a population size of 1910, a 95% confidence coefficient, a 10% tolerable error, and a 10% predicted frequency. A sample size of 120 female students from all four academic years was initially determined by the program to consist of 119 girls. The sample involved 30 student from each academic year. It divided equally into two main groups (60 for each one), study (which will receive educational intervention) and control group (which will receive routine care).

**Tools of Data Collection:**

**Data was gained using two tools as the following**

**Tool (I) A structured questionnaire for interviews was used in this study:** This tool was designed and utilized by the researcher according to literature review and consulting expertise in this area, it structured to include the following parts: (Goda et al., 2020), (Mohamed et al., 2024), and (Elmoniem et al., 2020)

**Part 1: Personal characteristics** included: age, residence, academic level, weight, height, and BMI.

**Part 2: Menstrual history:** It used to assess basic characteristics of menstrual cycle for each student such as (age of menarche, interval, duration, , and number of pads per day),

family history of dysmenorrhea, presence of any symptoms with dysmenorrhea, if yes, type of symptoms, frequency of dysmenorrhea, and taking analgesics in previous menstruation).

**Part 3: student activities during menstruation:** to assess effect of dysmenorrhea on daily activity as has an effect on attending faculty, on studying and understanding the lesson, on examination scores, household activities, visiting holy places, friends and relatives during menstruation, physical activities, and daily activities change with menstruation.

#### **Tool (II): WALIDD primary dysmenorrhea intensity scale.**

The researchers adapted this scale, which was initially created by **Teherán et al. (2018)**, for the purpose of measuring the severity of primary dysmenorrhea. Working ability (zero: no; one: almost never; two: almost always; three: always) was one of the four components. Location is the second item, and it can be zero, one, two, three, or four sites; Item 3: Dysmenorrhea Intensity (0: no pain, 1: mild discomfort, 2: severe pain, 3: tremendous pain) Pain days (zero, one to two, three to four, and three to five days) make up the fourth item.

#### **Scoring system for primary dysmenorrhea intensity scale.**

Each variable had a total score between 0 and 3, and the cumulative score could be

anywhere between 0 and 12. The degree of dysmenorrhea was evaluated and ranked in the following order: There are three types of dysmenorrhea: absent (zero), minor (1-4), moderate (5-7), and severe (eight to twelve) (**Mohamed et al., 2024**),

#### **Supportive materials**

It was done by the researcher according to literature review (**Upganlawar et al., 2023**) and (**Rejeki et al., 2021**). In order to provide the girls with some information, it was prepared as a bouchore using straightforward Arabic language and a picture regarding dysmenorrhea definition, symptoms, examples of stretching exercises and how to perform.

#### **Tools Validity**

Before making any necessary changes to test the tool's content validity, a panel of three obstetrics and gynecological nursing experts assessed the instruments for clarity, relevance, comprehensiveness, understanding, applicability, and ease of use.

#### **Tools Reliability**

The consistency of the tools was calculated by using Cronbach's Alpha; and they were 0.760 and 0.689 for structured interviewing questionnaire and WALIDD primary dysmenorrhea intensity scale respectively

#### **Operational design**

Pilot study and field work were the two phases of implementing this design.

### **Pilot study:**

Twelve girl students, representing 10% of the population, participated in a pilot study to assess the tools' comprehensiveness and clarity as well as the time needed to complete the questionnaire. Because the results of the pilot study showed that no additional changes or improvements were needed, the girls from the pilot study were added to the final sample.

### **Field work**

This study's data collection period ran for four months, from September 2024 to December 2024.

**Procedures phases:** This was carried out in five phases as follow

**Preparatory Phase:** An extensive review of the study area was carried out, as available books, scientific magazines, electronic dissertations, the internet, articles, and periodicals.

### **Assessment phase (for study and control group):**

- The faculty of nursing's research ethics committee granted formal approval (**REC202492**). The researcher welcomed each student, introduced herself, went over the purpose, time frame, and activities of the study, and discussed informed consent at the start of the interview.
- The intensity of pain was evaluated by the researchers using WALIDD primary dysmenorrhea intensity scale to

determine level of dysmenorrhea, and students with moderate and severe form of dysmenorrhea was involved to the study.

- Following obtaining informed consent from all girl students who satisfied the inclusion criteria, data pertaining to personal characteristics, menstrual history, and daily activity were collected through interviews and pretest questionnaires.

### **Planning phase:**

In this phase, the researchers set the study goals and objectives, prepare the sources and teaching techniques.

To attain the goal and objectives of the study, the researchers developed and prepared the information contents and the teaching strategies including group discussion, lectures, brainstorming, demonstration and re-demonstration, and the use of visual aids like pictures, handouts, poster, and videos.

The study students separating into two equal groups randomly (study and control).

### **Implementation phase (for study group):**

- It started immediately after assessment (pre- intervention).
- Each student received one training session in the laboratory of the obstetric and gynecological department of the faculty, to provide information about the exercise as definition and advantages of the exercise and how to perform the stretching exercise.

- The exercise demonstrated first by the researchers and then the students were Permitted to engage in exercise as supervised by the researchers.
- These instructions were given to each girl student separately or in a group from 5 to 10 students according to the availability of the girl students.
- The researcher obtained each student's WhatsApp number and sent them videos and brochures with written instructions and illustrated exercises along with pictures. The purpose of the brochures was to remind the students to complete the exercise within the designated time.
- Every girl student was urged by the researchers to perform all four stretch exercises; each exercise lasted for five seconds and was repeated ten times, or three times a week. The students were instructed by the researchers to refrain from exercising when they were menstruating **(Kisner and Colby, 2007; Murtiningsih et al.,2019).**
- For the first stretching exercise, the students were instructed to stand, bend their trunk forward from the hip joint in a straight line, aligning their back and shoulders, and keep their upper body parallel to the floor for five seconds (ten repetitions). Students were to stand for the second stretching exercise, lift one heel off the ground, and then alternately perform the exercise with the other heel (20

repetitions). In order to perform the third stretching exercise, students were instructed to open their shoulders, extend their hands and trunks forward, and then, after ten repetitions, squat for five seconds while fully bending their knees. Students were instructed to place their feet wider than their shoulders as part of the fourth stretching exercise. The student was told by the researchers to bend, reach her left hand above her head, and touch her left ankle with her right hand. The exercise described above was repeated ten times for the other foot, following the same methodology **(Thermacare, 2010)**

Students was given schedule to do the exercise three times per week for four weeks, so the researchers sent a massage to remind them to do this exercise three times per week (minimum each step repeated 10 exercises at each time)

Control group received routine care.

#### **Evaluation phase:**

In this phase, the post-test was administered after eight weeks of implementing the exercise for the study and control groups to compare effect of stretching exercise on dysmenorrhea intensity

#### **Administrative design:**

Each girl students who took part in the research gave her informed consent, and the study was kept totally private. The girl student could have left the study at any

moment.

#### **Statistical design:**

For statistical analysis, SPSS for Windows version 26.0 was utilized. Every variable in continuous data had a normal distribution and was expressed as mean, standard deviation (SD). The data was presented using percentages and numbers to indicate its categories. The t-test was used to compare variables whose data were continuous. Using categorized data, the Chi-square and McNemar tests were applied to compare variables. P-values were deemed statistically significant if they were less than 0.05.

#### **Results:**

**Table (1)** illustrates that regarding age 85% and 78.3% of the studied girls in the study and the control group respectively had an age from 19-22 years old, about 60% and 66.7% the study and the control group respectively lived at rural areas, 65.0% of them in the study group and 53.3% in the control group had a normal BMI. With no statistical significant difference between the study and control groups regarding all previous variables at p-value > 0.05.

**Table (2)** shows menstrual characteristics of the studied girls, and reported that regarding age of menarche 75.0% of the studied girls in the study group and 83.3% in the control group had their menarche from 12-15 years old. Concerning its duration, 83.3% of them in the

study the control group had duration from 3-7 days, about 83.3% of them in the study group and 86.6% in the control group had interval from 21-35 day. Also 46.7% and 58.3% of them in the study and control group respectively used from 2-3 pads per days. Regarding onset of menstrual pain, 70.0% and 78.3% of them in the study and control group their pain started in the first day of menstruation. About 81.7% and 78.3% of them in the study and control group their pain repeated every month. Concerning symptoms with dysmenorrhea, 83.3% in the study group and 80.0% in the control group experienced severs and persistent abdominal pain. With no statistical significant difference between the study and control groups regarding all previous variables at p-value > 0.05

**Figure (1)** demonstrates that 55.0% and 51.7% of the studied girls in the study and control group had a family history of dysmenorrhea, with no statistical significant difference between the study and control groups at p-value 0.714.

**Table (3)** clarifies that there were no statistical significant difference between the study and control groups before intervention regarding all items of their change on daily activities at p-value > 0.05.

**Table (4)** clarifies that there were highly statistical significant difference between the study and

control groups after intervention regarding all items of their change on daily activities at p-value 0.001\*\*.

**Figure (2)** reveals that 86.6% of the studied girls in the study group and 90% in the control group had severe level of dysmenorrhea before intervention, with no statistical significant difference between the study and control groups at p-value 0.703. While after intervention changed to be 36.7% of them in the study group and 80% in the control group had severe level of dysmenorrhea, with highly statistical significant difference between the study and control groups at p-value 0.001\*\*.

**Table (5)** illustrates that, there were positive correlation between level of dysmenorrhea in the study group and the studied girls' age, academic year, weight, and height, while there were no correlation between level of dysmenorrhea residence and BMI. In the control group, there were positive correlation between level of dysmenorrhea and the

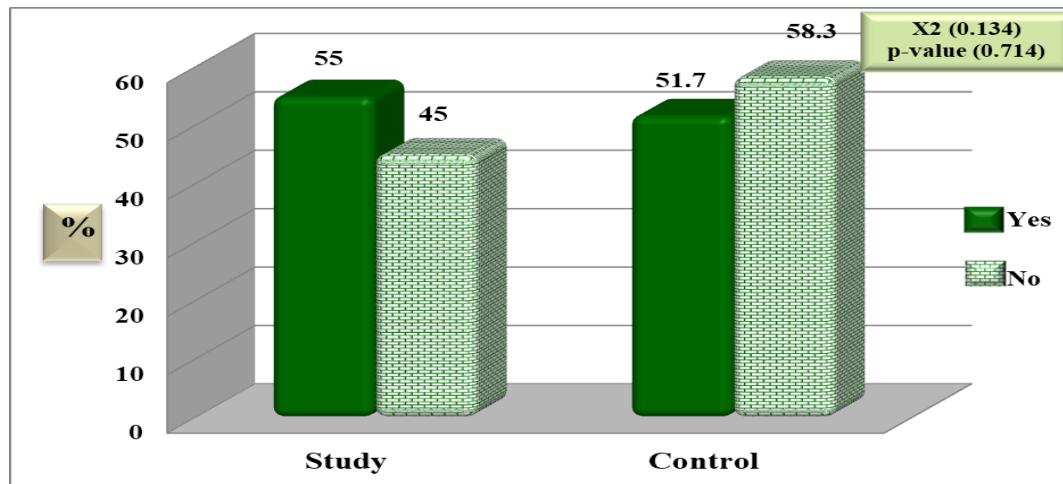
studied girls' age and weight, while there were no correlation between level of dysmenorrhea residence academic year, height and BMI.

**Table (1) The studied girls' personal characteristics in the study and control groups (n=120)**

Personal characteristics	Study group		Control group		X <sup>2</sup>	P-value
	N (60)	%	N (60)	%		
<b>Age / years</b>						
17-18	4	6.7	6	10.0		
19-22	<b>51</b>	<b>85.0</b>	<b>47</b>	<b>78.3</b>		
>22 years	5	8.3	7	11.7		
<b>Age (mean±SD)</b>	20.50±1.408		20.60±1.520		1.245	.940
<b>Residence</b>						
Urban	24	40.0	20	33.3		
Rural	<b>36</b>	<b>60.0</b>	<b>40</b>	<b>66.7</b>		
<b>Academic year</b>						
First	15	25.0	15	25.0		
Second	15	25.0	15	25.0		
Third	15	25.0	15	25.0		
Fourth	15	25.0	15	25.0		
<b>Weight/Kg (mean±SD)</b>	60.68±7.514		61.33±8.909		.188	.665
<b>Height/Cm (mean±SD)</b>	158.53±3.744		159.13±3.942		.732	.392
<b>Body mass index (BMI)</b>						
Underweight(<18.5)	2	3.3	3	5.0		
Normal (18.5-25)	<b>39</b>	<b>65.0</b>	<b>32</b>	<b>53.3</b>		
Obese (>25-30)	17	28.4	23	38.4		
Overweight> 30	2	3.3	2	3.3		
<b>BMI(mean±SD)</b>	24.13±3.05986		24.26±3.69812		.039	.843

**Table (2) The studied girls' menstrual characteristics in the study and control groups (n=120):**

Menstrual characteristics	Study group		Control group		X <sup>2</sup>	P-value
	N(60)	%	N (60)	%		
<b>Age of Menarche</b>						
<12 years	8	13.3	4	6.7		
12-15 years	<b>45</b>	<b>75.0</b>	<b>50</b>	<b>83.3</b>		
>15 years	7	11.7	6	10.0		
<b>Duration/ day</b>						
< 3 days	4	6.7	3	5.0		
3-7 days	<b>50</b>	<b>83.3</b>	<b>53</b>	<b>88.3</b>		
> 7 days	6	10.0	4	6.7		
<b>Interval/ day</b>						
< 21 day	7	11.7	4	6.7		
21-35 day	<b>50</b>	<b>83.3</b>	<b>52</b>	<b>86.6</b>		
> 35 day	3	5.0	4	6.7		
<b>Number of pads per day</b>						
2-3 pads	<b>28</b>	<b>46.7</b>	<b>35</b>	<b>58.3</b>		
More than 3 pads	32	53.3	25	41.7		
<b>Number of pads (Mean±SD)</b>	<b>3.62±1.075</b>		<b>3.37±1.134</b>		3.935	.269
<b>Onset of menstrual pain</b>						
1-2 day before menstruation	18	30.0	13	21.7		
The first day of menstruation	<b>42</b>	<b>70.0</b>	<b>47</b>	<b>78.3</b>		
<b>Frequency of dysmenorrhea:</b>						
Every month	<b>49</b>	<b>81.7</b>	<b>47</b>	<b>78.3</b>		
Irregular	8	13.3	47	15.0		
With stress only	3	5.0	4	6.7		
<b>Type of symptoms with dysmenorrhea :</b>						
Severs and persistent abdominal pain	<b>50</b>	<b>83.3</b>	<b>48</b>	<b>80.0</b>	.223	.637
Back or leg pain	35	58.3	39	65.0	.564	.453
Nausea and vomiting	11	18.3	9	15.0	.240	.624
Constipation or diarrhea	7	11.7	6	10.0	.086	.769
Severe headache	9	15.0	7	11.7	.288	.591
<b>Taking analgesics in previous menstruation</b>						
Yes	44	73.3	34	56.7		
No	16	26.7	26	43.3		



**Figure (1) The studied girls' family history of dysmenorrhea in the study and control groups (n=120)**

**Table (3) The studied girls' change on daily activities in the study and control groups before intervention (n=120)**

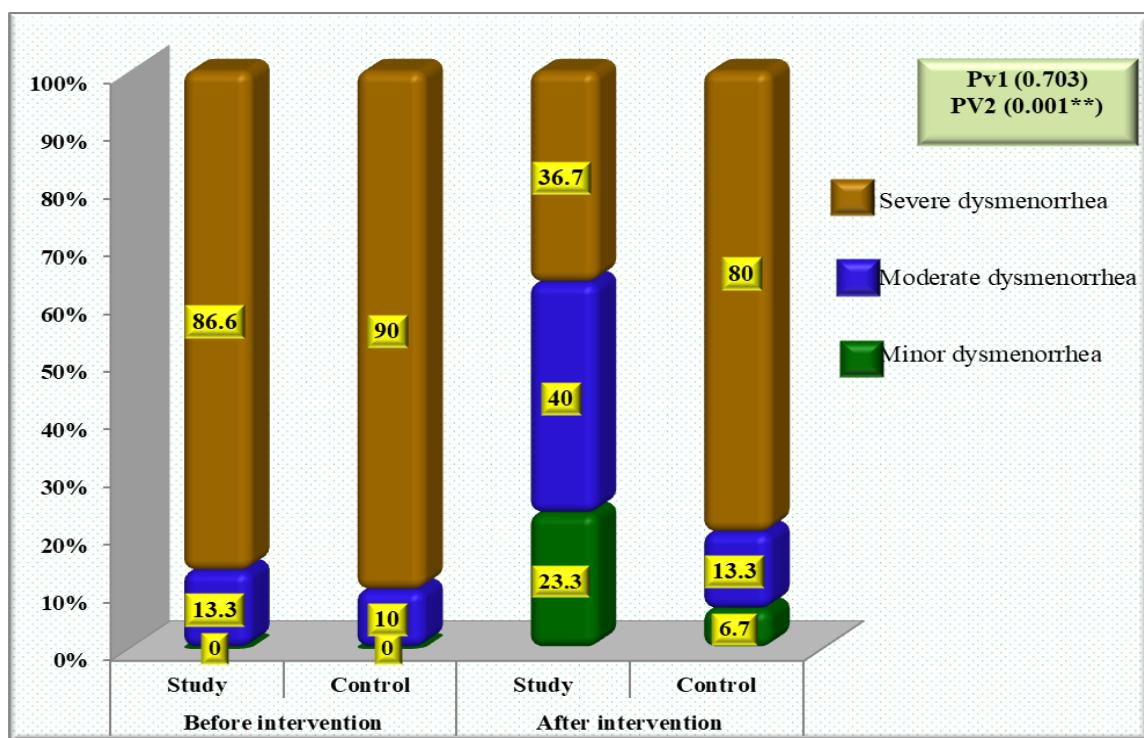
Items	Study group		Control group		$\chi^2$	P-value
	N (60)	%	N (60)	%		
Dysmenorrhea has an effect on attending faculty					.076	.783
Yes	52	86.7	53	88.3		
No	8	13.3	7	11.7		
Dysmenorrhea has an effect on studying and understanding the lesson					.120	.729
Yes	56	93.3	55	91.7		
No	4	6.7	5	8.3		
Dysmenorrhea has an effect on examination scores					.076	.783
Yes	52	86.7	53	88.3		
No	8	13.3	7	11.7		
Dysmenorrhea has an effect on household activities					.063	.863
Yes	50	83.3	51	85		
No	10	16.7	9	15		

<b>Visiting Holy places, friends and relatives during menstruation</b>					.261	.609
Yes	50	83.3	52	86.7	223	.637
No	10	16.7	8	13.3		
<b>Physical activities (walking ,exercises)</b>					1.154	.283
Yes	48	80.0	50	83.3		
No	12	20.0	10	16.7		
<b>Do any of your daily activities change with menstruation?</b>						
Yes	50	83.3	54	90.0		
No	10	16.7	6	10.0		

**Table (4) The studied girls' change on daily activities in the study and control groups after intervention (n=120)**

Items	Study group		Control group		X <sup>2</sup>	P-value
	N (60)	%	N (60)	%		
<b>Dysmenorrhea has an effect on attending faculty</b>					15.00	<b>0.001**</b>
Yes	30	50.0	50	83.3		
No	30	50.0	10	16.7		
<b>Dysmenorrhea has an effect on studying and understanding the lesson</b>					18.15	<b>0.001**</b>
Yes	29	48.3	51	85.0		
No	31	51.7	9	15.0		
<b>Dysmenorrhea has an effect on examination scores</b>					15.404	<b>0.001**</b>
Yes	31	51.7	51	85.0		
No	29	48.3	9	15.0		
<b>Dysmenorrhea has an effect household activities</b>					13.374	<b>0.001**</b>
Yes	30	50.0	49	81.7		
No	30	50.0	11	18.3		
<b>Visiting Holy places, friends and relatives during menstruation</b>					8.336	<b>0.004**</b>
Yes	32	53.3	47	78.3		
No	28	46.7	13	21.7		
<b>Physical activities (walking ,exercises)</b>					19.548	<b>0.001**</b>
Yes	22	36.7	46	76.7		
No	38	63.3	14	23.3		

<b>Do any of your daily activities change with menstruation?</b>					12.626	<b>0.001**</b>
Yes	27	45.0	46	76.7		
No	33	55.0	14	23.3		



**Figure (2) level of dysmenorrhea in the study and control groups before and after intervention (n=120)**

**Table (5) correlation between level of dysmenorrhea in the study and control groups before intervention and personal characteristics (n=120)**

Item		Study group	Control group
<b>Age</b>	Pearson Correlation	.337**	.530**
	Sig. (2-tailed)	.008	.000
<b>Residence</b>	Pearson Correlation	.109	.149
	Sig. (2-tailed)	.405	.256
<b>Academic year</b>	Pearson Correlation	.341**	.180
	Sig. (2-tailed)	.008	.168
<b>Weight</b>	Pearson Correlation	-.259*	.319*
	Sig. (2-tailed)	.046	.013
<b>Height</b>	Pearson Correlation	-.352**	-.028
	Sig. (2-tailed)	.006	.830
<b>BMI</b>	Pearson Correlation	-.117	-.164
	Sig. (2-tailed)	.372	.212
<b>Family history of dysmenorrhea</b>	Pearson Correlation	-.133	-.010
	Sig. (2-tailed)	.310	.938

**Discussion:**

More than half of girls between the ages of 18 and 25 suffer from dysmenorrhea, the most prevalent gynecologic disorder in young girls. Its main symptoms, including pain, have a negative impact on everyday life and academic performance. Primary dysmenorrhea is treated with both pharmaceutical and non-pharmacological methods. About 15% of girls with primary dysmenorrhea may experience side effects from pharmaceutical treatments, which may not always be completely effective. Furthermore, Egyptian girls and young women are discouraged from taking medication for dysmenorrhea because they think it could impair fertility or result in dependence (**Moustafa1 et al., 2023**). So, the present study designed to evaluate the effect of stretching exercises on improving pain and daily activities of girls with primary dysmenorrhea.

Concerning personal characteristics, present study illustrated that three-fifths of the study group and two-thirds of the control group lived in rural areas, and less than two-thirds of the study group and more than half of the control group had a normal BMI. The majority of the girls in the study group and the control groups were between the ages of 19 and 22. Considering all prior variables, there was no statistically significant difference between the study and control groups..

Similar finding were reported by (**ElShora et al., 2023**), who conducted research in Egypt to

evaluate the impact of a set of combined exercises on primary symptoms of dysmenorrhea in nursing students. They found that the vast majority of nursing students in both the study and control groups were between the ages of 19 and 22, and that over two-thirds of the study group and over one-third of the control group had normal body mass indexes. Considering all prior variables, there was no statistically significant difference between the study and control groups. Also (**Elmoniem et al., 2020**), who conducted a study to compare the effectiveness of stretching exercises and heat application in easing the discomfort of primary dysmenorrhea in female university students. The results showed that there was no statistically significant difference in BMI, age, residence, or academic year between the study and control groups. This resemblance stems from using comparable study samples and environments.

Regarding menstrual characteristics, actual study represented that three quarters of the studied girls in the study group and the majority in the control group had their menarche from 12-15 years old. The majority of them in the study the control group had duration from 3-7 days, and had interval from 21-35 day. Also less than one half of them in the study and less than three fifths in the control group used from 2-3 pads per days. Regarding onset of menstrual pain, more than two thirds in the study and more than three in the control group their pain started in the first day of menstruation. The

majority of them in the study the control group their pain repeated every month.

On the same line, (**Mohamed et al., 2024**), who implemented their study in Egypt to compare between the effect of Rocking, Stretching, and Kegel exercises on pain intensity of primary dysmenorrhea among university girl students, Also (**Saleh & E Mowafy, 2016**), who carried out their study in Egypt to compare between stretching and core strengthening exercises in management of dysmenorrhea, and both of them found that there were no statistical significant difference between both groups regarding menarche, duration, interval, and number of pads per day. Similarity back to working on similar sample, and the same settings (Egypt).

Concerning symptoms associated with dysmenorrhea actual study illustrated that the majority of them in the study the control group experienced severs and persistent abdominal pain. With no statistical significant difference between both groups regarding all previous variables. Congruent with previous findings (**Elmoniem et al., 2020**), showed that less than three quarters of the studied girls experienced lower abdominal pain and back pain, slightly more than one quarters of them had nausea and vomiting during menstruation. Also (**Abedel & Mohamed, 2017**), who carried out their study to investigate the effect of pelvic rocking exercises on primary dysmenorrhea among adolescent girls, showed that one half of the studied girls experienced

lower back pain during menstruation.

Regarding family history of dysmenorrhea, more than half of the studied girls in both group had a family history of dysmenorrhea, with no statistical significant difference between both groups. Near to previous findings, (**John & Sr, 2019**), who conducted their study to determine the impact of pelvic rocking exercise on adolescent girls' dysmenorrhea by evaluating the pre-test and post-test levels of the condition in both the experimental and control groups, and found that more than three fifths in the study and the control group had a family history of dysmenorrhea, with no statistical significant difference between both groups. This ensured that family history of dysmenorrhea act as a risk factor for having dysmenorrhea. Also (**Mohamed et al., 2024**), who showed that more than three fifths in the stretching group, less than half of them in the pelvic exercise, but less than one third of them in the kegel group, but these difference made statistical significant difference between the three study groups. From the researcher point of view family history of dysmenorrhea still act as a risk factor for having dysmenorrhea, but statistical difference between the three study groups back to dissimilarity in the percent of family history in each group.

As regard change on daily activities, current study clarifies that around one half of the studied girls their daily activities affected by dysmenorrhea, with no statistical

significant difference between the study and control groups before intervention regarding all items of their change on daily activities. While after intervention, that there were highly statistical significant difference between both groups after intervention regarding all items of their change on daily activities at as there was improvement in the study group in daily activities back to improvement in level of pain. in agreement with previous findings, (**Abedel & Mohamed, 2017**), who revealed that there was a significant improvement in the daily activities after applying rocking exercises, that not found in control group. This similarity ensured that exercise play a vital role in improving menstrual pain that affect positively on their life activities.

Regarding the severity of the dysmenorrhea, the current study found that there was no statistically significant difference between the study and control groups, with the majority of the girls in the study and the vast majority of those in the control group experiencing severe dysmenorrhea prior to intervention. Following the intervention, there was a highly statistically significant difference between the study and control groups, with over one-third of the study group experiencing severe dysmenorrhea and the majority of the control group experiencing the same condition.

On the same line, (**Saleh & E Mowafy, 2016**) demonstrated that around three quarters of the studied girls had a severe level of dysmenorrhea before intervention,

that improved after intervention to be slightly more than one quarter with highly statistical significant difference between pre and post intervention. Also (**Sagita et al., 2024**), who conducted their research to determine whether abdominal stretching exercises could lessen the severity of dysmenorrhea pain, and (**Amaliah et al., 2021**), who implemented a study entitled “the effect of abdominal stretching exercise on the reduction of intensity of dysmenorrhea”, both of them illustrated that there was an improvement in the level of pain after applying stretching exercises, with highly statistical significant difference between pre and post intervention.

Also (**God a et al., 2020**), demonstrated that the great majority of the studied girls had no and mild pain in the study group after intervention, while more than one half of them had a severe dysmenorrhea level, with highly statistical significant difference between the study and control groups. This improvement might be the result of exercise increasing the uterus's blood flow and metabolism, which may help to lessen the symptoms of dysmenorrhea.

Regarding correlation between level of dysmenorrhea in the study group and personal characteristics, present study illustrates that, there were positive correlation between level of dysmenorrhea in the study group and control group and the studied girls' age and weight before intervention. Similar findings reported by (**Moustafal et al., 2023**), who

carried out their study to assess the prevalence of dysmenorrhea among adolescent girls, and found that there were relation between dysmenorrhea level and the studied girls' age and weight. Also (**Elmoniem et al., 2020**), showed that high significant correlation between body mass index in stretching exercise group and demonstrated that severity of primary dysmenorrhea was increased by gaining weight and increasing BMI.

### **Conclusion:**

Based on the current study's findings, it can be concluded that: A significant improvement occurred in the studied girls' level of dysmenorrhea and daily activities after application stretching exercise in the study group.

### **Recommendations:**

- Regular stretching exercises should be emphasized in college and university health education programs as a way to lessen primary dysmenorrhea.
- Generally speaking, stretching exercises are a better treatment for dysmenorrhea than taking analgesics.
- Provide all teenage girls with dysmenorrhea with an illustrated booklet that includes figures and a brief explanation of stretching exercises.
- Making generalizations with a large sample size.

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## **Nurses' Knowledge and Attitude toward Physical Health Care for Patients with Psychiatric Disorders**

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**Abstract:** Physical health problems are a serious global issue among patients with psychiatric disorders leading to increased risk of early mortality. The most important causes related to unmet physical health needs are nurses' level of knowledge and attitude toward physical health care. **Aim:** to assess nurses' knowledge and attitude toward physical health care for patients with psychiatric disorders. **Subjects:** All nurses who provide direct care to patients (90 nurses) were involved. **Settings:** The study was conducted at the Inpatient Psychiatric Department in two settings; Tanta University Hospital, and The Neurology, Psychiatry, and Neuro-Surgery Center, both settings are affiliated to Ministry of High Education and Scientific Research. **Study design:** A descriptive research design was utilized. **Study tools:** two tools were used: **Tool I:** Structured questionnaire of nurses' knowledge about physical health care for patients with psychiatric disorders, **Tool II:** The Physical Health Attitude Scale (PHASE). **Results:** the study revealed that about half of the studied nurses had moderate level of knowledge and more than one third of them had positive attitude toward physical health care among patients with psychiatric disorders. There was statistically significant positive correlation between nurses' knowledge and attitude toward provision of physical health care among patients with psychiatric disorders.

**Conclusion** Based on the results of the present study it can be concluded that mental health nurses' level of knowledge regarding provision of physical health care for patients with psychiatric disorders positively correlated with their positive attitude.

**Recommendations:** Developing educational programs for enhancing level of knowledge and attitude of nurses toward provision of physical health care among patients with psychiatric disorders.

**Key words:** Patients with Psychiatric Disorders, Physical Health Care, Nurses' knowledge, Nurses' attitude.

## Introduction

Psychiatric disorders are known as serious public health issues which cause misery and incapacity and exists in different forms, including schizophrenia, anxiety and mood disorders (Amirani, et al, 2020). Psychiatric disorders contribute 14% of the global burden of diseases, and 30% of the non-fatal diseases burden, which is deteriorated by physical health problems (GBD 2019 Mental Disorders Collaborators, 2022). There is evidence that individuals with psychiatric disorders receive substandard physical health care when compared to the general population (Gray & Brown, 2017, Fiorillo& Sartorius, 2021). A considerable number of them suffer from hypertension, diabetes, or dyslipidemia, and are at a heightened risk of acquiring cardiovascular disease or other physical comorbidities (Afzal, et al, 2021; Rogers, et al, 2021). Furthermore their life expectancy is dramatically decreased by 7 to 20 years due to the high occurrence of physical comorbidity, which frequently has poor physical care (Launders, et al, 2022). Thus, it is essential that people with psychiatric problems have access to high quality physical health care due to the substantial comorbidity between mental and physical health diseases. (Gasper, 2016).

Numerous correlated factors have negative effect on physical health of people with psychiatric disorders. These include unhealthy lifestyle such as physical inactivity, poor eating patterns, smoking habits,

prescribed drugs, barriers in accessing care, poor uptake of health screening and self-stigma. In addition, the attitudes of nurses and lack of nurses' knowledge are most likely to be relevant factors towards the poor outcome of physical health for people with psychiatric disorders (Bressington et al 2018).

Nurses employed in mental health settings play a crucial role in identifying patients at risk of deterioration through continuous assessment and action in response to shifting physical health condition (Ince & Gunusen, 2018, Liyew, et al, 2020). However evidence postulated that lack of knowledge as well as the negative attitudes toward provision of physical health care play vital role in patients' physical health needs to be disregarded (Bressington, et al, 2018, Dickens, et al, 2019).

Knowledge of nurse is vital in enhancing patient satisfaction and the quality of care and treatment outcomes, it can also successfully lower medical expenses and shorten hospital stays while maintaining patient safety. This allows for a more efficient way to addressing increasingly complicated care issues. (Li, H., et al, 2024). So that lack of knowledge regards physical healthcare of patients impedes the practice of mental health nurses' full participation in physical health care activities.

Moreover, planning care for the physical health of individuals with psychiatric disorders would be challenging for mental health nurses (MHNs) with limited knowledge and expertise (Buzlu, and Sahin-

**Bayindir, 2022).** Therefore, mental health nurses who care for patients with psychiatric patients must receive appropriate information about assessment and management of physical health care to bridge the gaps in healthcare needs so these patients can experience elevated health outcomes (Bolt, 2024).

On the other side, negative attitudes of nurses can have adverse consequences on people with psychiatric disorders from delays in seeking physical help to decreased quality of care provided. Negative attitudes toward physical health care by nurses have been reported in many studies across the world (Gasper 2016, Skargon, 2020; Butler, et al, 2020). Attitudes have a role in shaping behavior and contribute to the practice of mental health nurses (Dickens, 2022). Nurses who possess a positive attitude towards providing physical health care leading to reduced morbidity and early mortality in psychiatric patients and improve quality of care by monitoring and screening patients and well referral (Osman & Barakat 2023). Hence assessing such attitude is an essential step in understanding such problems and, if needed, developing and implementing appropriate interventions to reduce it. Unfortunately, a multitude of research revealed that a large number of mental health nurses had negative attitudes regarding the provision of physical health care, in addition to lacking their confidence and participation in pertinent interventions tailored to the requirements of individuals with

psychiatric problems. (Rodgers, et al, 2018; Reilly, et al, 2024).

On the other hand, nurses have a high degree of expertise, knowledge, and a positive attitude toward providing physical health care are associated with lowering morbidity and early death in patients with psychiatric disorders and improves quality of care through patient screening and monitoring (Chee, Wynaden & Heslop, 2018,Osman et al, 2023).

#### **Significance of the problem:**

The physical health of individuals experiencing psychiatric disorders is often ignored by the healthcare professionals, resulting in more undiagnosed or undertreated conditions compared to people without psychiatric disorders with a prevalence rate of these conditions ranging from 40 to 70% in patients with schizophrenia and 20–30% in persons00 with bipolar disorders. So that, people with psychiatric disorders have a twofold to threefold increased risk of premature mortality and decline in life expectancy of 10–20 years than the general population (Gronholm, et al, 2021).

Despite of mental health nurses play a vital role in providing care for common physical problems, promoting healthy lifestyles and improving the self-care of individuals with psychiatric disorders , little research has been done to understand how mental health nurses' knowledge and attitudes may affect care provision or health outcomes (Firth et al., 2019).Therefore the present study was conducted to shed light on knowledge and attitude of nurses

toward physical health care of patients with psychiatric disorders.

### **Aim of the study**

To assess nurses' knowledge and attitude toward physical health care for patients with psychiatric disorders.

### **Research questions:-**

What are the levels of nurses' knowledge about physical health care for patients with psychiatric disorders?

What is the nurses' attitude toward physical health care for patients with psychiatric disorders?

### **Subjects & Method**

#### **Subjects**

#### **Research design:-**

A descriptive research design was used in the current study.

#### **Setting:-**

The present study was carried out at Inpatient Psychiatric Department of the following settings:

- a) Tanta University Hospital. Its capacity is (42 beds) divided into two wards for men (26 beds) and two wards for women (16 beds).
- b) Neurology, Psychiatry, and Neuro-Surgery Center. This center has a capacity of (77 beds) Both previously settings are affiliated to Ministry of High Education and Scientific Research

#### **Subjects:**

All nurses who provide direct care to patients 90 nurses at the time of data collection (55 work at Inpatient psychiatric department at the psychiatry, Neurology and Neurosurgery Center and 35 work at The Inpatient Psychiatric Department of Tanta University Hospital)

**Tools of the study:** -The data was gathered by using two tools:-  
**Tool I: Structured questionnaire of nurses' knowledge about physical health care for patients with psychiatric disorders :**

### **Part (1): Socio-demographic and Occupational Data Questionnaire:**

This tool was developed by the researcher after review of related literatures (Hennessy, et al, 2018; Dickens, et al, 2019). It was created for collecting information about the socio demographic and occupational characteristic of the studied nurses. It included items such as; (age, gender, marital status, residence, educational level, years of experience at psychiatric nursing, and prior physical health care courses).

### **Part (2): Nurses' Knowledge about Physical Health Care for Patients with Psychiatric Disorders:**

It was developed by researcher after review of relevant literatures (Idvall, et al. 2012; Rashedi, et al, 2014; Bregar, et al, 2018). It was developed to assess knowledge of nurses toward physical care for patient with psychiatric disorders. This questionnaire consists of 6 questions and it covered nurses' knowledge about the following points:

Definition of physical health care, components, benefits, causes, barriers, needs for psychiatric patients. Questions were presented in the Multi choice question (MCQ) format.

Each question has alternatives answers and only one of them is considered correct answer. Scoring for each question was divided as correct answer was given score (1) and incorrect answer was given score (0).

**Total scoring system was divided as follow:**

- < 60% was indicated low level of knowledge
- 60% -80% was indicated moderate level of knowledge
- > 80% was indicated high level of knowledge

**Tool II: The Physical Health Attitude Scale (PHASe)**

The Physical Health Attitude Scale (PHASe) was adopted from Robson & Haddad (2012). The scale aimed to assess attitude of mental health nurses toward provision of physical healthcare for psychiatric patients. It consisted of 28 items reflecting the personal nurses' attitudes regarding physical health care, split into four subscales:

- Subscale one: - Nurses' attitudes to involvement in physical health care (10 items).
- Subscale two: Nurses' confidence in delivering physical health care (6 items).
- Subscale three: - Nurses' perceived barriers to physical health care delivery (7 items).
- Subscale four: - (Nurses' attitudes to smoking (5 items).
- Items of the scale were assessed on a Likert scale of 1 to 5, where 1 considers strongly disagree and 5 considers strongly agree. Scores was arranged as follow:
- < 50% were negative attitude.

- > 50% -75% were neutral attitude
- > 75% were positive attitude

**Method**

**The study was carried out according to the following steps:-**

**1-Administrative process:**

1. The researchers attained an official permission from the Dean of Faculty of Nursing, Tanta University and was directed to the responsible authorities to seek their approval and cooperation after explaining the purpose of the study.

**2. Ethical and legal consideration:**

-The approval was granted from Faculty of Nursing, Scientific Research Ethical Committee, and Tanta University. Code no (295-9-2023)

-Nature of the study didn't put the participants in danger or discomfort.

-After clarifying the nature and purpose of the study, nurses gave their informed consent to participate.

-Confidentiality and privacy were strictly upheld during data collection

-During the study the researcher informed the studied nurses about their right to refuse participation or withdrawn from the study at any time they want without providing justification.

**3. Content validity:**

Five professionals in the field of psychiatric nursing reviewed the tools used in the study to ensure that the questionnaire was clear and had valid content. Changes were made in response to their revision.

**4. Content reliability:-**

Cronbach's Alpha test was used and it was found to be (0.81) for knowledge items (tool I), (0.89) for physical health attitude scale (tool II) and (0.94) for the entire study tool.

## 5. Pilot study:-

Pilot study was conducted on nine nurses (10%) to evaluate feasibility, clarity and applicability of tools. It was used to determine the duration it would take to interview the participants as well as recognize potential challenges that might come up during the actual study. Because the tools kept unchanged, the pilot study's participants were included into actual study.

## 6. Actual study:

It was carried out by researcher to assess nurses' knowledge and attitude toward physical health care for patients with psychiatric disorders.

An informed consent was reconfirmed from nurses for participation in the study after illustrating the aim of the study.

The tools were distributed in individual basis to studied nurses and the researcher asked nurses to complete the questionnaire in front of the researcher for any needed clarification. Tool I which used to assess nurses' knowledge lasted for 15-25 minutes from nurses to complete it. Tool II took 10-20 minutes from nurses to complete it so that nurses took 30-45 minutes to fill all sheets. Data was collected over 5 months from April 2024 to August 2024.

## Statistical analysis

(SPSS) version 23 was used to organize, computerize and validate the study data in order to perform tabulation and statistical analysis. The quantitative data were computed by mean, range, and standard deviation. For comparison between

means of two variables independent sample t test was performed and for comparing more than two means One Way Anova test was used. For categorical variables numbers and percent were calculated. Comparison was done using chi-square test ( $\chi^2$ ). Pearson's correlation coefficient (r) was performed to identify correlation between variables. A significance was adopted at  $P<0.05$  for interpretation of results of tests of significance (\*). Also, highly significant was adopted at  $P<0.01$  for interpretation of results of tests of significance (\*\*).

## Results:-

**Table (1)** clarifies distribution of studied nurses according to their socio-demographic and occupational characteristics. In relation to age, about more than the half of studied nurses (60%) aged between 22 to 35 years old with Mean  $\pm$  SD  $35.62 \pm 9.371$ . Regarding to sex, about three quarters of studied nurses (75.6%) were female.

Relating to marital status, about two thirds of studied nurses (71.1%) were married. It was found that half of the studied nurses (51.1%) had nursing technical institute.

Concerning residence, about two thirds of studied nurses (62.2%) were living in rural. In relation to number of years of experience in the field of psychiatric nursing , more than one third of studied nurses(38.9%) had 1 to 5 experiences' years while the minority of them(2.2%) had between 16 to 20 experiences' years. As regard to receiving previous training program on physical health care, more than of

half of the studied nurses (52.2%) didn't receive any of these programs. **Figure (1)** demonstrates total mean scores of knowledge subscales of the studied nurses regarding provision of physical health care for patients with psychiatric disorders. It was noticed that the highest ranking knowledge subscale among the studied nurses was relationship between the patient's physical health and mental health with mean (4.488) while the least ranking knowledge subscale was methods of improving the provision of physical health care, its mean was(0.62) and in between obstacles of physical health care subscales, concepts of physical health and physical health care and needs of patients with psychiatric disorders to physical healthcare, mean was (0.63, 1.44, 1.46) respectively. In relation to items of benefits of physical health care, its indicators and periodic examination, mean was (2.02, 2.63 and 2.68) respectively.

Concerning to mean of role of nurse, common physical symptoms and components of physical health care was (2.79, 3.39 and 4.32) respectively.

**Figure (2)** illustrates distribution of the studied nurses according to their levels of knowledge about physical health care for patients with psychiatric disorders. It was showed that (41.1%) had moderate level of knowledge and (24.4%, 34.4%) had low and high level of knowledge respectively

**Figure (3)** illustrates total mean scores of physical health attitude sub scales among the studied nurses. It was found that mean of attitude to

involvement in the physical health care subscale was (31.13) while perceived barriers in delivering the physical health care subscale was (19.16). In relation to mean of attitude to smoking and confidence in delivering the physical health care subscales was (19.38), (20.71) respectively.

**Figure (4)** demonstrates distribution of the studied nurses according to their levels of attitude toward provision of physical health care for patients with psychiatric disorders. It emphasized that (36.7%) of the studied nurses had positive attitude while (28.9%) of them had negative attitude and about one third of them (34.4%) had neutral attitude

**Table 2** demonstrates correlation between total knowledge score and total attitude score of the studied nurses. It was showed that there is a highly positive statistical significant correlation between total knowledge score and total attitude score which means that increasing nurses' knowledge leading to increase their level of attitude toward physical health care for patients with psychiatric disorders and vice versa where ( $r = 0.753$ ,  $p = 0.001$ ).

**Table 3** illustrates relationship between socio-demographic characteristics and levels of knowledge of the studied nurses. This table showed that there is a highly positive statistical significant relationship between age, educational level, marital status and nurses level of knowledge, where ( $p=0.001$ -  $0.001$ -  $0.001$ ) respectively.

In relation to age, the nurses aged (22-35) years had more level of

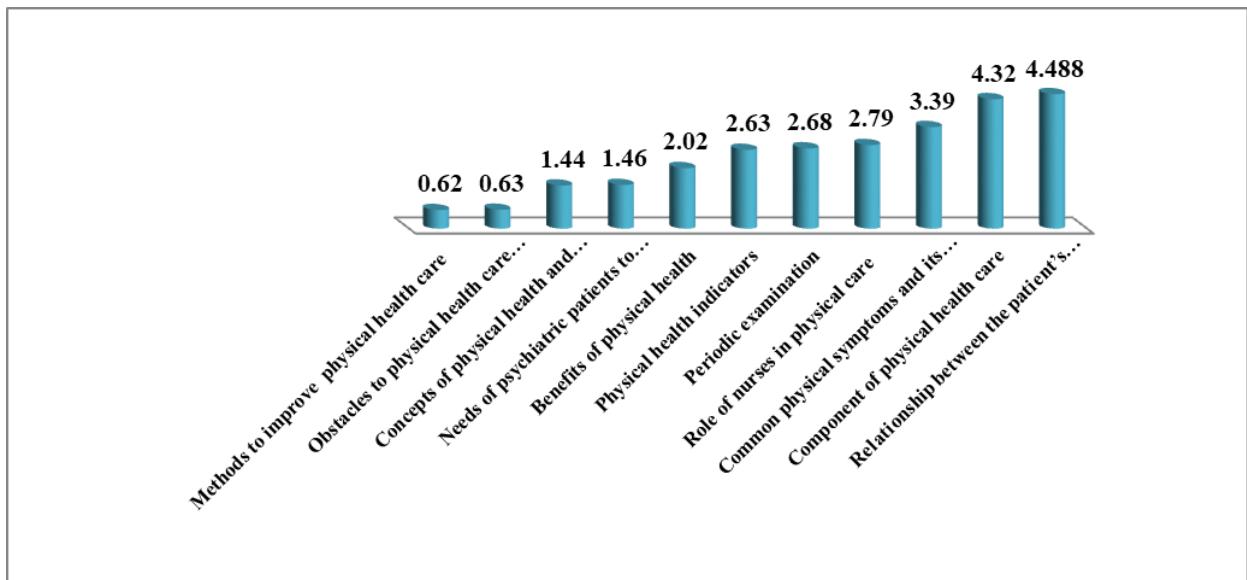
knowledge than other aged groups. Regarding educational level, nurses who had Bachelor of Science in nursing were having high level of knowledge than other groups. As regard to marital status, it was found that single nurses had more level of knowledge regarding to physical health care for patients with psychiatric disorders than other groups.

**Table 4** illustrates relationship between socio-demographic characteristics and levels of attitude of the studied nurses toward provision of physical health care for patients with psychiatric disorders. This table shows that there is a highly positive statistical significant relationship between age, educational level, marital status and nurses' level of attitude, where ( $p=0.001$ -  $0.001$ -  $0.001$ ) respectively.

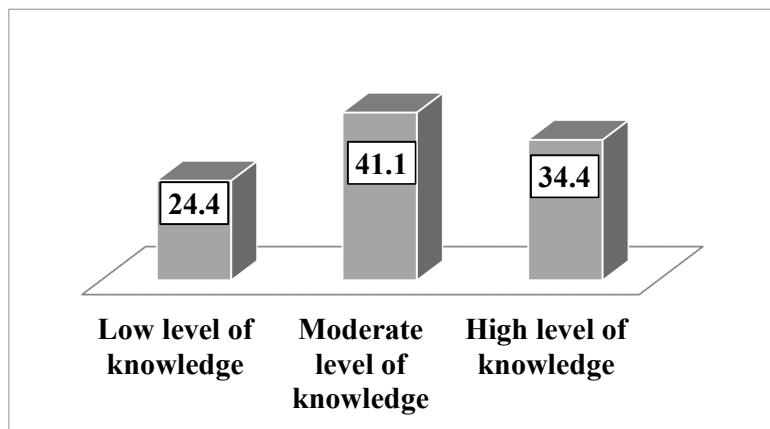
In relation to age, the nurses aged (22-35) years had more level of attitude than other aged groups. Concerning to educational level, nurses who had Bachelor of Science in nursing were having positive attitude than other groups. Regarding marital status, it was found that single nurses had more level of attitude regarding physical health care for patients with psychiatric disorders than other groups.

**Table (1): Distribution of Studied Nurses according to their Socio-demographic and Occupational Data**

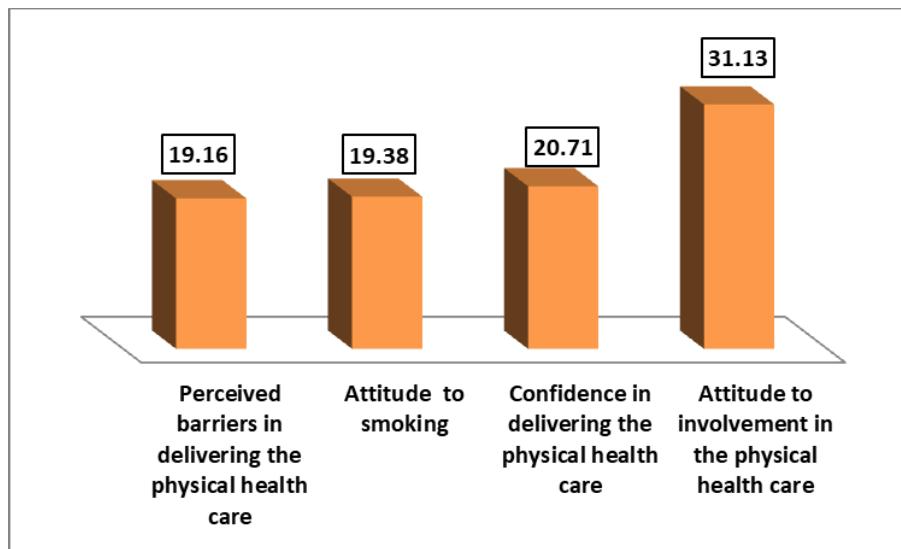
Nurses socio-demographic and Occupational data	The studied nurses (n=90)	
	No	%
<b>Age in years</b>		
22-35	54	60.0
35-45	19	21.1
45-55	17	18.9
<b>Range</b>	22-53	
<b>Mean ± SD</b>	$35.62 \pm 9.371$	
<b>Sex</b>		
Male	22	24.4
Female	68	75.6
<b>Marital status</b>		
Single	18	20.0
Married	64	71.1
Separated	1	1.1
Divorced	3	3.3
Widowed	4	4.4
<b>Educational level</b>		
Diploma in Nursing (3 years)	24	26.7
Nursing Technical Institute	46	51.1
Bachelor of Science in Nursing	20	22.2
<b>Residence</b>		
Urban	34	37.8
Rural	56	62.2
<b>Number of years of experience in the field of psychiatric nursing</b>		
1-5	35	38.9
5-10	28	31.1
10-15	6	6.7
15-20	2	2.2
More than 20	19	21.1
<b>Having training program on physical health care for patients with psychiatric disorders?</b>		
Yes	43	47.8
No	47	52.2



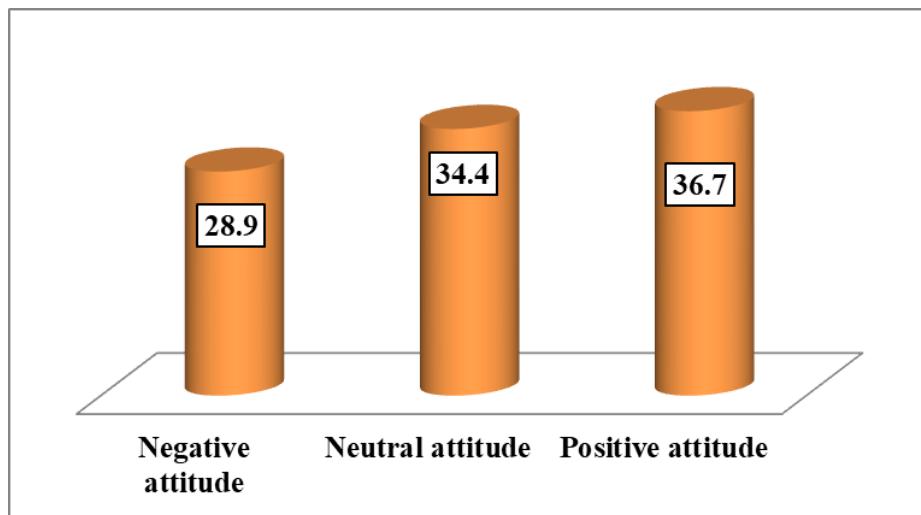
**Figure (1): Mean Score of Knowledge Subscales of the Studied Nurses Regarding Physical Health Care for Patients with Psychiatric**



**Figure (2): Distribution of the Studied Nurses According to Their Levels of Knowledge about Physical Health Care for Patients with Psychiatric Disorders**



**Figure (3): Mean Score of Physical Health Attitude Subscales for the Studied Nurses**



**Figure (4): Distribution of the Studied Nurses according to their Levels of Attitude toward Provision of Physical Health Care for Patients with Psychiatric Disorders**

**Table (2) Correlation between Total Knowledge Score and Total Attitude Score of the Studied Nurses**

Total knowledge score	Total attitude score	
	r	P
	0.753	0.001**

\*\* Correlation is highly significant at  $p < 0.01$  level

**Table (3): Relation between Socio-demographic and Occupational Characteristics of the Studied Nurses and their Levels of Knowledge regarding Provision of Physical Health Care for Patients with Psychiatric Disorders**

Socio-demographic variables	The studied sample (n=90)	t / f p
	Total of knowledge	
<b>Age in years</b>		
22-35	26.85±3.276	13.651
35-45	20.26±7.140	0.001**
45-55	22.76±6.638	
<b>Sex</b>		
Male	25.77±4.461	1.029
Female	24.34±6.019	0.306
<b>Educational level</b>		
Diploma in Nursing (3 years)	21.21±6.640	8. 68
Nursing Technical Institute	25.22±5.081	0.001**
Bachelor of Science in Nursing	27.65±3.438	
<b>Marital status</b>		
Single	27.56±3.258	
Married	24.75±5.24	
Separate	25.00±0.00	9.345
Divorced	9.33±4.726	0.001**
Widowed	22.25±3.862	
<b>Residence</b>		
Urban	24.53±6.430	0.206
Rural	24.79±5.246	0.837
<b>Number of years of experience in the field of psychiatric nursing</b>		
1-5	25.46±5.802	1.644
5-10	25.89±4.228	0.171
10-15	22.50±5.394	
15-20	24.50±7.778	
More than20	22.21±6.828	
<b>Having training program on physical health care for patients with psychiatric disorders?</b>		
Yes	2.00±0.724	1.189
No	2.19±0.798	0.238

**Table (4): Relation between Total Score of Attitude toward Provision of Physical Health Care to Patients with Psychiatric Disorders and Socio-demographic Characteristics of the Studied Nurses**

<b>socio-demographic characteristics</b>		<b>Attitude total score</b>
<b>Age in years</b>	22-35	97.26±17.480
	36-45	78.95±18.213
	46-55	78.29±25.330
	f- test	10.050
	p-value	0.001**
<b>Sex</b>	Male	90.23±21.865
	Female	89.68±21.118
	t- test	0.105
	p-value	0.916
<b>Educational level</b>	Diploma in Nursing	76.04±22.896
	Nursing Technical Institute	91.54±18.797
	Bachelor of Science in Nursing	102.35±14.752
	f- test	10.618
	p-value	0.001**
<b>Marital status</b>	Single	100.67±18.020
	Married	89.97±19.392
	Separate	67.00±0.00
	Divorced	53.33±22.030
	Widow	71.50±24.256
	f- test	5.305
	p-value	0.001**
<b>Residence</b>	Urban	91.00±21.522
	Rural	89.09±21.132
	t- test	0.413
	p-value	0.681
<b>Years of experience in psychiatric nursing</b>	1-5	93.49±21.257
	5-10	94.07±16.810
	10-15	83.83±17.348
	15-20	86.50±27.577
	More than20	79.00±24.976
	f- test	2.002
	p-value	0.101
<b>Having training program on physical health care for patients with psychiatric disorders?</b>	Yes	86.91±20.835
	No	92.47±21.365
	t- test	1.248
	p-value	0.215

## Discussion

Physical health care, including screening, disease prevention, and health promotion, should be given high priority for nurses caring for patients with psychiatric disorders because physical health in individuals with psychiatric disorders is often neglected, suggesting that this population faces an elevated risk of morbidity and death from physical health issues like obesity, diabetes, metabolic syndrome, hypertension, cardiovascular disease, and respiratory diseases than the general population (Penninx and Lange, 2018; Garrido-Torres, et al ,2021). Mental health nurses work closely with patients who suffer from psychiatric disorders have an essential role in helping them resolve physical health issues. Nursing studies have proven that nurses' knowledge and attitude regarding provision of physical care are closely linked to the effectiveness and quality of nursing care for psychiatric patients. As a result nurses' knowledge and attitude toward physical health care have become the focus of recent nursing researches in the field of mental health nursing (Celik Ince, et al., 2018). In the scope of this, the current study was developed to assess nurses' attitudes and level of knowledge regarding physical health care for patients with psychiatric disorders. The main results revealed by the study are most of the studied nurses had moderate level of knowledge and positive attitude

regarding physical health care for this patients group.

Concerning nurses' level of knowledge regarding provision of physical health care for patients with psychiatric disorders, the current study proved that most of the studied nurses had knowledge since about nearly half of them had moderate level of knowledge and approximately one third of them exhibited high level of knowledge regarding physical health care, this results may be due to the following rationalizations:-

- Educational background of the studied nurses

Most of the studied nurses graduated from Bachelor of Science in nursing and Nursing Technical institute (5 years). In the faculty of nursing, psychiatric educational curriculum concerned on integration between physical and mental health care as well as focused on providing a holistic approach care for individuals with psychiatric disorders. In this point, results of the current study supported this rational that knowledge subscale of relationship between physical and mental health was the first ranking. This means that nurses are prepared to understand and manage any physical health problem affect their patients as well as psychotropic medications' side effects that represents as painful and serious physical health problems affecting patients with psychiatric disorders. (Goh, et al ,2021)

The results of the current study were in line with the study conducted by Dickens et al. (2019) showed that mental health nurses had satisfactory

knowledge about provision of physical health care as well as nurses' role in physical health care for patients with psychiatric disorders

Additionally, The study results of conducted by **Lundström et al. (2020)** revealed that mental health nurses had moderate level of knowledge about the interplay between physical health and mental health as well as significance of physical activity and eating healthy diet. The current findings were in contrast with the study of **Hennessy, S., & Cocoman, A. M. (2018)** found that nurses had low level of knowledge related to physical health care.

Regarding to level of nurses' attitude toward provision of physical health care, the current findings showed that more than one third of the studied nurses held positive attitude regarding physical health care among patients with psychiatric disorders, this may attributed to several explanations. Firstly, part of this results may be related to the majority of studied nurses had moderate and high level of knowledge which may be positively affected on nurses' attitude meaning that an increase in knowledge level may lead to increase of level of attitude regarding physical health care owing to knowledge develops deeper understanding of the topic shaping nurses' beliefs and judgments. The more informed persons are, the more likely they are to hold attitude based on evidence, logic and understanding (**Andrade, et al, 2020**). This rationalization is

supported by results of the recent study which revealed positive correlation between knowledge and attitude regarding physical care among studied nurses.

Secondly, the section of nursing training and education at General Secretariat of Mental Health always has a new trend toward nursing care in which nurses must care for patients holistically, mentally as well as physically. Additionally nurses had strong belief in the right of every patient to receive equal holistic care regardless his psychiatric condition which reported by some studied nurses during data collection of the present study.

This finding was in line with a study by **Ganiah et al. (2017)** found that nurses at mental health facilities held positive attitudes in general physical health care facets, such as helping patients with psychiatric disorders control their weight and offering advice on how to prevent heart disease.

The results of the present study were in harmony with the study of **Holmberg (2020)** found that mental health nurses' motivation to practice and their attitudes on their role in providing physical health care showed to be positive.

These findings contrasted with the study carried by **De Melo et al. (2016)** concluded that nurses had negative attitudes when providing care to individuals with psychiatric problems. Furthermore **Giandinoto et al. (2018)** stated that mental health nurses exhibited a negative attitude toward patients with psychiatric problems as well as their

physical health demands and circumstances. Concerning correlation between nurses' knowledge and attitude toward provision of physical health care for patients with psychiatric disorders, the current results demonstrated that positive correlation between nurses' knowledge and attitudes significantly in which nurses who had higher level of knowledge related to physical health care reported more positive attitudes toward this also and vice versa. These findings may be attributed to increased awareness because gaining knowledge about physical health care often leads to greater awareness, which can shift nurses' attitude. Knowledge can help forming positive attitudes by providing a more complete understanding of the benefits or importance of a particular issue or behavior. For example, learning about the harmful effects of psychotropic medication may change nurses' attitude, making them more positive toward patients' symptoms and its management.

**Additionally**, knowledge allows nurses to make more informed decisions and it can also help challenge and reduce negative or prejudiced attitudes. As a result, nurses develop attitudes that reflect rationality and practicality, because knowledge directly influences attitudes by shaping how to interpret and respond to physical health needs of patients with psychiatric disorders (**Kruse, et al, 2022**). The present study findings go in the same line with the findings of **Dickens et al.**

(2019) revealed that knowledge and attitude of mental health nurse related to physical health care are positively correlated.

Regarding to relation between studied nurses' age, educational level, marital status and their level of knowledge and attitude toward physical health care for patients with psychiatric disorders, the current findings declared that there was a statistically highly significant positive relation between studied nurses' age, educational level, marital status and their level of knowledge and attitude toward physical health care.

Regarding age, the result pointed out that majority of nurses aged between (22-35) years old had moderate level of knowledge and positive attitude related to provision of physical health care because they are newly graduated and still had recent knowledge and adaptability of younger nurses to technology which aids their abilities to integrate new knowledge quickly (**Brown, et al, 2020**).

The **Venables et al. (2023)** study supported the current findings by demonstrating that young nurses also scored higher in both knowledge and attitudes than older nurses toward physical health care for patients with psychiatric disorders.

According to a study by **Lee et al. (2021)** that conducted at psychiatric inpatient settings was in contrast with the present findings revealed that young nurses tend to have low level of knowledge and have a negative attitude toward the use of physical assessment, which is a

component of nursing care is provided to patients with psychiatric disorders

Concerning level of education, the study revealed that majority of nurses who had nursing technical institute and Bachelor of Science in nursing, their level of knowledge and attitude related to physical health care for patients with psychiatric disorders are better than other nurses who had diploma in nursing. This may be related to many of psychiatric nursing curriculums have been advanced with most recent literatures pointed the importance of providing holistic care to patients with psychiatric disorders that improves nurses' knowledge and attitude toward them.

As well as when level of education increases, nurses communication skills will be advanced between nurses themselves and their mentors as well as with psychiatrists leading to interdisciplinary collaboration which foster nurses' positive attitude toward physical health care as well as toward these patients group (Tusaie, K., & Fitzpatrick, J. J, 2022).

The findings were consistent with the study by El-Aqou et al. (2020) which showed that nurses with higher education levels are better able to possess a high degree of knowledge and attitude regarding a pain management issue which is considered an important part of physical care for individuals with psychiatric disorders.

According to Liyew et al. (2020) study, nurses' attitudes and expertise regarding physical assessment—the

most crucial aspect of the physical health care process—were not significantly correlated with their educational status, which contrasts with the present finding

### **Conclusion & Recommendations**

**Conclusion Based on the results of the present study**, it can be concluded that mental health nurses' level of knowledge regarding provision of physical health care for individuals with psychiatric disorders positively correlated with their positive attitude.

### **Recommendations**

-Developing educational programs for enhancing level of knowledge and attitude of nurses toward provision of physical health care among patients with psychiatric disorders.

-In-services update training programs should be provided for nurses about physical health care for patients with psychiatric disorders.

- Further studies are needed to assess other factors affecting physical health care among psychiatric patients.

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## Nurse Managers' Perception Regarding Artificial Intelligence and Health Logistic Management

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### Abstract

**Background:** Artificial intelligence has the ability to bring about helpful changes in healthcare especially management of logistics tasks within a hospital. **Aim of the study:** To assess nurse managers' perception regarding artificial intelligence and health logistic management. **Research design:** A descriptive correlational design was used. **Setting:** The study was conducted at Tanta University Hospitals. **Subjects:** All (n=280) nurse managers, who are working in the previously mentioned setting. **Tools:** Two tools were used to collect data; Tool I: Nurse managers' perception about artificial intelligence, Tool II: Nurse managers' perception regarding health logistic management structured questionnaires. **Results:** - More than two-thirds (66.8%) of nurse managers had a low level of perception regarding overall artificial intelligence as well as, more than three-quarters (79.6%) of them had a moderate level of perception regarding health logistic management. **Conclusion:** A positive statistically significant correlation was found among nurse managers overall perception of artificial intelligence and health logistic management. **Recommendations:** Hospital administrator should encourage nurse managers to increase their knowledge and perception toward artificial intelligence and health logistic management through training programs and providing further education to enable them to integrate them into their practices.

**Keywords:** Artificial Intelligence, Health Logistic Management, Nurse Managers

### Introduction

A range of services are provided by healthcare organizations to help people stay healthy and receive care when they are ill or injured. These medical facilities act as centers of healing, with committed staff members from physicians and nurses to medical equipment technicians and support personnel managing patient care and

collaborating to promote wellbeing (Lennon et al.,2023). Nurse managers are leaders in healthcare organizations who assist in implementing new concepts and procedures for the facility's or organization's improvement in addition providing direction to the nurses in their department. (Mudd et al., 2023).

Healthcare operations need drastic changes to digitalize the healthcare organization. Since then, artificial intelligence (AI) has been successful in capturing the interest of important healthcare executives and providers in order to gain a competitive edge in the job market. AI is an attempt to make the computer or the machine that works with programming resemble a human being, whether in thinking, actions, solution to problems, and practice of all aspects of daily life (Apell & Eriksson, 2023).

Six domains comprise the features of artificial intelligence technology among nurse managers: perception toward artificial intelligence technology, advantage of using artificial intelligence technology, economics of using artificial intelligence technology in the work, performance expectancy with using artificial intelligence technology in the work, barrier to artificial intelligence technology application in nursing care and general attitude toward using artificial intelligence technology (Abdullah& Fakiehan ,2020).

First, nurse managers' perception regarding AI are varied and can be broadly positive or negative views (De Gelder, & Solanas,2021). Second, AI technology has many benefits for nurses, including bettering patient care and increasing productivity. It can also automate repetitive administrative duties like scheduling, paperwork, and inventory control, freeing up nurses to concentrate on providing direct patient care (Khanzode& Sarode, 2020).

Third, predictive analytics powered by AI can identify patients who are at risk for complications, enabling early intervention and reducing costly

hospital readmissions (Cao, 2022). Fourth; AI can provide nurses with real-time decision support, offering evidence-based recommendations for patient care, which can lead to more accurate and effective nursing care (Figueroa-Armijos et al.,2023) Fifth; The infrastructure required to support AI technology is lacking in many healthcare facilities. Finally, overall, even if there is a lot of excitement around AI's potential advantages, this is tempered by concerns about ethical issues, job displacement, data privacy, and the requirement for legal frameworks to guarantee the equitable and open application of AI technologies (Renz & Hilbig, 2020).

Advanced technologies like artificial intelligence (AI), virtual reality, and robotics are already used on a regular basis in various enterprises. A broad range of abilities is required to meet the need for all logistic tasks in the hospital because nurse managers divide up the responsibilities among several departments and units, some of which are quite important (El Hamdi& Abouabdellah, 2022) Thus, the application of AI for the best possible administration of hospital logistics operations is essential for cutting expenses, improving treatment quality, and promptly meeting supply availability requirements (Rajpurkar et al., 2022).

Logistics is the process of making sure that the appropriate product is available for the right consumer at the right time, location, and quantity in the right condition at the right price (Khan et al., (2020). Logistics management is the process of handling the integrated management of all material and related information flow from suppliers

through the conversion of input materials up to the final customer (Issitt et al., 2022).

A successful relief effort in hospitals depends on effective logistics, which manages the flow of supplies, information, and services to meet the patients' immediate requirements (Dembrower et al.2020). The use of AI is essential to manage logistics tasks in a hospital as efficiently as possible to lower expenses, improve care quality, and meet supply-related demands on time while avoiding shortages that cause stock ruptures. Logistic management involves seven domains: customer service, demand forecasting, communication, store, physical inventory, transport and medical waste product (Esmaeilzadeh,2020) First, customer service is a critical component of patient care, ensuring that patients and their families feel valued, respected, and supported throughout their healthcare experience (Adam et al.,2021).

Second, demand forecast in healthcare involves predicting the future demand for healthcare services, medical supplies, and other related products (Seyedan & Mafakheri, 2020). Third, communication is the process by which nurse managers exchange information using a common set of signs, symbols, or behaviors (Liu et al., 2022). Communicate health logistic involves hospital center monthly report which includes essential information related to the management of medical supplies; a stock card is a manual or electronic record-keeping tool used to track the inventory of medical supplies and requisition for medical supplies contain

the name of health commodity (Wilson et al., 2022).

Fourth; store is a room or space for the storing of medical supplies that should be clean, dry and ventilated (Grewal et al., 2020) Fifth; physical inventory refers to the process of manually counting and recording all items in a store to verify the actual inventory levels (Hashmi et al., 2021) Sixth; Transport is the movement of people or materials from one location to another. Finally, in healthcare logistics management, this includes moving medical supplies, patients, labs, and medical waste products from one department to another (Liew et al., 2020).

Nurse managers have an important role in the good management of healthcare organization by overseeing the nursing staff, managing budgets, ensuring compliance with healthcare regulations, implementing policies and procedures, and improving the quality of patient care. (Warshawsky & Cramer, 2019)

### Significance of the study

Artificial intelligence has a transformative impact on healthcare services, especially logistics services, as it has proven its effective role in creating a qualitative shift in supply chain management, warehousing and transportation, demand forecasting, customer service, and inventory management. AI is a valuable technology that can be relied upon in the logistics sector to enhance decision-making, enhance adaptability, reduce costs and increase company competitiveness (Dossou et al.,2021).

From the researcher's perspective, many healthcare organizations especially Tanta University Hospitals are slow to adopt AI technologies into

their supply chain, and even those that invest in this technology are not leveraging its full power (**Boute & Udenio, 2022**). Thus, assessing nurse managers' perception toward healthcare logistics and artificial intelligence is crucial for nursing practice because it can encourage them to adopt these technologies and help them prepare for future challenges.

### **Aim of the study**

Assess nurse managers' perception regarding artificial intelligence and health logistic management.

### **Research Questions**

1. What are the levels of nurse managers' perception regarding artificial intelligence and health logistic management?
2. What is the relation between nurse managers' perception of artificial intelligence and health logistic management?

### **Research design:**

A descriptive-correlational research design was used in the present study.

### **Study setting:**

This study was conducted at Tanta University Hospitals which is affiliated to the Ministry of Higher Education and Scientific research. Tanta University Hospitals is a landmark in the medical world in the middle of the delta including Pediatric Hospital, Medical Hospital, Psychiatric Hospital, The New Surgical Hospital, Tanta International Educational Hospital, Emergency Hospital, Ophthalmology Hospital, Student Hospital and the Tanta University Main Hospital (Gynecology and Obstetrics, Cardiac, Neurology, Tropical, Blood bank, Central Laboratory and Oncology departments).

### **Subjects:**

The subjects of the study included all (n=280) nurse managers, who are working in the previously mentioned setting and are available at the time of data collection.

### **Tools of data collection:**

To achieve the aim of study, the following two tools were used.

### **Tool I: Nurse Managers' Perception about Artificial Intelligence Structured Questionnaire**

This tool was developed by researcher based on **Oh et al., (2019)** and related literature (**Abdullah & Fakiehan, 2020; Schepman & Rodway, 2023**), it was used to assess nurse manager' perception about artificial intelligence. It consisted of two parts as follows:

**Part 1:** Personal data of nurse managers included age, gender, marital status, hospital name, position, educational level, years of experience, training program about artificial intelligence and logistics management.

**Part 2:** Nurse Managers' Perception of Artificial Intelligence Questionnaire: it consisted of 38 items categorized into six subscale distributed as the following:

- **Perception toward AI technology:** included 9 items (No 1-9).
- **Advantages of using AI technology:** included 8 items (No 10-17).
- **Economic expectation of using AI technology in the work:** included 3 items (No18-20).
- **Performance expectancy with using AI technology in the work:** included 5 items (No 21-25).
- **Barrier to AI technology application in nursing care:** included 6 items (No 26-31).

- **General attitude toward using AI technology:** included 7 items (No 32-38).

**Scoring system:**

Nurse managers' responses were measured on a 5 points Likert Scale ranging from 5 to 1 where; strongly agree (5), agree (4), neutral (3), disagree (2), and strongly disagree (1). The strongly disagree response was added to disagree and strongly agree was added to agree response. The total scores were calculated by summing the scores of all categories, then classified according to statistical cut-off point for:

- High level of artificial intelligence perception >75% (equal 142)
- Moderate level of artificial intelligence perception 60%-75% (equal 23-143)
- Low level of artificial intelligence perception <60% (equal 22)

**Tool II: Nurse Managers' Perception Regarding Health Logistic Management Structured Questionnaire.**

This tool was developed by **Dobrzańska et al., (2013)** and was modified by the researcher based on related literature (**Kazakov et al., 2023** and **Zhu et al., 2021**). It was used to assess nurse managers' perception regarding health logistic management. It consisted of 47 items categorized into seven subscales as follow:

- **Customer service:** included 4 items (No 1-4).
- **Demand forecasting:** included 4 items (No 5-8).
- **Communication** is divided into three categories.
- **Hospital center monthly report LMIS:** included 3 items (No 9-11).
- **Department stock card:** included 4 items (No 12-15).

- **Requisition for medical supplies:** included 2 items (No 16-17).

- **Store:** included 10 items (No 18-27).

- **Physical inventory:** included 3 items (No 28-30).

- **Transport** divided into three categories;

- **Transport medical supply:** included 5 items (No 31-35).

- **Transport patient from department to another department:** included 4 items (No 36-39).

- **Transport laboratory:** included 2 items (No 40-41).

- **Medical waste product:** included 6 items (No 42-47).

**Scoring system:**

Nurse managers' responses were measured on a 5-points Likert Scale ranging from 5 to 1 where; strongly agree (5), agree (4), neutral (3), disagree (2), and strongly disagree (1). The strongly disagree response was added to disagree and strongly agree was added to agree response. The total scores were calculated by summing the scores of all categories, then classified according to statistical cut-off point for:

- High level of health logistic management perception >75% (equal 175)

- Moderate level of health logistic management perception 60%-75% (equal 28-176)

- Low level of health logistic management perception <60%. (equal 27)

**Method**

1. An official permission was obtained from the Dean of Faculty of Nursing to the authoritative personnel that submitted to the previously mentioned setting.

2. The purpose of the study was explained and made clear to the directors of hospitals and the managers of each unit to gain their cooperation.
3. **Ethical considerations:**
  - Approval was obtained from the Scientific Research Ethics Committee before conducting the study with code number 324-11-2023.
  - The nature of the study was not causing harm to the entire sample.
  - Informed consent was obtained from the study's participants after explanation of the study's aim.
  - Confidentiality and anonymity were maintained regarding data collection and the participants have the right to withdrawal.
4. Tools were translated from English to Arabic to ensure that they are comprehensible and culturally relevant for the participant. This translation process followed a standard translation and the back -translation procedure:
  - **Initial Translation:** The tools were translated into Arabic by a qualified translator fluent in both English and Arabic and familiar with the cultural nuances of both languages.
  - **Back-Translation:** A different translator, who was not involved in the initial translation and is also fluent in both languages, was independently translating the Arabic version back into English. This step helped to check for consistency and accuracy in the translation.
  - **Comparison and revision:** The original English version and the back-translated English version were compared. Any discrepancies were discussed and resolved by a panel of experts including translator and researchers, to finalize the Arabic version of the tools.
5. Tools (I, II) presented to jury of five experts in the area of specialty to check their content validity and the clarity of the questionnaire. The experts were two professors, and three assistant professors of nursing administration from the faculty of nursing, at Tanta University. The experts' responses were represented in four points rating scale ranging from (1-4) when (1) not relevant, (2) little relevant, (3) relevant, and (4) strongly relevant. Necessary modifications were made including clarification, omission of certain items and adding others and simplifying work related words.
- The face validity value of tool (I) nurse managers' perception about artificial intelligence structured questionnaire was 97.3% & tool (II) nurse managers' perception regarding health logistic management structured questionnaire was 98.8%.
6. A pilot study was carried out on a sample (10%) of the subject (n=28), and they were included into the main study sample during the actual collection of data. The pilot study was done to test clarity, sequence of items, applicability, and relevance of the questions, minor modifications were done. The pilot study was done also to determine the needed time to complete the questionnaire.
- The estimated time needed to complete the questionnaire items from nursing manager was 20 – 30 minutes for each sheet.
7. Reliability of tools was tested using Cronbach's Alpha Coefficient test. Reliability of tool (I) nurse managers' perception about artificial intelligence structured questionnaire= 0.892 and reliability of tool (II) nurse managers' perception regarding health logistic

management structured questionnaire = 0.958.

8. **Data collection phase:** the data were collected from nurse managers by the researcher. The researcher met the respondents' nurse manager individually in different areas under study during working hours to distribute the questionnaire. The subjects recorded the answer in the presence of the researcher to ascertain that all questions were answered.
9. The data was collected over a period of six months started from the beginning of March 2024 until the end of August 2024.

#### **Statistical analysis:**

The statistical analysis of the data was performed using IBM SPSS software version 20.0 (Armonk, NY: IBM Corp, released 2011). Categorical data were summarized as numbers and percentages. For continuous data, normality was assessed using the Kolmogorov-Smirnov test. Quantitative data were described using range (minimum and maximum), mean, standard deviation and median. The significance of the obtained results was judged at the 5% level. The used tests were student t-test for normally distributed quantitative variables to compare between two studied categories, F-test (ANOVA) For normally distributed quantitative variables to compare between more than two categories and Pearson coefficient to correlate between two normally distributed quantitative variables.

#### **Results**

**Table (1)** shows distribution of nurse managers according their personal data. It was observed that, nurse managers' age ranged between 25 – 50 years with

mean age  $31.04+4.87$ , more than half (59.6%) of them fall in the age group from 25 to  $<30$  years and the majority (87.9%) of them were female. The most (95.7%) of nurse managers were married and more than one-quarter (26.1%) of them were worked at Tanta University Main Hospital. As regards position, more than three-quarters (78.6%) of nurse managers were charge nurse. Regarding educational level, the majority (84.6%) of nurse managers had bachelor in nursing science. Also, as noticed, nurse managers' year of experience ranged between 3-25 years with mean  $8.25+4.77$  and the majority (80.7%) of them fall in the group of years of experience from 5 to  $<10$ . As well as, all (100%) of nurse managers did not attend the training program about health logistic management or artificial intelligence.

**Table (2)** displays mean scores, standard deviation, and ranking of nurse managers' perception about artificial intelligence dimensions. As noticed, general attitude toward using artificial intelligence technology was ranked as the highest dimension of nurse managers' perception about artificial intelligence. While, perception toward artificial intelligence technology was ranked as the lowest dimension.

**Table (3):** Displays mean scores, standard deviation, and ranking of nurse managers' perception regarding health logistic management dimensions. As noticed, customer service was ranked as the highest dimension of nurse managers' perception regarding health logistic management. While, physical inventory was ranked as the lowest dimension.

**Figure (1)** denotes that, more than two-thirds (66.8%) of nurse managers had a low perception level regarding to overall perception about artificial intelligence. While, none of them had a high perception level regarding perception about artificial intelligence.

**Figure (2)** denotes that more than three-quarters (79.6%) of nurse managers had a moderate perception level regarding to perception about health logistic management. While, none of nurse managers had a high perception level regarding to perception about health logistic management.

**Figure (3):** Illustrates a positive statistically significant correlation was found among nurse managers' overall perception of artificial intelligence and health logistic management ( $r = 0.133$ ) at ( $p=0.026^*$ ).

**Table (4)** presents relations between nurse managers' perception about artificial intelligence and their personal data. There was no significant difference between nurse managers' perception about artificial intelligence and their personal data except educational level where  $p \leq 0.05$ .

**Table (5)** portrays the relation between nurse managers' perception about health logistic management and their personal data. It indicated that there was no significant difference between nurse managers' perception about health logistic management and their personal data except hospital name where  $p \leq 0.05$ .

**Table (1): Distribution of nurse managers according to their personal data (n = 280)**

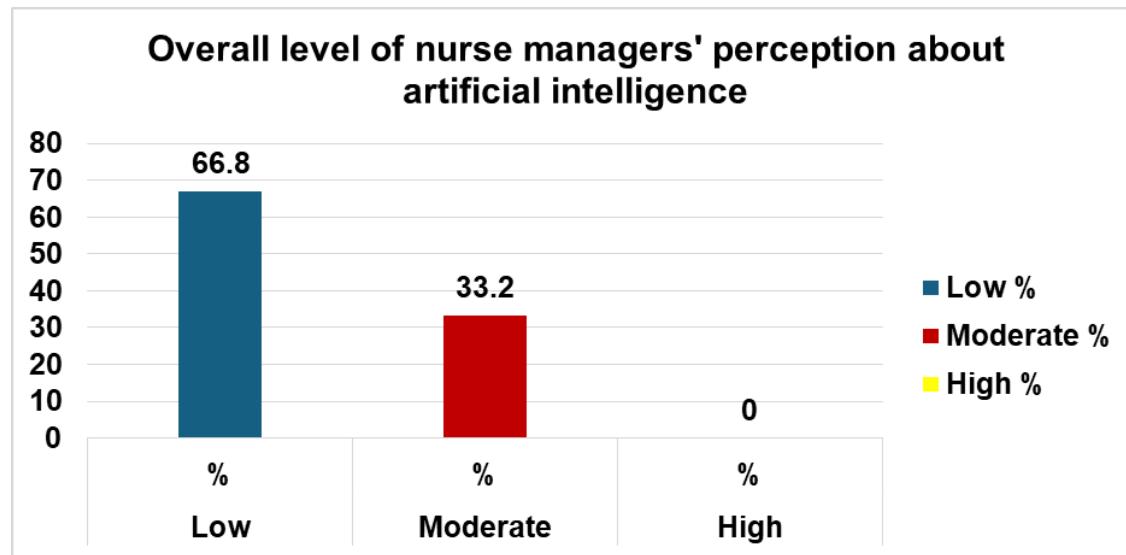
<b>Personal data</b>	<b>No.</b>	<b>%</b>
<b>Age (years)</b>		
25 – 30	167	59.6
31 – 40	90	32.1
41 – 50	23	8.2
Min. – Max.		25.0 – 48.0
Mean $\pm$ SD.		31.04 $\pm$ 4.87
<b>Gender</b>		
Male	34	12.1
Female	246	87.9
<b>Marital status</b>		
Married	268	95.7
Not married	12	4.3
<b>Hospital name</b>		
Emergency	42	15.0
Medical	20	7.1
Pediatric	21	7.5
Psychiatric	30	10.7
Student	17	6.1
Surgical	37	13.2
Tanta international educational	40	14.3
Tanta university main	73	26.1
<b>Position</b>		
Nurse manager	6	2.1
Supervisor	36	12.9
Head nurse	18	6.4
Charge nurse	220	78.6
<b>Educational level</b>		
Technical nursing institute diploma	23	8.2
Bachelor in nursing science	237	84.6
Other post graduate studies	20	7.1
<b>Years of experience in nursing</b>		
5 – <10	226	80.7
10 – <15	25	8.9
15 – <20	12	4.3
$\geq$ 20	17	6.1
Min. – Max.		3.0 – 25.0
Mean $\pm$ SD.		8.25 $\pm$ 4.77
<b>Attendance training program about health logistic management or artificial intelligence</b>		
No	280	100.0

**Table (2): Mean scores, standard deviation, and ranking of nurse managers' perception about artificial intelligence dimensions (n = 280)**

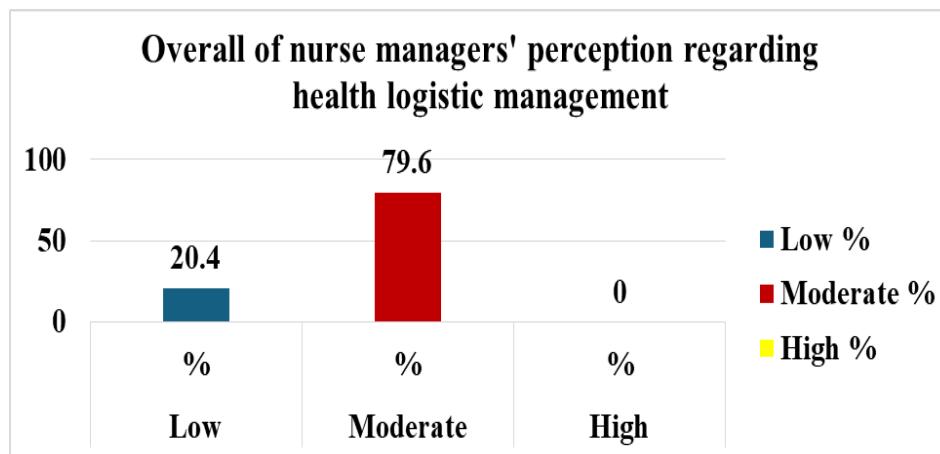
Nurse managers' perception about artificial Intelligence	No of item	Score range	Total score			Average score (1 – 5)	Ranking
			Min. – Max.	Mean $\pm$ SD.	Median		
-Perception toward artificial intelligence technology	9	(9 – 45)	18.0 – 39.0	26.94 $\pm$ 4.25	27.0	2.99 $\pm$ 0.47	6
-Advantages of using artificial intelligence technology	8	(8 – 40)	21.0 – 32.0	28.30 $\pm$ 3.09	29.0	3.54 $\pm$ 0.39	2
-Economic expectation of using artificial-intelligence technology in the work	3	(3 – 15)	6.0 – 12.0	9.54 $\pm$ 1.82	9.0	3.18 $\pm$ 0.61	4
-Performance expectancy with using artificial intelligence technology in the work	5	(5 – 25)	6.0 – 20.0	13.67 $\pm$ 4.21	13.0	3.33 $\pm$ 0.54	3
-Barrier to artificial intelligence technology application in nursing care	6	(6 – 30)	12.0 – 24.0	19.04 $\pm$ 3.23	19.0	3.17 $\pm$ 0.54	5
-General attitude toward using artificial intelligence technology	7	(7 – 35)	15.0 – 31.0	25.03 $\pm$ 2.89	25.0	3.58 $\pm$ 0.41	1
<b>Overall</b>	<b>38</b>	(38 – 190)	101.0 – 148.0	125.6 $\pm$ 8.18	126.0	3.30 $\pm$ 0.22	-

**Table (3): Mean scores, standard deviation, and ranking of nurse managers' perception regarding health logistic management dimensions (n = 280)**

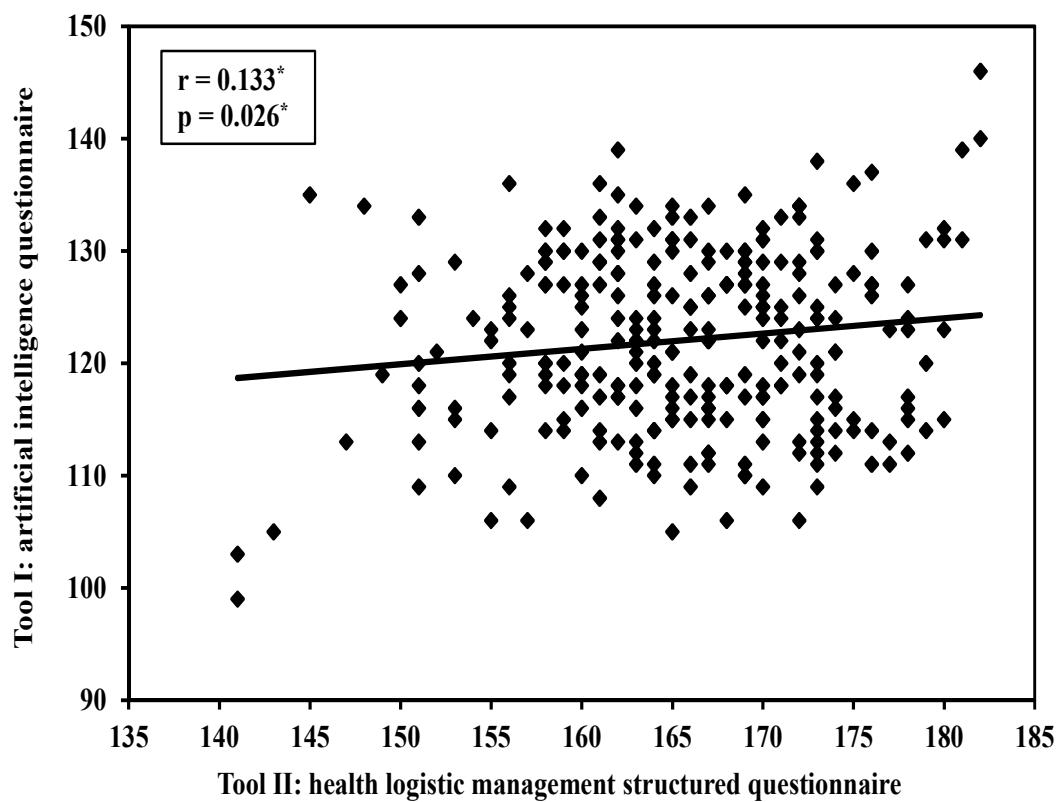
Nurse managers' perception regarding health logistic management	No of item	Score Range	Total score			Average Score (1 – 5)	Ranking
			Min. – Max.	Mean $\pm$ SD.	Median		
-Customer service	4	(4 – 20)	8.0 – 20.0	15.74 $\pm$ 2.36	16.0	3 $\pm$ 0.59	1
-Demand forecasting	4	(4 – 20)	10.0 – 19.0	14.10 $\pm$ 2.39	14.0	3 $\pm$ 0.60	3
-Communication	9	(9 – 45)	20.0 – 39.0	31.15 $\pm$ 3.85	32.0	3.46 $\pm$ 0.43	4
Hospital center monthly report regarding LMIS	3	(3 – 15)	6.0 – 12.0	9.34 $\pm$ 1.87	9.0	3.11 $\pm$ 0.62	-
Department stock card	4	(4 – 20)	8.0 – 19.0	14.31 $\pm$ 2.04	15.0	3.58 $\pm$ 0.51	-
Requisition for medical supplies	2	(2 – 10)	4.0 – 10.0	7.50 $\pm$ 1.37	8.0	5 $\pm$ 0.68	-
-Store	10	(10 – 50)	20.0 – 40.0	33.70 $\pm$ 4.34	34.0	7 $\pm$ 0.43	5
-Physical inventory	3	(3 – 15)	6.0 – 11.0	10.01 $\pm$ 1.29	10.0	4 $\pm$ 0.43	7
-Transport	11	(11 – 55)	30.0 – 52.0	40.71 $\pm$ 3.19	40.50	3.70 $\pm$ 0.29	2
Medical supply	5	(5 – 25)	11.0 – 22.0	16.98 $\pm$ 2.34	17.0	3.40 $\pm$ 0.47	-
Patient from department to another department	4	(4 – 20)	10.0 – 20.0	15.52 $\pm$ 1.67	16.0	3.88 $\pm$ 0.42	-
Laboratory	2	(2 – 10)	6.0 – 10.0	8.21 $\pm$ 1.12	8.0	1 $\pm$ 0.56	-
-Medical waste product	6	(6 – 30)	14.0 – 25.0	20.19 $\pm$ 2.16	20.0	3.36 $\pm$ 0.36	6
<b>Overall</b>	<b>47</b>	(47- 235)	141.0 – 182.0	165.6 $\pm$ 7.84	166.0	3.52 $\pm$ 0.17	-



**Figure (1)** Levels of nurse managers' overall perception about artificial intelligence dimension (N = 280)



**Figure (2)** Levels of nurse managers' overall perception about health logistic management.



**Figure (3): Correlation between nurse managers' overall perception of artificial intelligence and overall health logistic management (n=280)**

**Table (4) Relation between nurse managers' perception about artificial intelligence and their personal data (n=280)**

<b>Personal data</b>	<b>N</b>	<b>Total score for nurse managers' perception regarding artificial intelligence</b>	<b>Test of Sig.</b>	<b>p</b>
		<b>Mean <math>\pm</math> SD.</b>		
<b>Gender</b>				
Male	<b>34</b>	124.3 $\pm$ 8.52		
Female	<b>246</b>	125.7 $\pm$ 8.14	t=0.991	0.323
<b>Age (years)</b>				
25 – 30	<b>167</b>	125.8 $\pm$ 7.54		
31 – 40	<b>90</b>	125.2 $\pm$ 8.85	F= 0.187	0.830
41 – 50	<b>23</b>	125.2 $\pm$ 10.12		
<b>Marital status</b>				
Married	<b>268</b>	125.6 $\pm$ 8.20		
Not married	<b>12</b>	124.9 $\pm$ 8.11	t= 0.281	0.779
<b>Hospital name</b>				
Emergency	<b>42</b>	126.6 $\pm$ 8.38		
Medical	<b>20</b>	127.6 $\pm$ 8.36		
Pediatric	<b>21</b>	126.7 $\pm$ 10.37		
Psychiatric	<b>30</b>	125.4 $\pm$ 7.80	F= 1.985	0.057
Student	<b>17</b>	127.8 $\pm$ 8.21		
Surgical	<b>37</b>	126.4 $\pm$ 7.85		
Tanta international educational	<b>40</b>	121.5 $\pm$ 8.50		
Tanta main university	<b>73</b>	125.5 $\pm$ 7.01		
<b>Position</b>				
Nurse manager	<b>6</b>	125.7 $\pm$ 7.03		
Supervisor	<b>36</b>	122.3 $\pm$ 8.87	F= 2.221	0.086
Head nurse	<b>18</b>	125.4 $\pm$ 9.65		
Charge nurse	<b>220</b>	126.1 $\pm$ 7.90		
<b>Educational level</b>				
Technical nursing institute diploma	<b>23</b>	122.0 $\pm$ 10.29	F= 3.749*	0.025*
Bachelor in nursing science	<b>237</b>	125.6 $\pm$ 7.98		
Other post graduate studies	<b>20</b>	128.8 $\pm$ 7.26		
<b>Years of experience in nursing</b>				
5 – <10	<b>226</b>	125.8 $\pm$ 7.79	F= 0.871	0.457
10 – <15	<b>25</b>	123.7 $\pm$ 9.95		
15 – <20	<b>12</b>	127.7 $\pm$ 8.38		
$\geq$ 20	<b>17</b>	124.4 $\pm$ 10.29		
Attendance training program about health logistic management or artificial intelligence				
No	<b>280</b>	125.6 $\pm$ 8.18	–	–

**Table (5): Relation between nurse managers' perception about health logistic management and their personal data (n=280)**

Personal data	N	Total score for nurse managers' perception regarding health logistic management	Test of Sig.	P
		Mean $\pm$ SD.		
<b>Gender</b>				
Male	34	166.24 $\pm$ 6.14	t= 0.504	0.615
Female	246	165.51 $\pm$ 8.05		
<b>Age (years)</b>				
25 – 30	167	166.08 $\pm$ 8.01	F= 0.829	0.437
31 – 40	90	164.78 $\pm$ 7.73		
41 – 50	23	165.30 $\pm$ 6.98		
<b>Marital status</b>				
Married	268	165.54 $\pm$ 7.84	t= 0.594	0.553
Not married	12	166.92 $\pm$ 8.01		
<b>Position</b>				
Nurse manager	6	161.0 $\pm$ 6.78	F= 1.564	0.198
Supervisor	36	165.17 $\pm$ 9.54		
Head nurse	18	163.06 $\pm$ 5.56		
Charge nurse	220	166.0 $\pm$ 7.68		
<b>Hospital name</b>				
Emergency	42	163.93 $\pm$ 7.80	F= 2.258*	0.030*
Medical	20	165.55 $\pm$ 7.27		
Pediatric	21	161.81 $\pm$ 10.84		
Psychiatric	30	168.97 $\pm$ 5.76		
Student	17	163.35 $\pm$ 5.79		
Surgical	37	165.86 $\pm$ 7.16		
Tanta international educational	40	165.50 $\pm$ 9.25		
Tanta main university	73	166.73 $\pm$ 7.12		
<b>Educational level</b>				
Technical nursing institute diploma	23	166.52 $\pm$ 8.01	F= 1.003	0.368
Bachelor in nursing science	237	165.70 $\pm$ 7.73		
Other post graduate studies	20	163.35 $\pm$ 8.89		
<b>Years of experience in nursing</b>				
5 – <10	226	165.87 $\pm$ 7.83	F= 1.537	0.205
10 – <15	25	162.72 $\pm$ 8.41		
15 – <20	12	167.58 $\pm$ 7.13		
$\geq$ 20	17	164.82 $\pm$ 7.12		
<b>Attendance training program about health logistic management or artificial intelligence</b>				
No	280	165.6 $\pm$ 7.84	–	–

## Discussion

Artificial intelligence encompasses a wide range of healthcare technologies that enhance patient care and change nurses' jobs. Nursing and AI technology are starting to collaborate to efficiently synthesize information, complete tasks, support decision making, and improve patient outcomes. On their own, each of these emerging technologies has enormous potential to improve healthcare. The integration of these methods and teaching nurses how to use technology effectively will impact health logistics management and create countless prospects for future advancements in healthcare, productivity, capacity, and quality. **Ronquillo et al., (2021).**

According to the current study, more than two-thirds of nurse managers had a low perception level regarding to overall perception about artificial intelligence with the lowest ranking among all dimensions. From the viewpoint of the researcher, this result might be explained by that all nurse managers not previously attend training program about artificial intelligence as evidenced in table (1) and specified that the nursing curriculum were not include the fundamentals of AI. Along with the present study findings is **Lai, et al. (2020)**, who confirmed a general deficit of perception in the participants of AI and **Swan, (2021)**, found that most nurses were either ignorant of or did not understand the use of AI in clinical practice.

According to the study's findings, more than three-quarters of nurse

managers had a moderate perception level regarding overall perception about health logistic management. Additionally, customer service was ranked as the highest dimension of nurse managers' perception regarding health logistic management. While physical inventory was ranked as the lowest dimension. These findings may be explained by nurse managers' unawareness of the importance of health logistics, which is a key component of a successful relief effort that focuses on efficiently managing the flow of supplies, information, and services to meet the vital needs of the impacted patient in an emergency. The current study's finding conflicted with **Ebrahim& Shokier, (2020)** who indicated that the majority of nursing leaders at Health Insurance Hospital had higher level of perception regarding health logistics management.

### Correlation between nurse manager' perception of artificial intelligence and health logistic management

The current study's results displayed a positive statistically significant correlation was found among nurse managers' overall perception of artificial intelligence and health logistic management. This study result may be interpreted by association between AI and healthcare logistics is strong and multifaceted, with AI technologies significantly improving several aspects of healthcare logistics management as the AI contributes to the efficacy, accuracy, and efficiency of healthcare logistics. On agreement

with this finding is **Aydan, (2019)** who evident that there was a significant correlation between the use of AI technology and everyday tasks of logistics, supply chain and transportation.

Also, **Reuter-Oppermann& Kühl, (2021)** demonstrated that addressing healthcare logistics issues with artificial intelligence, and particularly machine learning techniques, is a promising strategy. While, **Islam, (2024)** concluded his study but does not mention a significant correlation between AI and logistics. Instead, it emphasized AI impact on operational efficiency and highlighting its importance in logistics.

#### **Relation between nurse managers' perception about artificial intelligence and personal data**

The data analysis of the present study clarifies that there was no significant difference between nurse manager' perception about artificial intelligence and their personal data except educational level. These mean that nurse manager with high educational level had the highest mean scores of AI perception. This result may be related to education was the most important environmental stimuli that affect the way the person think and his impression about anything. The study's result of **Elsayed and Sleem, (2021)**, who asserted that there is a significant positive relation between education of nurse managers' demographic characteristics and their perception toward using AI.

Also, **Ahmed AbdelhakamAhmed et al., (2024)** reported that there

were statistically significant differences between nurses' levels of perception toward artificial intelligence in health care setting and educational level. On the other side, **Abdullah, (2020)** reported that no significant differences in employees' perception of AI and educational level. Moreover, **Sabra et al. (2023)**, demonstrate that no significant difference is found between nurses' perception toward AI and their qualifications.

#### **Relation between nurse managers' perception about impact of health logistic management and personal data**

The present study's findings showed that there was no significant difference between nurse managers' perception about health logistic management and their personal data except hospital name, this finding is evidenced by nurse manager from psychiatric hospital had the highest mean scores of health logistic management perception. This result may be due to Psychiatric hospital logistics encompass a variety of tasks that are essential to the delivery of patient services. This finding matches with **Ebrahim & Shokier, (2020)** who indicated that there was an extremely statistically significant differences between total health logistic management perception and three study settings.

#### **Conclusion**

Based on the findings of the present study it was concluded that more than two-thirds (66.8%) of nurse managers had a low perception level about artificial intelligence.

Moreover, general attitude toward

using artificial intelligence technology was ranked as the highest dimension of nurse managers' perception about artificial intelligence. While, perception toward artificial intelligence technology was ranked as the lowest dimension.

Also, more than three-quarters (79.6%) of nurse managers had a moderate perception level about health logistic management. Additionally, customer service was ranked as the highest dimension of nurse managers' perception regarding health logistic management. While, physical inventory was ranked as the lowest dimension. In addition to, there was a positive statistically significant correlation found among nurse managers' overall perception of artificial intelligence and health logistic management.

### **Recommendations**

#### **For hospital administrator**

- Enhance the readiness of the hospital for AI through good technological infrastructure and budget.
- Develop a strong strategy for hospitals to use AI technology.
- Encourage nurse managers to increase their knowledge and perception toward AI and health logistic management through training programs and providing further education to enable them to integrate them into their practices.
- Develop policy for secure data storage and uses.
- Develop climate that supports innovation regarding AI applications.

#### **For nurse managers**

- Address concerns or discomfort associated with AI to encourage its broader adoption across various fields in nursing.
- Provide needed resources to apply AI technology in the health field.
- Provide proper training to nurse managers, transparent communication about AI's capabilities and limitations, and stringent ethical guidelines will be crucial in optimizing the integration of AI into nursing practice.
- Regular guidance on the importance of good customer service and hospital policy regarding store and transportation of patient and medical supply.
- Developing cooperation between staff for transporting medical supplies.

#### **Nursing faculties:**

- Introduce fundamentals of AI and health logistic management into nursing curricula.
- Ensure collaboration between educators and nursing professionals to integrate AI competencies into nursing curricula and professional development programs.

#### **For further research:**

- Assess the AI impact on the patient-nurse relationship.
- Examine ethical and legal guidelines used by nurses for implementation of AI in nursing practice that affect patients care.
- Identify barriers affecting utilization of artificial intelligence and health logistic management in health care settings.

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## **Effect of Comprehensive Nursing Intervention on Patient's Knowledge, Anxiety and Self-care Practice following Vitrectomy for Diabetic Retinopathy**

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### **Abstract**

**Background:** Diabetic retinopathy is a major health problem that is consider the first cause of blindness worldwide. Nurses play a crucial role in managing patients undergoing vitrectomy for diabetic retinopathy. Vitrectomy which plays a vital role in the treatment of severe complications of diabetic retinopathy. **Aim:** This study was conducted to evaluate the effect of comprehensive nursing intervention on patient' knowledge, anxiety and self-care practice following vitrectomy for diabetic retinopathy. **Design:** Quasi-experimental design was applied in this study. **Subject:** purposive sample of 60 adult patients, they were distributed equally to control and study groups (30 for each). **Setting:** Data were collected from the Ophthalmology Diagnostic Laser Unit at El Kaser Al Ani hospital, affiliated to Cairo University, Cairo, Egypt. **Tools:** Data were collected through four tools. Tool(1) Structured Interview questionnaire; Tool(2) Patient's Knowledge Assessment Questionnaire; Tool(3) self-care compliance scale; and Tool(4) Hamilton Anxiety Rating Scale (HAM-A) **Result:** there is an improvement of patients' level of knowledge, level of anxiety post comprehensive nursing intervention program. While there is a highly statistically significant improvement of patients regarding self-care practice ( $P>0.001$ ) post comprehensive nursing intervention program for diabetic retinopathy patients following vitrectomy. **Conclusion:** The finding of the study concluded that, diabetic retinopathy patients following vitrectomy who receive comprehensive nursing intervention improve their knowledge, self-care practices and decrease level of anxiety. **Recommendation:** Comprehensive nursing intervention for diabetic retinopathy patients following vitrectomy is essential.

**Key words:** comprehensive nursing intervention, Diabetic retinopathy, self-care vitrectomy, practice

**Introduction:**

Diabetic retinopathy (DR) is a group of fundus disorders caused by long-term, progressive diabetes that are distinguished by retinal microvascular leakage and obstruction. It is a serious microvascular consequence of diabetes that can have a big effect on a patient's vision. It can potentially cause blindness if treatment is not received, which would significantly obstacles patient is performing daily life activities (**Wufuer, et al., 2024 and Galiero, et al., 2023**). Researches emphasis that 422 million people with diabetes globally reside in low- and middle-income nations, and the disease is directly responsible for 1.5 million each year (**WHO, 2023**).

According to the latest data, 463 million adults currently have diabetes internationally, with China ranking first. Approximately 60% of diabetics will develop DR. Diabetic retinopathy (DR) is one of the major microvascular complications among diabetics and the (DR) is one of the common visually impairing complications (**Zhang, et al., 2023**).

One of the main complications of diabetes that can lead to blindness is diabetic retinopathy. In order to treat DR effectively, systemic management of blood pressure, cholesterol, and hyperglycemia is necessary in addition to local treatments like vitrectomy. Damage to the retina's blood vessels occurs in DR, and when the condition worsens, vitrectomy is frequently required as a surgical procedure. The light-sensing tissue in the rear of the eye

is called the retina. What fills the center of the eye is a clear, jelly-like fluid called vitreous. (**Zou, et al., 2022 and Park, et al., 2021, Lim, 2019**)

Numerous disorders, including proliferative diabetic retinopathy, proliferative retinopathy after vascular occlusion and vasculitis, trauma, retinal breaks, and posterior vitreous detachment without retinal break, are linked to vitreous hemorrhage. Numerous factors, such as the rupture of aberrant or normal arteries or the extension of blood from a nearby source, can result in vitreous hemorrhage (**Shaikh, et al., 2023**).

When it comes to treating serious DR problems, vitrectomy is essential. Vitrectomy is used to control the formation of scar tissue that may impair vision and to remove blood from the retinal blood vessels that have bled from the vitreous gel inside the eye. Putting up with improved retinal therapy and vision (**Johns Hopkins Medicine, 2024 and Elsevier patient education, 2024**). Vitreal hemorrhage, retinal detachment, increased intraocular pressure (IOP), infection and inflammation, neovascular glaucoma, and double vision are among the most frequent side effects (**Belin, and Parke 2020**). For patients following vitrectomy surgery, comprehensive nurse intervention is essential to ensuring the best possible recovery and addressing any potential problems. These are the main elements of nursing care before, during, and after surgery. Comprehensive patient education about vitrectomy, including its goal, risk factors, and the significance of adhering

to postoperative instructions, should be given by the preoperative nurse. The nurse should also perform a preoperative evaluation, which should include a review of the patient's medical history, current medications, and any allergies. This aids in creating a nursing care plan based on the requirements of the patient. Additionally, the nurse produces a preoperative instruction package that includes nutritional guidelines, small meals, and self-care practices before to hospitalization (**NHS, 2024**).

The nurse helps during the intraoperative period by setting up equipment, keeping an eye on vital signs, and maintaining a clean environment. Additionally, the nurse provides reassurance and emotional support to those who are experiencing anxiety. The nurse checks vital signs and examines the eye for any indications of complications, such as increased redness, swelling, or discharge, during the post-operative phase. The nurses also give out painkillers and medications. Put an eye patch on. Instruct the patient to maintain head position if a gas bubble is used during surgery to ensure appropriate recovery (**Johns Hopkins Medicine, 2024**).

Establishing a positive nurse-patient connection initially, offering an efficient, all-encompassing nursing intervention, and creating an educational program on the self-care practices of patients with DR after vitrectomy are all ways that nurses can encourage patients to share in their self-

care practices. Increased illness information, help people understand appropriate self-care techniques, better adherence to recommended therapy, strict blood glucose control, and reduced anxiety are all part of the educational program. To motivate individuals who are at risk to seek prompt and appropriate care, appropriate health education is essential. Additionally, this will need creating instructional resources that are clear, concise, and culturally relevant in light of the community's current knowledge, attitudes, and behaviors.

**(Khalaf, 2019, and Wufuer, et al., 2024).**

### **Significance of the study:**

According to these statistics, diabetes mellitus is a serious worldwide health issue that requires immediate attention (**Zhang, et al., 2023**). As a result, DR, a microvascular consequence of diabetes, is becoming more common in Egyptians. According to researches 2014 assessment, 5% of diabetic individuals are legally blind, while 42% of them have retinopathy (**Elmassry, et al., 2023**).

In Egypt, the prevalence of retinopathy caused by chronic diabetic complications increased from 8.1% to 41.5%. One significant public health issue that has a detrimental impact on patients' quality of life is visual impairment brought on by DR. Most diabetes people who lose their vision do so because they are unaware of their condition rather than because they are unable to treat it (**Safaan, et al., 2023**). 83% of patients with diabetic

retinopathy and 78% of patients with vision-threatening disease did not know they had the condition at their initial visit (**Singh, et al.,2022 and Mostafa, 2023**).

Visual impairment brought on by DR and the expenses of treating it have a significant negative impact on patients' quality of life and place a significant financial strain on society. Boundaries resulting from it can produce psychological and environmental-social problems, as well as impact several parts of the patient's life. Decreased productivity and quality of life, which, when combined with depression brought on by vision loss and stress from not being able to perform everyday tasks, lower the patient's quality of life (**Beaser, & Howson, 2018 and Saffan, el al., 2023**).

#### **Aim of the study:**

This study aims to evaluate the effect of comprehensive nursing intervention on patient' knowledge, anxiety and self-care practice following vitrectomy for diabetic retinopathy.

#### **Research hypothesis:**

$H_1$ . Patients who received the comprehensive nursing intervention exhibit improved knowledge, for vitrectomy than the patients who don't follow the comprehensive nursing intervention

$H_2$ Patients who received the comprehensive nursing intervention exhibit improved self-care practices for vitrectomy than the patients who don't follow the comprehensive nursing intervention

$H_3$ . Patients who received the comprehensive nursing intervention exhibit decrease level of anxiety post vitrectomy than the patients who don't follow the comprehensive nursing intervention

#### **Subject &Methods:**

##### **Research design:**

A quasi-experimental research design, was utilize to conduct the study. which involved the use of control and study approaches for patients.

##### **Setting:**

This study subject was recruited from Ophthalmology Diagnostic Laser Unit at Al Kaser Al Ani hospital, affiliated to Cairo University, Cairo, Egypt. The sitting composed of operating room, service of ophthalmology condition for outpatients and inpatients clinics, all of them in the in the ninth floor at emergency & surgery building.

##### **Subjects:**

The study subjects comprised a purposive sample of 60 adult patients. They were distributed equally into control and study groups (30 for each). All studied patients were selected according to the following criteria:

- Male and female adult patients ranging from 20-60 years old.
- Undergoing vitrectomy surgery pre, during, and post-surgery
- Able to communicate effectively and follow instructions.
- Patients had smart phones and was able to use WhatsApp group to follow patient and give instruction during saying at home
- Exclusion criteria were patients with serious cardiovascular or

cerebrovascular diseases, mental disturbances.

#### **Sample size calculation:**

The sample size calculation was done by subject size calculator program with confidence level at 95 %, accepted error d=error proportion (0.05) and p=probability (50%) =0.50. Population size 63, minimal sample size =50, increased to 75.

#### **Tools for data collection:**

In order to fulfill the objective of the study, four tools were used for data collection.

#### **Tool I: Structured interview questionnaire for patients with diabetic retinopathy undergoing vitrectomy.**

This tool was developed by the researchers after reviewing the related literatures, to collect baseline data. It was divided into two parts as the following:

**Part 1: Patient's socio demographic characteristics:** Including age, gender, marital status, level of education, occupation, residence, and monthly income.

#### **Part 2: Patient's medical profile:**

Including indication for surgery, previous eye surgery, affected eye, type of anesthesia, complaint of other chronic diseases.

#### **Tool II: Patient's Knowledge Assessment Questionnaire:**

This part was designed to assess patient's knowledge regarding DR, treatment methods and their advantages and disadvantages, surgery indication, complications, nursing requirements before, during and after surgery, eye

care, postural activity, and diet control. it was adapted from (**American Academy of ophthalmology, 2021**), it consisted of 30 questions. Answers were scored as the following:

Correct answer was scored =1

Incorrect answer or don't know was scored =0

#### **Scoring System:**

-The total score was evaluated as the following:

-Poor less than 50% (less than score 15)

- Fair 50-60% (score 15 - 18)

- Good more than 60% (more than score 18)

#### **Tool III: self-care compliance scale:**

**This tool was adopted from (Cho and Rho, 2012)** to assess self-care practice for patient with diabetic retinopathy patient undergoing vitrectomy. It consists 15(items) distributed in four domains. Eye drops administration (4 items), eye care (3 items), protection of operation site (6 items), and daily life activities (2 items). Each item is scored according to a 3-point Likert scale ranging from 1 (never carry out the self-care) to 3 (Always carry out the self-care).

#### **Scoring system:**

15 points with Likert scale 1-3 -with total score 45 divided as following:

- Inadequate self -compliance from (15-23)
- Adequate self-compliance from (more than 24)

#### **Tool IV: Hamilton Anxiety Rating Scale (HAM-A):**

This tool was adopted from (**Maier, et al.,1988**) to assess the severity symptoms of anxiety. The scale consists

of 14 items, each defined by a series of symptoms, and measures both psychic anxiety (mental agitation and psychological distress) and somatic anxiety (physical complaints related to anxiety).

**Scoring system:** Each item is scored on a scale of 0 (not present) to 4 (severe), with a total score range of 0–56. The result of evaluation can be interpreted as the following:

- 17 or less indicates mild anxiety
- 18-24 indicates mild to moderate anxiety
- 25–30 moderate to severe

### **Ethical considerations**

It was approved by the Research Ethics Committee at the Faculty of Nursing, Damanhour University, before the beginning of the actual work. After describing the aim, methods, and significance of the study, the hospital director official approval was approved and was obtained from the directors of ophthalmology department to get their permission to conduct the study. Furthermore, after explaining the purpose of the study to the studied patients' written & oral agreement was obtained. They received guarantees about the privacy of the information gathered. The studied patients were informed of their right to participate in the study or not, as well as their right to withdraw from it at any moment.

### **Content validity:**

A panel of five professors from Adult Health Nursing Department. Faculty of Nursing, Damanhour University and Helwan University, reviewed the tools for clarity, relevance.

Comprehensiveness, understanding and applicability.

### **Reliability:**

The reliability of the added question was assessed by using test-retest for a group of 10 patients who were asked to answer the questions and were asked to answer the same questions after two weeks. The answers in the two testing were analyzed and computed for reliability. It reaches 85% ( $r = 0.85$ ), which is considered reliable. A pilot study was performed to test the practicality and applicability of the tools and to determine any obstacles that may be encountered during the period of data collection.

### **Field of work:**

The data was collected from the beginning of October 2023 to end of March 2024 Ophthalmology Diagnostic Laser Unit at Al Kaser Al Ani hospital, affiliated to Cairo University, Cairo, Egypt. Patients were interviewed in ophthalmology department 3 days per week (Saturday, Sunday, and Monday) in the morning shift from 9 am to 2 pm. Data were collected at three time periods: day before operation, second day of operation, and after one month for follow up (during this month there is a follow up instruction through what's App).

The study was recruited through four phases, namely; assessment, planning, implementation and evaluation phase.

### **1. Assessment phase:**

Researchers conducted initial assessment through individual interview with each studied patient, to assess baseline data about sociodemographic characteristics,

medical profile, patient's level of knowledge, self-care practices and level of anxiety symptoms, using tool I, II, III, and IV. A simple introduction about the aim and duration of the study was done; it took between 20 and 30 minutes.

## **2. Planning phase:**

According to the data collected from the initial assessment phase, the planning of comprehensive nursing intervention was developed for patients by the researchers to determine the objective of the study

An Arabic leaflet for diabetic retinopathy patients undergoing vitrectomy, regarding self-care practice and needed information about vitrectomy surgery procedure pre, during, and post operative care including indication for surgery, postoperative position, eye care, use of eye drops, post operative self-care regimen developed by researchers based on studied patients' needs identified during the assessment phase. The researches interview with patient 3 sessions(day of surgery, second day of surgery and after one month for follow up) . Each session takes 10-15 minutes. Number of patients in each session about 2-3 patient according to schedule of surgery.

## **3. Implementation phase:**

Comprehensive nursing intervention was given in simplified Arabic language, in 2 theoretical part of vitrectomy as (definition of vitrectomy surgery, causes, indication, nursing care, and discharge instructions), and 2 practical sessions related to vitrectomy

surgery (application of eye care, eye drops, and eye ointment).

The teaching session was given preoperatively using demon-strations and redemonstration.

Each session lasted from 10 to 15 minutes. Each session began with a review of the previous session and the objectives of the present one.

Comprehensive nursing intervention was given for the study group only, the control group was given the hospital routine care.

**4. Evaluation phase:** The researchers evaluate the effect of implementing the comprehensive nursing intervention on patients' knowledge, and self-care practices, anxiety level immediately postoperatively before discharge for both control and study groups. The follow up was done one month post implantation of comprehensive nursing intervention to evaluate the patient's retention of the knowledge and self-care they have learned. And assess level of anxiety. The goal of establishing this interval was to evaluate if interventions were beneficial after a period of implementation. Communication with the studied patients was maintained through a WhatsApp group to answer questions, and to raise or schedule for follow- up meeting.

## **Statistical analysis:**

Results were tabulated and statistically analyzed using standard computer program using SPSS V.24 program. Categorical variables were described by number and percent (N, %), where continuous variables described by mean and standard deviation (Mean, SD).

Chi-square test, ANOVA and fisher exact, regression test used to compare between categorical variables  $p < 0.05$  was considered statistically significant.

**Results: Distribution of the studied patients regarding to socio demographic characteristics (Table 1):** Represents that (56.7%) in the control group their aged was range (45-60) years, with mean age  $X \pm SD$  (49.3  $\pm$  5.6). (63.3%) of the study group in the same age group (45-60) years old with  $X \pm SD$  (43  $\pm$  3.54). Regarding gender (56.7%) of the control group was male and (60%) of the study group was male and also. Regarding marital status, (36.6%, 43.3%) was married in control and study group respectively. In addition, (40%, 33.3%) was read and write in the control and study group respectively. Regarding occupation 43.3% of the control group has a manual work. While (40%) of the study group was employee. In consideration of area of residence (53.3%, 63.3%) of the control and study group respectively was live in ruler area. Regarding monthly income, (63.3%, 75.7%) have a sufficient income in the control, and study group respectively. Regarding treatment system, (66.7%, 73.3%) has a health insurance in the control and study group respectively.

**Distribution of the studied patients regarding medical profile (Table 2):** Mentions that (33.3%) of the control group has an indication of the surgery resulting from macular hole, and (40%) of the study group has the same cause. Regarding affected eye (66.7%, 60%) has left eye affection in control and

study group respectively. Regarding type of anesthesia used in the operation (70%) of the control group has a local anesthesia while (76.7%) of the study group has the same type of anesthesia. In consideration of chronic disease, the patients in the control group (83.3%) complain of diabetes and (86.3) of hem has hypertension, while in the study group (70%) has a diabetes and (73.3) % has other daises. Regarding previous eye surgery (43.3%) of patients in the control group has a previous eye surgery, while (60%) of them in the study group pass a previous eye surgery, **Satisfactory level of knowledge for studied patients (Figure 1):** Illustrates that 20% of the control group has a good level of knowledge in pre intervention, and improved to 30% in post, and follow up stages with no great change in their level of knowledge. While in study group 20% has a good level of knowledge in pre intervention stage, while in post increased to be 76.7% and in follow up become 66.7%.

**Total level of anxiety for studied patients (Table 3):** illustrates that concerning control group 32% of the studied patients has a severe anxiety, 42% has a moderate level of anxiety while just 2% has a minimal level of anxiety in pre intervention, and changed to become 29% has a severe anxiety and 37% has a moderate level of anxiety while the patients has a minimal level of anxiety increased to 10% in post, and regarding follow up stages there was a great change, 14% has severe anxiety level while 25% has a moderate level of anxiety and 28% has a minimal anxiety

level. Regarding study group 46% of studied patients has a severe level of anxiety, 30% has a moderate level of anxiety while just 3% has a minimal level of anxiety in pre intervention, and improved to become 10% has a severe anxiety and 6% has a moderate level of anxiety while the patients has a minimal level of anxiety increased to 62% in post, and regarding follow up stages there was a great improvement, 18% has severe anxiety level while 10% has a moderate level of anxiety and 51% has a minimal anxiety level.

**Comparison between studied patients (Table 4):** Clarifies that 83.3% of the control group has an adequate level of self-care practices in pre, post, and follow up stages with no significance difference or change in their level, and their  $X \pm SD$  was (30.2 $\pm$ 2.6, 33.4 $\pm$ 5.1, 32.4 $\pm$ 5.3) in pre, post and follow up respectively. While in study group the result reflects that 76.7% has an adequate level of self-care in pre stage with  $X \pm SD$  35.4 $\pm$ 2.3, in post become 100% with  $X \pm SD$  42.1 $\pm$ 2.5 and in follow up become 96.7% with  $X \pm SD$  40.1 $\pm$ 3.5, which reflects a highly statistically significant improvement( $P<0.001$ ).

**Patient self-care compliance level for studied patients' Figure (2)** Shows that 83.3% of the control group has an adequate level of self-care compliance in pre, post, and follow up stages with no significance difference or change in their level of compliance. While in study group the result reflects that 76.7% has an adequate level of self-care

compliance in pre stage, in post become 100% and in follow up become 96.7%.

**The correlation between patient's level of knowledge improvement and self-care level in control group Table (5):** Presents that, there was no significant correlation between knowledge, and self-care compliance in the control group ( $P>0.05$ ).

**The correlation between patient's level of knowledge improvement and self-care level in study group (Table 6):** shows that, there was a highly statistically significant relation between level of knowledge improvement and self-care compliance level with ( $P<0.001$ ) in study group.

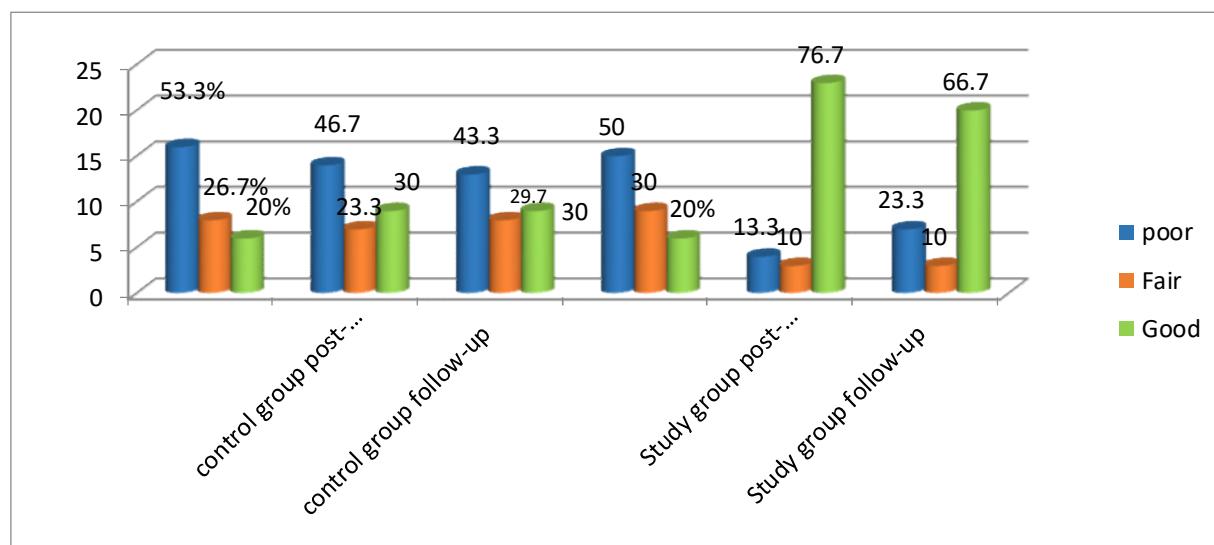
**The correlation between patient's level of knowledge their level of anxiety regarding studied patients Table (7):** presents that, there was a highly statistically significant relation between level of knowledge improvement and level of anxiety with ( $P<0.001$ ).

**Table (1): Frequency Distribution of the studied patients regarding to socio demographic characteristics (n= 60)**

Variable	Control group (n= 30)		Study group (n= 30)		P
	NO	%	NO	%	
<b>Age</b>					
20< 35	6	20%	5	16.7%	
35 < 45	7	23.3%	6	20%	
45-60	17	56.7%	19	63.3%	0.324
	Mean= 49.3 ±5.6				
<b>Gender</b>					
Male	17	56.7%	18	60%	
Female	13	43.3%	12	40%	0.384
<b>Marital status</b>					
Single	7	23.4%	5	16.7%	
Married	11	36.6%	13	43.3%	
Divorced	4	13.3%	5	16.7%	
Widow	8	26.7%	7	23.3%	0.253
<b>Education level</b>					
Illiterate	6	20%	7	23.3%	
Read and write	12	40%	10	33.3%	
Primary school	4	13.3%	5	16.7%	
Secondary school	6	20%	5	16.7%	
Highly educated	2	6.7%	3	10%	0.430
<b>Occupation</b>					
Not working	7	23.3%	9	30%	
Employee	10	33.3%	12	40%	
Manual	13	43.3%	9	30%	0.542
<b>Area of residence</b>					
Urban	14	46.7%	11	36.7%	
Rural	16	53.3%	19	63.3%	0.301
<b>Monthly income</b>					
Sufficient	19	63.3%	23	75.7%	
Insufficient	11	36.7%	7	23.3%	0.300
<b>Treatment system</b>					
Health insurance	20	66.7%	22	73.3%	
State expenditure	10	33.3%	8	26.7%	0.734

**Table (2): Frequency Distribution of the studied patients regarding medical profile (N=60)**

Variable	Control group (n= 30)		Study group (n= 30)		P
	NO	%	NO	%	
<b>Indication for surgery</b>					
Vitreous hemorrhage	9	30%	10	33.3%	
Macular hole	10	33.3%	12	40 %	
Retinal detachment	4	13.3%	5	16.7%	
Others	7	23.3%	3	10%	0.356
<b>Affected eye</b>					
Right	10	33.3%	12	40%	
Left	20	66.7%	18	60 %	0.523
<b>Type of anesthesia</b>					
Local	21	70%	23	76.7%	
General	9	30%	7	23.3%	0.238
<b>Presence of chronic disease</b>					
Yes	28	93.3%	25	83.3%	
No	2	6.7%	5	16.7%	0.251
<b>If yes describe</b>					
D M	25	83.3%	21	70%	
Hypertension	26	86.7%	19	63.3%	
Others	18	60%	22	73.3%	0.381
<b>Previous eye surgery</b>					
Yes	13	43.3%	18	60%	
No	17	56.7%	12	40%	0.302



-Poor: score &lt; 50.0%

-Fair: score 50.0 % - 75.0%

-Good: score &gt; 75.0%

**Figure (1): Satisfactory level of knowledge for studied patients (control & study groups) (n=60)**

**Table (3): Total level of anxiety for studied patients (control & study groups) (N=60)**

Group	Level of Anxiety	Pre	Post	Follow up
Control group	Minimal anxiety	2%	10%	28%
	Mild anxiety	24%	24%	33%
	Moderate anxiety	42%	37%	25%
	Severe anxiety	32%	29%	14%
Study group	Minimal anxiety	3%	62%	51%
	Mild anxiety	21%	22%	21%
	Moderate anxiety	30%	6%	10%
	Severe anxiety	46%	10%	18%

**Table (4): Comparison between studied patients (Control and study group) regarding overall Self-care practices (n=60)**

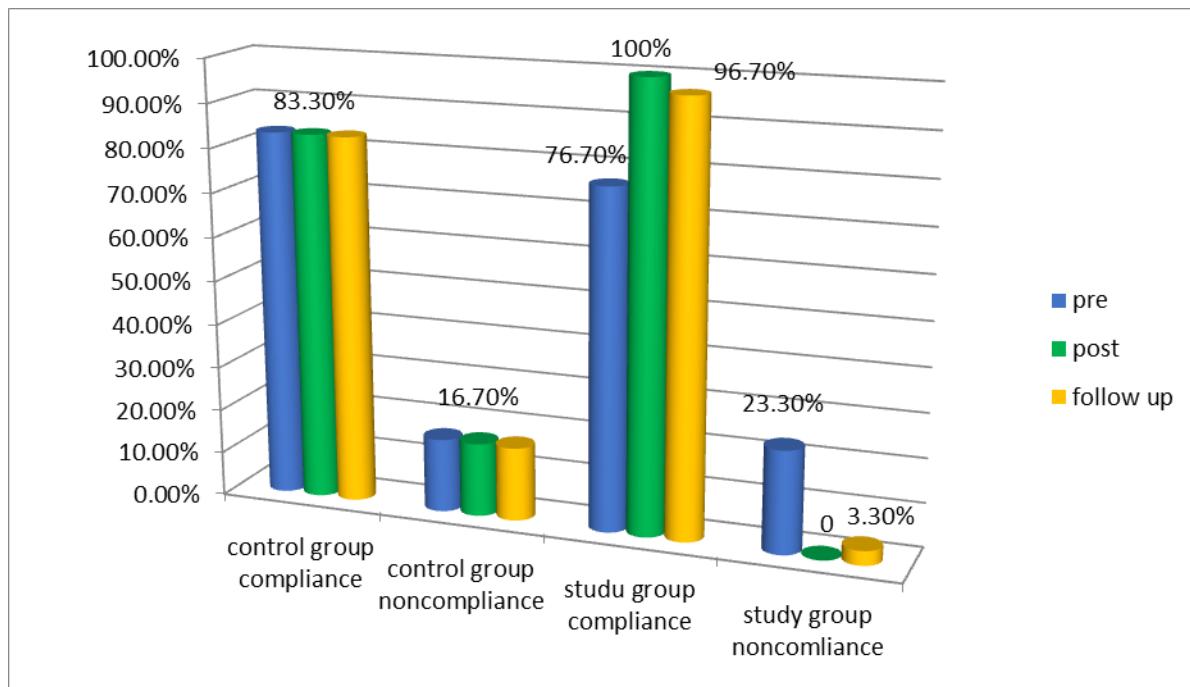
Overall Self-care Practices	Pre		Post		Follow up		Z	P
	No.	%	No.	%	No.	%		
<b>Control group</b>								
Adequate	25	83.3%	25	83.3%	25	83.3%	1.58	0.069**
Inadequate	5	16.7%	5	16.7%	5	16.7%		
Overall mean score	30.2±2.6		33.4±5.1		32.4±5.3		1.74	0.349**
<b>Study group</b>								
Adequate	23	76.7%	30	100%	29	96.7%	5.77	0.000**
Inadequate	7	23.3%	0	0.0%	1	3.3%		
Overall mean score	35.4±2.3		42.1±2.5		40.1±3.5		7.88	0.001**

\*Statistically significant P&gt;0.5

\*\* highly statistically significant P&lt;0.001

Inadequate self-compliance: (15-23)

Adequate self-compliance: more than 24



**Figure (2) patient self-care compliance level for studied patients' (control& study) (n=60)**

**Table (5): The correlation between patient's level of knowledge improvement and self-care level in control group (n=30):**

Knowledge	Self-care						P-value	
	Pre intervention		Post intervention		Follow up			
	Inadequate	Adequate	Inadequate	Adequate	Inadequate	Adequate		
Poor	0	53.33%	0	46.7%	0	43.33%	0.057	
Fair	13.33%	13.33%	13.33%	10%	13.33%	13.33%	0.048	
Good	3.33%	16.7%	3.33%	26.7%	6.7%	23.33%	0.056	

**Table (6): The correlation between patient's level of knowledge improvement and self-care level in study group (n=30):**

Knowledge	Self-care						P-value	
	Pre intervention		Post intervention		Follow up			
	Inadequate	Adequate	Inadequate	Adequate	Inadequate	Adequate		
Poor	3.33%	46.7%	0	13.33%	0	23.33%	0.001**	
Fair	13.33%	16.7%	0	10%	0	10%	0.001**	
Good	6.7%	13.33%	0	76.7%	3.33%	63.33%	0.001**	

\*\*p<0.001 is highly significant

**Table (7): The correlation between patient's level of knowledge their level of anxiety regarding studied patients (n=60)**

Variable	Level of knowledge							
	Post intervention				Follow up			
	Control group		Study group		Control group		Study group	
	R	P value	R	P value	R	P value	R	P value
Level of anxiety	0.766	0.001**	0.856	0.001**	0.967	0.001**	0.978	0.001**

\*\*p<0.001 is highly significant

### Discussion:

Diabetic retinopathy (DR) is a common microvascular complication of diabetes and can significantly impact patients' vision. (Hammes et al., 2023). Vitrectomy is one of the mainstays of DR treatment. However, patients are only able to recover or retain partial useful vision after surgery, and most patients continue to have psychological, emotional, and social problems (Berrocal et al., 2021 and Assi et al., 2021). Comprehensive nursing interventions include enhancing patient knowledge, self-care practices measures can improve (Makhdoom, et al.,2024). This study aims to evaluate the effect of comprehensive nursing intervention on patient' knowledge, anxiety and self-care practice following vitrectomy for diabetic retinopathy.

Based on the sociodemographic and medical characteristics of the patients with diabetic retinopathy under investigation, the results of this study showed that the majority of the

patients in the control and study groups were between the ages of 45 and 60. This result was consistent with Al Baiuomy et al., (2019). They discovered that most DR patients were between the ages of 50 and 60. In terms of gender, the results of this study showed that there were more male patients than female patients. These results were consistent with those of Najee & Shakir (2019), who found that male patients made up the largest percentage of both the control and study groups. These results ran counter to those of Baiuomy et al., (2021). They discovered that women make up the majority of participants across all groupings.

Regarding educational attainment, the results of this study indicated that the majority of patients in the control and study groups are only able to read and write. It can be because they didn't care to get educated in the past and didn't understand the value of education. This result was comparable to that of Makhdoom et al. (2019),

who discovered that 40% of the patients in the study group lacked literacy.

Our findings shows that the studied patients had enough income which may be related to the majority of them were males, working and covered with health insurance. However, our findings in line with the findings of **Al Zarea (2016)** who reported that, half of his studied patients belonged to high economic status and contradicted with **Foster et al., (2016)** who found that, the majority of patients were housewives and a majority of those had lower income.

**Regarding the patients, medical profile,** the present study showed that more than one third of them the macular hole was the indication of vitrectomy surgery This may be related to the pathophysiological changes of retina due to long duration of DM. This finding disagreed with **Khalaf et al., (2019)** who found that nearly two-thirds of studied retinopathy patients suffered from type II diabetes mellitus.& two third of the studied patients done surgery in the left eye. Also, the majority of the studied patients have hypertension as an associated chronic disease with DM this constant with **Khalaf et al., (2019)** who revealed that hypertension was the most prevalent chronic condition with DR patients, with 74.5% of the study group suffering from it.

Prior to the adoption of comprehensive nursing care, the majority of patients in the study and control groups had low overall knowledge scores regarding

diabetic retinopathy. This may be explained by the fact that the majority of the patients in the study were either illiterate or just able to read and write. Additionally, it can be because medical professionals don't have enough time to educate patients about DR. This result was consistent with that of **Hosseini et al. (2021)**, who reported that prior to the start of their educational program; the participants' understanding of diabetic retinopathy was inadequate.

More than three-quarters of the study group had a strong total knowledge score when the comprehensive nursing care was implemented, while the minority had low knowledge, according to the study's findings. The use of various teaching techniques, such as lectures, films, and colored booklets, along with the researcher's reinforcement of the material at the conclusion of each session and before the next one, as well as the study group's compliance with the guidelines regarding diabetic retinopathy, may be the cause of this increase in patient knowledge. These results were consistent with those of **Duan et al. (2017)**, who reported that following the intervention, most participants' understanding of diabetic retinopathy increased. This comes in contrast with **Najee & Shakir (2019)** who found that diabetic retinopathy knowledge has decreased after three months post-implementation of the educational program.

The results of the current study showed that when comprehensive

nursing care was implemented, the degree of self-care practices improved. According to the researcher, this progress resulted from ongoing patient follow-up, regular re-demonstration of self-care techniques, and ongoing correction of skills that patients and their caregivers had overlooked or done improperly. In order to help patients remember and to make knowledge easier to obtain when needed, a colored booklet depicting various self-care techniques was also given to them. The study also underlined how crucial it is to support patients' self-care behaviors.

Furthermore, there was a highly statistically, significant difference within study group pre, and post-implementation of comprehensive nursing care. This may be explained by the that patient level of knowledge was improved which augment their adherence with self-care practices, these results mean that the patients have got many benefits from the implementation of comprehensive nursing care.

This finding was similar to **Baiuomy et al., (2021)** who illustrated that the self-care practices was significantly increased in the experimental group compared to the control group after intervention. This result approved the hypothesis of the current study which stated "the patient will have improvement in self-care practices after the implementation of comprehensive nursing care". Moreover, this finding was congruent with **Umaefulam& Premkumar**

**(2020)** who showed in a study "Impact of mobile health in diabetic retinopathy awareness and eye care behavior among Indigenous women" that, the self-care practices score of DR patients post implementation of the educational intervention was increased.

**Concerning anxiety level**, the finding of current study showed that, majority of the studied patient had moderate or severe anxiety which may be related to DR patients undergoing vitrectomy, experience sudden blurred vision, dark shadows and other subjective feelings, which often make patients feel fear and anxiety. Additionally, DR patients become concerned about the surgical effect, disease prognosis and outcome in the post-surgery phase, with an increased sense of uncertainty. This is consistent with the findings of **Shi et al. (2022) & Zhang et al. (2023)**. Post- implementation of comprehensive nursing care the study result showed significant difference between patient's level of knowledge their level of anxiety which explained by the positive effect of comprehensive nursing care for DR patients, guide them to vent their negative emotions and relieve their fear and anxiety. Additionally, communicate with those patients promptly, inform them of the causes, risk factors, treatment methods and relevant prognostic information, reduce their fear of follow-up treatment and improve their coping ability and selfcare.

## 5. Conclusion

Based on the findings of the current study, it can be concluded that, application of comprehensive nursing interventions following vitrectomy for diabetic retinopathy patients reflected on improve level of knowledge, decrease anxiety level, and improve self-care practice.

## 6. Recommendations

Based upon the results of the current study, the following recommendations are suggested:

- Educational sessions by nurses in the ophthalmology department about the self-care practices for vitrectomy is required.
- Ophthalmology nurses should receive periodic in-service training programs to update and improve their awareness about self-care practices regarding vitrectomy.
- A simplified illustrated and comprehensive brochure and posters including vitrectomy vascular self-care practices guidelines should be available at health care settings and provided for patients undergoing vitrectomy.
- Replication of the current research on a larger statistical sample size drawn from various geographical areas and with a long-term follow-up is recommended to obtain more generalizable results.

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## **Influence of Head Nurses' Abusive Supervision on Nurses' Organizational Silence: A Descriptive-correlation Study**

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### **Abstract**

Abusive supervision is a logical factor that promotes nurses to display negative feelings, depletes their cognitive resources, and diminishes their perspectives of interactional justice and silent behaviors. **Aim:** Assess the influence of head nurses' abusive supervision on nurses' organizational silence. **Design:** A descriptive - correlational design was used. **Subjects:** The study included two groups namely all (n=35) head nurses and a stratified random sample of nurses (n=310). **Tools:** It involved abusive supervision and nurses' organizational silence scale. **Results:** The current study's findings showed that 40.0% of head nurses had a moderate level of abusive supervision as well as the majority (84.8%) of nurses reported a low level of overall nurses' organizational silence. **Conclusion:** There was a highly statistically significant positive correlation between nurses' abusive supervision and their organizational silence. **Recommendations:** Hospital management provides educational programs, seminars, and workshops for nursing staff regarding abusive supervision and organizational silence.

**Keywords:** Abusive supervision, Organizational silence, and Nursing staff.

### **Introduction**

Supervision entails the oversight, guidance and direction provided by a more experienced or knowledgeable individual to others. It involves monitoring performance, providing feedback, offering support and facilitating growth and development

(**Warman, 2022**). While, non-supportive supervision has worse effect on nurses' motivation and feeling that their efforts are not valued while their mistakes are pointed out immediately.

Abusive supervision refers to hostile, aggressive or demeaning behavior by a supervisor towards subordinates including verbal abuse, micromanagement, intimidation, belittling or resource withholding. In nursing, it negatively impacts nurses' well-being, job satisfaction and work environment, leading to increased stress, anxiety, and burnout (Ambrose & Ganegoda, 2020). This affects patient care quality as nurses become less engaged and motivated while also eroding trust and communication within the healthcare team. Chronic exposure to abusive behavior can cause turnover intentions and job dissatisfaction, worsening staffing shortages and compromising patient care continuity Modaresnezhad, M., Andrews, M. C., Mesmer-Magnus, J., Viswesvaran, C., & Deshpande, S. (2021).

Abusive supervision involves three dimensions: as angry-active, humiliation active and passive abuse. Angry-active abuse is verbal behavior of nurse supervisors of anger such as scolding nurse in public and showing anger with no explanation. Humiliation-active abuse is verbal and non-verbal behavior; verbal as taunts and threats from nurse supervisor, and nonverbal behavior as hitting the table hard when angry with nurses. Finally, passive abuse refers to superiors' nonverbal behavior toward nurses regarding to the completion of their work as not appreciating the nurses' hard work, breaking promises,

withholding important information and making aggressive eye contact. (Ambrose & Ganegoda, 2020)

The toxic environment created by abusive behavior can stifle open communication channels, inhibiting nurses from reporting instances of abuse or raising concerns about patient care. This silence perpetuates the cycle of abuse, exacerbating the negative effect on well-being of nurses and patient outcomes (Wang et al., 2022).

Organizational silence refers to the phenomenon where nurses withhold information, feedback, or concerns within their workplace environment often due to fear of negative consequences such as retribution, ostracism, or job loss. This silence can manifest in various forms including not speaking up about unethical practices, avoiding discussions on sensitive topics or refraining from offering suggestions for improvement (Oyewunmi & Oyewunmi, 2022).

Nurses' organizational silence involves three features: acquiescent, defensive and pro-social silence. Acquiescent silence refers to nurses' withholding the relevant ideas, information, or opinions as their beliefs that the expression of opinions is valueless and that talking about or reporting problems are unlikely to make a difference. Defensive silence, this silence purpose is to protect oneself against external threats. This type involves withholding of information because of the fear that

the expression of opinions and ideas may result in personal risks. Lastly, pro-social silence means withholding information, work related ideas, or opinions with that benefit of others or organization while taking into account others' feelings. This type of silence is based on cooperation and altruism of the nurse to others.

### **Significance of study:**

Understanding the dynamics between abusive leadership and organizational silence sheds light on the toxic workplace environments prevalent in healthcare settings which can have detrimental effects on nurses' well-being and patient care outcomes (Zaman et al., 2023). From my experience in the hospital some abusive supervision has negative effect on suppression of nursing opinions and out-come to patients work results. Furthermore, by highlighting the consequences of abusive supervision on nurses' willingness to speak up, the study underscores the importance of promoting respectful and supportive leadership practices to mitigate the negative impact on both nurses and the organization as a whole (Oyewunmi & Oyewunmi, 2022).

### **Aim of the study**

Assess the influence of head nurses' abusive supervision on nurses' organizational silence.

### **Research Questions:**

- What are nursing staff's perception levels regarding abusive supervision?
- What are nurses' organizational silence levels?

- What is influence of headnurses' abusive supervision on nurses' organizational silence?

### **Subjects and Method**

#### **Research design:**

A descriptive-correlation design was used in the present study.

#### **Setting:**

The study conducted at Tanta Main University Hospitals, which affiliated to Minister of Higher Education and Scientific Research namely; gynecology and obstetrics, cardiac, neurology, plastic, Tropical, Chest, Pediatric, and Medical hospitals units.

#### **Subjects:**

The subjects of this study included two groups namely:

- All (N=35) head nurses at the previously mentioned settings.

-Astratified (n=310) random sample of nurses were selected from total number of nurses (1618).

**Tools:** Two tools were used: -

**Tool I: Abusive Supervision questionnaire.** was used to assess nurses' and head nurses' perception regarding abusive supervision.

This tool was modified by the researcher, guided by Lyu 2019 .It consisted of two parts as follows:

**Part one:** Nursing staff's personal: It included head nurses' and nurses' personal data such as their age, department, qualification, marital status, and years of experience.

**Part two:** Abusive supervision scale.

It covered three dimensions: angry active abuse (7items), humiliation active (6items), and passive abuse (15items).

## Scoring system

Nursing staff's responses were measured on a five points Likert Scale ranging from 5 to 1 as always= 5, sometimes= 4, often=3, rarely= 2 and never = 1. The total score calculated by cut-off points and summing scores of all categories. The total scores represent varying levels as follows:

- High level of abusive supervision  $\geq 75\%$
- Moderate level of abusive supervision  $60\%- < 75\%$
- Low level of abusive supervision  $< 60\%$ .

## Tool II: Nurses' Organizational Silence Scale: to assess nurses' organizational silence.

This tool was developed by **Acaray and Akturan (2015)** and was modified by researcher based on related literature **Abied and Khalil(2019)**, **Elçi and Erdilek(2014)**, **Acaray, Akturan(2015)** to assess nurses' organizational silence. It contained three features of silence namely acquiescent silence (13items), defensive silence (12 items), prosocial silence (9 items).

## Scoring system

Nurses' responses were measured on a five points Likert Scale ranging from: strongly agree (5), agree (4), neutral (3), disagree (2) and strongly disagree (1). The total score calculated by cut off points and summing scores of all categories. The total scores represent varying levels as follows:

- High perception level of organizational silence  $\geq 75\%$

- Moderate perception level of organizational silence  $60\%- < 75\%$
- Low perception level of organizational silence  $< 60\%$

## Methods

1. An official permission obtained from the Dean of Faculty of Nursing and the authoritative personnel of all departments of Tanta Main University Hospital that submitted to the previously mentioned settings.
2. The purpose of study was explained and made clear to directors of hospitals and manger of each unit to gain their cooperation.
3. **Ethical considerations:**
  - Consent of the ethical scientific research committee of the Faculty of Nursing was obtained with a code number 45-4-2022.
  - Nature of the study not cause harm to the entire sample.
  - Informed consent was obtained from nursing staff after explanation of the study's aim.
  - Confidentiality and privacy were maintained regarding data collection and explain that was used for study purpose only.
  - The right to withdrawal at any time was accepted.
4. After reviewing the related literature in this field the tools translated to Arabic to collect data from nurse.
5. Tools were reviewed submitted to five experts in the area to check their content and validity.

- The face validity of tools were calculated based on experts opinions after calculating content the validity index which was 93.9% for tool (I) and 94.6% for tool (II)
- 6. A pilot study was carried out on a sample (10%) of head nurse (n= 4) and staff nurses (n= 31) from Emergency hospital, who were excluded from the main study sample during the actual collection of data. The pilot study was done to test clarity, sequence of items, applicability, and relevance of the questions and to determine the needed time to complete the questionnaire. Necessary modifications were included clarification, omission of certain questions and adding others and simple work related words were used.
- Reliability of tools were tested using Cronbach's Alpha which was 0.999 for tool (I) , and 0.999 for tool (II) , about abusive supervision and organizational silence questionnaire.
- 7. The estimated time needed to complete the questionnaire items from nursing staff was (20-30) minutes.
- 8. **Data collection phase:** the data were collected from nursing staff by the researcher met nursing staff individually in different areas under study during working hours to distribute the questionnaire. The subjects recorded the answer in the presence of the researcher to ascertain that all questions were answered.
- 10. The data was collected over period of seven months started from

the beginning of August 2022 until the end of January 2022.

## Results

**Table (1)** Shows that all (100.0%) of head nurses were more than or equal 35 years old with a mean score of  $41.37 \pm 3.85$ , while most (92.3%) of the nurses had less than 35 years old with a mean  $36.49 \pm 1.46$ . As well, the highest percentage (25.7%, and 18.4%) of the studied head nurses and nurses worked in medical department and gynecology & obstetrics departments, respectively. Moreover, most (91.4%, 90.6%) of the studied head nurses and nurses were married, respectively.

The same table revealed that, nearly two-thirds (65.7%) of head nurses had a baccalaureate degree, whilst more than three-fifths (61.0%) of the studied nurses enrolled in a technical institute of nursing. Besides, around - three quarters (77.1%, 74.8%) of head nurses and nurses had more than more or equal to 15 years of experience with a mean score of  $18.31 \pm 3.60$  and  $15.64 \pm 2.57$  years, respectively.

**Figure (1)** Shows that two-fifths (40.0%) of the head nurses reported a moderate level perception of abusive supervision. As well more than one third (35.8%) of the nurses reported a high level perception of abusive supervision.

**Figure (2):** displays that more than two thirds (68.8%) of the head nurses reported a low level of overall organizational silence. As well as, majority (84.8%) of the nurses

reported a low level of overall nurses organizational silence.

**Figure (3):** Shows a positive statistically significant correlation between head nurses' abusive supervision and their organizational silence at ( $r=0.673$ ;  $P<0.001$ )

**Figure (4):** shows a positive statistically significant correlation between nurses' abusive supervision and their organizational silence perception at ( $r=0.404$ - $p<0.001$ ).

**Table (2):** Reveals statistically significant difference relation between head nurses' abusive supervision perception and their all personal characteristic except their years of experience (at  $p\leq 0.05$  ), As well as, no a statically significant relation between nurses' abusive supervision perception and all their personal characteristic except department.

**Table (3):** Reveals that head nurses there was no statistically significant relation between head' nurses' organizational silence perception and their personal characteristic except their work department and qualification (at  $p\leq 0.05$  ).According to nurses, there was no statistically significant relation between nurses organizational silence and their personal characteristic except their work department.

**Table (4):** illustrates that the evident in this table, there the head nurses overall mean score was  $65.31 \pm 21.87$  and nurses mean score was  $58.41 \pm 25.67$  with no statistically significant difference between the studied groups

as regard their perception abusive supervision at ( $p> 0.05$ ).

Specifically head nurses' highest mean score ( $66.07 \pm 21.51$ ) was related to humiliation domain followed by angry active abuse with mean score  $65.82 \pm 22.05$ . While, the lowest mean score ( $64.76 \pm 22.39$ ) was related to passive abuse. According to nurses' highest mean score ( $58.46 \pm 25.84$ ) was related to angry active abuse followed by passive abuse with mean score  $58.42 \pm 25.70$ .While the lowest mean score ( $58.35 \pm 25.85$ ) was related to humiliation.

**Table (1):** Distribution of head nurses and nurses as regard to their personal data

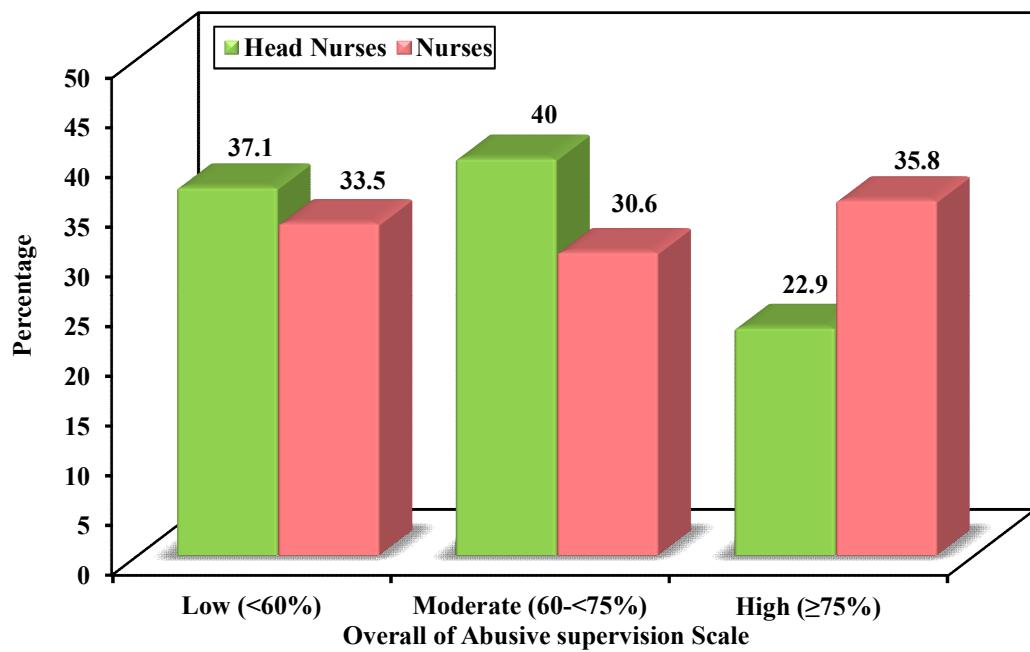
Personal characteristics	Head Nurses (n = 35)		Nurses (n = 310)		Test of sig.	p		
	No.	%	No.	%				
Age								
<35	0	0.0	24	7.7	$\chi^2 =$	FEP = 0.152		
$\leq 35$	35	100.0	286	92.3	2.912			
Min. – Max.	36.0 – 50.0		33.0 – 40.0		$t =$ 7.434*	<0.001*		
Mean $\pm$ SD.	$41.37 \pm 3.85$		$36.49 \pm 1.46$					
Median	42.0		36.0					
Department								
Gynecology and obstetrics	4	11.4	57	18.4				
Cardiac	6	17.1	41	13.2				
Neurology	3	8.6	40	12.9				
Plastic	2	5.7	25	8.1	$\chi^2 =$	MCp = 0.112		
Tropical	3	8.6	45	14.5	11.121			
Chest	3	8.6	49	15.8				
Pediatric	5	14.3	24	7.7				
Medical	9	25.7	29	9.4				
Marital status								
Married	32	91.4	281	90.6	$\chi^2 =$	MCp = 1.000		
Un married/single	3	8.6	29	9.4	0.023			
Qualification								
Nursing Diploma	4	11.4	29	9.4				
Baccalaureate Degree	23	65.7	92	29.7	$\chi^2 =$ 82.276*	MCp <0.001*		
Technical Institute of nursing	0	0.0	189	61.0				
Master Degree	7	20.0	0	0.0				
Doctorate Degree	1	2.9	0	0.0				
Years of experience								
<15	8	22.9	78	25.2	$\chi^2 =$	0.765		
$\leq 15$	27	77.1	232	74.8	0.089			
Min. – Max.	12.0 – 27.0		10.0 – 20.0		$t =$ 4.275*	<0.001*		
Mean $\pm$ SD.	$18.31 \pm 3.60$		$15.64 \pm 2.57$					
Median	19.0		16.0					

 $\chi^2$ : Chi square test MC: Monte Carlo FE: Fisher Exact

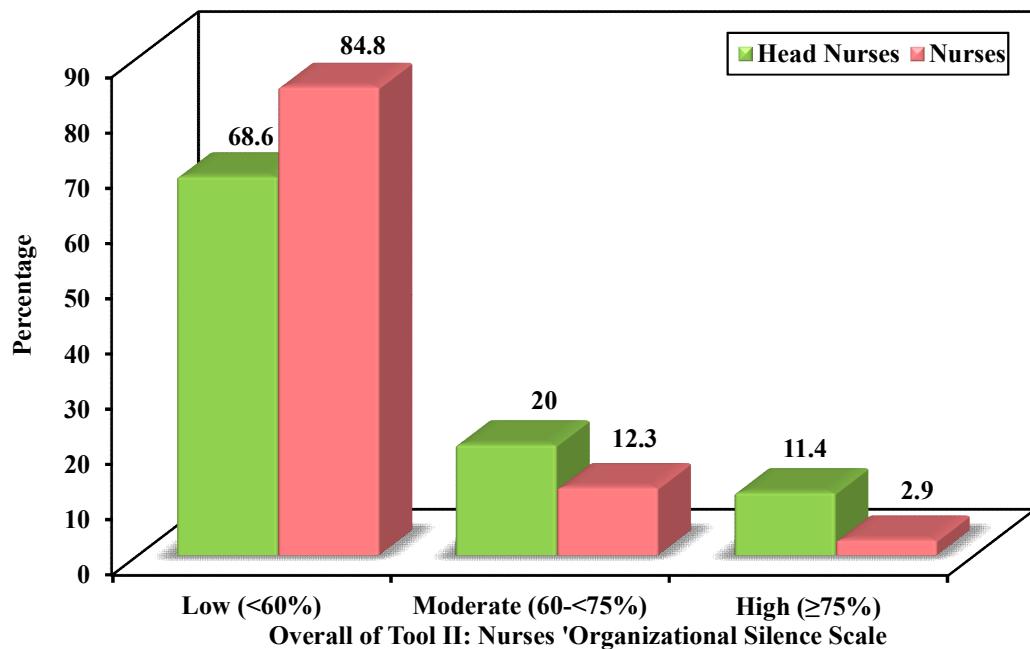
t: Student t-test

p: p value for comparing between the studied groups

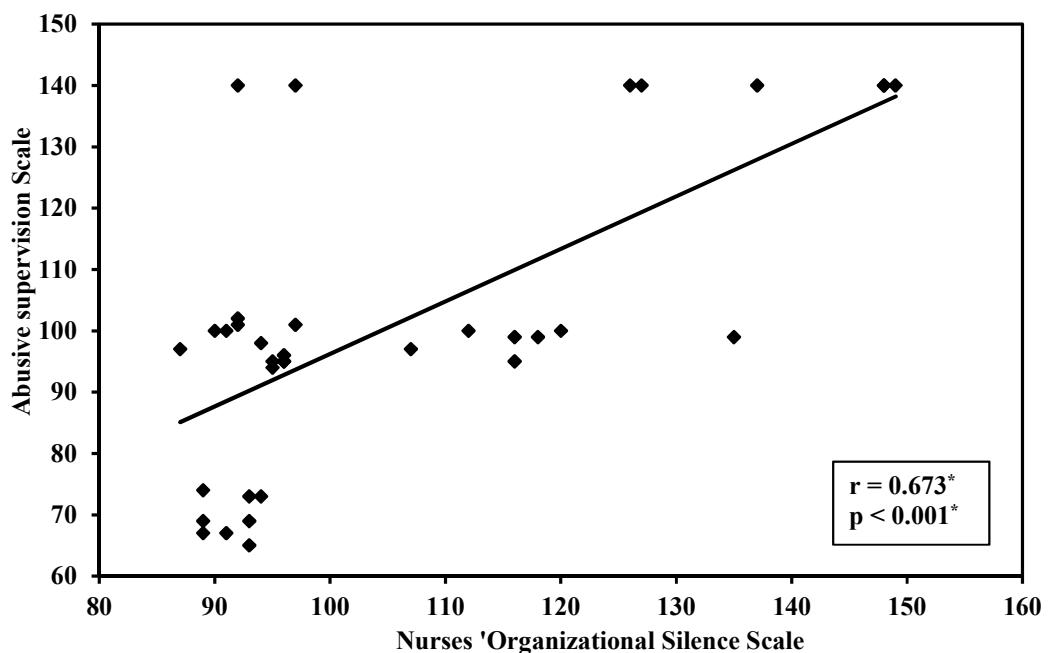
\*: Statistically significant at  $p \leq 0.05$



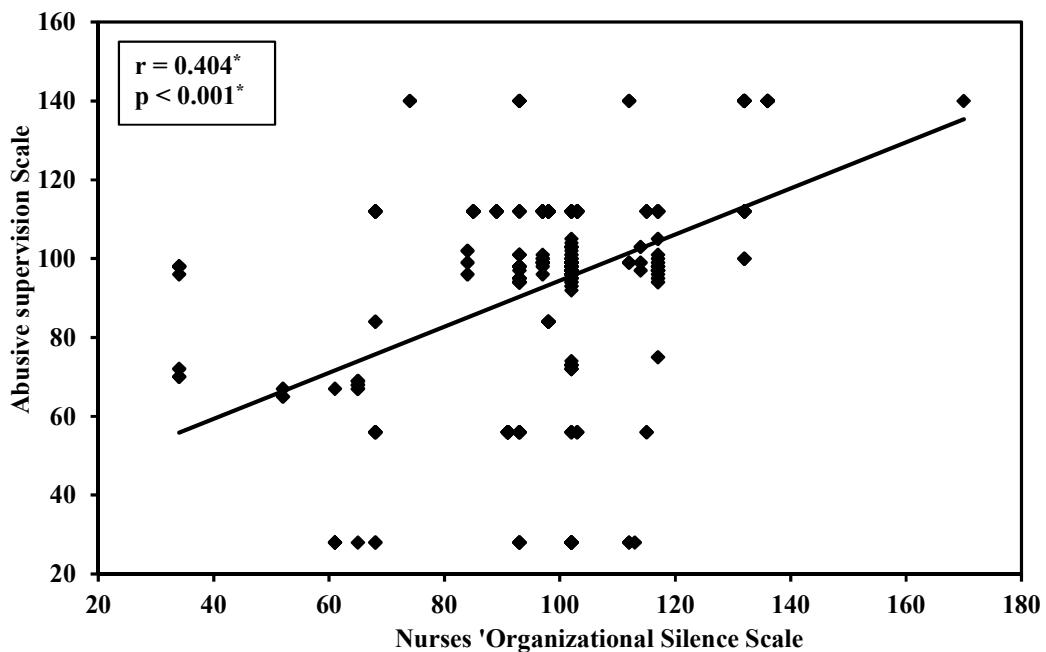
**Figure (1): levels of overall perceptions for head nurses' and nurses' abusive supervision**



**Figure (2): Level of head nurses' and nurses' perception according to overall of 'organizational silence domain**



**Figure (3): Correlation between head nurses' perception about abusive supervision and their organizational silence**



**Figure (4): Correlation between nurses' perception about abusive supervision and their organizational silence**

**Table (2): Relation between head nurses' and nurses' perception about abusive supervision and their personal characteristics**

Personal characteristics variable	Mean score for of Abusive supervision Scale	
	Head Nurses (n = 35)	Nurses (n = 310)
	Mean ± SD.	Mean ± SD.
Age		
<35	–	67.37 ± 12.79
≤35	65.30 ± 21.87	57.66 ± 26.34
t (p)	–	3.194* (0.003*)
Department		
Gynecology & obstetrics	36.16 ± 3.05	69.50 ± 20.22
Cardiac	88.54 ± 17.75	61.87 ± 12.68
Neurology	53.27 ± 14.54	59.0 ± 20.33
Plastic	60.27 ± 1.89	51.0 ± 35.71
Tropical	63.39 ± 2.36	60.56 ± 22.92
Chest	47.02 ± 11.09	56.54 ± 28.92
Pediatric	92.86 ± 15.97	57.48 ± 33.64
Medical	59.33 ± 9.34	37.93 ± 24.54
F (p)	11.796* (<0.001*)	5.080* (<0.001*)
Marital status		
Married	66.52 ± 22.10	56.52 ± 25.72
Un married/single	52.38 ± 16.81	76.72 ± 16.49
t (p)	1.073 (0.291)	4.139* (0.001*)
Qualification		
Nursing Diploma	60.27 ± 27.99	66.38 ± 11.81
Baccalaureate Degree	60.56 ± 19.58	50.05 ± 22.78
Master Degree	78.83 ± 19.86	–
Doctorate Degree	100.0	–
Technical Institute of nursing	–	61.26 ± 27.55
F (p)	2.437 (0.083)	7.770* (0.001*)
Years of experience		
<15	64.51 ± 24.41	54.78 ± 21.08
≤15	65.54 ± 21.56	59.63 ± 26.97
t (p)	0.116 (0.909)	1.631 (0.105)

SD: Standard deviation

t: Student t-test

F: F for One way ANOVA test

\*: Statistically significant at  $p \leq 0.05$

**Table (3): Relation between head nurses' and nurses' perception about organizational silence and their personal characteristics.**

Personal characteristics variable	Organizational silence	
	Head Nurses (n = 35)	Nurses (n = 310)
	Mean ± SD.	Mean ± SD.
Age		
<35	–	45.07 ± 25.39
≤35	52.73 ± 14.16	47.43 ± 13.40
t (p)	–	0.449 (0.657)
Department		
Gynecology and obstetrics	42.10 ± 1.93	47.33 ± 17.18
Cardiac	51.72 ± 12.71	46.16 ± 17.12
Neurology	54.42 ± 17.22	52.34 ± 10.42
Plastic	41.91 ± 4.16	40.67 ± 15.07
Tropical	44.36 ± 2.78	46.32 ± 6.72
Chest	43.14 ± 2.58	46.61 ± 13.99
Pediatric	73.96 ± 18.29	53.71 ± 6.53
Medical	54.17 ± 8.39	44.37 ± 21.01
F (p)	3.972* (0.004*)	2.387* (0.022*)
Marital status		
Married	53.01 ± 14.61	46.83 ± 14.57
Un married/single	49.75 ± 9.19	51.22 ± 14.82
t (p)	0.376 (0.710)	1.542 (0.124)
Qualification		
Nursing Diploma	51.28 ± 16.42	45.92 ± 23.09
Baccalaureate Degree	48.56 ± 8.65	48.44 ± 13.18
Master Degree	65.02 ± 21.04	–
Doctorate Degree	68.38	–
Technical Institute of nursing	–	46.86 ± 13.68
F (p)	3.459* (0.028*)	0.490 (0.613)
Years of experience		
<15	56.34 ± 17.82	46.67 ± 19.09
≤15	51.66 ± 13.10	47.43 ± 12.83
t (p)	0.817 (0.420)	0.328 (0.743)

SD: Standard deviation t: Student t-test

F: F for One way ANOVA test

\*: Statistically significant at  $p \leq 0.05$

**Table (4):Comparison between head nurses and nurses' perception according to mean score standard deviation and ranking of abusive supervision domains.**

Abusive supervision Scale.	Head Nurses (n = 35)	Rank	Nurses (n = 310)	Rank	t	p
Angry active abuse		2		1		
Total Score (7 – 35)	16.0 – 35.0		7.0 – 35.0			
Min. – Max.	25.43 ± 6.18		23.37 ± 7.23			
Mean ± SD.						
% Score					1.620	0.106
Min. – Max.	32.14 – 100.0		0.0 – 100.0			
Mean ± SD.	65.82 ± 22.05		58.46 ± 25.84			
Humiliation		1		3		
Total Score (6 – 30)	13.0 – 30.0		6.0 – 30.0			
Min. – Max.	21.86 ± 5.16		20.0 ± 6.20			
Mean ± SD.						
% Score					1.702	0.090
Min. – Max.	29.17 – 100.0		0.0 – 100.0			
Mean ± SD.	66.07 ± 21.51		58.35 ± 25.85			
Passive abuse		3		2		
Total Score (15 – 75)	33.0 – 75.0		15.0 – 75.0			
Min. – Max.	53.86 ± 13.43		50.05 ± 15.42			
Mean ± SD.						
% Score					1.401	0.162
Min. – Max.	30.0 – 100.0		0.0 – 100.0			
Mean ± SD.	64.76 ± 22.39		58.42 ± 25.70			
Overall						
Total Score (28 – 140)	65.0 – 140.0		28.0 – 140.0			
Min. – Max.	101.14 ± 24.49		93.42 ± 28.75			
Mean ± SD.						
% Score					1.527	0.128
Min. – Max.	33.04 – 100.0		0.0 – 100.0			
Mean ± SD.	65.31 ± 21.87		58.41 ± 25.67			

t: Student t-test

p: p value for comparing between the studied groups

## Discussion

### Nursing staff perceptions regarding abusive supervision

The current study demonstrated that two fifths of the head nurses reported a moderate level of overall abusive supervision. While, more than one-third of the nurses reported a high level of abusive supervision. From the researcher's point of view, this result may be due to those head nurses may think that the less control and flexible leadership is present, the less deviation is observed in the work. In addition, the hierarchical pressures and demands within healthcare settings may contribute significantly to the perceptions of abusive supervision among nursing staff, while head nurses experienced a moderate level due to their intermediary role, while staff nurses report higher levels as a result of direct supervisory interactions.

Along with the study result, **Xu et al., (2021)** whose study revealed that abusive supervision level was moderate as perceived by middle level managers.

In contrast, to the current result is **Lyu et. al., (2019)** who found the majority of studied sample had a low level of abusive supervision from a who found that minority of studied sample had a low abusive supervision from their supervisors. Also, the current study contradictory with **Abou Ramdan & Eid (2020)** who reported that only the lower percentage of the studied nurses had a high level of abusive supervision from their supervisors.

### Nursing staff's perceptions regarding organizational silence

As for overall of organizational silence among nursing staff, the present study results displayed that more than two thirds of the head nurses and most of staff nurses reported low levels of overall organizational silence. This results could reflected a culture of transparency and active engagement within the organization. It is possible that the management fosters an atmosphere where nurses feel empowered to voice concerns and suggestions without fear of retaliation or dismissal. Additionally, the low levels could reflect strong leadership that actively solicits input and feedback from staff, further diminishing any tendencies toward silence.

The present study result is in agreement with **Alqarni, (2020)** who found that the studied participants' perception level of organizational silence was low. Likewise, study conducted by **Mohamed et al., (2021)** reported that the highest percentage of the studied staff nurses is low level of the organizational silence. Parallel with the present study, **Abd-Erhaman et al., (2022)** who illustrated that two-thirds of nurses had low level of organizational silence in the studied setting.

Conversely, the present finding is inconsistent with study carried out by **Sakr, Ibrahim & Ageiz, (2023)** who declared that level of organizational silence was moderate as reported by nurses.

Accordingly, the current study illustrated the head nurses' overall mean score of perceived

organizational silence was higher than staff nurses' mean score. Head nurses' highest mean score was related to defensive silence domain followed by prosocial silence domain with mean score, while the lowest mean score was related to acquiescence silence domain. From the researchers' point of views the higher overall mean score of perceived organizational silence among head nurses, as compared to staff nurses, could reflect their heightened awareness of and involvement in organizational issues that they may feel reluctant to address openly. The prominence of defensive silence, with the highest mean score, suggested that both head nurses and staff nurses may withhold information out of fear of negative repercussions, which could stem from organizational culture, abusive supervision or past experiences of unfavorable responses to feedback. This result is along with study carried out by **Al-Alwani & Tufekci, (2022)** who stated that defensive silence is prevalent in high-stakes work environments like healthcare, where professionals may refrain from speaking out due to concerns about job security, reputation, or punitive reactions. Consistently, **Mohammed et al, (2024)** who identified the prosocial silence as a common form of organizational silence where nurses prioritize harmony and positive relationships over expressing potentially disruptive concerns. Furthermore, the present study result revealed that nurses' highest mean score was related to acquiescence

silence domain followed by defensive silence domain, while the lowest mean score was related to prosocial silence. In addition, there was a highly statistically significant difference between the studied groups as regard their scores of defensive silence and pro social silence domains, whilst there were no statistically significant difference between the studied groups as regard their scores of acquiescence silence domain. **Yang et al., (2022)**

#### **Relation between nursing staff study variables and personal characteristics.**

The current study displayed that there was no statistically significant difference between head nurses' abusive supervision and their personal characteristic except their work department. This may be due to the possibility that abusive supervision behaviors are more closely linked to the specific environment and demands of certain departments rather than to individual characteristics of the head nurses themselves, such as age, gender, or years of experience. Different departments may foster distinct pressures and cultural norms that could contribute to varying levels of tolerance or tendencies for abusive supervision.

This finding is consistent with a study conducted by **Dongyuan, (2020)** who found that there was significant association between the head nurses' abusive supervision and their work department. On contrary, **Zhang et al., (2022)** revealed a significant association between the studied head nurses' abusive

supervision and their age and gender. **Helaly et al., (2024)** affirmed that there was a significant difference in head nurses' abusive supervision and their work unit.

Also, contradictory findings by **Maqbool et al., (2024)** showed significant relationships between head nurses' years of experience and tendencies for abusive behaviors. In addition, the current study portrayed that there was statistically significant relation between staff nurses' abusive supervision and their personal characteristic except years of experience. This may be because nurses perceived similarly abusive supervision regardless of their familiarity with the work environment, likely due to shared professional norms and values. Abusive supervision may elicit uniform negative effects on job satisfaction, self-esteem, and mental well-being that overshadow differences in experience, causing such behaviors to exert a standard impact regardless of the nurses' length of service.

Regarding age, the present study showed that nurses' who are less than 35 years old perceived higher level of abusive supervision. This may because they may have less experience in handling hierarchical pressures or managing workplace stressors. This result was congruent with **Xu et al., (2023)** whose study found a significant association between nurses' age and perceived abusive supervision. In contrast, a study conducted by **Hassan & Ali, (2022)** and **Diab & Hassan, (2023)** reported that there was no significant

relation between nurses' all demographic characteristics and abusive supervision.

This may be due to work pressures of this setting. This stressful environment, combined with the critical and high-paced nature of the work, may elevate the instances of perceived supervisory abuse in this specific department. This result was compatible with **Lyu et al., (2019)** who found a significant relation between nurses' abusive supervision and their work unit. Conversely, **Shih et al., (2023)** who noticed that there is no significant difference in nurses' abused supervision according to their work department. As regard marital status, the current study showed that unmarried or single nurses experienced higher level of abusive supervision. This may be attributed to single nurses may face higher job pressures or may be perceived as more available or less established in their careers, which could contribute to them being subjected to more negative behaviors by supervisors. Along with this result, study conducted by **Badran & Akeel, (2022)**. Noticed that there was significant relation between nurses' abusive supervision and their marital status. This finding was against **Özkan, (2022)** who showed that there was no significant association between nurses' abusive supervision and their marital status. According to qualification, the present study declared that nurses with nursing diploma had a higher perceived abusive supervision. This may be due to that nurses with a nursing diploma might had less

formal education and training compared to those with higher qualifications. As a result, they could be more vulnerable to experiencing perceived abusive supervision, possibly due to lower levels of confidence, fewer opportunities for professional development, or less autonomy in their roles.

Study carried out by **Aly & Zakaria, (2021)** who found that no significant relation was found between nurses' abusive supervision and their qualification. On the other hand, In the same scene, **Abdallah & Mostafa, (2021)**, who concluded that nurses' qualification had significant impact on their perspectives of abusive supervision. Also, **Helaly et al., (2024)** reported that there was significant relation between nurses' abusive supervision and their qualification

Considering relation between organizational silence among nursing staff and their personal characteristics, the current study illustrated that there was no statistically significant relation between head nurses' organizational silence and their personal characteristic except their work department and qualification.

As regard work department, the studied head nurses who are working at pediatric department experience high perceived organizational silence. This may be due to the unique challenges and stressors associated with working in pediatric departments. In this regard, **Zekeriya (2021)** revealed that work unit may affect the distribution of concepts related to organizational

silence. Likewise, **Yang et al., (2022)** demonstrated that work department had significant effects on organizational silence level. In contrast, **Sakr et al., (2023)** who reported that there was not significant association between perceived organizational silence and participants' work department.

Concerning qualification, the studied head nurses who had master degree experienced high perceived organizational silence. This may because they might be more sensitive to hierarchical constraints or perceive a lack of openness to their ideas and concerns, leading them to withhold their perspectives despite their awareness and expertise. Correspondingly, **De los Santos et al., (2020)** affirmed that highest attained education could significantly predict organizational silence. Moreover, **Labrague & De Los Santos (2020)** showed that educational qualification in the nursing profession affect organizational silence.

Moreover, the current study indicates that there was no statistically significant relation between staff nurses' organizational silence and their personal characteristic except their work department. It was noticed that nurses who are working at pediatric department experience had a higher perception level of organizational silence. Pediatric nurses often encounter high-stress situations, frequent interactions with patients' families, and emotional challenges that may lead them to withhold opinions or feedback, potentially to

avoid additional stress or conflict within the team.

This result was contra indicated **Baghdadi, Farghaly & Alsayed, (2021)** who found that there was statistically significance relation between organizational silence as perceived by the studied staff nurses and their working unit. Conversely, this result contradicted with **El Abdou et al., (2023)** whose study declared that there were statistically significance relations between organizational silence as perceived by the studied staff nurses and their age, gender and experience years.

### **Conclusion**

The present study concluded that highest percent of the head nurses noted a moderate level at overall perception of abusive supervision. Also the highest percent of the staff nurses reported a high level at overall of abusive supervision. Also, the lowest percent of the head nurses perception reported a high level of overall of abusive supervision perception and the lowest percent of nurses reported at a moderate nurses reported a high level at overall of abusive supervision. Level at overall of abusive supervision. While, the highest percent of the head nurses and staff nurses reported a low level of overall organizational silence. While the lowest percent of the head nurses and staff nurses reported high level of overall organizational silence.

### **Recommendations**

**Based on the results of the current study, the following suggestions were made:**

#### **For nursing management**

- Modify hospital policies to allow nursing staff to be more accountable for their work through no blames or sham policy toward their unintentional defects.
- Provide educational programs, seminars and workshops for nursing staff about professional accountability and ownership to increases their opinion about abusive supervision and organizational silence.
- Support nursing staff through differ time to connect the nurses' core values with the organization's values.
- Establish well communication structure system inside departments

#### **For head nurses:**

- Ensure that everyone from nurses is being treated as equals.
- Provide rewards that are helpful for improving abusive supervision because it can give them a better idea of the possible results of their actions.
- Provide a cooperative work environment to improve belongingness and connectedness.
- Maintain decision-making autonomy, integration, and involvement to decrease nursing staff silence.
- Attend periodic meeting with nursing staff to take feedback.

#### **For Staff nurses:**

- Attend seminars and workshops programs to be up date.
- Build good relationship with their colleagues depend on respect and trust.
- Improve nursing profession through sharing in nursing research.

-Keep on quality of profession through commitment with polices and problems.

#### For future research:

-Further research needs to prove the current study results in different health care organization.

-Study the relation between nursing staff organizational silence and their work load.

-Conduct educational program about abusive supervision.

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## **Awareness of Mothers Regarding Communication with their Adolescent Daughters about Reproductive Health**

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### **Abstract**

**Background:** In Egypt, reproductive health (RH) care has become a priority for the government in recent years. However, cultural barriers often prevent clear and open discussions about reproductive health. **Aim:** To assess the awareness of mothers regarding communication with their adolescent daughters about reproductive health. **Study design:** A cross-sectional descriptive study design has been used. **Study setting:** This study was conducted at the school health units in Gharbiya Governorate. **Study subjects:** A convenience sample of 400 mothers, who had female adolescents aged (10-19 years). **Study tool:** Data was collected using three tools, Tool I: Mothers', knowledge about reproductive health: to assess socio demographic characteristics of the mothers. Tool II: Awareness of mothers toward reproductive health education. Tool III: Communication of mothers with their adolescent daughters about reproductive health issues. **Results:** More than three quarters (76.3%) of the studied mothers had low level of knowledge about reproductive health. The study found that 64.3% of the studied mothers had negative awareness regarding communication of reproductive health with their adolescent daughters with a mean of  $25.59 \pm 2.50$ . The mothers' total knowledge and awareness scores and their communication barriers scores revealed a statistically significant negative correlation. **Conclusion:** Nearly two thirds of the studied mothers had negative awareness regarding communication of reproductive health with their adolescent daughters. **Recommendations:** Community health nurse has to conduct awareness campaigns to educate mothers about the importance of reproductive health communication and its impact on female adolescents' health and well-being.

**Key words:** Awareness, female adolescents, communication, reproductive health.

**Introduction:**

According to the United Nations, adolescents were defined as those between 10 and 19 years old. It is a period between childhood and adulthood (Bonnie, Backes, Alegria, Diaz & Brindis, 2019). Adolescents are considered a high risk group as their health is influenced by a wide range of biological and social factors such as poverty and family problems (Nawi et al., 2021). In addition, this period is characterized by risk-taking and experimental behavior, which exposes female adolescents to reproductive health problems (Willoughby, Heffer, Good & Magnacca, 2021).

In 2023, United Nations International Children's Emergency Fund (UNICEF) estimated that there were 1.3 billion adolescents worldwide, making up 16% of the world's population (UNICEF, 2023). In Egypt, young people are becoming more prevalent quickly. Around 19.5 million adolescent make up 19% of the whole population (Elnakib et al., 2022). Female adolescents are about 8.7 million representing 9% of total population according to Central Agency for Public Mobilization and Statistics (CAPMASS, 2022).

According to WHO reproductive health is defined as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity, in all matters relating to the reproductive system and its functions and processes (Kalidhasan & Arumugam, 2020).

Mothers and their adolescent daughters should discuss reproductive health issues, including physical changes during puberty, menstrual hygiene, breast self-examination, dietary habits during adolescence, female circumcision, sexual harassment, early marriage, and sexuality transmitted diseases. (Zakaria, Xu, Karim & Cheng, 2019).

Adolescents may acquire information about reproductive health from a range of sources, including the internet, books, magazines, parents, teachers, and friends. Mothers are among the preferred sources for their adolescents daughters RH education. So mothers are an ideal source of reproductive health guidance because they can provide specific information based on their adolescents' family background, religion, and culture. Healthy RH practices and general well-being can be improved through discussion between mothers and their adolescent daughters (Agu et al., 2021).

Mothers may face barriers that restrict them from discussing to their adolescents daughters about reproductive health, including shame, generational differences, their own education and perception of their female adolescent daughters' understanding, religious and traditional misconceptions, their jobs, and a lack of time (Yibrehu & Mbwele, 2020).

Community health nurses play a vital role in providing adolescents with

reproductive health care in a variety of settings, such as public health clinics, schools, and homes. So, they can help female adolescents to have access to reproductive health care. They can educate mothers on the value of having communication about reproductive health issues with their daughters (Ramalepa, 2023). Community health nurses should be aware of the obstacles that prevent mothers from communicating to their adolescent daughters and should assist them in overcoming these obstacles (Coast, Lattof & Strong, 2019).

### **Significance of the study:**

Adolescents undergo major physical and emotional changes. The Egyptian public school curriculum does not provide much information on reproductive health to students. Female adolescent in particular are often kept away from learning about reproductive health (RH) issues because of the cultural and religious factors. Determining mothers adolescent daughters' communication about reproductive health issues helps to explore roles for mothers in supporting their female adolescents' RH needs and design appropriate intervention programs. Therefore, the aim of the current study was to evaluate the awareness of mothers regarding communication with their adolescent daughters about reproductive health.

**Aim of the Study:** The study aimed to evaluate the awareness of mothers regarding communication with their

adolescent daughters about reproductive health.

### **Subjects and method:**

#### **Subjects**

**Study Design:** A cross-sectional descriptive study design was used in this study.

**Study settings:** Three school health units were used as the study's settings in Gharbiya Governorate, Tanta city.

**Study subjects:** The study included a convenience sample of 400 mothers, who had female adolescents aged (10-19 years).

### **Tools of data collection:**

The researcher used three tools to gather the data needed for this study.

**Tool I: Mothers' knowledge about reproductive health:** It consisted of two parts as follows:

**Part (1): Socio-demographic characteristics of the mothers:** This part included data about age, education, occupation of mother, marital status, residence, number of alive children, family type, family size as well as numbers of rooms.

**Part (2): Knowledge of mothers regarding reproductive health:** This part was developed by the researcher based on related literatures (Othman et al., 2020; Priva, 2005 and Korri et al., 2021). It consisted of 20 questions to evaluate the mothers' knowledge regarding reproductive health. The following topics were covered: Definition of reproductive health, whether they communicated with their friends about reproductive health issues, as well as problems of adolescent reproductive health,

concept of puberty, physical and psycho-social changes of adolescents, the contraceptive methods that she know. Furthermore, questions about menstruation, pregnancy, nutrition and sexually transmitted diseases as well as sources of information about reproductive health.

**Scoring system:**

-Every correct answer was scored one (1), the incorrect one was scored zero (0). These scores were summed up, and the total score was converted into a percentage.

**The total score was classified as follows:**

-Low level of Knowledge: (< 50%) of total score. (0-29)

-Moderate level of Knowledge: (50% - < 75%) of total score. (30-44)

-High level of Knowledge: (75%-100%) of total score. (45-60)

**Tool II: Awareness of mothers towards reproductive health education:**

The researcher modified and adapted this tool from a scale designed by Priva S, 2005. It consisted of two parts:

**Part (1): Awareness of mothers regarding communication of reproductive health with their adolescent daughters:** It consisted of eight statements to assess the awareness of mothers as regard communication with their adolescent daughters about reproductive health issues. It included statements whether if reproductive health issues should be discussed openly, the causes if she does not talk to her daughter about

RH as shyness, her daughter is too young to talk about RH issues, and RH issue is not traditionally acceptable between mother and her adolescent daughter.

**Part (2): Awareness of mothers towards the need of reproductive health education.** It consisted of eight statements to assess the awareness of mothers toward the need of RH education such as whether reproductive health is essential for a healthy life, whether it enhances understanding of issues related to reproductive health, whether it starts with a positive perspective on life, whether it acts as an opportunity for premarital counselling, whether it raises awareness of adolescents' rights, whether it covers topics like sexual harassment, and whether it promotes positive habits and behavioral change.

**The scoring system for awareness was as follows:**

-These statements was rated on a 5 point likert scale including: Strongly agree (5), Agree(4), Undecided(3), Disagree(2) and Strongly disagree (1)

-These scores were summed up, and the total score was converted into percentage.

**The total score was classified as the follows:**

-Positive awareness towards reproductive health education: ( $\geq 60\%$ ) of the total score.

-Negative awareness towards reproductive health education: (<60%) the total score.

### **Tool III: Communication of mothers with their adolescent daughters about reproductive health issues:**

The researcher adapted this tool based on relevant literature. It was composed of three parts.

**Part (1): Mothers' communication experiences with their adolescent daughters toward reproductive health.** This part was adapted by the researcher based on literatures (Oo et al., 2013 and Noe et al., 2018). It consisted of six multiple choice questions to assess the communication experiences of the mothers with their adolescent daughters toward reproductive health. It consisted of the following questions: whether they discussed reproductive health with their adolescent daughters, frequency reproductive health discussion in the past six months, discussion topic she discussed with her adolescent daughters, timing of first time she had discussions about reproductive health and tendency to discuss reproductive health issues with her adolescent daughter.

#### **Scoring system:**

-Every correct answer was scored one (1), the incorrect one was scored zero (0). These scores were summed up, and the total score was converted into percentage.

The total score was classified as follows:

-Ineffective communication experiences (<60%) (0-14) of total communication score.

-Effective communication experiences ( $\geq 60\%$ ) (15-26) of total communication score.

**Part (2): Self-reported communication practices of mothers with their adolescent daughters.** This part was adapted by the researcher using Parent-Adolescent Communication Scale (PACS) which was designed by (Sales et al., 2008). It included 18 statements to assess communication practices of mothers with their adolescent daughters about reproductive health. It covered the following items: whether she can discuss her beliefs about reproductive health with her adolescent daughter without feeling embarrassed, if her adolescent daughter is always a good listener, if she sometimes afraid to ask her adolescent daughter for what she wants about reproductive health issues, and if there are topics she avoids discussing with her adolescent daughter.

#### **Scoring system:**

-These statements was rated on a likert scale including: 1=never, 2=rarely, 3=sometimes, 4=often.

-These score were summed up and the total score was converted into a percentage.

#### **The total score was classified as the following:**

-Effective communication: ( $\geq 60\%$ ) of total communication practices score.

-Ineffective communication: ( $< 60\%$ ) of total communication practices score.

**Part (3): Barriers of communication between mothers and their adolescent daughters about reproductive health issues.** This part was adapted by the researcher based on literatures (Gomaa et al., 2022 and Nurachmah et al., 2018). It included 18 statements to identify barriers of communication between mothers and their adolescent daughters about RH issues. It included statements related to the following items; social barriers as generation gaps, culture barriers as traditional norms and beliefs that prevent talking about reproductive health, and economic barriers.

#### **The scoring system:**

- The response for each statement was either disagree given a score of (0) or agree given a score of (1).
- These scores were summed up and the total score was converted into a percentage.

#### **The total score was classified as the following:**

- Many barriers (score of 75 %).
- Some barriers score of (50 - <75 %)
- Few barriers (score of <50 %).

#### **Method**

#### **The study was conducted as follows:**

##### **1-Obtaining approval**

-The Dean of the Faculty of Nursing approved formal permission to conduct the study, which was then submitted to the manager of selected School Health Units.

-The manager of School Health Units was explained about the objectives of the study to obtain his consent to

collect data from the previous settings.

#### **2-Ethical and legal considerations:**

- The Faculty of Nursing's Scientific Research Ethical Committees gave their approval for the study to be conducted. (Code no: 16/11/2022).
- An informed consent was obtained from all study subjects after providing appropriate explanation about the purpose of the study.
- Each mother was informed that she has the right to withdraw from the study any time she wants.
- Nature of the study did not cause any harm or pain for the entire sample.
- Confidentiality and privacy was taken into consideration regarding the data collected.
- All sheets were anonymous.

#### **3-Developing the study tools:**

-The researcher developed the study tool I after reviewing the related literatures

-The study tool II and III was adapted, modified and translated into Arabic language by the researcher based on literature review.

-Before the study was conducted, a jury of five professors who were experts in the field of community health nursing evaluated the study tools for face and content validity. Total questionnaire content validity index was found to be 94.35%.

-Reliability was calculated to study tool using Cronbach's Alpha test. Total questionnaire Cronbach's Alpha was 0.872.

-Significance was at  $p<0.05$  for interpretation of the results.

#### **4-Pilot study:**

-The researcher conducted a pilot study on 10% of the sample to test the tools for clarity and applicability, identify possible barriers for the researcher during data collection, and estimate the time required to collect data from each mother. Consequently, the required adjustments were made. These mothers were not included in the study's sample.

#### **5-Actual study:**

-The researcher met the mothers of female adolescents in the waiting area of the selected three school health units at Tanta city.

-The structured interview sheet was individually fulfilled from each mother of female adolescents at the three previously selected school health units.

-It took an average of 20 minutes to gather the data from each mother. The researcher spent two days a week with the mothers of female adolescents.

-Data was collected by the researcher over a period of five months starting from the first of June 2023 to the end of October 2023.

#### **6-Statistical analysis of the data:**

SPSS (Statistical Package for Social Science) version 25 (IBM Corporation, Armonk, NY, USA) was used to code, enter, tabulate, and analyze the data that was gathered. Range, mean, and standard deviation were computed for quantitative data. Chi-square test was used for qualitative data, which describe a

categorical set of data by frequency, percentage, or proportion of each category, comparison between two groups, and more. The Z value of the Mann-whitney test was used to compare the means of two groups of independent samples' non-parametric data. To compare more than two non-parametric data means, Kruskal-Wallis was computed. Pearson's correlation coefficient (r) was used to assess the relationship between the variables.

#### **Results**

**Table (I): It shows the distribution of the studied mothers according to their socio-demographic characteristics.** This table represented that about half of studied mothers (54.0%) their age ranged from more than 35 to 45 years with mean age  $42.53\pm6.97$  years. As regard to level of education, slightly more than half of studied mothers (53.2%) had secondary education. About two-thirds of the mothers (66.0%) were working. As regard to mothers' job, 22.3% were working in administrative work. The majority of the studied mothers (83.8%) were married. About 61.5% were from rural area. The mean age of marriage was  $20.69\pm2.86$  years and 60.3% had three to four children.

**Table (II): Represents the distribution of the studied mothers regarding their total score of knowledge about reproductive health.** The table illustrated that, 76.3% of the studied mothers had low level of knowledge about

reproductive health, while (17.5%) of them had moderate level of knowledge. It also revealed that the mean score of the studied mothers' knowledge was  $21.74 \pm 10.63$ .

**Table (III): Represents the distribution of the studied mothers regarding their total awareness score of communication and the need for reproductive health education with their adolescent daughters.** The table showed that 64.3% of the studied mothers had negative awareness regarding communication of reproductive health with adolescent daughter. Meanwhile, more than two thirds (69.5%) of them had positive awareness towards the need for reproductive health education. As regard to total awareness score, 51.5% of the studied mothers had total positive awareness toward reproductive health education and communication, with a mean score of total awareness level towards reproductive health education and communication was  $54.53 \pm 6.08$ .

**Table (IV): Represents the distribution of studied mothers regarding communication experiences and self-reported communication practices scores with their adolescent daughters.** The table illustrated that, almost (93.8%) of the studied mothers had ineffective communication experiences. with a mean of  $6.34 \pm 4.61$ . Regarding the level of self-reported communication practices, 61.0% of the studied mothers had ineffective

communication practices with a mean of  $47.04 \pm 7.46$ .

**Table (V): Represents the distribution of studied mothers regarding communication barriers between them and their adolescent daughters about reproductive health issues.** Concerning the social barriers, the majority of the studied mothers (81.8%) reported generation gaps. Regarding the cultural barriers, 73.5% of the studied mothers reported traditional norms, customs and believes. In relation to economic barriers 63.7% of the studied mothers stated that they hadn't sufficient time needed to discuss RH issues, followed by mothers occupation was (57.3%). In respect to the individual barriers, most of the studied mothers (79.3%) reported that they didn't have enough and correct information.

**Table (VI): Represents the relationship between knowledge total score level of the studied mothers and their total awareness and communication scores with their daughters about reproductive health.** The table indicated that, there were a statistically significant relationship between total knowledge score level of the studied mothers and their total awareness towards reproductive health ( $P < 0.05$ ), where those who had high level of knowledge gained total positive awareness score. This was also true regarding their communication experiences score level, self-reported communication practices and barriers scores towards their daughters about

reproductive health ( $P<0.05$ ), where those who had high level of knowledge gained effective experiences score level, more self-reported communication practices and few communication barriers scores towards their daughters about reproductive health.

**Table (VII): Represents the relationship between total awareness of the studied mothers about reproductive health and their socio demographic characteristics.**

It was found that, there was a statistically significant positive relationship between total awareness of the studied mothers and their educational level, occupation, job. Regarding education those who had university education gained high score. As regard to occupation, working ones gained higher score. In relation to job mothers who work at professional job had higher score. In contrary, there was no statistically significant relationship with age, marital status and residence.

**Table (I): Distribution of the studied mothers according to their socio-demographic characteristics.**

Socio-demographic characteristics	The studied mothers (n=400)	
	N	%
<b>Age in years</b>		
23-35	69	17.3
>35-45	216	54.0
>45-59	115	28.7
Range	23-59	
Mean±SD	42.53±6.97	
<b>Educational level</b>		
Illiterate or read and write	83	20.8
Elementary education	33	8.2
Secondary / technical secondary education	213	53.2
University & postgraduate education	71	17.8
<b>Occupation of the mother</b>		
Working	264	66.0
House wife	136	34.0
<b>Mothers' job</b>		
House wife	136	34.0
Administrative work	89	22.3
Craft work	42	10.5
Professional work	65	16.2
Business work	68	17.0
<b>Marital status</b>		
Married	335	83.8
Divorced	32	8.0
Widow	33	8.2
<b>Residence</b>		
Rural	246	61.5
Urban	154	38.5
<b>Age of marriage in years</b>		
12-20	232	58.0
>20-30	168	42.0
Range	12-30	
Mean±SD	20.69±2.86	
<b>No. of alive children</b>		
1 & 2	138	34.5
3 & 4	241	60.3
5-7	21	5.2

**Table (II): Distribution of the studied mothers regarding their total score of knowledge about reproductive health.**

Total knowledge score and level about reproductive health	The studied mothers (n=400)	
	N	%
<b>Total knowledge level</b> Low level (<50%) (0-29)	305	76.3
	70	17.5
	25	6.2
<b>Total knowledge score (0-60)</b> Range Mean±SD	10-58 21.74±10.63	

**Table (III): Distribution of the studied mothers regarding their total awareness score of RH communication and the need for reproductive health education with their adolescent daughters.**

Awareness level towards reproductive health communication and education	The studied mothers (n=400)	
	N	%
<b>I-Awareness level regarding communication of RH with adolescent daughter</b> Negative awareness (<60%) (8-26) Positive awareness ( $\geq 60\%$ ) (27-40)	257	64.3
	143	35.8
	Range Mean±SD	8-35 25.59±2.50
<b>II-Awareness level towards the need of RH education</b> Negative awareness (<60%) (8-26) Positive awareness ( $\geq 60\%$ ) (27-40)	122	30.5
	278	69.5
	Range Mean±SD	8-40 28.95±5.33
<b>Total awareness level towards RH education and communication.</b> Negative awareness (<60%) (16-53) Positive awareness ( $\geq 60\%$ ) (54-80)	194	48.5
	206	51.5
	Range Mean±SD	16-72 54.53±6.08

**Table (IV): Distribution of studied mothers regarding communication experiences and self-reported communication practices scores with their adolescent daughters.**

<b>Level of communication with adolescent daughters toward reproductive health</b>	<b>Level of communication experiences and self-reported communication practices of the studied mothers (n=400)</b>	
	<b>N</b>	<b>%</b>
<b><u>Level of communication experiences</u></b> Ineffective experiences (<60%) (0-14)	375	93.8
Effective experiences ( $\geq 60\%$ ) (15-26)	25	6.2
<b>Mean±SD</b>		<b>6.34±4.61</b>
<b><u>Level of self-reported communication practices</u></b> Ineffective practices (<60%) (18-49)	244	61.0
Effective practices ( $\geq 60\%$ ) (50-72)	156	39.0
<b>Mean±SD</b>		<b>47.04±7.46</b>

**Table (V): Distribution of the studied mothers regarding communication barriers between them and their adolescent daughters about reproductive health issues.**

Communication barriers between mothers and their adolescent daughters about reproductive health issues	The studied mothers (n=400)			
	Disagree		Agree	
	N	%	N	%
<b>Social barriers.*</b>				
1- Generation gaps	73	18.3	327	81.8
2- The ability to obtain information from any source other than mother.	138	34.5	262	65.5
3- Feeling that talk about RH encourage sexual experience.	148	37.0	252	63.0
4- Feeling that talk about RH offends the modesty of your adolescent daughter,	126	31.5	274	68.5
5- Mothers depend on school to take adequate information regarding RH.	175	43.8	225	56.3
<b>Cultural barriers.*</b>				
1- Traditional norms, customs and believes	106	26.5	294	73.5
2- The belief that talking about RH is not suitable for your adolescent daughter's age.	115	28.7	285	71.3
3- The belief that talking about RH is only before marriage.	148	37.0	252	63.0
4- Talking about reproductive health contradicts religious belief	169	42.3	231	57.8
5- Talking about reproductive health is unethical topic for discussion.	160	40.0	240	60.0
<b>Economic barriers.*</b>				
1- Mothers occupation	171	42.8	229	57.3
2- Taking extra working hours to improve the family income	174	43.5	226	56.5
3- Insufficient time needed to discuss RH issues	145	36.3	255	63.7
<b>Individual barriers.*</b>				
1- Lack of communication skills of mothers.	93	23.3	307	76.8
2- Feeling shame when talking about RH	106	26.5	294	73.5
3- Feeling that I don't have enough and correct information.	83	20.8	317	79.3
4- Difference in the educational level between me and my daughter	101	25.3	299	74.8
5- Inability to use examples during communication to clarify information.	89	22.3	311	77.8

\*More than one answer is correct.

**Table (VI): Relationship between total knowledge score level of the studied mothers and their total awareness and communication scores with their daughters about reproductive health.**

Total score level of awareness and communication	Total knowledge score level of the studied mothers (n=400)						$\chi^2$ test P value	
	Low level (n=305)		Moderate level (n=70)		High level (n=25)			
	N	%	N	%	N	%		
<b>Total awareness score level towards reproductive health education</b>								
Negative awareness	179	58.7	13	18.6	2	8.0	54.196 0.0001*	
Positive awareness	126	41.3	57	81.4	23	92.0		
<b>Total communication experiences score level with adolescent daughters</b>								
Ineffective experiences	305	100	61	87.1	9	36.0	167.845 0.0001*	
Effective experiences	0	0	9	12.9	16	64.0		
<b>Total self-reported communication practices scores level with adolescent daughters</b>								
Ineffective practices	226	74.1	15	21.4	3	12.0	93.302 0.0001*	
Effective practices	79	25.9	55	78.6	22	88.0		
<b>Total communication barriers scores level about reproductive health issues</b>								
Few barriers	45	14.8	49	70.0	17	68.0	133.140 0.0001*	
Some barriers	29	9.5	6	8.6	8	32.0		
Many barriers	231	75.7	15	21.4	0	0		

\*Statistically significant (P<0.05)

**Table (VII): Relationship between total awareness of the studied mothers with their adolescent daughters about reproductive health and their socio demographic characteristics.**

Socio-demographic characteristics	N	Awareness total scores towards reproductive health education of the studied mothers (n=400)		
		Mean±SD	Z value or $\chi^2$ value	P value
<b>Age years</b>				
23-35	69	54.45±6.30	0.698	0.705
>35-45	216	54.75±5.99		
>45-59	115	54.17±6.14		
<b>Educational level</b>				
Illiterate or read and write	83	52.57±5.30	50.792	0.0001*
Elementary education	33	53.00±6.07		
Secondary / technical secondary education	213	54.01±5.78		
University & postgraduate education	71	59.10±5.58		
<b>Occupation of the mother</b>				
Working	264	55.61±5.86	5.243	0.0001*
House wife	136	52.43±5.97		
<b>Mothers' job</b>				
House wife	136	52.43±5.97	18.208	0.0001*
Administrative work	89	56.52±4.06		
Craft work	42	54.90±5.44		
Professional work	65	56.71±7.69		
Business work	68	53.82±5.73		
<b>Marital status</b>				
Married	335	54.38±5.65	4.558	0.102
Divorced	32	57.19±6.80		
Widow	33	53.54±8.63		
<b>Residence</b>				
Rural	246	54.43±5.92	0.654	0.513
Urban	154	54.70±6.35		

**Discussion:**

Adolescent girls in Egypt face a number of issues, including unsafe abortions and early childbearing with high rates of unwanted pregnancies related to physiological and psychological factors predisposing them to reproductive health problems. (Panjalipour et al.,

2020). Effective communication between mothers and their adolescent daughters regarding RH requires mothers to be able to communicate openly and give accurate and correct advice about RH to their adolescent daughters as they become more sexually

aware. (**Silva et al., 2022**). Therefore, the aim of the current study was to evaluate the awareness of mothers regarding communication with their adolescent daughters about reproductive health.

Mothers' knowledge about reproductive health must not be ignored, as it is the first step for raising their awareness toward the importance of communication with their adolescent girls regarding RH. The findings of the current study indicated that more than three quarters of the studied mothers had low level of knowledge about reproductive health. (**Table II**). This result is in contrary with the findings of the study conducted by **Alderaan et al., (2020)** who reported that the majority of the studied mothers had good knowledge regarding the different issues of puberty. This may be due to cultural difference and higher educational level of their participants as most of them had university education. Meanwhile, less than one fifth of mothers had university education in the current study (**Table I**).

Awareness is to be conscious of a subject. Mothers of adolescent girls should be aware of the importance of communicating RH issues with their daughters. From this perspective, the present study showed that more than three fifth of the studied mothers had negative awareness regarding communication of RH with their adolescent daughter. **Table (III)**. This agrees with **Noe et al.,(2018)** who found that slightly less than three fifth

of mothers had negative awareness. From the researcher point of view, this can be justified as, about two-thirds of the studied mothers in the present study were working which is considered an economic barriers for communication (**Table V**).

Reproductive health education can help mothers better understanding the social development and interaction with their adolescent daughters. Concerning awareness toward reproductive health education, the current study showed that more than half of the studied mothers had total positive awareness toward reproductive health education and communication. (**Table III**). This is similar with **Shams, Parhizkar, Mousavizadeh & Majdpour. (2017)** who revealed that about half of the mothers believed that they need reproductive health education and communication. From the researcher point of view this can be attributed to as most of the studied mothers was from rural areas, which potentially limited their access to reproductive health information.

Successful mother- female adolescent communication about RH issues frequently raises awareness of these issues and lowers risky conduct and its effects on female adolescent populations. This study showed that, almost all of the studied mothers had ineffective communication experiences. (**Table IV**). These findings are in the same line with **Oaa et al., (2017)**. They found that, less than three quarters of mothers had ineffective communication

experiences with their adolescent daughters about of RH education. This can be attributed by that most of the studied mothers in the present study reported that they didn't have enough and correct information about RH issues.

Mothers face significant challenges when discussing reproductive health (RH) issues with their adolescent daughters. These challenges stem from deeply rooted cultural and generational factors that create communication gaps. The barriers that were reported by the mothers in the present study regarding their ineffective communication with their adolescent daughters were the generation gap, traditional norms and customs, and the belief that talking about RH is inappropriate for their daughters' age. They also reported feeling with shame regarding talking about RH issues conversations, while others reported that they lack accurate information about RH. (**Table V**).

Similarly, **Namukwaya et al. (2023)**, who found that sociocultural norms and limited parental knowledge were significant barriers to effective parent-adolescent communication about sexual and reproductive health. This can be justified that the consistent identification of cultural taboos, generational differences, and limited parental knowledge as barriers to effective communication about reproductive health which highlight how these factors prevent open discussions between parents and adolescents, emphasizing the universal

nature of these challenges across different cultural contexts.

Effective mothers' communication practices with their adolescent daughters about RH emphasize on creating a supportive environment, through mothers' active listening which can enhancing daughters' understanding of RH and empowering them to make informed decisions. In this light, more than three fifth of the studied mothers had ineffective communication practices. (**Table IV**). This finding is in line with **Singh et al., (2023)** who found that more than half of the mothers had ineffective communication practices about RH issues. This can be justified as most of the studied mothers in the present study facing many communication barriers such as economic barriers as about two thirds of them were working and they face cultural barriers such a traditional norms and customs (**Table I**) and (**Table V**).

Knowledge and awareness are intrinsically linked together. It is expected that those mothers who had high knowledge about RH and positive awareness will have a tendency to communicate with their female adolescents about RH. This was proved in the current study, as there was a statistically significant relationship between total knowledge score of the studied mothers and their total awareness score towards reproductive health. Those who had high level of knowledge about RH gained total positive awareness score. (**Table VI**).

Similarly, the study performed by **Kashyap & Choudhari. (2024)** who found that there was a significant relationship between total knowledge of the mothers, and their total awareness regarding reproductive health. This can be justified as, when knowledge are present, better awareness is expected. Mothers who are well-prepared and knowledgeable are the best sources of reproductive health for their girls. It is critical to keep in mind that education is an essential aspect. The current study revealed presence of a highly statistically significant positive relationship between total knowledge score as well as total awareness of the studied mothers and their education, where the university educated ones gained significantly higher score more than others. (**Table VII**). These findings agree with Iranian study done by **Bekele, Dekkisa, Abara, & Megersa. (2022)**. They found that, there was a statistically significant relationship between mothers' knowledge, total awareness and their education. This can be justified as, educated mothers have greater access to information and resources, which enables them to engage more effectively in discussions with their adolescent daughters on these sensitive topics.

Finally, it can be concluded that the present study directed the light to give more attention to the importance of communication between mothers and their daughters regarding RH issues. However, most of the studied mothers had low level of knowledge about RH,

as well as they felt uncomfortable approaching their female adolescents about sexual matters. Consequently, they reported more need for education and guide their daughters away from relying on the internet and peers. Therefore more education programs should be conducted to mothers of adolescent girls to support them to guide their adolescent daughters effectively.

### **Conclusion**

It can be concluded from the current study's results that, most of the studied mothers were unaware of the importance of communication with their daughters about RH and had poor communication practices with them, as nearly two thirds of the studied mothers had negative awareness regarding communication of reproductive health with their adolescent daughters. Furthermore, more than three quarters of the studied mothers had low level of knowledge about reproductive health.

### **Recommendations**

**In light of the present study's findings, the following recommendations are suggested:**

- 1) Community health nurse has to conduct awareness campaigns to educate mothers about the importance of RH communication and its effects on adolescents' health and well-being.
- 2) There is a need for developing training programs at primary health care settings to equip mothers with effective communication techniques for discussing sensitive RH topics with their daughters.

- 3) Strengthening collaboration between schools and families by incorporating RH education programs that engage both students and parents, ensuring a unified approach to RH awareness.
- 4) Mass media including radio, television, and social media platforms need to broadcast educational programs that guide mothers on how to approach RH topics effectively with their daughters.

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## Effect of Implementing Tracheostomy Care Guidelines on Patients' Clinical Outcomes at the Intensive Care Units

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### Abstract

**Background:** Tracheostomy care practices vary widely among healthcare providers, leading to inconsistent patient outcomes; differ widely among healthcare providers and institutions, potentially resulting in inconsistent care. Therefore, standardized tracheostomy care guidelines have been established. **The study aimed** to evaluate the effect of implementing tracheostomy care guidelines on patients' clinical outcomes at the Intensive Care Units. **Method:** A quasi-experimental pretest-posttest research design was performed with a purposive sample of 80 patients with tracheostomy recruited from three Intensive Care Units affiliated with Tanta University Hospitals in Egypt. Data were collected using four tools: **Tool I:** Tracheostomy Patients Assessment Sheet. **Tool II:** Glasgow Coma Scale. **Tool III:** Tracheostomy Patients Clinical Outcomes. **Tool IV:** Tracheostomy Adverse Events. **Results:** The results revealed that statistically significant improvements were observed regarding mechanical ventilator and physiological parameters, and reduced tracheostomy adverse events among the study group ( $P<0.5$ ). Notably, 15% of the study group achieved a high prediction of successful decannulation two weeks post-insertion compared to no one in the control group. **Conclusion:** Implementing tracheostomy care guidelines markedly improves clinical outcomes by enhancing physiological stability, increasing decannulation success, and reducing adverse events. **Recommendations:** Ongoing training program for critical care nurses about tracheostomy care guidelines for updating their knowledge and practice in the ICU. Monitoring of tracheostomy cuff pressure should be integrated into routine care for critically ill patients to improve patient's clinical outcomes and prevent adverse events.

**Keywords:** Clinical Outcomes, Tracheostomy Care Guidelines.

**Introduction:**

Tracheostomy is one of the surgical interventions conducted at intensive care units (ICUs) (**Smith et al., 2020**). This procedure is typically indicated for patients requiring long-term mechanical ventilation (MV) and those facing difficulties during the weaning process. It is also recommended for upper airway obstructions caused by laryngeal edema from inhalation injuries, anaphylaxis, trauma, or infections (**Simonds, 2023**).

According to **Wise, Sparks, Spray, Nolder & Willis, (2023)** tracheostomy is a safe intervention for critically ill patients requiring prolonged ventilation who need extended ventilation, with the goal of reducing the duration of mechanical ventilation, facilitate weaning from the ventilator, decrease the need for sedation, and enhance patient comfort. Conversely, **Lubianca, Castagno, and Schuster et al. (2022)** emphasize that several complications can arise during the procedure, immediately afterward, or even long-term. These complications include bleeding, pneumothorax, tracheoesophageal fistula, mucus plugging leading to tube blockage, accidental tube displacement, and infections at the stoma site.

**Miu et al. (2024)** assert that tracheostomy care requires evidence-based guidelines. Key aspects include ensuring a patent airway, maintaining proper cuff pressure, performing suctioning, humidifying inspired

oxygen, practicing oral hygiene, providing adequate nutrition, and maintaining a comprehensive care plan. Additionally, effective communication with the healthcare team regarding any changes to the care plan is essential, along with preparing emergency equipment and adhering to a transport safety checklist.

**Significance of the study:**

Adverse events related to tracheostomies remain a significant global concern, accounting for approximately half of all airway-related fatalities and cases of hypoxic brain injury in critical care settings. The incidence of tracheostomies among patients requiring MV has increased from 16.7 to 34.3 per 100,000 adults (**Abrial et al., 2021**). In the United States, more than 110,000 tracheostomy procedures are performed annually (**Kim et al., 2023**). A statistical report from Tanta University Hospitals indicated that in 2021, there were 345 patients on MV in both settings (**Annual statistics of Tanta Emergency Intensive Care Units**).

Therefore, nurses must be equipped with the appropriate evidence-based practice approach to meet tracheostomy patients' needs safely and competently.

**The aim of this study** was to evaluate the effect of implementing tracheostomy care guidelines on patients' clinical outcomes at the intensive care units.

**Research hypothesis:**

The critically ill patient who received tracheostomy care guidelines is expected to have an improvement in their clinical outcomes in Intensive Care Units.

**Clinical outcomes:** Means improving physiological parameters such as; enhancing prediction of successful decannulation, decreasing incidence of adverse events, and maintaining tracheostomy cuff pressure

**Subjects and method:**

**Design:** A quasi-experimental pretest-posttest research design was performed in this study.

**Settings:** This study was conducted at both the Traumatology and Emergency Medicine and Surgical Anesthesia Intensive Care Unit at Tanta University Hospitals.

**Subjects:** A Purposive sample of 80 adult patients with tracheostomy from the previously mentioned settings who met the inclusion criteria were assigned using the Epi Info program. Based on the total population, there were 145 admissions per year across both settings. The sample size was calculated as the following:  $Z =$  confidence level 95%,  $d =$  Error proportion (0.05),  $P =$  population (60%)

The subjects were divided into two groups:

**Control group:** Consisted of 40 adult patients who received routine tracheostomy care. which include; assessment of stomal secretion, ensuring well inflated cuff without

measurement with a manometer, suctioning, and stomal care for patients with tracheostomy

**Study group:** Consisted of 40 adult patients who received tracheostomy care-based guidelines from the primary researcher.

**Tools of data collection:** Four tools were utilized in this study

**Tool (I): Tracheostomy Patients Assessment Sheet;** it was developed by the researcher following a review of relevant literature to evaluate tracheostomy patients. The assessment consisted of three components, detailed as follows: -

**Part (1): Demographic characteristics;** concerned with data related to patients' code, age, sex, and job.

**Part (2): Clinical data for tracheostomy patients;** this part was used to assess clinical and medical data of patients with tracheostomy such as; admission diagnosis, present medical history and past history, the size of the tracheostomy tube and suction catheter size (Kim et al., 2023).

**Part (3): Mechanical ventilator assessment data;** This section was used to assess parameters of mechanical ventilation such as the mode of a mechanical ventilator, a fraction of inspired oxygen (FIO2), respiratory rate (RR), tidal volume (Vt), peak inspiratory pressure (PIP), pressure limit and positive end-expiratory pressure (PEEP) (Grasselli et al., 2021).

**Tool II: Glasgow Coma Scale (GCS);** developed by **Graham Teasdale and Bryan Jennett in 1974** and later adopted by **Cook in 2021**, this tool evaluates a patient's level of consciousness. It includes three domains: eye-opening is scored from 1 to 4, verbal response from 1 to 5, and motor response from 1 to 6.

These scores are added together to provide a total score between 3 and 15 and classified according to Minor GCS  $\geq 13$ , Moderate GCS 9 – 12 and Severe, with GCS  $\leq 8$

**Tool III: Tracheostomy Patients Clinical Outcomes;** It was developed by the researchers following a review of pertinent literature (**Ghiani et al., 2022; Battaglini et al., 2023; Poral, Kovammal, Nalamate, Kurien, & Thomas, 2024**) to assess clinical outcomes of tracheostomy patients. It was divided into three parts as the following;

**Part (1): Physiological parameters;** It included; temperature, heart rate, respiratory rate, mean arterial blood pressure, and oxygen saturation (spo2). The scoring system of this part was noted as mean & standard deviation.

**Part (2): Tracheostomy cuff pressure flow sheet;** ensuring that cuff pressure was in the recommended ranges from 20-30 cm H<sub>2</sub>O. The scoring system was reported as mean  $\pm$  standard deviation.

**Part (3): Prediction of early successful decannulation indicators;** involved assessment of the following; consciousness ( $\geq 5$  or  $<5$ ),

hemodynamic stability (no active infection and hemodynamic stability), adequate swallowing, decreased tracheal suction frequency ( $\leq 2$  or  $> 2$  suction every 8 hours), oxygenation  $> 90\%$ , no comorbidities, absent of sedation, voluntary coughing and ability to tolerate tube capping  $> 24$  hours. All items were observed and scored using a dichotomous scale as present was scored (1) and absent was scored (0) All items were calculated and classified as the following;  $< 5$  indicated a low successful rate for decannulation. 5-7 indicated a moderate successful rate for decannulation. 8- 9 indicated a highly successful rate for decannulation

**Tool IV: Tracheostomy Adverse Events:** This tool was developed by the researcher after examining relevant literature (**Narwani, Dacey, & Lerner, 2024; Twose , Cottam, Jones, Lowes, & Nunn, 2024**) to assess adverse events of tracheostomy and consisted of the following; bleeding, stoma site infection, tracheostomy tube dislodgement, tracheostomy tube occlusion as, respiratory related events.

#### Scoring system

Present sign was scored (1) and absent sign was scored (0)

#### Method

The study was accomplished through the following steps:

**1-Administrative process:** Official permission to conduct the study was obtained by the Dean of the Faculty of Nursing to the Director of Anesthesia,

Traumatology and Emergency Medicine and the Surgical Intensive Care Units, Tanta University Hospitals the study and collect data from selected setting.

## **2-Ethical consideration:**

-Approval of Scientific Research Ethics Committee of the Faculty of Nursing was obtained with code number (127/10/22) and the Scientific Research Ethics Committee of the Faculty of Medicine with code number (36109/11/22).

-Patients were assured of privacy and confidentiality regarding data collection. A code number was used instead of names.

-The study was not causing any harm to the patient

**3-Validity of tools:** content validity of all tools of the study was tested for clarity and applicability by (7) experts in the field of specialty such as Critical Care and Emergency Nursing, Anesthesia and Biostatistics and modifications were done.

**4-Reliability of the tool:** The reliability of the developed tools was assessed using Cronbach's alpha, which yielded scores of 0.82 for Tool I, 0.85 for Tool II, and 0.95 for Tools III and IV. The overall Cronbach's alpha for the entire study sheet was 0.88.

## **5-A pilot study:**

It was performed on eight adult patients with tracheostomy before the actual study the tools were tested for clarity and applicability, as well as to identify any obstacles the researcher might face during data collection. As

a result, the researcher made the necessary modifications prior to the study. Data from the pilot study were excluded from the current research.

## **6-Field work:**

-Data collection for this study was conducted within the period from the end of October 2023 to the end of October 2024.

-The researcher started with a control group of patients first to prevent data contamination.

**The present study was conducted through four phases:** Assessment, planning, implementation and evaluation.

### **1. Assessment phase: -**

- The researcher assesses patients in both control and study group with tracheostomy immediately after insertion who fulfilled inclusion criteria to obtain baseline data about demographic characteristics as code, age, sex and job using **tool I (part 1)**

- The researcher also, assess clinical data for tracheostomy patients and mechanical ventilator parameters **tool I (part 2&3)**

- Assess level of consciousness using tool II Glasgow Coma Scale (GCS).

- Assess tracheostomy patients' clinical outcomes (physiological parameters, assess tracheostomy cuff pressure, prediction of early successful decannulation) through;

**- Tool III part (1,2, 3).**

- Assess adverse events of tracheostomy and include using a tool (IV).

## 2. Planning phase: -

- A tracheostomy care guideline for patients in ICU was developed based on the assessment of study subjects and existing guidelines found based on the relevant literature (Twose et al., 2024) regarding the effect of implementing tracheostomy care guidelines on patients' clinical outcomes at the Intensive Care Units.

### Expected Clinical Outcomes: -

- Improve physiological parameters
- Maintain tracheostomy cuff pressure
- Enhance prediction of successful decannulation
- Decrease the incidence of adverse events

## 3. Implementation phase: -

At the beginning of this phase, the researcher prepared the patients and equipment, then divided patients into two groups

**Control group:** Routine care was implemented by nurses as; assessment of stomal secretion, ensuring well-inflated cuff without measurement with manometer, suctioning and stomal care.

**Study group:** A tracheostomy care guideline was implemented for patients undergoing tracheostomy within 24 hours after insertion by the researcher daily for two weeks during morning and afternoon shifts, while the night shifts, nurses in the critical care unit implemented the guidelines after receiving training from the researcher. The content of tracheostomy care guidelines was

applied according to patients' assessment.

### A tracheostomy care guideline for mechanically ventilated patients included the following: -

- Maintaining tracheostomy tube stabilization through ensure it is stabilized in a central position, avoiding any angling or contact between the tube and the tracheal mucosa.
- Maintain proper cuff management in which; at 20-30cm H<sub>2</sub>O.
- Maintain tracheostomy humidification (active humidification was used for adult patients in the ventilator circuit, temperature modified to 37°C to ensure 100% relative humidity)
- Tracheostomy suctioning; conducted when clinically warranted for the patient, rather than as a routine procedure. Using an open technique, and employ a non-touch method.
- Care for the stoma by minimizing shear and friction forces, and apply barrier wipes around the stoma site for patients with moist skin or excessive secretions.
- Ensure oral hygiene is maintained twice daily, with regular rinsing or moistening of the mouth at intervals.

## 4. Evaluation phase: -

Evaluation of both groups was done three times immediately, one week, and two weeks after insertion of the tracheostomy tube by using tool I Part (3). Also, tool II, tool III, and tool IV. A comparison was performed between two groups to determine effect of implementing tracheostomy

care guidelines on patients' clinical outcomes at the Intensive Care Units.

### Results:

**Table (1) represents socio-demographic characteristics in both studied groups.** It was noted that over half (55%) of the control group and more than one-third (37.5%) of the study group were aged between 50 and 60 years, with a mean  $\pm$  standard deviation ( $45.60 \pm 12.912$  and  $43.15 \pm 10.807$ ) respectively. Also, more than half (52.5%, 57.5%) of them were male respectively.

**Figure (1) illustrates patients' clinical characteristics of the studied groups.** It was noticed that a higher proportion (40%, 45%) of critically ill patients in the control and study groups were diagnosed with traumatic brain injury, while the lower (10%, 7.5%) of control and study groups were diagnosed with cervical injury and respiratory failure, respectively.

**Figure (2) shows modes of mechanical ventilators among the studied groups.** The findings of this result highlighted that, immediately after tube insertion the majority (70%, 75%) of the control and study group were on VC SIMV mode respectively. On the other hand, it was noticed that there was a considerable percentage of patients' prognoses to CPAP/PSV 17.5%, 57.5% of the control and study group, respectively post a week after insertion and only 2.5% of the control group compared to a considerable percentage (20%) of the study group

were weaned post two weeks after tube insertion.

**Table (2) shows the distribution of mechanical ventilator parameters for the studied groups throughout the study.** It was observed that there was a significant difference regarding PEEP post-a week and two weeks after tube insertion. In addition, respiratory rate and peak inspiratory pressure post two weeks after insertion among two groups where ( $p < 0.005$ ).

**Table (3) reveals mean scores of the studied groups regarding level of consciousness using Glasgow Coma scale (GCS) throughout period of study.** This table reveals that the mean  $\pm$  SD of Glasgow coma scale (GCS) in control group was  $4.10 \pm 1.215$  while,  $4.80 \pm 0.911$  in the study group immediately after tube insertion where there was an increase in the mean  $\pm$  SD to ( $4.80 \pm 1.224$  and  $5.65 \pm 1.122$ ) among control and study group post a week after insertion respectively. Then followed by an increase to ( $5.20 \pm 1.814$  and  $6.08 \pm 1.474$ ) post two weeks after insertion in both groups respectively. In addition, a statistically significant difference was observed between control and study group throughout the period of study ( $P < 0.05$ ).

**Table (4) presents mean scores of physiological parameters and tracheostomy cuff pressure among the studied groups.** Concerning physiological parameters, there was a significant decrease in respiratory rate in control and study groups where  $p$

(0.008 and 0.031) respectively throughout the period of study, with a statistically significant difference among both groups post a week from insertion ( $p=0.028$ ). Regarding mean arterial blood pressure, there was a high statistically significant difference among the two groups two weeks after tracheostomy tube insertion ( $p=0.000$ ).

**Concerning oxygen saturation,** A high statistically significant difference among the two groups post-a week and after two weeks from insertion were observed with ( $p<0.005$ ).

**Regarding tracheostomy cuff pressure,** there was a high statistically significant difference between both groups post-a week and two weeks after tube insertion ( $p=0.000$ ).

**Table (5) reveals the percentage distribution of prediction of early successful decannulation of the studied groups.** This table showed that a considerable percentage of 15% of the study group showed a high prediction of successful decannulation rate post two weeks of insertion where ( $P= 0.000$ ) compared with no one in the control group. **Additionally,** there were highly statistically significant differences regarding the prediction of successful decannulation post-a week and two weeks after tube insertion among two groups where  $P= 0.000$ .

**Table (6) shows the percent distribution of bleeding and local signs of stoma site infection among the studied groups.** It was noticed

that there was a statistically significant increase about local signs of infection among control group regarding all items of local signs of stoma site infection except bleeding beside the tracheal cannula where ( $p<0.005$ ) and no statistically significant difference was observed regarding bleeding or local signs of infection in the study group ( $P>0.5$ )

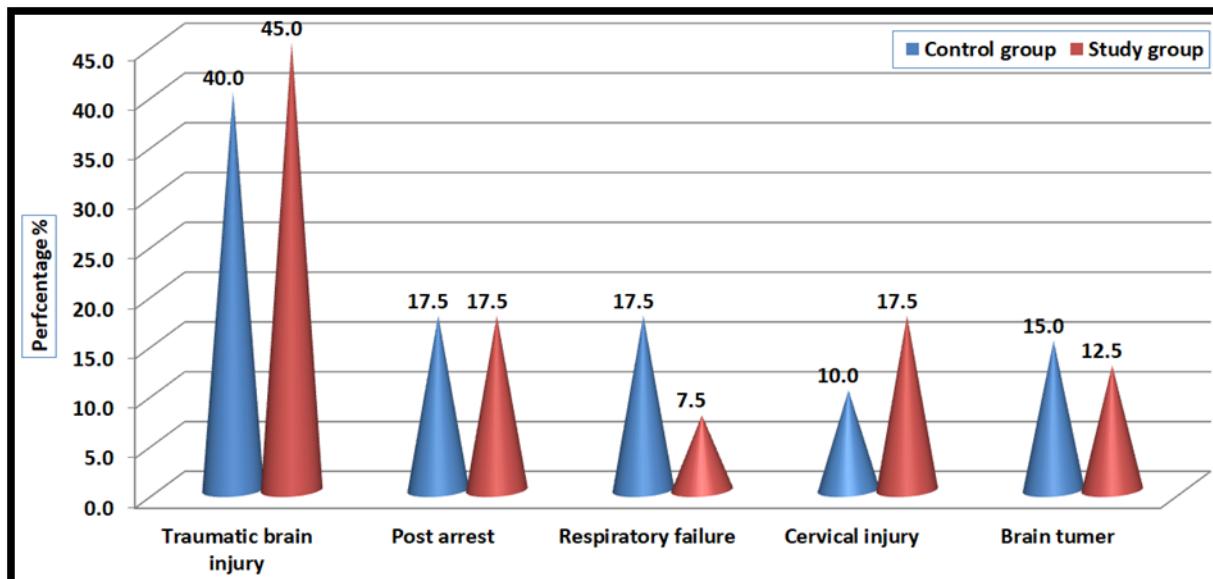
**Table (7); shows a relation between the mode of mechanical ventilator of the studied groups and their early successful decannulation score.** It was noted that the higher mean scores for prediction of early successful decannulation at two weeks after tube insertion were ( $6.00\pm0.00$  and  $6.63\pm1.302$ ) for patients weaned from mechanical ventilation in both control and study groups, respectively. In contrast, lower mean scores for successful decannulation were recorded for patients on PC(SIMV) mode immediately after tube insertion, with scores of ( $3.67\pm0.778$  and  $3.00\pm1.414$ ) for control and study groups, respectively. Additionally, there was a statistically significant relation between the CPAP/PSV mode and early successful decannulation a week post-insertion, with a  $P$  value of 0.029.

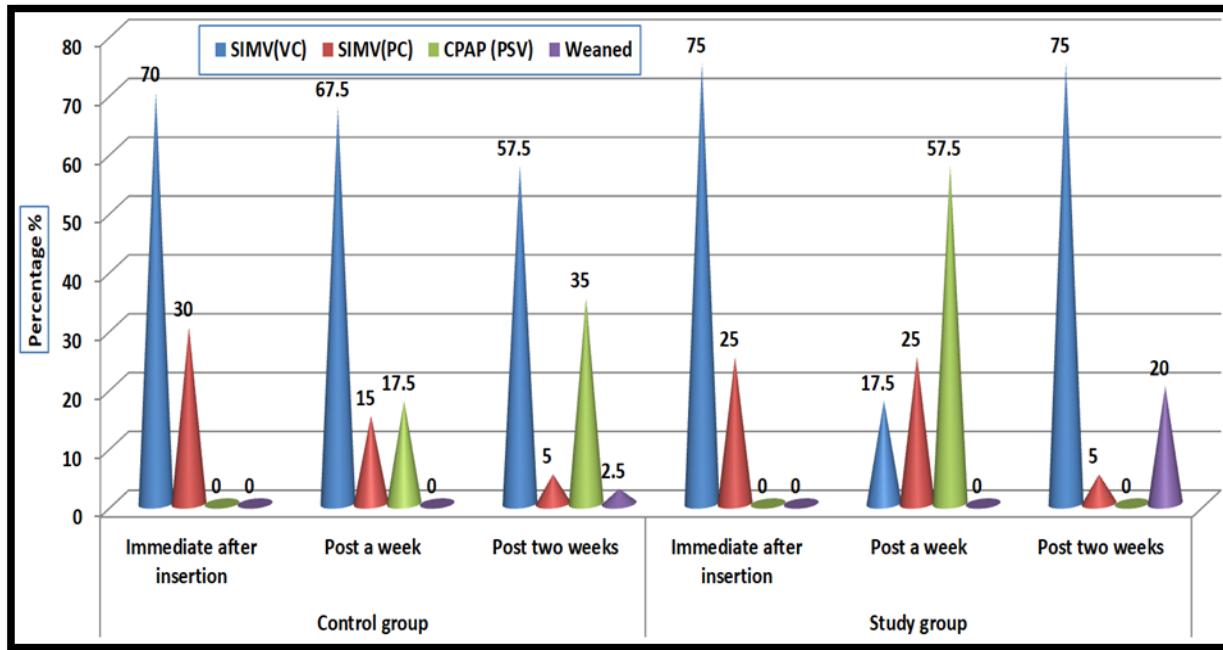
**Table (8); illustrates the correlation between the prediction of early successful decannulation scores of the studied groups and their physiological parameters.** Regarding the control group, it was observed that there was a positive significant

correlation between the prediction of early successful decannulation and (heart rate, mean arterial blood pressure, and oxygen saturation) immediately after tube insertion where ( $P < 0.05$ ). While, a positive statistically significant correlation was found in relation to (mean arterial blood pressure and oxygen saturation) post a week where ( $P < 0.05$ ). In addition a highly statistically significant positive correlation with oxygen saturation post two weeks after tube insertion where ( $P = 0.000$ ). There was a significant positive correlation between early successful decannulation and (oxygen saturation and mean arterial blood pressure) immediately and two weeks after tube insertion among study group respectively where ( $P < 0.05$ ). While, there was a significant positive correlation with (heart rate, mean arterial blood pressure, and oxygen saturation) and a statistically negative correlation with respiratory rate post a week after tube insertion where ( $P < 0.05$ ). In relation to tracheostomy cuff pressure, it was noticed that a statistically negative correlation with early successful decannulation post a week after tube insertion in the control group where ( $P < 0.05$ ).

**Table (1): Socio-demographic characteristics of both studied groups.**

Characteristics	The studied patients (n=80)				$\chi^2$ P	
	Control group (n=40)		Study group (n=40)			
	N	%	N	%		
<b>Age (in years)</b>						
- (21-<30)	5	12.5	3	7.5	4.619	
- (30-<40)	8	20.0	11	27.5	0.202	
- (40-<50)	5	12.5	11	27.5		
- (50-60)	22	55.0	15	37.5		
<b>Range</b>	<b>(21-60)</b>		<b>(21-60)</b>		t=0.847	
<b>Mean <math>\pm</math> SD</b>	<b>45.60<math>\pm</math>12.912</b>		<b>43.15<math>\pm</math>10.807</b>		P=0.360	
<b>Gender</b>						
- Male	21	52.5	23	57.5	FE	
- Female	19	47.5	17	42.5	0.822	

FE: Fisher' exact test,  $\chi^2$ : Chi-Square test, p-value  $\leq 0.05$  (significant)**Figure (1): patients' clinical characteristics of the studied groups**



**Figure (2): Modes of mechanical ventilator among the studied groups**

**Table (2): Distribution of mechanical ventilator parameters for the studied groups throughout period of study**

Parameters	The studied patients (n=80)							
	Control group (n=40)			F P	Study group (n=40)			F P
	Immediate after insertion	Post a week	Post two weeks		Immediate after insertion	Post a week	Post two weeks	
1. Fraction of inspired oxygen (%)	(35-70) 47.88±8.979	(30-70) 39.63±9.700	(0-60) 33.25±10.595	<b>22.484 0.000*</b>	(30-70) 46.88±9.653	(30-60) 38.75±8.530	(0-50) 28.38±15.623	<b>25.164 0.000*</b>
<b>Control group Vs Study group t , P</b>	0.480, 0.633	0.304, 0.762	1.311, 0.194					
2. Respiratory rate	(12-20) 14.90±1.780	(0-22) 12.55±5.818	(0-24) 9.63±7.594	<b>8.851 0.000*</b>	(12-22) 14.78±1.901	(90-18) 10.80±6.418	(0-16) 7.18±7.324	<b>17.615 0.000*</b>
<b>Control group Vs Study group t , P</b>	1.706, 0.092	1.423 , 0.159	2.033 , 0.046*					
3. Tidal volume	(0-500) 412.50±100.734	(0-500) 336.00±185.649	(0-500) 255.50±223.618	<b>7.817 0.001*</b>	(0-500) 373.25±16.310	(0-500) 262.00±17.600	(0-500) 166.25±17.912	<b>10.685 0.000*</b>
<b>Control group Vs Study group t , P</b>	0.428 , 0.670	1.278 , 0.205	1.636 , 0.106					
4. Peak inspiratory pressure	(20-45) 30.38±4.855	(25-45) 33.00±4.501	(0-45) 29.80±8.262	<b>3.115 0.048*</b>	(20-35) 28.40±3.768	(20-35) 28.65±4.583	(0-35) 22.10±12.017	<b>9.204 0.000*</b>
<b>Control group Vs Study group t , P</b>	1.803 , 0.075	1.952 , 0.055	4.283 , 0.000*					
5. Pressure limit	(40-60) 49.38±5.904	(40-60) 51.75±5.133	(0-60) 50.38±10.089	1.047 0.354	(30-60) 47.50±5.883	(30-60) 49.13±6.783	(0-60) 37.63±4.122	<b>8.824 0.000*</b>
<b>Control group Vs Study group t , P</b>	1.633 , 0.106	1.469 , 0.146	1.808 , 0.074					
6. Positive end expiratory pressure	(5-10) 6.05±1.131	(5-10) 6.13±1.090	(0-10) 6.35±1.610	0.578 0.563	(5-10) 6.58±1.583	(5-10) 6.68±1.591	(0-10) 5.40±2.799	<b>4.685 0.011*</b>
<b>Control group Vs Study group t , P</b>	1.861 , 0.067	3.445 , 0.001*	3.339 , 0.001*					

\* Significant at level P&lt;0.05

**Table (3): Distribution of the studied groups regarding level of consciousness using Glasgow Coma scale (GCS) throughout period of study**

Feature	The studied patients (n=80)												$\chi^2$ P		
	Control group (n=40)						Study group (n=40)								
	Immediate after insertion		Post a week		Post two weeks		Immediate after insertion		Post a week		Post two weeks				
	N	%	N	%	N	%	N	%	N	%	N	%			
• Eye opening															
• None	16	40.0	8	20.0	12	30.0			9	22.5	5	12.5	7	17.5	<b>13.870</b> <b>0.031*</b>
• To pain	22	55.0	27	67.5	12	30.0			20	50.0	16	40.0	8	20.0	
• To speech	0	0.0	5	12.5	13	32.5			8	20.0	16	40.0	17	42.5	
• Spontaneous	2	5.0	0	0.0	3	7.5			3	7.5	3	7.5	8	20.0	
• Motor response															
• None	4	10.0	4	10.0	4	10.0			2	5.0	0	0.0	0	0.0	<b>30.681</b> <b>0.000*</b>
• Abnormal extension	20	50.0	4	10.0	3	7.5			12	30.0	5	12.5	2	5.0	
• Abnormal flexion	12	30.0	25	62.5	24	60.0			23	57.5	22	55.0	25	62.5	
• Withdrawal from pain	4	10.0	7	17.5	5	12.5			3	7.5	13	32.5	8	20.0	
• Localized pain	0	0.0	0	0.0	4	10.0			0	0.0	0	0.0	5	12.5	
• Total GCS level															
• Severe	34	85.0	30	75.0	24	60.0			32	80.0	19	47.5	11	27.5	<b>28.107</b> <b>0.000*</b>
• Moderate	6	15.0	10	25.0	13	32.5			8	20.0	21	52.5	26	65.0	
• Mild	0	0.0	0	0.0	3	7.5			0	0.0	0	0.0	3	7.5	
Range	(2-7)		(2-7)		(2-9)		F=5.936 P=0.004*	(3-7)		(3-8)		(3-9)		F=11.862 P=0.000*	
Mean $\pm$ SD	<b>4.10<math>\pm</math>1.215</b>		<b>4.80<math>\pm</math>1.224</b>		<b>5.20<math>\pm</math>1.814</b>			<b>4.80<math>\pm</math>0.911</b>		<b>5.65<math>\pm</math>1.122</b>		<b>6.08<math>\pm</math>1.474</b>			
Control Vs Study															
t	2.914		3.238		2.367										
P	<b>0.005*</b>		<b>0.002*</b>		<b>0.020*</b>										

(2-5) Severe

(6-8) Moderate

(9-10) Mild

\* Significant at level P&lt;0.05

**Table (4): Mean scores of physiological parameters and tracheostomy cuff pressure among the studied groups.**

Physiological parameters	The studied patients (n=80)							
	Control group (n=40)			F P	Study group (n=40)			F P
	Immediate after insertion	Post a week	Post two weeks		Pre	Post a weeks	Post two weeks	
1. Heart rate (b/m)	(50-150) 84.55±28.943	(50-120) 80.30±21.825	(50-130) 80.53±21.002	0.391 0.677	(55-140) 85.25±22.685	(55-120) 81.23±17.041	(50-110) 82.65±16.296	0.467 0.628
<b>Control group Vs Study group t, P</b>	0.120 , 0.904	0.428 , 0.670	1.051 , 0.297					
2. Respiratory rate (c/m)	(14-27) 17.30±3.818	(14-24) 18.08±3.331	(12-25) 15.70±3.057	<b>5.027 0.008*</b>	(14-26) 17.65±3.498	(14-27) 17.40±2.836	(14-20) 16.05±2.160	<b>3.565 0.031*</b>
<b>Control group Vs Study group t, P</b>	0.808 , 0.422	<b>2.245 , 0.028*</b>	0.211 , 0.833					
3. Mean arterial blood pressure (mm hg)	(45-110) 69.60±15.884	(50-115) 72.55±18.136	(50-120) 73.68±18.902	0.566 0.569	(50-120) 73.43±16.662	(50-124) 77.80±17.212	(50-115) 80.20±16.212	1.692 0.189
<b>Control group Vs Study group t, P</b>	0.976 , 0.332	1.328 , 0.188	<b>3.867 , 0.000*</b>					
4. Temperature (°c)	(36.5-38.0) 37.26±0.408	(36.7-38.5) 37.65±0.503	(36.4-38.5) 37.51±0.586	<b>6.137 0.003*</b>	(36.5-38) 37.19±0.395	(36.2-38.2) 37.25±0.424	(36.4-37.8) 37.15±0.370	0.614 0.543
<b>Control group Vs Study group t, P</b>	1.201 , 0.115	0.506 , 0.615	0.591 , 0.556					
5. Oxygen saturation (SpO <sub>2</sub> ) %	(88-99) 92.53±3.336	(85-96) 89.33±3.269	(84-98) 90.10±4.199	<b>8.478 0.000*</b>	(86-99) 90.90±3.136	(85-98) 92.33±3.116	(90-99) 92.73±2.298	<b>4.447 0.014*</b>
<b>Control group Vs Study group t, P</b>	1.657 , 0.102	<b>3.286 , 0.002*</b>	<b>3.468 , 0.001*</b>					
6. Tracheostomy cuff pressure (20-30cm H <sub>2</sub> O)	(20-35) 28.75±3.349	(25-90) 51.88±20.213	(20-100) 47.75±19.512	<b>22.805 0.000*</b>	(20-45) 28.88±4.598	(20-30) 27.25±3.572	(20-30) 27.88±3.376	1.780 0.173
<b>Control group Vs Study group t, P</b>	0.139 , 0.890	<b>7.587 , 0.000*</b>	<b>6.348 , 0.000*</b>					

\* Significant at level P&lt;0.05

**Table (5): Percentage distribution of prediction of early successful decannulation of the studied groups.**

Early successful decannulation level	The studied patients (n=80)														
	Control group (n=40)						$\chi^2$ P	Study group (n=40)					$\chi^2$ P		
	Immediate after insertion		Post a week		Post two weeks			Immediate after insertion		Post a week		Post two weeks			
	N	%	N	%	N	%		N	%	N	%	N	%		
Low successful rate	32	80.0	35	87.5	30	75.0	2.111 0.348	34	85.0	14	35.0	9	22.5		
Moderate successful rate	8	20.0	5	12.5	10	25.0		6	15.0	26	65.0	25	62.5		
Highly successful rate	0	0.0	0	0.0	0	0.0		0	0.0	0	0.0	6	15.0		
Range	(1-6)		(1-6)		(1-7)		F=1.797	(0-5)		(1-7)		(2-9)		F=30.283	
Mean $\pm$ SD	$3.40 \pm 1.236$		$2.85 \pm 1.292$		$3.23 \pm 1.441$		P=0.170	$3.00 \pm 1.396$		$4.75 \pm 1.532$		$5.70 \pm 1.772$		P=0.000*	
Control Vs Study group															
t	1.357		<b>5.9970</b>		<b>6.8550</b>										
P	0.179		<b>0.000*</b>		<b>0.000*</b>										

<5 Low successful rate (5-7) Moderate successful rate (8-9) highly successful rate \* Significant at level P<0.05

**Table (6): Percent distribution of bleeding and local signs of stoma site infection among the studied groups.**

Local signs	The studied patients (n=80)												$\chi^2$ P		
	Control group (n=40)						$\chi^2$ P	Study group (n=40)							
	Immediate after insertion		Post a week		Post two weeks			Immediate after insertion		Post a week		Post two weeks			
	N	%	N	%	N	%		N	%	N	%	N	%		
<b>Bleeding beside tracheal cannula</b>	1	2.5	3	7.5	3	7.5	0.499	3	7.5	1	2.5	0	0.0	0.110	
<b>Local signs of stoma site infection</b>															
<b>Fever</b>	3	7.5	13	32.5	10	25.0	<b>0.001*</b>	2	5.0	1	2.5	0	0.0	0.191	
<b>Swelling</b>	3	7.5	19	47.5	19	47.5	<b>0.000*</b>	2	5.0	4	10.0	2	5.0	0.602	
<b>Redness around the stoma</b>	8	20.0	19	47.5	19	47.5	<b>0.011*</b>	3	7.5	3	7.5	2	5.0	0.869	
<b>Bad oder</b>	0	0.0	0	0.0	6	15.0	<b>0.001*</b>	0	0.0	0	0.0	1	2.5	0.331	
<b>Presence of an ulcer around the stoma</b>	0	0.0	0	0.0	3	7.5	<b>0.034*</b>	0	0.0	0	0.0	0	0.0	-	

**Table (7): Relation between mode of mechanical ventilator of the studied groups and their early successful decannulation score**

Mode of mechanical ventilator	The studied patients (n=80) Early successful decannulation score Mean ± SD					
	Control group (n=40)			Study group (n=40)		
	Immediate after insertion	Post a week	Post two weeks	Immediate after insertion	Post a week	Post two weeks
- VC (SIMV)	3.29±1.384	3.26±1.289	3.04±1.261	3.00±1.414	<b>5.57±1.134</b>	5.40±1.850
- PC (SIMV)	<b>3.67±0.778</b>	3.50±1.049	4.00±0.00	<b>3.00±1.414</b>	4.70±1.829	6.50±0.707
- CPAP /PSV	-	<b>3.86±1.215</b>	3.21±1.672	-	4.52±1.473	-
- Weaned	-	-	<b>6.00±0.00</b>	-	-	<b>6.63±1.302</b>
F , P	0.793 , 0.379	<b>3.887 , 0.029*</b>	1.626 , 0.200	0.00 , 1.00	1.286 , 0.288	1.795 , 0.180

\* Significant at level P&lt;0.05

**Table (8): Correlation between early successful decannulation score of the studied groups and their physiological parameters**

Physiological parameters	The studied patients (n=80) Early successful decannulation score											
	Control group (n=40)						Study group (n=40)					
	Immediate after insertion		Post a week		Post two weeks		Immediate after insertion		Post a week		Post two weeks	
	r	P	r	P	r	P	r	P	r	P	r	P
1. Heart rate (b/m)	<b>0.346</b>	<b>0.029*</b>	0.239	0.138	0.255	0.112	0.306	0.055	<b>0.375</b>	<b>0.017*</b>	0.281	0.079
2. Respiratory rate (c/m)	0.072	0.660	0.122	0.454	0.103	0.527	-0.110	0.498	<b>-0.336</b>	<b>0.034*</b>	-0.257	0.109
3. Mean arterial blood pressure (mm hg)	<b>0.418</b>	<b>0.007**</b>	<b>0.355</b>	<b>0.025*</b>	0.289	0.071	0.284	0.075	<b>0.363</b>	<b>0.021*</b>	<b>0.321</b>	<b>0.044*</b>
4. Temperature (°c)	0.035	0.832	-0.036	0.825	0.083	0.611	-0.056	0.732	0.089	0.586	0.018	0.910
5. Oxygen saturation (SpO <sub>2</sub> ) %	<b>0.626</b>	<b>0.000**</b>	<b>0.413</b>	<b>0.008**</b>	<b>0.606</b>	<b>0.000**</b>	<b>0.527</b>	<b>0.000**</b>	<b>0.431</b>	<b>0.005**</b>	0.288	0.072
6. Tracheostomy cuff pressure	-0.093	0.569	0.045	0.781	<b>-0.410</b>	<b>0.009**</b>	0.280	0.081	0.152	0.348	0.019	0.906

r: Pearson's correlation coefficient

\* Significant at level P&lt;0.05

**Discussion:**

Safe practices in tracheostomy care increase patients' comfort, decrease the incidence of laryngeal injury, reduce the need for sedation, facilitate weaning from the mechanical ventilator, shorten the length of stay, and decrease the mortality rate.

**Part I: Clinical data of studied patients of both groups.** The findings

of the study showed that nearly half of both groups were diagnosed with traumatic brain injury. This is because the percentage of men is greater than women in this study, this may be attributed to the fact that severe injuries. This finding matched with (Papaioannou et al., 2024) who reported that more than half of the total patient number suffered from central nervous system causes, and more than half of them were subjected to tracheostomy.

**Part II: Assessment of ventilator mode and parameters of both studied groups.** Concerning the mode of the mechanical ventilator, the findings of this result highlighted that the majority of the control and study group were on VC (SIMV) mode immediately after tube insertion.

In addition; a considerable percentage of the study group were weaned post two weeks after tube insertion. This can be justified by after intubation, patients often require immediate respiratory support to ensure adequate oxygenation and ventilation. Volume Control (VC) in Synchronized Intermittent Mandatory Ventilation

(SIMV) mode is commonly used to provide consistent tidal volumes and help stabilize respiratory parameters. As a result, SIMV is utilized to facilitate a gradual transition from controlled ventilation to spontaneous breathing.

This finding is along the same line with Ismail, El-Soussi, Othman, & Hassan, (2022), who found that most of the studied patients were on SIMV mode.

**Part III: Assessment of patient's level of consciousness, physiological parameters, and tracheostomy cuff pressure.** In the current study, a statistically significant difference was observed between the control and study groups throughout the study period concerning the Glasgow Coma Scale, this can be justified by near half of both groups were suffering from severe illness as; traumatic brain injury. In harmony with these findings Alhashemi et al., (2022) who found that there was a highly statistically significant difference between two groups in relation to Glasgow coma scale.

For physiological parameters, this study reveals that there was a statistically significant difference between the control and study groups concerning respiratory rate, mean arterial blood pressure, and oxygen saturation (spo2). This may be related to the support of mechanical ventilator to respiratory function. This finding is in agreement with Taha, Nashaat, & Mohamed, (2024) who was noted that there was a significant difference between the intervention

and control groups regarding physiological parameters, including respiratory rate, SpO<sub>2</sub>, and mean arterial pressure. **On observation of tracheostomy cuff pressure**, there was a highly significant difference between the two groups post-a week and two weeks after tube insertion. This may be associated with the adjustment of tracheostomy cuff pressure using a manometer by the researchers in the study group. While, the nurses in the control group used incorrect volumes. This finding is congruent with **(Dokooohaki, Ebrahimzadeh, & Sharifi, 2024)** who illustrated that there was a highly statistically significant difference between both control and case groups regarding tracheostomy cuff pressure.

**Part IV: Effect of tracheostomy care guidelines on early successful decannulation and adverse events.** The current results indicated a highly statistically significant difference only within the study group throughout the study, as well as a highly statistically significant difference between the control and study groups one week and two weeks after tube insertion regarding successful decannulation. Therefore, it is possible to predict early successful decannulation early in the clinical course, while the likelihood of tracheostomy decannulation significantly decreases as the number of comorbidities increases.

The current findings are consistent with **Mannini et al., (2021)** who showed that decannulation probability was successfully predicted with a notable

improvement in the estimated weaning time.

**Concerning adverse events**, the present study found that there was no statistically significant difference among the control or study group throughout the study about bleeding. This can be justified by tracheostomy procedures are safe and have low complication rates. These results are similar to **Alsunaid, Holden, Kohli, Diaz, & O'Meara, (2021)** who revealed that a small amount of bleeding may occur following the initial procedure and after changing the tracheostomy tube; however, this bleeding is typically minimal, self-limiting, and can be managed with topical agents.

**Regarding local signs of infection**, the current study highlighted that there was a statistically significant increase about local signs of infection including fever, swelling, redness around the stoma, bad odor and presence of ulcer around the stoma in control group post a week and two weeks after insertion. These results were matched with **Ye et al., (2020)** who showed that the rate of pulmonary infection for the routine care group increased more than the comprehensive nursing care group.

**Part V: Correlation and relations, tracheostomy cuff pressure, adverse events and early successful decannulation of both studied groups.**

Regarding the relation between the mode of the mechanical ventilator of the studied groups and their early successful decannulation score throughout periods of implementation. It was noted that the

higher mean scores for early successful decannulation at two weeks after tube insertion were for patients weaned from mechanical ventilation. Additionally, there was a statistically significant relation between the CPAP/PSV mode and early successful decannulation a week post-insertion. as patients on CPAP/PSV more independent and take spontaneous breathing with only pressure support from mechanical ventilator.

**Similarly, Ghiani et al. (2022)** reported that using non-invasive ventilation as a weaning strategy led to successful decannulation in 43% of long-term ventilator-dependent patients who had previously experienced weaning failure. **Concerning the correlation between the early successful decannulation score of the studied groups and their mechanical ventilator parameters.** This study demonstrates a statistically significant negative correlation between early successful decannulation and mechanical ventilator parameters fraction of inspired oxygen, respiratory rate, tidal volume, peak inspiratory pressure, pressure limit, and positive end-expiratory. justified by improving ventilator parameters, the patient has adequate lung function and is less dependent on mechanical ventilator. This finding is in agreement with (Tornari et al., 2021) who found that a higher FiO<sub>2</sub> during tracheostomy, along with increased pressure and peak flow, correlates with a longer delay in

decannulation for patients with COVID-19.

### **Conclusions:**

The present study revealed that implementing tracheostomy care guidelines markedly improves clinical outcomes by enhancing physiological stability, increasing decannulation success, and reducing adverse events.

### **Recommendations:**

1. Monitoring of tracheostomy cuff pressure should be integrated into routine care for critically ill patients to improve patient's clinical outcomes and prevent adverse events.
2. Ongoing training program for critical care nurses about tracheostomy care guidelines for updating their knowledge and practice in the ICU.

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## Relation between Nursing Academic Staff Resilience and Sustainable Education

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### **Abstract:**

**Background:** With the increasing global focus on sustainability and its impact on health and the environment, resilience is a vigorous process necessary for nursing academic staff to overcome the challenges involved in sustainable education. **Aim of the study:** To explore the relation between nursing academic staff resilience and sustainable education. **Subjects and Method:** Using a descriptive correlational research design, all available (194) nursing academic staff members at the Faculty of Nursing, Tanta University, were involved in the study. **Tool:** Two tools were utilized: Nursing Academic Staff Resilience questionnaire and the Unit-Based Sustainability Assessment Tool. **Results:** Nearly two-thirds (69.6%) of the nursing academic staff members had a high level of resilience, while nearly one-fifth (21.1%) had a moderate level. In terms of sustainable education, more than forty percent (41.2%) of the nursing academic staff had low perception levels for overall sustainable education, while more than one-third (35.1%) had a high level. **Conclusion:** A statistically significant positive correlation was observed between the overall resilience and overall sustainability of nursing academic staff. **Recommendation:** Universities support the integration of sustainability courses into the curriculum, provide additional training for academic nursing staff about sustainability, and encourage them to conduct research on sustainability, accompanied by ample incentives to motivate their engagement.

**Key words:** Nursing Academic Staff, Resilience, Sustainable Education

## Introduction

Higher education institutions have an essential role in fostering attitudes towards sustainable development by incorporating educational processes, operations, and research in relationships with the external community (**Zaleniene & Pereira, 2021**). Resilience is one of the concepts of education sustainability development that adds an innovative perspective to its achievement (**OECD, 2021**). Academic staff in faculties, as the “pillars of societies”, are critical to knowing “what to teach” and “how to teach and “how to manage educational challenges and adversities” in the era of sustainable development. They have a pivotal role in the societal transformation process and lead towards a sustainable future (**Pishghadam et al., 2021**). The resilience approach underlines the ability of talent to adapt to changes, learning skills, creativity, future orientation, and occasions rather than vulnerabilities and weaknesses (**Brewer et al., 2021**).

The resilience of nursing academic staff is a vigorous process composed of personal capabilities, contextual means, approaches, and outcomes that enthusiastically have to work interactively and cooperatively to adjust to difficulties that contest the education system (**Rivera et al., 2022**). Consequently, it has been identified as an essential characteristic necessary for academic staff to overcome the challenges involved in

nursing sustainability education (**OECD, 2021**).

As pinpointed by **Beltman, (2021)**, four conceptualizations exist for the conception of resilience. The first is person-focused, which reflects resilience as an individual trait established in stressful situations. The second conceptualization is process-focus, which studies resilience as the outcome of person-context interaction in which people actively practice and use suitable tactics to sustain their commitment and safety in the face of challenges. The third is context-focused of resilience disputes, resilience as the ability to adapt to a stressed situation and maintain one's ability in a challenging sociocultural context. Fourth is system-focused, define resilience as the process in which many systems, both internal and external to the person, dynamically interact with one another. Resilience characteristics that are required to respond to sustainability education requirements are represented by academic staff to display a sense of security and self-confidence. These characteristics are as follows; positive; depend on how staff maintains a positive outlook despite challenges. Focused, having a clear vision and know what they want to attain flexible, having a special agility in facing uncertainty. Organized, change structured approaches to managing ambiguity. Proactive, engage in change and manoeuvres to gain an advantage and solve problems rather than defend

against it (**Al-Omari, 2017**). Together, these characteristics help nursing academic staff navigate through complexity and uncertainty when reaching sustainability education. Resilience creates various optimistic outcomes in education at the macro level and for academic staff and students at the micro level (**Wang, 2021**).

Resilience reduces academic staff tension, especially in the “vulnerability period”, when workload is high, limited support, increasing anxiety due to challenges and uncertainty regarding how to manage student behaviour during activities that address sustainability concerns. Moreover, it improves staff dedication, job satisfaction, well-being, teaching effectiveness, motivation, professional identity, retention, and self-confidence (**Derakhshan et al., 2020**). Similarly, educators' resilience affects nursing students' engagement, motivation, and academic achievement. At the macro level, positive indicators are considered for successful sustainability education and attaining Egypt's vision for 2030 (**Li et al., 2019**).

In 2015, the 2030 Agenda for Sustainable Development was approved, encompassing 17 Sustainable Development Goals aimed at addressing global challenges such as climate change, inequality, sustainable communities, and environmental conservation (**UNESCO, 2017**). The systemic and

interrelated nature of these challenges needs action from all disciplines and professions. Higher education is increasingly recognized as a proxy for renovation to create the necessary changes to meet the 2030 agenda and deliver not only discipline-specific knowledge but also ways to practice and integrate sustainability goals in the education system (**Mouneer, 2021**).

Sustainability in education is emerging as a key, innovative concept that universities are increasingly embracing and promoting by incorporating sustainable development principles into their daily operations. (**Boarin et al., 2020**). It is a unique educational perception that challenges conventional educational approaches and calls for new systems for integrative learning reaching particular courses, curricula, extension programs, research, and community-driven enterprises (**Zaleniene & Pereira, 2021**).

Sustainability in academic institutions represents a constructive shift toward environmental responsibility, emphasizing the need to integrate content, teaching methods, and outcomes that help students enhance their understanding of the environment, economy, and society. (**Holdsworth & Sandri, 2021**). A well-planned and well-established platform is needed to increase awareness among students and empower their critical thinking and decision-making capabilities.

Sustainability education covers critical dimensions in higher education, including curriculum, research and scholarship activities, community engagement, examination/assessment of sustainability topics, staff expertise and willingness to practice, and management practices related to sustainability (**Togo & Lotz-Sisitka, 2009**).

Integrating sustainability in nursing curricula is crucial for strengthening the capacity for social learning and change by supporting students in acquiring and developing the main sustainability-related skills required for shifting toward more sustainable health systems (**Tun, 2019**). Research collaboration related to sustainability can complement the nursing curriculum by preparing students to solve real difficulties in clinical practice, thus making a positive influence to common well-being. (**Huss et al., 2021**).

Community engagement offers academic staff and nursing students the chance to gain experience in tackling the sustainability challenges faced by society, as well as in applied research and the development of problem-solving talent. Sustainability topics/activities examination and assessment are important for encouraging students to reflect on these issues within the faculty's institutional practices, helping them recognize that sustainability is a key priority (**Teherani et al., 2021**).

Expertise in sustainability is critical for enhancing the incorporation of

sustainability issues into an academic department's activities when carrying out research and teaching sustainability topics that develop academic staff skills and abilities (**Holdsworth & Sandri, 2021**). Sustainability management practices are organized approaches for incorporating environmental, social, and financial factors into decision-making and operations to achieve long-term viability and ethical responsibility. These practices include staff recruitment, professional development, research funding allocation, and academic planning (**Pedro et al., 2023**).

### **Significance of the study**

The growing body of knowledge has been settled towards higher education to implement sustainability and pushes universities and faculties to make changes to achieve their goals and incorporate innovative concepts for the dissemination of sustainable awareness among academic staff, students, and the whole academic community (**Hermann & Bossle, 2020**). The sustainable development goal of quality education, which obviously recommends that “by 2030 ensure all learners acquire knowledge and skills needed to promote sustainability education development”.

The vision of the Faculty of Nursing at Tanta University is to “investing knowledge in nursing and achieving sustainable development”. The creation of a generation of sustainable nurses requires fostering sustainable

education by integrating and practicing sustainability as a cross-cutting new approach in teaching, research, operations, community, and knowledge transfer via academic staff. Accordingly, resilience has been recognized as a key characteristic that is considered a prerequisite for attaining sustainability education and coping with its challenges. Although the number of studies about resilience in nursing is growing, research on resilience in sustainability education achievement remains limited. Therefore, the purpose of this research was to explore the relation between nursing academic staff resilience and sustainability education.

### **Aim of study:**

To explore the relation between nursing academic staff resilience and sustainable education.

### **Research Questions:**

- What are the levels of nursing academic staff resilience?
- What are the levels of sustainable education as perceived by nursing academic staff?
- What is the relation between nursing academic staff resilience and sustainable education?

### **Subjects and Method**

**Research design:** A descriptive correlational research design was utilized.

### **Study setting:**

The study was conducted at the Faculty of Nursing, Tanta University that is affiliated to the Ministry of Higher Education and Scientific

Research. The faculty comprises seven departments: Nursing Administration, Community Health & Geriatric Nursing, Maternal & Child Health, Critical Care & Emergency Nursing, Medical-Surgical Nursing, and Psychiatric & Mental Health Nursing. The faculty is one of the leading universities in Egypt that has a national reputation for its quality and integral impact in offering undergraduate and postgraduate nursing programs. The faculty accredited forms the National Authority for Educational Quality and Accreditation since 2019. As well, awarded ISO certification of 9001:2015 & 21001:2018 since 2023.

### **Subjects:**

The sample of this study included all (194) available nursing academic staff at the previously declared setting. It divided as following; Professors (n=21), assistant professors (n=21), lecturers (n=49), assistant lecturers (n=31), and demonstrators (n=72).

**Inclusion criteria:** the study included staff who were actively part of the workforce and not on leave. It encompassed all categories of academic nursing staff.

### **Tools:**

To achieve the aim of the current study two tools were used:

### **Tool I: Nursing Academic Staff Resilience Questionnaire**

Based on Al-Omari, (2017), Morris,(2002) and Conner, (1992) this tool was developed by the researcher to assess levels of nursing

academic staff resilience . It consisted of 14 items allotted into five dimensions; positive (4 items), focused (1item), flexible (4items), organized (2 items), and proactive (3 items). Furthermore, seven items related to personal characteristics of the nursing academic staff were used.

### **Scoring system**

Nursing academic staff responses were considered against 3-point Liert scales ranging between 1 and 3; where 3 = always, 2= sometimes and 1= never. The level of resiliency of the nursing academic staff were scored statistically on the basis on the following cut-off values: >75% high level of resiliency; 75%-60%, moderate level; and <60% low resiliency.

### **Tool II: Unit-Based Sustainability Assessment Tool (USAT)**

The tool was constructed by **Togo & Lotz-Sisitka, (2009)** and adapted by the researchers. It was utilized to determine to what level faculty of nursing have integrated sustainability concerns in education as perceived by the nursing academic staff. The tool included six indicators (dimensions) of sustainability, including curriculum (8 items), research/ and scholarship activities (3 items), community engagement (3 items), examination/assessment of sustainability topics (3 items), staff expertise and willingness to participate in sustainability teaching/research (3 items) and management practices of sustainability (9 items).

### **Scoring system**

The rating scale for this tool ranged from 1 to 5, where 5= great deal, 4= sustainable, 3=adequate, 2= little and 1= none. The possible scores range from 29 to 145, and higher number of scores represent higher level of sustainable education. The explanation and translation of the scales into levels were scored statistically based on the cut-off value, as >75% indicates a high level of sustainable education performance, 75%-60% indicates a moderate level, and <60% indicates low performance.

### **Validity and reliability:**

The Validity and reliability of the study instruments were established by going through a rigorous process of face and content validity coupled with inter and intra -rater reliability by pilot testing. To maintain content validity, the data collection tools were reviewed and judged by five experts in different specialties of nursing such as administration, community and psychiatric nursing. They were asked to assess the significance and relevance of each item on a 4-point rating scale ranging from 4= strongly relevant to 1= not relevant. According to the experts' feedback, some minor changes were made to the tools to enhance the clarity and the pertinence. This process ensured that the instruments effectively measured the constructs of resilience and sustainability education among nursing academic staff.

The reliability of the tools was assessed using Cronbach's alpha

coefficient test, which yielded values of 0.801 and 0.783 for the resilience and sustainable education respectively, demonstrating good internal consistency. Additionally, a pilot study was conducted on 10% of the target population (n=22), who were excluded from the final study sample, to further test the tools' effectiveness in capturing the intended data. The pilot study would ensure that any difficulties in the study tools are detected and corrected before the main study could take place.

#### **Procedure:**

Prior to data collection, permission to conduct the study was first obtained from the relevant authorities at the Faculty of Nursing, Tanta University. The study employed an online survey on Google Forms, making it easy for all the eligible nursing academic staff members to participate in the study. The participants were reached through their WhatsApp numbers, and the questionnaires were provided in both Arabic & English in an effort to accommodate the different language abilities of the staff; this helped to ensure that all participants understood each question and their responses accordingly.

The estimated time to complete the questionnaire was approximately 10 to 15 minutes for each participant. The data was collected over a time span of 4 weeks starting from January to February 2023. At this stage, the researchers kept track of any responses in order to invite the

eligible number of nursing academic staff, and all the information gathered was documented and properly archived for future analysis.

#### **Ethical considerations:**

Before the data collection procedure, approval was obtained to conduct the study from the Scientific Research Ethical Committee at the Faculty of Nursing, Tanta University code no (182-12- 2022). The study was conducted with high levels of Ethical consideration including informing participants about the purpose of the study, their voluntary contribution, and their right to withdraw from the study at any time. Oral consent was obtained, ensuring that participants understood their rights and the research objectives. Confidentiality and anonymity were rigorously maintained.

#### **Statistical analysis of data**

The data were entered into a computer and analysed using IBM SPSS software version 20.0. Qualitative data are presented as frequencies and percentages. Quantitative data are described using the range (minimum and maximum), mean, standard deviation, and median. Statistical significance was determined at the 5% level. The chi-square test was used to compare categorical variables across different categories, while the Pearson correlation coefficient was employed to examine the relationships between two normally distributed quantitative variables.

## Results

**Table (1):** Distribution of nursing academic staff according to personal characteristics. The highest percentage (42.8%) of nursing academic staff were aged 30- $<40$  years, with a mean age of  $35.13 \pm 9.66$  years. The majority (98.5%, 86.6%) were female and married. Nearly half (49%) had a doctoral degree, and 31.4% had a baccalaureate degree. Regarding academic positions, the highest percentage (37.1%, 25.3%) were demonstrators and lecturers, while the lowest percentage (10.8%) were assistant professors and professors. More than half (50.5%) had  $<10$  years of experience, with a mean of  $11.46 \pm 9.86$  years. A total of 18%, 16.5%, and 16% of the participants were from medical-surgical, administration, and maternal & child health departments, respectively.

**Figure (1):** Levels of overall resilience for nursing academic staff. Nearly two-thirds of the nursing academic staff members had a high level of resilience, while nearly one-fifth of them had a moderate level.

**Table (2):** Levels of nursing academic staff across resilience dimensions. As shown in the table, majority (83%) of the nursing academic staff had a high level of resilience in the organized dimension. More than sixty (64.4%, 60.8%) of them had a high level of proactive and flexible dimensions, while more than half (54.1%, 53.6%) had a high level of positive and focused dimensions.

**Figure (2):** Distribution of nursing academic staff according to overall perception levels of sustainable education. More than forty percent (41.2%) of the nursing academic staff had low perception levels of overall sustainable education. More than one-third had a high perception level, and fewer than one-quarter had a moderate level.

**Table (3):** Perception levels of nursing academic staff across sustainable education indicators. More than fifty percent (51%) of the nursing academic staff had low perception levels of sustainability management practices in education as well as in research and scholarship activities. 50% of them had low perception levels of sustainability examination. More than forty percent (40.7%) of them had a high perception level of sustainability integration in community engagement as well as in the curriculum. 41.8% of the nursing academic staff had moderate perception level of expertise and willingness to join in sustainability education.

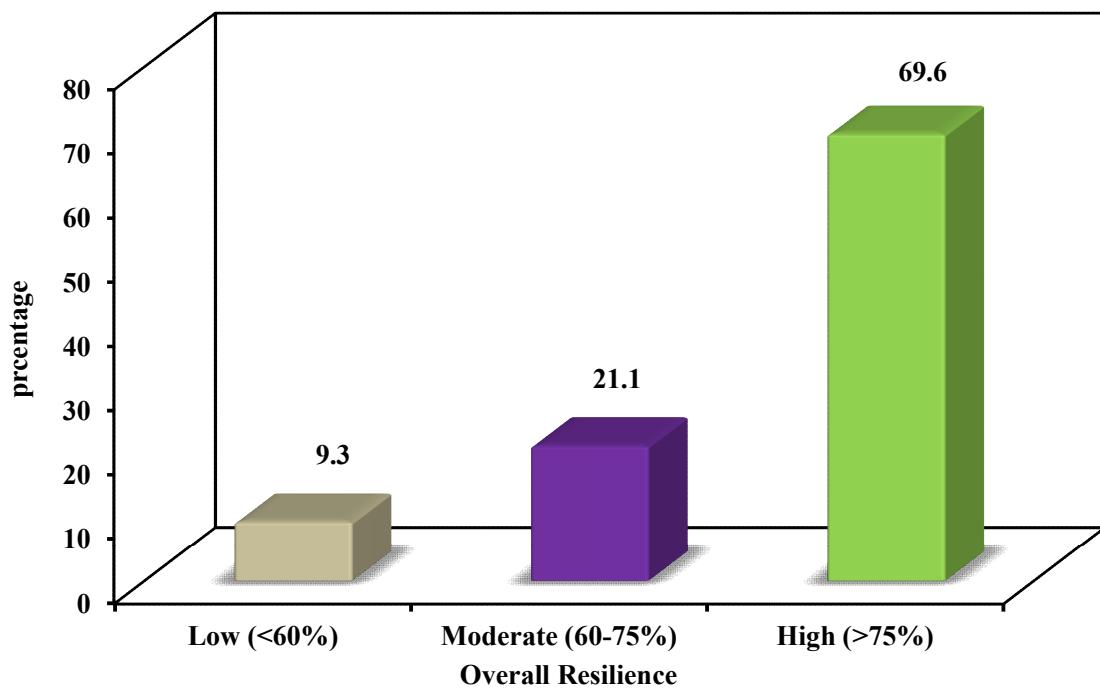
**Figure (3):** shows the correlation between nursing academic staff overall resilience and overall sustainability. There was a statistically significant positive correlation between the overall resilience of nursing academic staff and overall sustainability ( $p < 0.001$ ).

**Table (4):** illustrates the relation between the level of overall sustainability and the level of overall resilience and the demographic data.

As shown in the table, there was a significant relationship between overall sustainability and department. Additionally, there was a significant relationship between overall resilience and age and department.

**Table (1): Distribution of nursing academic staff according to personal Characteristics (n = 194)**

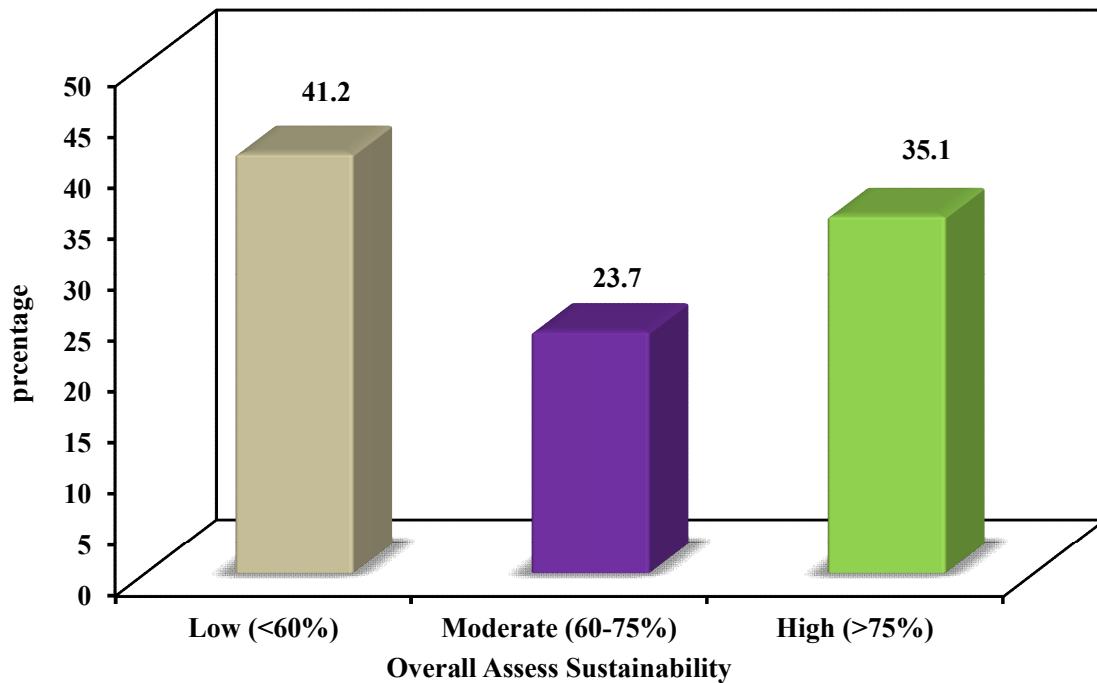
Personal Characteristics	No.	%
<b>Age</b>		
<30	68	35.1
30-<40	83	42.8
40-<50	16	8.2
≥50	27	13.9
Min. – Max.	24.0 – 70.0	
Mean ± SD.	<b>35.13 ± 9.66</b>	
Median	32.0	
<b>Gender</b>		
Male	3	1.5
Female	191	98.5
<b>Qualification</b>		
Baccalaureate Degree	61	31.4
Master	38	19.6
Doctoral	95	49.0
<b>Academic position</b>		
Demonstrator	72	37.1
Assistant lecturer	31	16.0
Lecturer	49	25.3
Assistant professor	21	10.8
Professor	21	10.8
<b>Years of experience</b>		
<10	98	50.5
10-<20	57	29.4
20-<30	24	12.4
≥30	15	7.7
Min. – Max.	1.0 – 42.0	
Mean ± SD.	<b>11.46 ± 9.86</b>	
Median	9.0	
<b>Department</b>		
Nursing administration	32	16.5
Community health	29	14.9
Maternal and child health	31	16.0
Critical care and emergency	21	10.8
Medical- surgical nursing	35	18.0
Paediatric nursing	22	11.3
Psychiatric-mental health	24	12.4
<b>Marital status</b>		
Married	168	86.6
Single	20	10.3
Others	6	3.1



**Figure (1): Levels of overall resilience for nursing academic staff (n = 194)**

**Table (2): Levels of nursing academic staff across resilience dimensions (n = 194)**

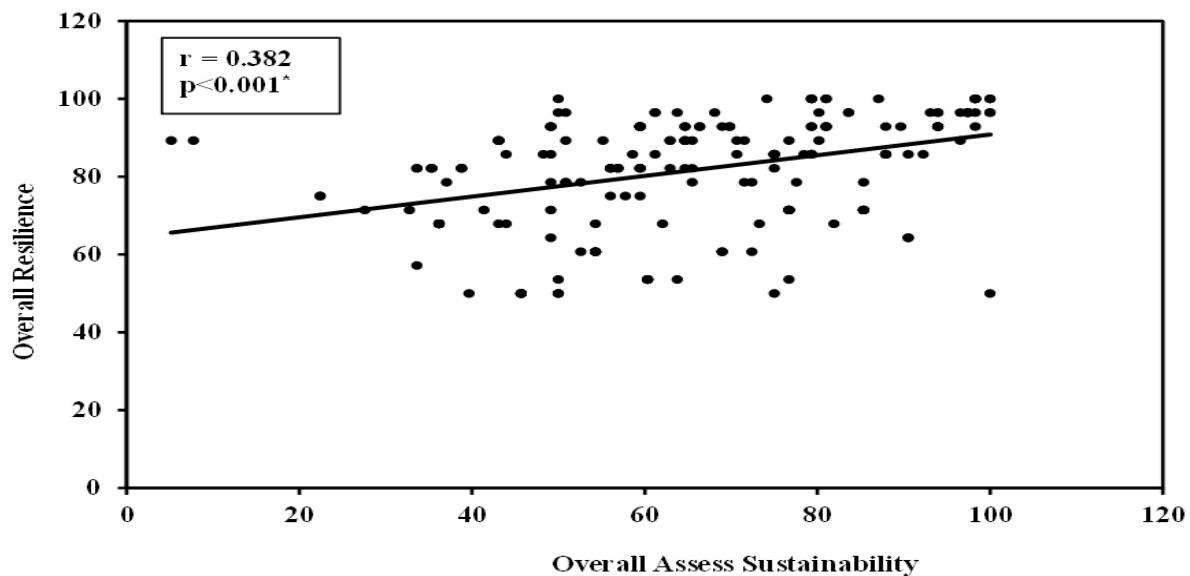
Level of resilience dimensions	Low (<60%)		Moderate (60-75%)		High (>75%)	
	No.	%	No.	%	No.	%
Positive	31	16.0	58	29.9	105	54.1
Focused	90	46.4	0	0.0	104	53.6
Flexible	24	12.4	52	26.8	118	60.8
Organized	13	6.7	20	10.3	161	83.0
Proactive	31	16.0	38	19.6	125	64.4



**Figure (2): Distribution of nursing academic staff according to overall perception levels of sustainable education**

**Table (3): Perception levels of nursing academic staff across sustainable education indicators (n = 194)**

Level of Assess Sustainability	Low (<60%)		Moderate (60-75%)		High (>75%)	
	No.	%	No.	%	No.	%
Curriculum	60	30.9	55	28.4	79	40.7
Research and scholarship activities	99	51.0	39	20.1	56	28.9
Community Engagement	79	39.7	38	19.6	77	40.7
Examination (assessment) of sustainability topics	97	50.0	37	19.1	60	30.9
Staff expertise and willingness to participate	63	32.4	81	41.8	50	25.8
Management practices of sustainability	99	51.0	49	25.3	46	23.7



**Figure (3): Correlation between overall resilience of nursing academic staff and overall sustainability (n = 194)**

**Table (4): Relation between level of overall sustainability and level of overall resilience with demographic data (n = 194)**

	Level of overall Sustainability						Level of Overall Resilience					
	Low (n = 80)		Moderate (n = 46)		High (n = 68)		Low (n = 18)		Moderate (n = 41)		High (n = 135)	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<b>Age</b>												
<30	28	35.0	20	43.5	20	29.4	6	33.3	21	51.2	41	30.4
30-<40	32	40.0	15	32.6	36	52.9	5	27.8	14	34.1	64	47.4
40-<50	8	10.0	3	6.5	5	7.4	0	.0	3	7.3	13	9.6
≥50	12	15.0	8	17.4	7	10.3	7	38.9	3	7.3	17	12.6
$\chi^2$ (P)	6.085 (0.414)						14.441* (MC p=0.017*)					
<b>Gender</b>												
Male	1	1.3	1	2.2	1	1.5	1	5.6	1	2.4	1	0.7
Female	79	98.8	45	97.8	67	98.5	17	94.4	40	97.6	134	99.3
$\chi^2$ (MC P)	0.664 (1.000)						3.427 (0.129)					
<b>Qualification</b>												
Baccalaureate Degree	26	32.5	15	32.6	20	29.4	5	27.8	18	43.9	38	28.1
Master	11	13.8	13	28.3	14	20.6	2	11.1	10	24.4	26	19.3
Doctoral	43	53.8	18	39.1	34	50.0	11	61.1	13	31.7	71	52.6
$\chi^2$ (P)	4.628 (0.328)						7.116 (0.130)					
<b>Academic posit</b>												
Demonstrator	31	38.8	20	43.5	21	30.9	7	38.9	21	51.2	44	32.6
Assistant lecturer	9	11.3	8	17.4	14	20.6	2	11.1	7	17.1	22	16.3
Lecturer	21	26.3	8	17.4	20	29.4	2	11.1	8	19.5	39	28.9
Assistant professor	8	10.0	4	8.7	9	13.2	1	5.6	3	7.3	17	12.6
Professor	11	13.8	6	13.0	4	5.9	6	33.3	2	4.9	13	9.6
$\chi^2$ (P)	7.959 (0.437)						13.767 (MC p=0.066)					
<b>Years of experience</b>												
<10	39	48.8	28	60.9	31	45.6	9	50.0	26	63.4	63	46.7
10-<20	22	27.5	8	17.4	27	39.7	2	11.1	9	22.0	46	34.1
20-<30	14	17.5	6	13.0	4	5.9	3	16.7	5	12.2	16	11.9
≥30	5	6.3	4	8.7	6	8.8	4	22.2	1	2.4	10	7.4
$\chi^2$ (P)	10.586 (0.102)						11.241 (MC p=0.061)					
<b>Department</b>												
Administration	14	17.5	8	17.4	10	14.7	1	5.6	8	19.5	23	17.0
Community	16	20.0	5	10.9	8	11.8	8	44.4	1	2.4	20	14.8
Maternal and child heath	13	16.3	7	15.2	11	16.2	1	5.6	3	7.3	27	20.0
Critical care and emergency	0	0.0	6	13.0	15	22.1	0	0.0	1	2.4	20	14.8
Medical surgical	19	23.8	8	17.4	8	11.8	7	38.9	12	29.3	16	11.9
Pediatric nursing	14	17.5	3	6.5	5	7.4	1	5.6	10	24.4	11	8.1
Psychiatric-mental health	4	5.0	9	19.6	11	16.2	0	0.0	6	14.6	18	13.3
$\chi^2$ (P)	33.108* (0.001*)						42.828* (MC p<0.001*)					
<b>Marital status</b>												
Married	71	88.8	40	87.0	57	83.8	16	88.9	33	80.5	119	88.1
Single	7	8.8	5	10.9	8	11.8	2	11.1	7	17.1	11	8.1
Others	2	2.5	1	2.2	3	4.4	0	0.0	1	2.4	5	3.7
$\chi^2$ (MC P)	1.176 (0.919)						3.032 (0.495)					

 $\chi^2$ : Chi-square test MC: Monte Carlo

p: p value for the relation between the level of overall assessed sustainability and the level of overall resilience with demographic data

\*: Statistically significant at  $p \leq 0.05$

## Discussion

Resilience in teaching refers to a teacher's ability to maintain their effectiveness and well-being despite the various challenges and pressures of the profession (**Zhang & Luo, 2023**). Nursing academic staff serves as change agents in nursing education for sustainable development, utilizing their diverse knowledge and skills to transform the educational environment in ways that better align with sustainable development goals. (**Dhaka, 2024**). So, the aim of the study was to explore the relation between nursing academic staff resilience and sustainable education.

**Concerning the level of resilience**, nearly seventy percent of the nursing academic staff members had a high level of resilience, while nearly one-fifth had a moderate level. This may be due to the challenges that academic nursing staff in the educational system face from operational disruptions, and job demands, which cause them to struggle to become more organized, proactive, and flexible to meet educational process expectations. They seek to implement new approaches and manoeuvres to gain an advantage and invest energy in problem-solving and teamwork. They always see life full of new opportunities for continuous education, believe that there are lessons to be learned from challenges, and expect the future to be filled with constantly shifting variables in the educational process.

**Glass (2007)** mentioned that as nursing academic staff develops greater hope and optimism, they enhance their resilience in dealing with workplace challenges by openly expressing their concerns and vulnerabilities. However, **Reyes et al, (2015)** proposed that academic staff need to consistently cultivate and strengthen their resilience in order to effectively adapt to the challenges of the work environment. **Borazon and Chuang (2023)** emphasized the significance of the environment, personal experiences, and educational programs in fostering the resilience of academic staff.

**Regarding levels of sustainable education**, more than forty percent of the nursing academic staff had a low perception level of total sustainable education, more than one-third had a high level, and less than one-fifth had a moderate perception level. This is may be due to sustainability being a relatively recent concept that has been introduced into the vision of the university, and nursing academic staff not having enough knowledge or training about it.

This finding is reinforced by **Morales et al, (2024)**, who reported that academic staff had little knowledge about sustainability, and **Molina et al., (2023)** found that participants had an unclear understanding of sustainability and emphasized the importance of promoting the attitudes and values essential for sustainable development. Also, **Aleixo et al, (2018)** found a large proportion of

academic staff did not receive training on sustainability. But **Bryant & Rundall (2019)** argued that sustainability is not a new concept and that nursing education should address sustainability for a long time.

**Regarding level of sustainability dimensions;** the study revealed that above forty percent of the academic staff had a high perception level for the curriculum indicator of sustainable education. This may be due to some departments of faculty enrolled in some courses that address sustainability concerns such as nursing leadership, nursing research, evidence-based practice and entrepreneurship courses. It is crucial for nursing students to be educated on sustainability and to understand the responsibility each individual holds in promoting actions that support sustainable professional practice.

**Zhang & Bourassa (2021)** mentioned that implementing a curriculum needs strong faculty involvement and interdisciplinary collaboration. The curriculum is designed to help students cultivate systems thinking and develop visionary leadership skills. **Aleixo et al, (2021)** reported that over twenty students stated that sustainability is not addressed in the course, while nearly thirty indicated that it is only covered occasionally. Additionally, **Correa et al, (2020)** found that the undergraduate design courses examined are still in the early stages of incorporating sustainability guidelines.

This study revealed that more than half of the academic staff had a low perception level for the research dimension. This finding suggests that there may be limited emphasis on generating new knowledge and evidence in the area of sustainability to inform sustainable practices within nursing. This result is supported by that of **Correa et al., (2020)** mentioned that there were few laboratories and research groups focused on sustainability issues.

The results revealed that more than forty percent of the nursing academic staff had high levels of perception for community engagement. This is due to nursing academic staff are involved in medical convoys monthly, which allows them to collaborate with local populations, identify health needs, and develop sustainable interventions to promote health and prevent illness. In addition, the students in the clinical areas related to the community health nursing department deal with the community and provide counselling to promote health and prevent diseases. **Teherani et al, (2021)** stated that it is important for students to become familiar with the real world and cooperate with community members to identify opportunities for engagement.

The results of the study revealed that more than thirty percent of academic nursing staff had high levels of sustainability topics examination, while half of them had low level. This result may be due to a lack of training opportunities for nursing academic

staff about how to engage this topic in the examination of curriculum. **Fields et al, (2023)** emphasize the importance of designing assessment tasks for empowering students on sustainability topics. **Elshall et al, (2022)** recommended the importance of professional development programs and training opportunities that can be offered to educators to improve their familiarity with sustainability principles and their ability to effectively assess students' knowledge in this area.

The results of the study discovered that above forty percent of the nursing academic staff had moderate levels of perception regarding staff expertise and willingness to participate, and more than half had low levels of expertise in the practice of sustainability domains. This may be due to the nursing academic staff's limited understanding of sustainability and its related topics. **Cebrián et al, (2015)**, supported our result and suggested that to further enhance the expertise and engagement of nursing academic staff in sustainability, it is important to provide opportunities for professional development and capacity building.

**Regarding the relationships between the study variables**, the results showed a statistically significant positive correlation between the overall resilience of nursing academic staff and overall sustainability. This result means that when resilience increases, sustainability increases. **Borazon &**

**Chuang (2023)** emphasized the importance of considering resilience as a dynamic capability, enabling educational institutions to develop the capacity to maintain equitable and appropriate learning opportunities and outcomes. **Roostaie et al, (2019)** identified a strong connection between sustainability and resilience, emphasizing its significance in the context of the growing frequency of natural hazards. **Marchese et al, (2018)** mentioned that resilience is a necessary prerequisite for sustainability.

There was a significant relation between overall resilience and age. This result is congruent with **Silva et al, (2020)** who stated a significant correlation between age and resilience, as the greater the age was, the greater the resilience score. Additionally, the results revealed a relation between overall resilience and department type. This may be due to some departments may face high levels of stress, workload, or job demands, which can impact the resilience of their staff. **Aqtam et al, (2023)** found a moderate negative correlation between nurses' stress level and their resilience level.

The study results revealed a significant relationship between overall sustainability and department type. This significant relation suggests that different faculties of nursing departments may vary in their commitment and practices regarding sustainability. This result is supported by **Friman et al, (2018)** who found

that some departments may prioritize sustainability initiatives, while others might not because of different operational priorities or limited awareness.

### Conclusion

Approximately seventy percent of the nursing academic staff members exhibited a high level of resilience, while one-fifth had a moderate level. In terms of total sustainable education, over forty percent of the nursing academic staff displayed a low level, while more than one-third demonstrated a high level. A Significant relation was observed between overall sustainability and department, as well as between overall resilience and both age and department. Furthermore, a statistically significant positive correlation was identified between the overall resilience and overall sustainability of nursing academic staff.

### Recommendation

#### Educational authorities:

- Mandatory integration of sustainability courses into the curriculum.
- Provision of workshops, seminars, or specialized courses focused on sustainability in nursing education and resilience.
- Develop appropriate examination materials and assessments that incorporate sustainability concepts within the nursing curriculum.
- Encourage academic staff to conduct research on sustainability,

accompanied by ample incentives to motivate their engagement.

#### For academic nursing staff

- Seek to attain workshops or training on sustainability, stress management, conflict resolution, and time management in order to be able to handle challenges effectively.
- Redesign curriculum to involve sustainability topics and methods of assessment.

#### For further research

- Conduct further research on challenges of sustainable education in universities and faculties
- The impact of sustainable education on students' behaviour.

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## **Relation between First-Line Nurse Managers' Managerial Competencies and Intensive Care Nurses' Job Crafting**

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### **Abstract**

**Background:** The intensive care units needed first-line nurse managers with managerial competencies to conduct changes in order to give staff nurses high-quality care and achieve organizational outcomes, as well as encourage intensive care nurses' job crafting. **Aim:** The present research aimed to investigate the relation between first-line nurse managers' managerial competencies and intensive care nurses' job crafting. **Subjects and Method: Design:** Descriptive correlational research design used in the study. **Setting:** The study was conducted at Tanta University Hospitals (Main and Emergency) at different Intensive Care Units. **Subject:** Consisted of 57 first-line nurse managers and 218 staff nurses working in the same setting. **Tools:** Two tools were used to collect data. **Tool I:** First-line Nurse Managers' Managerial Competencies Questionnaire. **Tool II:** Intensive Care Nurses' Job Crafting Questionnaire. **Results:** Around two thirds (67.6%) of nursing staff perceived that first-line nurse managers had a high level of managerial competencies, which the majority (87.7%) of them had a high level of leadership dimension. Around one-third (32.1%) of the staff nurses had a high level of intensive care nurses' job crafting, while, 55.5% of them had a moderate level of task crafting dimension. **Conclusion:** There was a statistically significant positive correlation between first-line nurse managers' managerial competencies and intensive care nurses' crafting. **Recommendations:** Hospital administration conducts continuous in-service training for first-line nurse managers that boosts their managerial competencies and nurses for job crafting. Foster a trust environment and organizational support to encourage the first-line nurse managers to use their managerial competencies in an efficient manner.

**Keywords:** First-Line Nurse Managers, Job Crafting, Intensive Care Nurses, Managerial Competencies

### **Introduction**

Nursing includes autonomous and collaborative care of patients of all ages, families, groups and communities, sick or well and in all settings. It covers the promotion of health, the prevention of illness, and the care of sick, disabled and dying people (Dzurec, 2024). So, nurses play a critical role in both health care facilities and emergency response. They are often the first to detect health emergencies and work on the front lines of disease prevention and the provision of primary health care, including promotion, prevention, treatment and rehabilitation (Al Ajarmehet al., 2022).

Therefore, critical care nurses endeavor to provide care to meet the unique needs of patients and their families through the integration of affective, cognitive and action caring processes (Sardo et al., 2023). First-line nurse managers are professional nurses who have a vital role in implementing hospital needs, values, and objectives into action at the unit level. Also, they can plan, organize, deliver and evaluate nursing and interdisciplinary care to a target group of patients as well as manage the human and material resources required to provide that care (Ibrahim et al., 2024). In addition to being a leader who is essential in ensuring consistent patient outcomes and they must be able to interpret general principles and transform them into particular clinical and organizational results while also identifying and tracking outcomes.

So, competency managerial skills are necessary (Demirtaş&Altuntaş, 2023).

Managerial competencies refer to the sets of knowledge, behaviors and attitudes that first-line nurse managers need to be effective in a variety of managerial activities or tasks and organizations and necessary for effectively and efficiently in a managerial role. Managerial competencies of first-line nurse managers include leadership, facilitation of spiritual nursing, self-management, nursing staffing and professional development, utilizing informatics, financial management and improvement of quality (Mudd et al., 2023). Leadership is the ability of first nurse line managers to inspire and direct nurses' excellence, performance to achieve hospital's goals (Jankelová & Joniaková, 2021).

In addition, facilitating spiritual nursing is ability to give unexplainable peace, power and happiness of patients that is an effective role to achieve main goals of first-line nurse managers which are health improvement, eliminating pain and discomfort (Taylor et al., 2023). Self-management is ability of nurse managers manage their behavior, evaluate their performance, that provides complete understanding of different nurses staff behavior. Someone with strong self-management skills is aware of what to do and how to act in different situations (Tornu et al., 2023).

Nursing staffing and professional development are different actions first line manager takes to succeed through education and participate in mentorship programs (**Nexo et al., 2024**).

Moreover, utilizing informatics which integrates nursing science with various information and analytical sciences to identify, manage and communicate data and information in nursing practice that illustrates the impact of informatics in any health care practice environment (**Schwartz et al., 2024**). Financial management which first line nurse managers balance decisions on the financial implications of units and manage finances to better align their financial status with their goals and objectives (**Mericle et al., 2023**). Quality improvement of care is the framework used to systematically improve processes and systems through continuously looking for ways to improve the quality of unit's outcomes (**Nooraei et al., 2024**).

First line nurse managers invest in new nursing roles and challenges through their managerial competencies at the job level as job crafting. It which allows nurses is able to change their tasks and other lineaments of work environment on their own initiative (**Felder et al., 2024**). Job crafting is the way in which staff nurses reformulate their work as a whole in a way that suits their personal interests and needs according to job requirements and resources (**Wang et al., 2024**). Job

crafting is nurses' self-initiated arrangements to the task or the relational boundaries of their work that are intended to improve person-job fit (**Han, 2023**). It is a process that nurses focused on what to craft and how to achieve common objectives (**Sheehan et al., 2023**).

Intensive care nurses' job crafting is self-initiated proactive behavior that nurses can expose at work to enhance their performance. Consequently, it is an advanced strategy to redesign jobs that combines nurses and hospital-initiated approaches (**Iida et al., 2024**). Therefore, job crafting is a behavior that attempts to change the boundaries of nurses work through modeling and readjusting nurse's work activity (**Srulovici et al., 2023**). The dimensions of job crafting are task crafting, relational crafting, and cognitive crafting. Task crafting refers to the act of physical changing of kind or quantity of tasks; nurses take the initiative to modify the tasks that they carry out (**Song et al., 2024**).

Also, relational crafting describes interpersonal relationships at work, as well as social interaction with patients and colleagues. Cognitive crafting is the process of nurses' perception changes about their job. Through making such modifications in job, to better recognize their work that enables nurses to re-evaluate how work affected them personally by changing the way they think about it (**Romeo et al., 2023**). Job crafting helps staff nurses to redesign their job processes and tasks for creating

sustainable changes within the hospital (Zhang et al., 2024).

Additionally, job crafting activities involving nurses on their perceived quality of care lead to positive organizational outcomes (Hussein & Ali, 2023). So, due to job crafting occurs at the team level nurse managers and staff nurses share ideas and make decisions for the nursing team's tasks. Therefore, first line nurse managers who apply managerial competencies effectively facilitate staff nurses job crafting that enhances health care outcomes (Yun, 2024).

### **Significance of study:**

Nursing is a science that crucial pillar of the health-care system through forming the scientific basis for professional nursing practice (Weismantel et al., 2024). So, in health care organizations directly affected by first line nurse managers competencies to ensure everything run smoothly in the units, especially intensive care nurses have a complex and challenging boundaries of healthcare that requires rapid decision-making, skill proficiency and strong teamwork for optimal patient outcomes (Leone-Sheehan et al., 2024). Nurses can overcome these stresses by managing their jobs and creating a healthy work environment. This is achieved through job crafting (Frangeskou et al., 2024). Job crafting consider how nurses shape their tasks in order to find meaning and value in their work and thus be more satisfied (Digonis & Giannouli, 2024). So, the aim of the study is to

investigate the relation between first-line nurse managers' managerial competencies and intensive care nurses' job crafting.

### **Aim of the study**

Investigate the relation between first-line nurse managers' managerial competencies and intensive care nurses' job crafting.

### **Research questions:**

1. What are the levels of first-line nurse managers' managerial competencies?
2. What are the levels of intensive care nurses' job crafting?
3. What is the relation between first-line nurse managers' managerial competencies and intensive care nurses' job crafting?

### **Subjects and Method**

#### **Research design:**

A descriptive correlation study design was used in the present study.

#### **Setting:**

The present study was conducted at Intensive Care Units at Tanta University Hospitals, including Tanta Main University and Emergency Hospitals. Main University Hospitals include the following units: Neurological ICU, Cardiac ICU and Oncology ICU. The Emergency Hospital includes Emergency Anesthesia ICU, Internal Medical ICU and Emergency Medical Intensive Care Unit. The Bed capacity was 109beds.

#### **Subjects**

The study subjects were consisted of all first-line nurse managers (n=57) from the previously mentioned setting

and representative randomly sample of staff nurses (n= 218) was working in the same setting and available at time of data collection.

#### **Tools of data collection:**

To achieve the aim of study, the following two tools were utilized:

#### **Tool I: First-Line Nurse Managers' Managerial Competencies Questionnaire.**

This tool was developed by the investigator based on **Gunawan, et al., (2019)** and related literature **Gunawan, et al., (2023)**. It was used to assess first-line nurse managers' managerial competencies level as perceived by them and intensive care nurses. It consisted of two parts as follows:

**Part I: Personal data:** It included nurses' personal data such as age, gender, position, marital status, qualification, years of experience and unit name.

**Part II: First-line Nurse Managers' Managerial Competencies Questionnaire:** It consisted of 42 items classified into seven dimensions: Leadership, facilitate spiritual nursing care, self-management, nursing staffing and professional development, utilizing informatics, financial management and applying quality care improvement

#### **Scoring system:**

Intensive care nurses and first-line nurse managers' responses were measured with a five-point Likert Scale ranging from (1) strongly disagree to (5) strongly agree. The

total scores were calculated by summing of all dimensions. The levels of first-line nurse managers' managerial competencies score were statistically calculated by cut-off point (60%) where:

- High level of first-line nurse managers' managerial competencies >75%.
- Moderate level of first-line nurse managers' managerial competencies 75%-60%
- Low level of first-line nurse managers' managerial competencies <60%.

#### **Tool II: Intensive Care Nurses' Job Crafting Questionnaire.**

This tool was developed by investigator based on **Wrzesniewski and Dutton, (2001)** and recent literature **Srulovici et al.,(2023); Hussien and Ali, (2023)**. It was used to assess intensive care nurses' job crafting level. It consisted of 68 items divided into three dimensions: Task crafting, cognitive crafting, relational crafting

#### **Scoring system:**

Intensive care nurses' responses were measured with a three-point Likert Scale. It ranged from 1= never to 3= always. The total scores were calculated by summing of all dimensions. The level of intensive care nurses' job crafting was statistically calculated by cut-off point (60%) where:- High level of intensive care nurses' job crafting >75%.

- Moderate level of intensive care nurses' job crafting 75%- 60%.
- Low level of intensive care nurses' job crafting < 60%.

## Results

**Table (1):** Represents the personal characteristics of nursing staff. As noticed in the table, the nursing staff's ages ranged between 20 up to 49 years old, also, 84.2% of first-line nurse managers and 29.8% of staff nurses had age 30 – <40 with the mean age of  $29.29 \pm 4.12$ . Over half (59.3%) of the nursing staff were females. More than half (58.5%) of the nursing staff were married. About two-thirds (65.5%) of the nursing staff had a Bachelor Degree of Nursing. 87.7% of first-line nurse managers and more than half (59.6%) of staff nurses had a Bachelor Degree of Nursing.

Additionally, around forty (44.4%) of the nursing staff had <5 years of experience with the mean  $5.78 \pm 3.76$ . About third (33.3%) of first-line nurse managers and 8.3% of staff nurses had 10 – <15 years of experience. Also, regarding their intensive care units, they were distributed in six intensive care units. 21.8% of nursing staff worked in the Neurology Intensive Care Unit and 12.0% were distributed in the Emergency Medical Intensive Care Unit.

**Figure (1):** Represents levels of first-line nurse managers' managerial competencies as perceived by nursing staff. This figure shows that about two thirds (67.6%) of nursing staff perceived that first-line nurse

managers had a high level of managerial competencies. Also, (13.5%) of nursing staff perceived that first-line nurse managers had a moderate level of managerial competencies. While nearly twenty (18.9%) of them perceived that first-line nurse managers had a low level of managerial competencies.

**Table (2):** Shows levels of first-line nurse managers' managerial competencies dimensions as perceived by nursing staff. The table shows that the majority (87.7%) of first-line nurse managers had a high level of leadership dimension of their managerial competencies. About two thirds (66.5%) of staff nurses perceived that first-line nurse managers had a high level of leadership dimension.

Almost a third (22.8% and 33.5%) of first-line nurse managers and staff nurses respectively had a moderate level regarding to development dimension of first-line nurse managers' managerial competencies. Also, 15.8% of first-line nurse managers and 12.8% of staff nurses perceived that first-line nurse managers had a low level related utilizing informatics dimension of first-line nurse managers' managerial competencies.

**Figure (2):** Illustrates levels of intensive care nurses' job crafting as perceived by staff nurses. This figure shows that about two-thirds (66.1%) of staff nurses had moderate levels of intensive care nurses' job crafting. Also, approximately one-third

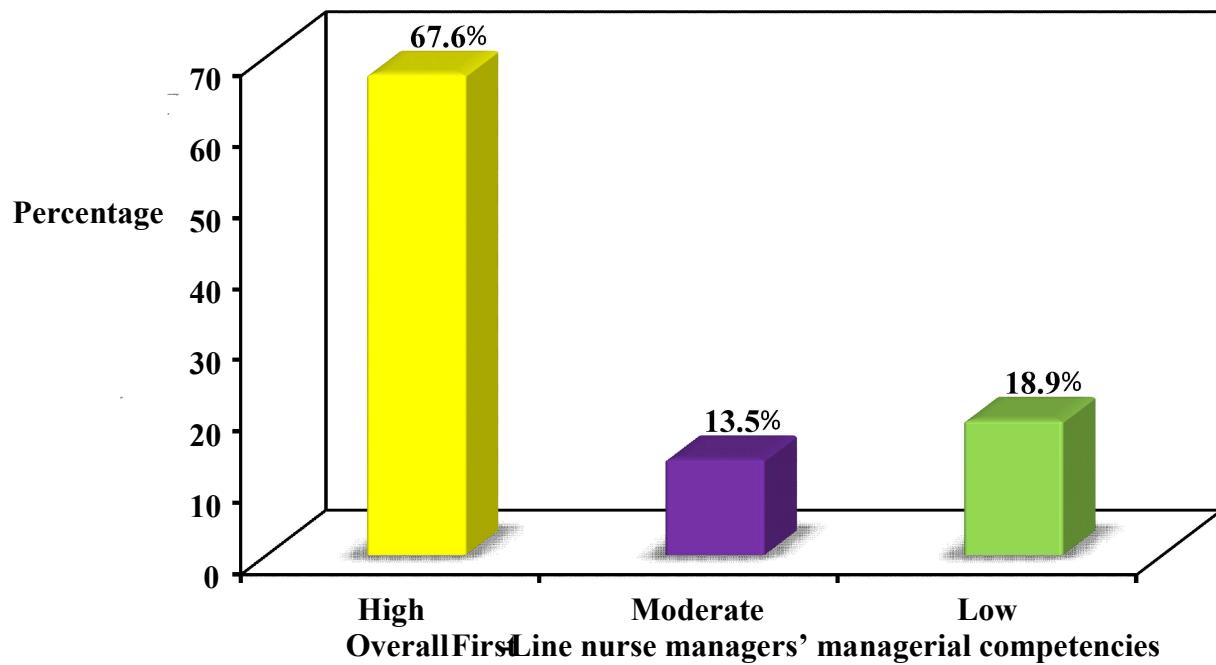
(32.1%) of the staff nurses had a high level while 1.8% of them had low level of intensive care nurses' job crafting.

**Table (3):** Shows levels of intensive care nurses' job crafting dimensions as perceived by staff nurses. The table shows that about half (55.5%) of nurses staff had a moderate level of task crafting dimension and the same percent for cognitive crafting dimension (55.5%) of intensive care nurses' job crafting. About two-thirds (67.0%) of nurses staff had a moderate level of relational crafting dimension of intensive care nurses' job crafting.

**Table (4):** Correlation between overall first-line nurse manager managerial competencies as perceived by nursing staff and staff nurse job crafting in intensive care units. There was a statistically significant positive correlation between overall managerial competencies and overall job crafting for nursing staff, where  $r = 0.148^*$ ,  $p\text{-value} = 0.029^*$

**Table (1): Personal characteristics of nursing staff (n=275)**

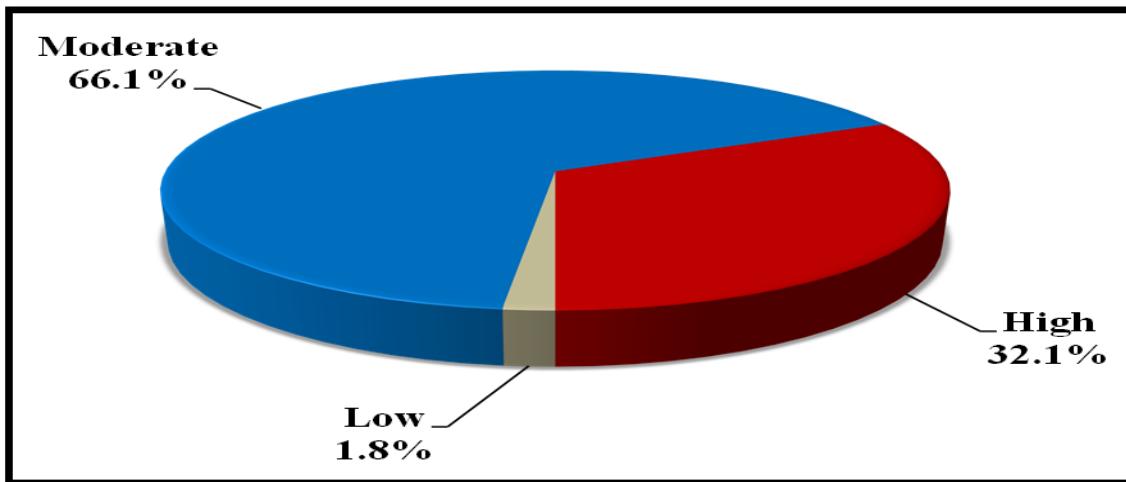
Personal characteristics of nursing staff	Total (n = 275)		First-line nurse managers (n = 57)		Staff nurse (n = 218)		Test of sig.	p
	No.	%	No.	%	No.	%		
<b>Age (years)</b>								
20 – <30	154	56.0	3	5.3	151	69.3	$\chi^2 = 2.902$	0.234
30 – <40	113	41.1	48	84.2	65	29.8		
40 – <50	8	2.9	6	10.5	2	0.9		
Min. – Max.	22.0 – 42.0		29.0 – 42.0		22.0 – 40.0		$t = 10.886^*$	<0.001*
Mean $\pm$ SD.	$29.29 \pm 4.12$		$33.72 \pm 3.31$		$28.13 \pm 3.48$			
<b>Sex</b>								
Male	112	40.7	19	33.3	93	42.7	$\chi^2 = 1.628$	0.202
Female	163	59.3	38	66.7	125	57.3		
<b>Marital status</b>								
Married	161	58.5	48	84.2	113	51.8	$\chi^2 = 19.515^*$	<0.001*
Not married	114	41.5	9	15.8	105	48.2		
<b>Qualification</b>								
Nursing Diploma	7	2.5	0	0.0	7	3.2	$FET = 36.997^*$	<0.001*
Technical Nursing Institute	76	27.6	1	1.8	75	34.3		
Bachelor of Nursing	180	65.5	50	87.7	130	59.6		
Post Graduate Studies	12	4.4	6	10.5	6	2.8		
<b>Years of experience</b>								
<5	122	44.4	0	0.0	122	56.0	$\chi^2 = 65.933^*$	<0.001*
5 – <10	109	39.6	34	59.6	75	34.4		
10 – <15	37	13.5	19	33.3	18	8.3		
$\geq 15$	7	2.5	4	7.0	3	1.4		
Min. – Max.	1.0 – 20.0		5.0 – 16.0		1.0 – 20.0		$t = 8.582^*$	<0.001*
Mean $\pm$ SD.	$5.78 \pm 3.76$		$9.16 \pm 2.97$		$4.89 \pm 3.43$			
<b>ICU name</b>								
Neurology ICU	60	21.8	8	14.0	52	23.9	$\chi^2 = 10.379^*$	0.065
Cardiac ICU	41	14.9	8	14.0	33	15.1		
Oncology ICU	58	21.1	8	14.0	50	22.9		
Emergency Anesthesia ICU	48	17.5	17	29.8	31	14.2		
Internal Medical ICU	35	12.7	8	14.0	27	12.4		
Emergency Medical ICU	33	12.0	8	14.0	25	11.5		



**Figure (1): Levels of first-line nurse managers' managerial competencies as perceived by nursing staff (n= 275)**

**Table (2): Levels of first-line nurse managers' managerial competencies dimensions as perceived by nursing staff (n= 275)**

First-line nurse managers' managerial competencies questionnaire	Total (n =275)		First-line nurse managers (n = 57)		Staff nurse (n = 218)		Test of sig.	P
	No.	%	No.	%	No.	%		
<b>Leadership of first-line nurse managers</b>								
High	195	70.9	50	87.7	145	66.5	11.857*	0.003*
Moderate	52	18.9	7	12.3	45	20.6		
Low	28	10.2	0	0.0	28	12.8		
<b>Facilitate spiritual nursing care</b>								
High	179	65.1	48	84.2	131	60.1	13.577*	0.001*
Moderate	69	25.1	9	15.8	60	27.5		
Low	27	9.8	0	0.0	27	12.4		
<b>Self-management of first-line nurse manager</b>								
High	180	65.5	45	78.9	135	61.9	5.791	0.055
Moderate	64	23.3	8	14.0	56	25.7		
Low	31	11.3	4	7.0	27	12.4		
<b>Staffing and professional development of first-line nurse managers</b>								
High	152	55.3	40	70.2	112	51.4	6.751*	0.034*
Moderate	86	31.3	13	22.8	73	33.5		
Low	37	13.4	4	7.0	33	15.1		
<b>Utilizing informatics to first-line nurse managers</b>								
High	140	50.9	24	42.1	116	53.2	2.230	0.328
Moderate	98	35.6	24	42.1	74	33.9		
Low	37	13.5	9	15.8	28	12.8		
<b>Financial management of first-line nurse managers</b>								
High	149	54.2	27	47.4	122	56.0	1.469	0.480
Moderate	83	30.2	19	33.3	64	29.4		
Low	43	15.6	11	19.3	32	14.7		
<b>Applying quality care improvement by first-line nurse managers</b>								
High	161	58.5	41	71.9	120	55.0	5.414	0.067
Moderate	76	27.7	10	17.5	66	30.3		
Low	38	13.8	6	10.5	32	14.7		



**Figure (2):** Levels of intensive care nurses' job crafting as perceived by staff nurses (n=218)

**Table (3):** Levels of intensive care nurses' job crafting dimensions as perceived by staff nurses (n=218)

Intensive care nurses' job crafting dimensions	Levels of job crafting					
	High		Moderate		Low	
	No.	%	No.	%	No.	%
Task crafting for intensive care nurses	84	38.5	121	55.5	13	6.0
Cognitive crafting for intensive care nurses as	88	40.4	121	55.5	9	4.1
Relational crafting for intensive care nurses	66	30.3	146	67.0	6	2.7

**Table (4):** Correlation between overall first-line nurse manager managerial competencies as perceived by nursing staff and staff nurse job crafting in intensive care units

	r	p
Overall First-line nurse managers' managerial competencies vs. Overall Intensive Care Nurses' Job Crafting	0.148*	0.029*

## Discussion

First-line nurse managers are a critical component of the complex and unpredictable healthcare system. Thus, retaining their competencies is essential for improved performance in healthcare organizations, especially in intensive care units. These managerial competencies may be a source of sustained healthcare organizations' performance and encourage intensive care nurses' job crafting (Mozzarelli et al., 2024). Job crafting is a staff nurses' initiative to shape their work environment to better suit their own requirements and preferences, as well as to accommodate organizational shifts. Therefore, the managerial competencies of their first-line nurse managers encourage them to proactively improve their working conditions, relationships and skills (Lynner et al., 2025).

The present study results revealed that the majority of first-line nurse managers and most of staff nurses had a high level of perception regarding first-line nurse managers' managerial competencies. This can be attributed to a high percentage of first-line nurse managers realized that they had ages above thirty years and years of experience within five up to nine. Additionally, most of nursing staff had Bachelor Nursing Degree. So, as first-line nurse managers, they get more knowledge, experience and coping skills through interactions with work environment which builds and enhances their managerial competencies.

In congruence with the present study finding Hamed et al., (2023) stated

that first-line nurse managers with older age and more years of experience were mature enough to determine the responsibility lies in establishing their managerial competencies and able to adapt with work requirements. On the other line, this result is contradictory with Menegazet al., (2024); Ghazala and Elshall, (2021) who believed that managerial competencies can be developed in first-line nurse managers position in addition to fixed personality characteristics.

The present study results showed that a high percentage of first-line nurse managers and most of staff nurses recognized that first-line nurse managers had a high level of leadership. Possibly from this result, first-line nurse managers are primarily responsible for leadership duties, which the majority of nurses illustrated that first-line nurse managers supporting staff nurses by delegating task responsibility and authority, encourage flexible self-scheduling for them and evaluate staff nurses performance based on standards. Along with the present finding Kuo et al., (2024) who showed that leadership of first-line nurse managers are considered an important skill, as the healthcare organizations depend on the leadership practices of management as a way to build and maintain a healthy work environment as well as to maximize staff satisfaction and patient outcomes. Dissimilar to this result, Alshamlani et al., (2024) who found that the majority of first-line nurse managers had poor leadership practice may be due to work burden

that cause confusion of the nursing managers mind, lack of continue learning about leadership, its requirements and development a personal skill.

Moreover, the result of the study as judged by the majority of first-line nurse managers and most of staff nurses discovered that first-line nurse managers had a high level of facilitate spiritual nursing care. This study result may be interpreted by the majority of nurses agreed that first-line nurse managers explain and demonstrate spiritual care practice to staff nurses and patients as well as encourage staff nurses to listen actively to patients' talk about their spiritual beliefs. This result is supported by **Kurtgözet al., (2024); Modderkolk et al., (2025)** who revealed that first-line nurse managers paying attention to the spiritual needs of patients and nurses staff. On the other hand, **Nilsson, (2022); Badanta et al., (2022)** who disagree with this results and reported that the majority of staff nurses felt that they had been inadequately prepared for spiritual care provision by their first-line nurse managers.

Furthermore, the study's finding according to nursing staff, most of first-line nurse managers demonstrated a high level of self-management. This means almost of them are involved in professional associations and professional development programs. This result is agreed with **Thapaet al., (2023)** stated that the majority of first-line nurse managers had a high level of self-management due to using

suitable education methods that help in improving their self-management skills. While contradicted this result **Nkhataet al., (2024)** who illustrated that less than one third of first-line nurse managers hadn't good perception level regarding the self-management.

The present study results showed that the majority of the intensive care nurses had a moderate level of job crafting. This study clarified that intensive care nurses have proactive behaviors that reorganize and redesign their roles to increase their motivation in the workplace. As well as, job crafting influenced intensive care nurses turnover attitude due to decreased psychological distress and higher work performance. Also, job crafting improved intensive care nurses' job satisfaction and the quality of nursing care in their units. The study results explained that job crafting encouraged goal orientation and good collaboration between intensive care nurses. These results confirmed by **Nwanzu and Babalola, (2024)** showed that there was a high level regarding staff nurses' job crafting. On contrary, **Sahayand Dwyer, (2021)** disagree that staff nurses as job crafters enjoy standing up for their opinions in the face of others because proactive staff nurses were more likely to start their own jobs and have a propensity to improve their work crafting.

The present study results revealed that more than half of intensive care nurses had a moderate level of task crafting. This might be due to intensive care nurses modifying the way of completing their work tasks.

This finding is consistent with **Alwali, (2023)** revealed that staff nurses have task crafting and tried with new techniques to improve their work, because their work setting allowed them to act freely without any restrictions. In disagreement of this finding, **Laguíat al., (2023)** confirmed that a lot of staff nurses disagree that they decide to accept more responsibilities at work.

More than half of intensive care nurses according to the current study exhibited a moderate level of cognitive crafting. This could be explained by intensive care nurses focusing on and viewing the main purpose of their job that helps them in completion of daily work tasks. In the same line, **Ghazzawi, (2021)** revealed that the majority of the staff nurses agreed that cognitive crafting reflected how work affected their personal values. Contrasted with the current finding, **Lanke and Nath, (2022)** who asserted that cognitive crafting of the work has influenced the staff nurses cognitive wellness.

Findings of the present study results showed that a high percentage of intensive care nurses possessed a moderate level of relational crafting. These findings may be due to intensive care nurses collaborating with interdisciplinary teams to achieve work goals. These results are supported by **Kamdrön and Randmann, (2023)** validated this finding and showed how meaningful work was produced by staff nurses 'relations with others at work. Therefore, meaningfulness is created when staff nurses actively spend time modifying or thinking about the

relational boundaries at work. On the contrary **Roczniewskaet al., (2023)** found that the majority of staff nurses disagree with planning relations at the work setting.

The present study reported that there was a correlation between first-line nurse managers' managerial competencies and intensive care nurses' job crafting. This result may be due to intensive care nurses constantly dealing with stressful situations and high level of strain when caring for critically ill patients. Similar findings were reported by **Dhar, (2025); Hwang and Shin, (2023)** who discovered significant correlations between managerial competencies of first-line nurse managers and job crafting of staff nurses. Likewise, **Laiet al., (2024)** who found that significant positive relations exist between all job crafting dimensions and managerial competencies. On the other hand, **Abd-Elhameed et al., (2023); Aung Po et al., (2024)** reported that there is a low link between first-line nurse managers managerial and staff nurses job crafting due to first-line nurse managers not having strong motivational abilities to encourage the staff nurses initiative behaviors.

### **Conclusion**

Based on the findings of the present study, there was a significant positive statistical correlation between first-line nurse managers' managerial competencies and intensive care nurses' job crafting.

## Recommendations

In the light of the findings obtained from the present study, the following recommendations were suggested:

### For hospital administration:

- Conduct continuous in-service training for first-line nurse managers that boosts their managerial competencies and staff nurses job crafting.

- Enhancing the first-line nurse managers' managerial competencies to promote staff nurses' job crafting.

### For first-line nurse managers:

- It is important for them to orientate their abilities and responsibilities.

- Attending workshops and in-service training on strengthening their competencies which reflect on staff nurses' performance and improving patient care outcomes.

### For nursing education:

- Introduce job crafting behavior in the nursing curricula to enforce nurses student to be more adaptable at work.

### For further research:

- Assess the factors that hinder first-line nurse managers from developing their managerial competencies within an organizational context.

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## Effect of Irritable Bowel Syndrome on Quality of Life among Patients in King Abdulaziz Hospital in Al-Ahsa Region

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### Abstract:

**Introduction:** Irritable bowel syndrome (IBS) is one of the most common digestive disorders and more prevalent reason for missing work after the common flu. **Methods:** the current study utilized cross-sectional descriptive research design and was conducted in King Abdulaziz Hospital in Al-Ahsa Region. The sample size 150 subjects who were in king Abdulaziz hospitals and fulfill the following criteria: age from 21- 60 years, both sex, accept to be included in the study and who selected according to Rome Criteria IV, which states that they must have experienced abdominal pain at least once per week for the previous three months. Subjects with a history of Crohn's disease, diverticulitis, peptic ulcer, ulcerative colitis, colon cancer, or IBS were not included in this study. **Four tools was used in this study**, patient's demographic data tool, patient's clinical data, the IBS-QOL tool and Irritable bowel syndrome - severity symptom scale (IBS-SSS) .**Results:** Nearly 50% of the participants were men between the ages of 21 and 29, and over 50% of those people were married, graduated from university and unemployed. Finally, the present study shows that most demographic and clinical factors do not significantly influence QOL in IBS patients though; family history plays an important role. **Conclusion:** The results of this study suggest that QOL was significantly correlated with the severity of IBS symptoms. **Recommendations:** Regular plans for continuous patient education are necessary for symptom control and to lessen the negative impact of the condition on QOL. Replicating the study with a bigger sample from a different kind of institution is necessary to generalize the results to a larger population.

**Key Words:** IBS, QOL, domains

## Introduction

Irritable bowel syndrome (IBS) is one of the most common gastrointestinal ailments and, second only to the common flu, a leading cause of missed workdays (**Defrees & Bailey 2017**). Patients with IBS sometimes find themselves disorganized in their professional lives due to the disease's remission and exacerbation periods. Systemic inflammation and altered microbiome diversity may occur in individuals with IBS due to infective gastroenteritis (**Ng Q.X., et al 2018**). Genetics, nutrition, mental and physical health issues, stress (the leading cause of colon stimulation in IBS patients), changes to the gut flora, chronic inflammation of the intestines, abnormal signaling, and an abnormal gut neuroendocrine system are all potential triggers for IBS (**El-Salhy et al., 2015**).

According to reports, the prevalence of IBS varies between countries, with over 10% of people worldwide being affected. According to reports, the incidence is 5.8% in the Middle East and Africa, 9.6% in Asia, 7.1% in North America and Europe, and 17.5% in Latin America (**Shin, 2023**). In contrast, by comparison, the IBS prevalence in Saudi Arabia was 15.7% of the population. According to the research, 11% of men and 12.5% of females in Saudi Arabia suffer from IBS. (**Almasary et al., 2023**). Changes in bowel function and abdominal pain caused by IBS, a chronic functional condition, significantly impact the patient's

regular life and job. It is a major health and economic burden, disproportionately affecting women and children, and it often occurs alongside other functional gastrointestinal disorders (FGIDs) (**Yang et al., 2022**).

Patients with IBS are more likely to use healthcare facilities than the general population, as seen by more frequent clinic visits, additional diagnostic testing, medication usage, and the possibility of unnecessary procedures (**Mohamed et al., 2021**). Patients with IBS, despite the condition's mild severity, have a far lower quality of life (QOL) than the overall population. (**Regina Sierzantowicz et al., 2020**).

The Rome Foundation criteria have four distinct versions: Rome I, II, III, and IV; they, along with the Manning criteria, form the basis of the diagnosis of IBS. Classifying symptom-based functional gastrointestinal illnesses is the goal of the Rome criteria (**Drossman, 2016**).

The IBS symptoms that most commonly occur and affect QOL include bloating, diet restriction, abdominal pain, and bowel difficulties. Over 50% of people with IBS are compelled to remain near the bathroom, and 57% felt they had no control over their lives. Additionally, emotional disorders such as being less confident, worry, depression, and anxiety (**Qora et al., 2018**).

What really matters for one's QOL is how they personally rate their own psychological, social, bodily, and

spiritual well-being. Factors beyond an individual's control that impact their QOL include their state of mind and physical health, their degree of autonomy, and the ways in which they engage socially with the world around them (Ngan et al., 2020).

### **Significance of Study**

QOL is low for those who suffer from IBS in comparison to the overall population and those who deal with other long-term health conditions. Along with gastrointestinal problems, IBS can cause headaches, sleep problems, menstrual symptoms, urinary problems, chronic fatigue syndrome (CFS), fibromyalgia, and unusual loss of weight (Sperber & Dekel, 2010). So, this study aimed to evaluate the effect of IBS on QOL among patients in King Fahad and King Abdulaziz hospitals in Al-Ahsa region.

### **Aim of the Study:**

This study aimed to evaluate the effect of IBS on QOL among patients in King Abdulaziz hospitals in Al-Ahsa region.

### **Research Questions:**

What is the relationship between IBS and QOL?

Which domains of the QOL is most affected by IBS?

## **II. Materials and methods**

**Study Design:** Cross-sectional descriptive research design.

**Setting:** The research took place in hospitals in Al-Ahsa. There are 10 hospitals in Al-Ahsa some of them are private hospitals and some are governmental hospitals.

We were conduct the study in one governmental hospital, King Abdulaziz hospital in Medical department and outpatient's clinics.

**Subjects:** The convenient sampling technique was used to collect the data of the study. The study subjects who were in King Abdulaziz hospitals and fulfill the following criteria:

**Inclusion Criteria:** Participants' ages range from 21 to 60, both sexes, and were chosen using the Rome Criteria IV, which is based on the presence of frequent abdominal pain that has happened at least once a week in the previous three months.

**Exclusion Criteria:** People with a history of Crohn's disease, diverticulitis, peptic ulcer, ulcerative colitis, and colon cancer.

**Sample Size:** The estimated sample size of 150 patients from the aforementioned environment was derived using a power analysis that used an effect size of 80, a confidence interval of 95%, and a significance level of 0.05.

**Tools of data collection:** Four tools was used in this study. the IBS-QOL tool and Irritable bowel syndrome - severity symptom scale (IBS-SSS)

**1- Patient's demographic data tool,** including their age, gender, marital status, level of education, and occupation.

**2- Patient's clinical data:** including information about their smoking status, duration of illness, any relevant family medical history, and the specific type of IBS they may have.

**3- The IBS-QOL survey** the work of (Drossman et al., 2000) is used. The IBS-QOL questionnaire serves as its foundation. From "Not at all" to "A lot" or "Extremely," the scale contains 34 items. There are five Likert-type response items and eight subscales, which are divided as follows: dysphoria (eight items), interference with activity (seven items), body image (four items), health worry (three items), food avoidance (three items), social reaction (four items), sexual issues (two items), and relationships (three items). The IBS-QOL is utilized to assess the intensity of symptoms and convert the obtained scores to a scale that ranges from 0 to 100 points. Scores that are higher suggest an improvement in HR-QOL.

**4-Irritable bowel syndrome - severity symptom scale (IBS-SSS):** It is adopted from (Francis, et al., 1997). The intensity of the symptoms can be assessed using it. Using the Visual Analogue Scale, the five-question survey assessed pain intensity, pain frequency, flatulence severity, satisfaction with defecation, and the impact of IBS on QOL. The scores can range from 0 to 500, with higher ratings indicating more severe symptoms (Mohamed et al., 2021). Based on the data collected, the scores will be divided into three parts: mild symptoms (75-175), medium symptoms (176-300), and extreme symptoms (301-500).

## Method

- Prior to conducting the study, the CoNA research committee approval was acquired.
- An approval from (KAIMRC) IRB committee.
- After giving the administrative authorities of the previously mentioned location an explanation of the study's goal, they were asked for permission to conduct the study.
- All measures were taken to guarantee the well-being and safety of the study participants in accordance with established ethical standards.
- Informed consent was signed.
- The study was completely voluntary, so participants could stop at any moment without any consequences. The participants' personal information was handled with the utmost confidentiality and was utilized exclusively for the research. Only authorized workers had access to the securely stored data.
- The study also adheres to the ethical principles of beneficence, non-maleficence, and respect for persons.
- A pilot study was conducted on (10%) of patients to test the feasibility and applicability of the tools and to determine any obstacles that may be encountered with the researcher during the period of data collection, accordingly, needed modifications were done.
- The pilot sample was included in the main study sample since no major modifications were done on the study tools.
- 5- Reliability: reliability was tested by using alpha Cronbach's factor as

follow: Cronbach's Alpha for tool I is 0.824, tool II is 0.872, for tool III is 0.775 and tool IV 0.812.

- Data of the study were collected over a period of 6 months.

## Results

### Table (1) Distribution of demographic and clinical data of the participants (N= 150)

Based on their demographic information, this table shows the distribution of patients with IBS. It reveals that about half (42 %) of the total sample were male in age group of 21-29 years old. As for the marital status, more than half of the total sample (60%) were married. In relation to the level of education, slightly more than half (53.34%) of the total sample graduated from university. Regarding occupation, more than half (55.33%) of the total sample were unemployed. In relation to smoking, most of total samples (78.67%) of the total sample are not smokers. Regarding family history, more than two thirds (64%) of the total sample have family history. Finally in relation to type of IBS, this table demonstrates that less than half (45.33%) and more than one third (37.33%) of the total sample have constipation and mixed IBS respectively.

### Table (2) Distribution of Mean Scores of Irritable Bowel Syndrome-Quality of life (IBS-QOL) subscales (Domains)

The table below displayed the distribution of the mean scores on the subscales (domains) related to IBS

and QOL. The results showed that the QOL categories related to food avoidance and health worry had the highest mean scores, with mean scores of 62.62 +21.81 and standard deviation of 61.46 +18.66, respectively.

### Table (3) Distribution of IBS-SSS

This table illustrates the distribution of IBS symptoms severity. It showed that about two thirds (62.000%) and minority (06.00%) of the total sample were having moderate and mild IBS symptoms respectively.

### Table (4) Correlation between total IBS-QOL subscales and total IBS-SSS

This table showed the correlation between the IBS-SSS and the subscales of the IBS-QOL are displayed in the table below. Correlation coefficients (r) and p-values (p) for each of the following subscales are provided: dysphoria, interference with activity, body image, health worry, food avoidance, social relations, and relationships. QOL is significantly correlated with the intensity of IBS symptoms, according to these data. A greater connection between symptom severity and the total IBS-QOL score ( $r = 0.61, p < .0001^*$ ) indicates that a lower QOL is associated with more severe symptoms in these domains. There is strong evidence for the validity of these results, as each subscale likewise has a substantial p-value.

### Table (5) Correlation between demographic, clinical factors and

### **IBS-QOL subscales (Domains) of the participants**

This table presents the correlation between demographic, clinical factors and IBS-QOL subscales (Domains) of the participants. It found that age was not significantly associated with QOL, suggesting that age may not influence how individuals with IBS perceive their QOL. Similarly, in terms of QOL, there were no statistically significant differences between the sexes. However, in the married, divorced, and widowed groups, participants reported similar scores, and men reported somewhat higher scores ( $M = 52.80$ ,  $SD = 17.39$ ) than women ( $M = 49.49$ ,  $SD = 11.74$ ). According to educational levels also did not affect QOL greater, because participants at different levels of education from illiterate to university-educated showed comparable scores. There were also no significant differences in QOL among participants by smoking status (current smoker, smoker, and passive smoker). However, the family history of IBS was significantly associated with QOL, with participants who had a family history reporting higher mean scores ( $M = 52.77$ ,  $SD = 13.63$ ) compared to those without ( $M = 47.54$ ,  $SD = 13.63$ ,  $p = 0.0327$ ). Lastly, type of IBS (diarrhea, nausea, or mixed) did not significantly affect QOL, as scores were similar across groups. These results suggest that

although most demographic and clinical factors do not significantly influence QOL in IBS patients though, family history plays an important role.

### **Table (6) Correlation between demographic, clinical data and IBS-SSS**

This table demonstrates the correlation between demographic, clinical data and IBS-SSS. It shows the age was not significantly associated with severity symptom scale IBS SSS; also the male and female were equal in suffering from IBS-SSS. As for marital status, those who suffer most are those who are divorced (mean=284.80). In addition to educational status, those who suffer most from the disease are illiterate (mean=286.66). As for the Occupation status, employees suffered more (mean=277.44). The majority of the sample (mean: 286.80) are smokers and those more suffer from IBS SSS than non-smokers, However, a family history was significantly associated with IBS SSS with participants who had a family history reporting higher mean scores compared to those without, Among the types of IBS, the highest percentage of participants experienced diarrhea (mean: 280.23), followed by mixed symptoms (mean: 276.73). Constipation was the least common type (mean: 271.33).

**Table (1) Distribution of demographic and clinical data of the participants (N= 150)**

Variable	N	%
<b>Age (Years):</b>		
21 – 29	64	42.667
30 – 39	33	22.000
49 – 49	25	16.667
50-60	28	18.667
<b>Gender</b>		
Male	63	42.00
Female	87	58.00
<b>Marital status</b>		
Single	49	32.66
Married	90	60.00
Divorced	5	3.33
Widow	6	4.00
<b>Level of education</b>		
Illiterate	3	2.0
Reads and writes	11	7.5
Basic education	21	14.0
Secondary schools	35	24.0
University education	80	53.34
<b>Occupation</b>		
Employed	67	44.67
Unemployed	83	55.33
<b>Smoking</b>		
Yes	15	10.00
No	118	78.67
Passive smoker	17	11.33
<b>Family history</b>		
Yes	96	64.00
No	54	36.00
<b>Type of irritable bowel syndrome</b>		
Diarrhea	26	17.33
Constipation	68	45.33
Mixed	56	37.33

**Table 2: Distribution of Mean Scores of IBS-QOL subscales (Domains)**

IBS-QOL Subscales (Domains)	Mean	SD
Dysphoria	52.83	18.16
Interference with Activity	52.24	17.71
Body image	52.70	16.51
Health worry	61.46	18.66
Food avoidance	62.62	21.81
Social relation	41.80	19.68
Relationship	48.31	20.69

**Table 3: Distribution of IBS-SSS**

Variable	N	%
Mild	9	06.00
Moderate	93	62.000
Sever	48	32.000

**Table 4: Correlation between total IBS-QOL subscales and total IBS-SSS**

IBS-QOL	Total IBS-SSS	
	r	p
Dysphoria	0.557783	<.0001*
Interference with Activity	0.55419	<.0001*
Body image	0.499764	<.0001*
Health worry	0.470486	<.0001*
Food avoidance	0.30932	0.0001*
Social relation	0.486851	<.0001*
Relationship	0.482889	<.0001*
Total IBS-QOL	0.61	<.0001*

**Table 5: Correlation between demographic, clinical factors and IBS-QOL subscales (Domains) of the participants**

Variable		M	SD	p	Test
<b>Age (Years):</b>		Mean 35.50	13.17	0.38	$r = -.07$
<b>Gender</b>	Male	52.80	17.39	0.16	$t (148) = 1.38$
	Female	49.49	11.74		
<b>Marital status</b>	Single	49.743252	14.009836	0.9228	F Ratio=0.16 DF (3)
	Married	51.383513	14.637146		
	Divorced	51.225806	15.031012		
	Widow	52.473118	17.524969		
<b>Level of education</b>	Illiterate	52.903226	12.55995	0.1775	F Ratio=1.5997 DF (4)
	Reads and writes	49.824885	14.535375		
	Basic education	47.096774	11.142815		
	Secondary schools	43.98827	8.6932614		
	University education	53.217742	15.500533		
<b>Occupation</b>	Employed	52.546943	15.314438	0.2064	T -1.26905 Df 1
	Unemployed	49.545278	13.62265		
<b>Smoking</b>	Yes	52.516129	19.077584	0.8010	0.2222 DF 2
	No	50.47567	14.554324		
	Passive smoker	52.296015	8.1302821		
<b>Family history</b>	Yes	96	52.768817	0.0327*	T 2.156466 DF1
	No	54	47.538829		
<b>Type of irritable bowel syndrome</b>	Diarrhea	51.960298	13.626479	0.9150	0.0889 DF (2)
	Constipation	50.749526	14.129329		
	Mixed	50.552995	15.359436		

**Table 6: Correlation between demographic, clinical data and Irritable bowel syndrome - severity symptom scale IBS SSS**

Variable		M	SD	p	Test
<b>Age (Years):</b>	Mean 35.50	13.17		0.54	r = 0.04
<b>Gender</b>	Male	274.70	62.90	0.8023	t (0.03), DF 3
	Female	275.15	82.00		
<b>Marital status</b>	Single	269.69	75.43	0.8023	F Ratio=0.3319 DF (3)
	Married	278.44	70.82		
	Divorced	284.80	50.73		
	Widow	255.83	66.74		
<b>Level of education</b>	Illiterate	286.66	58.79	0.9356	F Ratio=0.2044 DF (4)
	Reads and writes	270.18	51.03		
	Basic education	267.09	68.515		
	Secondary schools	270.11	87.09		
	University education	279.23	68.27		
<b>Occupation</b>	Employed	277.44	73.86	0.1546	t -0.39314 DF (148)
	Unemployed	272.83	69.52		
<b>Smoking</b>	Yes	286.80	88.724	0.7944	<b>F Ratio</b> 0.2305 DF 2
	No	273.50	71.62		
	Passive smoker	274.05	52.749		
<b>Family history</b>	Yes	289.61	65.14	0.0006*	T 3.496638 DF1
	No	248.72	74.78		
<b>Type of irritable bowel syndrome</b>	Diarrhea	280.23	50.028	0.8404	0.1741 DF (2)
	Constipation	271.33	75.314		
	Mixed	276.73	75.43		

**Discussion:**

IBS is characterized by persistent abdominal pain and an irregular bowel movement (constipation, diarrhea, or both) (Bonetto et al., 2021). QOL as it relates to capacities (such as being able to lead a fulfilling life in terms of mental and physical health) (Quality of life, 2024). QOL is significantly impacted by the prevalence of IBS. It is believed that over 50% of individuals with IBS also suffer from mental health difficulties, which further complicates treatment and reduces their QOL. (Kopczyńska et al., 2018).

As a result of the heavy burdens placed on males by their families and jobs, the current study found that men made up around half of the sample. This outcome aligned with the conclusions drawn by (Kopczyńska et al., 2018), who observed that in the IBS group, women's IBS-QOL scores were marginally lower than men's. Conversely, (Kim, 2018) asserted that women are more likely to suffer from IBS than men.

The current study demonstrated that patients aged 21–29 are more likely to experience irritable bowel syndrome as a result of a combination of life transitions, such as career changes, education, or relationships. Additionally, this age group often experiences irregular eating habits, poor sleep, and increased use of caffeine. This discovery was corroborated by (Tang et al., 2012), who observed that patients aged 48–57 had lower scores compared to individuals aged

28–37. Contrary to this discovery, (Cheng et al., and 2024) revealed that patients aged 43 years or older are more prevalent.

Regarding the marital status, more than half of the total samples who suffer from IBS were married. This finding is justified by the stress from relationships, caregiving responsibilities, and social expectations. This finding contradicts that of (Aljahdli et al., 2023), who discovered that IBS is more common in people who are not married.

Regarding the topic of family history, the current study found that almost two-thirds of the entire group has a history of IBS. This result agreed with that of (Jadallah et al., 2022), which found that the likelihood of acquiring IBS was eight times higher in individuals with a positive family history of the disorder than in patients with a negative one.

Finally, the results indicated that less than half and more than one-third of the total sample, respectively, have constipation and mixed IBS. (Aljahdli et al., 2023) corroborated the findings by demonstrating that mixed IBS was the most prevalent variant.

The results of the mean scores of the IBS-QOL subscales (Domains) indicate that the Health Worry and Food Avoidance QOL domains had the highest mean scores. Patients avoid foods that irritate the bowel because they believe they will exacerbate their symptoms. In sharp contrast to this finding, the study by (Melchior et al., 2021) found that

just under a quarter of the patients in their group avoided bowl-stimulating items.

Approximately two-thirds of the whole group displayed mild IBS symptoms, according to the current study's findings on the IBS-SSS. This is attributable to stress and irregular eating patterns. The results of (Aljahdli et al., 2023) showed that most of the participants were just mildly uncomfortable, which is completely at odds with our findings.

### **Regarding to correlation between total IBS-QOL subscales and total IBS-SS**

This finding provides more evidence linking dysphoria to IBS. This finding is justified by IBS can influence anxiety and depression due to the discomfort and pain in the gastrointestinal tract. This result agreed with that of (Sibelli et al., 2018), who found that difficulties in processing emotions are associated with more severe irritable bowel syndrome symptoms.

According to activity, the results showed that the IBS caused activity intolerance because the daily activities, like going to school or work, increased the stress on the digestive system. This result was consistent with the findings of (Ballou et al., 2019), who reported that individuals with IBS were more likely to avoid locations without bathrooms, experience difficulty making arrangements, avoid leaving the house, and be reluctant to travel. Conversely, (Johannesson et al., 2015) reported that a moderate increase in physical activity has been

demonstrated to alleviate gastrointestinal symptoms in IBS.

The substantial influence of body image is demonstrated in this result. IBS patients have complex body image problems due to changes in their perceived body shape with physical symptoms like bloating and distention of the abdomen. Similar to (Jedel et al., 2015), who noted that body image are significant concerns for IBS patients and may affect their QOL. However, (Geller et al., 2024) who suggested that IBS negatively affects body image appreciation.

The result shows that health worry is correlated with IBS severity. Because the diagnosis is frequently predicated on ruling out other disorders, which can leave patients feeling unsure about their health and afraid that their symptoms are more severe. These findings corroborate those of (Song et al., 2012), who found that compared to the general population, those with IBS report significantly greater levels of stress, anxiety, and trait anxiety.

According to food avoidance, the results showed that there is a simple relationship between IBS and food avoidance because of certain foods, like spicy foods, fatty foods, and soft drinks, can trigger or worsen symptoms like abdominal pain, bloating, diarrhea, or constipation, this finding is similar to (Böhn et al. 2013), who noted that food avoidance helps to minimize IBS symptoms.

According to social relations, the result showed a relationship between social relations and IBS. Individuals may avoid social settings because

they are concerned that their symptoms will manifest in public. This outcome is comparable to that of (**Sowerbutts et al., 2020**), who discovered that they experienced a variety of negative emotions and social consequences, including challenges in maintaining relationships and socializing.

### **Concerning the correlation between demographic, clinical factors and IBS-QOL subscales (Domains) of the sample**

First of all, the relationship between age and IBS-QOL is very weak and statistically non-significant due to age increases IBS-QOL scores might slightly decrease, but the effect is negligible. Similar to (**Melchior et al., 2022**), who found that age does not independently affect the QOL among IBS patients. On the contrary, (**Chen et al., 2022**), who found that older adults may experience a different impact on IBS-QOL.

Although males reported somewhat higher scores owing to biological, psychological, and social factors, there were no significant differences in QOL ratings between men and women in terms of gender. However, this result was disproven by (**Fan et al., 2024**), who noted that women frequently report worse QOL and symptoms.

Referring to marital status, widows show the largest variability than the single, due to widow groups suggest diverse individual coping mechanisms, social support differences. This finding was accepted by (**Chen et al., 2021**), who mentioned that marital status affects QOL through differences in

social support. On the other hand, (**Chen al., 2022**), who mentioned that marital status alone is not a determinant of IBS-QOL.

Regarding education level, it significantly affects IBS-QOL due to people with higher education levels often having better access to health information, enabling them to understand and manage their conditions more effectively. The findings corroborated those of (**Shorey et al., 2021**), who proposed that more education could improve people's health.

Regarding occupation, employed patients also reported a better QOL compared to the unemployed. Due to employment can instill a sense of purpose and routine that may reduce psychological distress. This result agreed with that of (**Frändemark et al., 2022**), which indicated that working-age people with IBS often come up with plans to improve their quality of life while still juggling the responsibilities of their jobs.

For smoking habits, Passive smokers reported a slightly better QOL compared to active smokers. Active smoking exacerbates symptoms due to increased inflammation in the gut and this affects QOL. This corresponds with the results of (**Papoutsopoulou et al., 2020**), who reported that smoking has an impact on the mental and physical health of patients with IBS.

Referring to family history, patients with family history of IBS was related to better QOL. Information, coping mechanisms, and medical guidance tend to be more readily available to those with a family

history of IBS. This result agreed with that of (Lee et al., 2019), who found that people who have a history of the condition in their family are more likely to practice good self-care, which improves their QOL.

Concerning the subtypes of IBS, the diarrhea-predominant form had a slightly better QOL than the constipation-predominant or mixed type. This finding is justified by diarrhea-predominant IBS comes and goes, making symptom management possibly easier. (Kaplan et al (2022) corroborated this discovery, indicating that functional gastrointestinal disorders are the most prevalent comorbidity in chronic constipation and defecatory disorders. Consequently, individuals who are affected experience more severe symptoms and a lower QOL.

#### **Regarding correlation between demographic, clinical data and IBS-SSS**

This research looked at how demographic and clinical variables correlated with the intensity of IBS symptoms. There was no statistically significant relationship between the severity of IBS symptoms and the age of the patient. Because IBS is influenced more by factors like stress, diet, and psychological health rather than age. Consistent with this conclusion was the study by (Makkawy et al., 2023), which indicated that although the frequency of IBS may change with age, the intensity of symptoms is not directly related to age but is affected by environmental variables such as stress and life choices. Similarly,

findings by (Glynn et al., 2021), who showed that psychological stressors, often associated with younger individuals, might exacerbate symptoms, but age itself does not play a decisive role in symptom severity.

Regarding to gender, comparison revealed slightly higher symptom severity in females than in males, though this difference was not statistically significant. This aligns with (Narayanan et al., 2021), who highlighted the role of hormonal influences, particularly among females, in increasing symptom severity. This finding reveals that most of total sample were divorced due to stress and psychological pressure resulting from going through the divorce experience. (Choi et al., 2017) noted that being in a married, divorced, or widowed status increases the likelihood of experiencing more severe IBS symptoms. On the other hand (Hafiz et al., 2023), who mentioned that most of the people who suffered were married.

The result of these correlations indicated that most of samples were illiterate due to their ignorance of how to control symptoms. The study's findings were contradictory (Niknam et al., 2016), which noted that the correlation between educational attainment and symptom intensity was not statistically significant. The current study indicated that many of them were employees due to exposure to physical, psychological and material stress. This finding was accepted with (Saha., 2014), who noted High-

pressure jobs or those that require long working hours may exacerbate the symptoms of the condition due to psychological stress, which in turn affects QOL.

The current results indicated that most of the samples were smokers due to smoker's smoke when they feel anxious and stressed, and this is also linked to the colon. This result corroborated that of (Saha, 2014), who noted that smoking increases the likelihood that symptoms may manifest following colon damage.

There is a substantial sample whose results are associated with family history due to suppression of feelings and the many quarrels between the infected and the uninfected. This finding was accepted with (Alemany et al., 2023), who found that one of the factors influencing the likelihood of developing IB) is family history.

Our study shows that individuals with relatives affected by IBS are more likely to develop it themselves. Most of the total sample had diarrhea due to colon disease associated to psychological state and anxiety, as well as to the function of the sympathetic system, which increases the occurrence of diarrhea.

(Choi et al., 2017) confirmed this result by showing that diarrhea patients had more depressive symptoms and more severe symptoms (such as bloating, nausea, loose or watery feces, and increased urgency) compared to diarrhea-free patients.

**V: Conclusion and recommendations:** Findings from this study point to health concerns

and food avoidance as areas of quality of life most affected by IBS. Additionally, there was a statistically significant correlation between the severity of IBS symptoms and QOL. Lastly, people with IBS do not have their QOL greatly affected by most clinical and demographic variables; nevertheless, family history does play a significant role.

**Recommendations:** Regular plans for continuous patient education are necessary for symptom control and to lessen the negative impact of the condition on QOL. In order to apply the findings to a broader population, the study needs to be repeated using a larger sample size and in a different type of hospital environment.

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## **Effectiveness of Simulation Versus Electronic Training Regarding Pediatric Tracheostomy Care on Nursing Students' Knowledge, Skills and Self-efficacy**

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### **Abstract:**

**Background:** Pediatric tracheostomy care requires effective training and specific technical skills and knowledge to ensure child's safety and prevent complications.

**Aim:** Evaluate the effectiveness of simulation versus electronic training regarding pediatric tracheostomy care on nursing students' knowledge, skills and self-efficacy.

**Subjects:** A convenience sampling of 200 pediatric nursing students. **Setting:** Pediatric Clinical Skills Lab, Faculty of Nursing, Tanta University. **Tools:** Tool (I) Students' Knowledge questionnaire about Tracheostomy. Tool (II) Observational Checklists of Tracheostomy Care. Tool (III) Learning Self-Efficacy Scale. **Results:** No statistically significant difference in students' knowledge was found between simulation and E-training groups at pretest, immediate posttest and one month later. Statistically significant differences were found in the mean scores regarding students' skills and self-efficacy between both groups immediately posttest and after one month. **Conclusion:** Simulation and E-training were effective strategies in improving students' knowledge regarding pediatric tracheostomy care. Simulation is more powerful than E-training in improving nursing students' skills and self-efficacy regarding pediatric tracheostomy care. **Recommendation:** Integration of E-learning with simulation training as a complementary modality, but not as a substitute.

**Keywords:** Electronic training, Knowledge, Nursing students, Pediatric tracheostomy care, Self-efficacy, Simulation, Skills.

### **Introduction:**

One of the fundamental needs of healthcare systems is to fulfill the needs of pediatric nursing through employing of highly skilled nurses. Thus, the essential roles of nursing education programs are delivering high quality education to nursing students and training proficient nurses who are able to give high quality and safe care

for children in the future (**Ghasemi, Moonaghi, Heydari, 2020**).

In nursing education, creative teaching and learning approaches enable nursing students to engage in self-regulated learning actively. This can transform conventional one-way education to student-centered learning and teaching style. The innovative approaches support the development of evidence-

based healthcare, health informatics, teamwork, communication, introspection, cultural sensitivity as well as critical thinking. (An, Oh, Park, 2022).

Simulation is one of innovative and technologically advanced approaches in nursing education. It helps students develop their clinical competency, confidence, analytical thinking skills and minimizes the errors before working in a real clinical setting. Numerous simulation modalities are used in medical education including full and partial body models with low and high fidelity capabilities, standardized patients and computer-based programs (Koukourikos, Tsaloglidou, Kourkouta et al., 2021).

Teaching through simulation has many advantages but can also present a few challenges in preparing nursing graduates for the future. It allows nursing students to develop skills without risk to patient. It also increases students' self-confidence, lessen anxiety in the real patient care setting, enables them to critically evaluate their own actions, reflect on their skills and criticize the clinical decisions of others (Baykara & Eyikara, 2018).

Nursing education is a significantly impacted by the advancements in information technology. Electronic learning has expanded and currently included into nursing education and training. Electronic learning is a nontraditional method of providing online education and correlates to virtual learning environments using electronic devices to deliver educational course outside of the conventional classroom. It encompasses wide range of online

technologies including web-based courses, multimedia resources, virtual classrooms and mobile applications (Bond, Buntins, Bedenlier et al., 2020).

The role of instructor in an online environment is different than in a traditional classroom. The emphasize has shifted from imparting knowledge to facilitate and stimulate the learning process. This transition from teacher-centered instruction to learner-centered facilitation needs pedagogical skills as predicting learners' needs, managing interactions, coordinating resources and mastering technologies (Rose, Ishak, Hamidun et al., 2024).

Tracheostomy is a life-saving procedure. In children, the indications for it involve congenital anomalies of upper respiratory tract, inflammatory diseases and medical conditions that need prolonged intubation. Nevertheless, there is a significant risk of morbidity and mortality with pediatric tracheostomy (Kang, Lin, Lee et al., 2022). Over 100,000 tracheostomies are now performed annually, including 4,000 in pediatric patients (Duymaz, Yilmaz, Önder et al., 2021, Watters, 2017).

Care of tracheostomy requires a multidisciplinary strategy, especially including nursing healthcare. Proper tracheostomy care requires frequent suctioning, stoma cleaning, periodic tracheostomy tube change, nutrition, and speech therapy. The insertion and management of tracheostomy are becoming prevalent in critical care units as well as general wards (Pereira, Silva, Vaz et al., 2020).

Innovative teaching learning strategies have a positive effect on students'

performance, achievement and self-efficacy. Nursing self-efficacy has been described as the expectations of acquiring the knowledge base and performing the different skills required for education. So, self-efficacy for nurses is crucial to provide quality care, develop their professional identities and improve their performance (Abusubhiah, Walshe, Creedon et al., 2023).

### **Significance of the study**

Pediatric tracheostomy care is an important procedure in pediatric nursing education as proper care reduces the risk of complications which can be life threatening. Therefore, undergraduate nurses should be familiar with the tracheostomy care. This can be achieved by using different modern educational strategies as simulation and E-training those makes the learning experience more effective and help students to be more qualified at real situations.

### **Aim of the study:**

Evaluate the effectiveness of simulation versus electronic training regarding pediatric tracheostomy care on nursing students' knowledge, skills and self-efficacy.

### **Research hypothesis:**

$H_1$ : Simulation training is expected to be more effective in improving nursing students' knowledge and skills regarding pediatric tracheostomy care more than electronic training.

$H_2$ : Students' self-efficacy is expected to be improved after training program using both simulation and electronic training of pediatric tracheostomy care.

### **Subjects and Method:**

**Research design:** A quasi-experimental research design was employed in this study.

**Setting:** The study was conducted at the Pediatric Clinical Skills Lab, Faculty of Nursing, Tanta University, a Ministry of Higher Education and Scientific Research affiliated institution.

**Subjects:** The study included a convenience sampling of 200 Pediatric Nursing students in the third year who was enrolled in the pediatric nursing course from 1/10/2023 to 1/1/2024. The total number of third year students during this period was 530 students so, to ensure adequate statistical power, the sample size was calculated using Epi-info software. The calculation was based on a 95% confidence level, a 5% margin of error, and a 50% estimated population proportion. This resulted in a sample size of 200 students. The recruited sample was then classified as follows:

**Group (1):** Simulation training group that was consisted of 100 students. They received tracheostomy care training in the Pediatric Skill Laboratory using simulation training on Tracheostomy manikin.

**Group (2):** Electronic training group was consisted of 100 students. They received tracheostomy care training using electronic application and on-line training using computers. Students were assigned to either the simulation or E-training group via systematic random sampling.

### **Tools of data collection:**

Three data collection tools were used in this study.

### **Tool I: Students' Knowledge questionnaire about Tracheostomy:**

It was developed by researcher to assess students' sociodemographic characteristics and their knowledge about tracheostomy. This questionnaire was comprised of two parts as follow:

**Part (1): Students' Sociodemographic characteristics:** It encompassed students' age, sex, past experience and previous training related to tracheostomy care.

**Part (2): Students' knowledge about tracheostomy:** The researcher developed it after reviewing literatures (Erturgul, Kesici, Bayrakci et al., 2016, Hussein, 2022). It was used to assess students' knowledge pre and post training course.

It included data about anatomy and physiology of respiratory system, trachea, tracheostomy (definition, indications, and parts of tracheostomy tube), tracheostomy care, and stoma cleaning procedure, appropriate pressure, and duration of tracheostomy suction and best position for tracheostomy tube change.

**Students' knowledge scoring system:**

- Correct & complete answer was scored (2).
- Correct & incomplete was scored (1).
- Incorrect or don't know was scored (0).

**Total score of students' knowledge was calculated and categorized as follow:**

- High knowledge level :> 80%.
- Moderate knowledge level: 60% - 80%.
- Low knowledge level :< 60%.

**Tool (II): Observational Checklists of Tracheostomy Care:**

The researcher developed it after a literature review. (Qawala, 2017, Bowden & Greenberg, 2016). It was used to assess students' practice

regarding tracheostomy after training course, it included the following skills: preparation of the equipment & children, tracheostomy suctioning, cleaning tracheostomy opening, changing tracheostomy ties and changing tracheostomy tube.

**Scoring system of students' practice:**

- Done step scored (1).
- Note done or incorrect step scored (0).

**Total score of students' skills was calculated as follow:**

- Unsatisfactory practice < 80 %.
- Satisfactory practice  $\geq$  80 %.

**Tool (III): Learning Self-Efficacy Scale (L-SES)**

It was developed by Kang, Chang, Kao et al., (2019) based on the framework of Bloom's taxonomy to collect data related to students' self-efficacy before and after training course. The items of the scale were answered and completed by the students using a five-point Likert scale ranging from "strongly disagree" to "strongly agree". The scale assessed self-efficacy across three domains: cognitive, affective and psychomotor.

**Scoring system of students' self-efficacy:**

- 1 = Strongly disagree.
- 2 = Disagree.
- 3 = Undecided – Neither agree nor disagree.
- 4 = Agree with the statement.
- 5 = Strongly agree with the statement.

**The total scores of students' self-efficacy** was calculated and classified into

- High self-efficacy from 60% and more of the total score.
- Low self-efficacy less than 60%.

**Method:**

The study was accomplished through the following steps.

**1. Administrative process:**

Formal permission to collect data was granted by the Dean of the Faculty of Nursing, Tanta University before the study began.

**Ethical and legal considerations: -**

- Ethical approval was obtained from the Scientific Research Ethical Committee of the Faculty of Nursing, Tanta University. (code no.161-12-2022).
- The study involved no risk of harm or pain to the entire sample.
- Confidentiality and privacy were strictly maintained throughout the data collection and analysis phases.
- All participated nursing students provided informed consent after detailed explanation of the study aim and assured that their participation was voluntary and would not affect their grades. The students were free to withdraw from the study at any time without explanation.

**Tools development:**

Three tools were utilized for data collection.

**Content validity:**

The study tools were reviewed for content validity and clarity by a jury of five experts in the field of Pediatric Nursing before conducting the study.

**Reliability of tools:**

The reliability of data collection tools was assessed using Cronbach's alpha. The resulting coefficients were 0.827 for knowledge and 0.721 for practice, indicating a high degree of reliability.

**A Pilot study:**

It was conducted on 20 students (10%) of the study sample. Pilot study was

excluded from the study because some modifications were done.

**Phases of the study: The study was conducted through four phases:****1-Assessment phase:**

This phase involved orienting both study groups to the study aim and collecting baseline data, including pre-training assessments of tracheostomy care knowledge and self-efficacy using the study tools (I & III).

**2-Planning Phase:****A- Setting of the training course objectives.****B- Preparation phase:**

1. Preparation of educational materials for theoretical and practical training in pediatric tracheostomy care.
2. Preparation of the environment. The study was conducted across two distinct modalities: a physical setting (pediatric skills laboratory) and a virtual setting (Microsoft Teams).
3. Preparation of the teaching and training methods. Booklet and pediatric tracheostomy simulator were prepared for simulation group while PowerPoint presentation included combination of text, high quality pictures and videos created by the researcher for electronic training group using Microsoft Teams application.

**3-Implementation phase:****Simulation group:**

- The researcher divided simulation group (100) students into 5 subgroups. Each subgroup consisted of 20 students. The theoretical and practical explanation related to pediatric tracheostomy care was carried out through 4 sessions for each subgroup of students two sessions / week. Each practical training session was lasting approximately 50 minutes in which the

researcher demonstrated tracheostomy care procedure on a manikin and then the students re-demonstrated the procedure steps while, being observed by the researcher.

#### **Electronic training group:**

- The researcher divided E- training group (100) students into 5 subgroups. Each subgroup consisted of 20 students. The researcher presented the tracheostomy care training course for each subgroup separately through 4 sessions, two sessions / week. The training sessions was implemented twice / week. The time of each session was about 50 minutes using different methods of teaching as: Power Point presentation contained combination of text and high-quality pictures for theoretical content and videos for practical content that were shared and presented to students for 35 minutes. The researcher allowed discussion and asking questions for 15 minutes at the end of each session.

#### **Teaching sessions for both study groups were as follow:**

**First educational session:** A theoretical session; it focused on anatomy and physiology of respiratory system, trachea, definition, indications and complications of tracheostomy.

**Second educational session:** A theoretical session that focused on definition, types and basic parts of pediatric tracheostomy tube and caring for a child with a tracheostomy.

**Third session:** A practical session that started by demonstrating skills including suctioning and cleaning of the tracheostomy.

**Fourth session:** A practical session that was concentrated on changing

tracheostomy ties and changing tracheostomy tube.

#### **4-Evaluation phase:**

Students' knowledge related to tracheostomy care and self-efficacy were evaluated three times, pre training, immediately after training and one month after implementation of the training course. Students' skills related to tracheostomy care were evaluated immediately and one month after training. Both groups were evaluated in the pediatric clinical lab using same instruments.

- The collection of data was carried out within 3 months starting from 1-10-2023 and ending at 1-1-2024.

#### **Statistical analysis:**

Data were organized, tabulated and analyzed using IBM SPSS software. Qualitative data were presented as numbers& percentages and quantitative as means and standard deviations. Statistical tests included Chi-square test to compare between different groups. ANOVA test to compare between more than two periods. Friedman test to compare between more than two periods. Student t-test to compare between two studied groups. Pearson coefficient to correlate between two normally distributed quantitative variables. Statistical significance was defined at  $P<0.05$  (\*) and highly significant at  $P<0.01$  (\*\*).

#### **Results:**

**Table (1):** illustrates socio-demographic characteristics of the students. The mean age was  $21.12 \pm 0.48$  years in simulation group and  $21.15 \pm 0.56$  years in E-training group. Regarding students' sex, it was evident that nearly two thirds of students (63%) in simulation group and nearly three

quarters (72%) in E-training group are female. Most of the students (89% & 92%) didn't have past experience about tracheostomy care in simulation and E-training groups respectively. Also, the majority of the students (91% & 95%) didn't attend any previous training related to tracheostomy care in simulation and E-training groups respectively.

**Table (2):** represents students' total knowledge regarding pediatric tracheostomy. At pre-test all simulation students had low knowledge level. Following training program ,100% of these students demonstrated high knowledge immediately post-test, which slightly decreased to 96% after one month ( $p<0.001$ ).

Concerning E-training group, it was noticed that 95% of the students had low level of knowledge pretest compared to 96% and 89% had high level of knowledge immediately posttest and after one month from implementation of training program respectively with a high statistically significant difference ( $p<0.001$ ). There was no statistically significant difference between simulation and E-training group pretest, immediately posttest and one month later.

**Table (3):** illustrates students' total practice regarding pediatric tracheostomy care. It was noticed that, all of students (100%) and 89% of simulation group compared to more than three quarters (87 % & 77%) of E-training group had satisfactory practice immediately posttest and one month after training respectively.

There was high statistically significant difference within the simulation group immediately post training and one

month later ( $p<0.001$ ) while there was no significant difference within the E-training group ( $p=0.058$ ). Also, there was statistically significant difference between both groups immediately posttest ( $p <0.001$ ) and after one month ( $p=0.024$ ).

**Table (4)** represents students' total score of self-efficacy. It was observed that, all of the students (100%) in simulation group had high self-efficacy compared to 96% and 92% of E-training group immediately after and one month after training respectively. Moreover, there was high statistically significant difference related to self-efficacy within the simulation and the E-training groups ( $p <0.001$ ). Also, there were high statistically significant differences in the mean of total score of self-efficacy between both groups immediately after training and one month later ( $p<0.001$ ).

**Table (5)** clarifies the correlation between total knowledge and total practice scores related to pediatric tracheostomy care in simulation and E-training groups. A highly statistically significant positive correlation was found in simulation group immediately after training ( $p<0.001$ ) and one month later ( $p=0.003$ ). Also, statistically positive correlation was observed in E-training group immediately after and one month after training ( $p=0.024$ ) ( $p=0.002$ ) respectively.

**Table (1): Percentage Distribution of the Studied Students According to Sociodemographic Characteristics (n=200).**

Socio demographic characteristics	Simulation group (n =100)	E-Training group (n =100)
<b>Age</b> Mean ± SD.	21.12 ± 0.48	21.15 ± 0.56
<b>Sex</b>	<b>%</b>	<b>%</b>
Male	37	28
Female	63	72
<b>Past experience about tracheostomy care</b>		
Yes	11	8
No	89	92
<b>Previous training related to tracheostomy care</b>		
Yes	9	5
No	91	95

**Table (2): Total Scores of the Studied Students' Knowledge Regarding Pediatric Tracheostomy**

Total score of students' knowledge about tracheostomy	Simulation group (n =100)				E-Training group (n =100)				Pretest	Immediately posttest	1 month posttest
	Pretest	Immediately posttest	1 month posttest	Test of sig. ( p <sub>0</sub> )	Pretest	Immediately posttest	1 month posttest	Test of sig. ( p <sub>0</sub> )	χ <sup>2</sup> ( p <sub>1</sub> )	χ <sup>2</sup> ( p <sub>2</sub> )	χ <sup>2</sup> ( p <sub>3</sub> )
	%	%	%		%	%	%		χ <sup>2</sup> ( p <sub>1</sub> )	χ <sup>2</sup> ( p <sub>2</sub> )	χ <sup>2</sup> ( p <sub>3</sub> )
Low (<60 %.)	100	0	0	Fr.=197.47	95	0	0				
Moderate (60% - 80 %.)	0	0	4	4	5	4	11	Fr.=193.241	5.128	4.082	3.532
High (> 80%).	0	100	96	(<0.001**)	0	96	89	(<0.001**)	(0.059)	(0.121)	(0.060)
<b>Mean ± SD</b>	15.54 ± 3.42	34.64± 1.27	33.21 ± 2.07	<b>F=2173.15</b> (<0.001**)	15.39 ±3.23	33.94± 2.08	32.23± 2.59	<b>F=1796.678</b> (<0.001**)			

Fr: Friedman test F test (ANOVA) with repeated measures

p<sub>0</sub>: p value for comparing between the same groupp<sub>1</sub>: p value for comparing between both groups pretestp<sub>2</sub>: p value for comparing between both groups immediately posttestp<sub>3</sub>: p value for comparing between both groups post 1 month

\*: Statistically significant at p &lt; 0.05

\*\*: Highly Statistically significant at p &lt; 0.0001

**Table (3): Total score of the studied students' practice regarding pediatric tracheostomy care**

Total score of students' practice	Simulation group (n =100)		E-Training group (n =100)		Immediately posttest	1 month posttest
	Immediately posttest	1 month posttest	Immediately posttest	1 month posttest	Test of sig. ( p <sub>1</sub> )	Test of sig. ( p <sub>2</sub> )
	%	%	%	%		
Unsatisfactory	0	11	13	23		
Satisfactory	100	89	87	77	$\chi^2 = 13.904$ (<0.001**)	$\chi^2 = 5.103$ (0.024*)
	<b>McN= 11.640</b> (p <sub>0</sub> =0.001**)		<b>McN= 8.028</b> (p <sub>0</sub> =0.052)			
<b>Mean ± SD</b>	100.6 ± 3.38	94.73 ± 6.85	92.51 ± 5.25	90.81 ± 8.08	$t=12.883$ (<0.001**)	$t=3.702$ (<0.001**)
	<b>t2= 12.972</b> (p <sub>0</sub> <0.001**)		<b>t2= 1.917</b> (p <sub>0</sub> =0.058)			

p<sub>0</sub>: p value for comparing between Post immediately and Post 1 month in same group

p<sub>1</sub>: p value for comparing between both groups immediately posttest

p<sub>2</sub>: p value for comparing between both groups post 1 month

\*: Statistically significant at p ≤ 0.05

\*\*: Highly Statistically significant at p < 0.0001

**Table (4): Percentage Distribution of the Studied Students According to their Total Score of Self-Efficacy**

Total score of Self-Efficacy	Simulation group (n =100)			E-Training group (n =100)			Pretest	Immediately posttest	1 month posttest
	Pretest	Immediately posttest	1 month posttest	Pretest	Immediately posttest	1 month posttest			
	%	%	%	%	%	%	Test of Sig. (p <sub>1</sub> )	Test of Sig. (p <sub>2</sub> )	Test of Sig. (p <sub>3</sub> )
Low	100	0	0	100	4	8	–	$\chi^2=4.082$ (0.121)	$\chi^2=8.333$ (0.007**)
	0	100	100	0	96	92			
Fr. = 200.00 (p <sub>0</sub> <0.001**)			Fr. = 184.333 (p <sub>0</sub> <0.001**)						
(Mean ± SD.)	25.88 ±4.14	52.25 ± 3.11	50.88 ±3.01	25.57 ±3.62	47.55 ± 3.24	45.74 ±2.90	$t= 0.564$ (0.574)	$t= 10.458$ (<0.001**)	$t= 12.297$ (<0.001**)
	F= 2260.606 (p <sub>0</sub> <0.001**)			F= 1702.705 (p <sub>0</sub> <0.001**)					

p<sub>0</sub>: p value for comparing between the studied periods in same groupp<sub>1</sub>: p value for comparing between both groups pretestp<sub>2</sub>: p value for comparing between both groups immediately posttestp<sub>3</sub>: p value for comparing between both groups post 1 month

\*: Statistically significant at p ≤ 0.05

\*\*: Highly Statistically significant at p &lt; 0.0001

**Table (5): Correlation between Total Knowledge and Total Practice scores Related to Pediatric Tracheostomy Care in Simulation and E-Training Groups.**

		Post immediately		Post 1 month
		Total Practice		Total Practice
Simulation group				
Total knowledge	r p	0.391 <0.001**		0.290 0.003**
E-training group				
Total knowledge	r p	0.226 0.024*		0.309 0.002**

r: Pearson coefficient \*: Statistically significant at p ≤ 0.05

\*\*: Highly Statistically significant at p &lt; 0.0001

**Discussion:**

Tracheostomy is one of the oldest and most often performed surgical procedures on critically ill children. Proper tracheostomy care is crucial and nurses are the front-line healthcare providers in pediatric tracheostomy care. There is evidence suggesting that adequate students' training regarding management of tracheotomies can improve patient comfort, decrease the need for sedation, lower the risk of laryngeal injury, accelerate weaning from the ventilator and shorten hospital stay (**Hussein, Mahmoud, Abd El-Salam et al., 2022, Mosalli, Aboumoustafa, Khayyat et al., 2022**).

Concerning students' knowledge about tracheostomy, the results of the current study showed that students in both studied groups had low level of knowledge before training. There was no significant difference between the two groups before teaching interventions. It may be attributed to that the vast majority of the students didn't receive any training course about tracheostomy care before and hadn't any experience about tracheostomy care. This result was matched with **Malk, Fahem, Soultan et al., (2022)** who studied "effectiveness of training program regarding tracheostomy care on nurses' performance at intensive care unit" and clarified that majority of nurses in their study had unsatisfactory level of knowledge regarding tracheostomy care preprogram implementation.

The results of the present study demonstrated that there was significant improvement in the knowledge regarding tracheostomy in simulation group immediately after and one month post training course with a statistically significant difference within the group. This may be due to frequent students' interaction and repetition also immersing students in realistic contexts through simulation bridge the gap between theory and practice leading to more effective knowledge acquisition and long-term retention. The result of the current study was in harmony with **Abdou & Abass (2021)** who studied " effect of high-fidelity simulation on nursing students' knowledge and skills regarding assessment and nursing intervention of acute coronary syndrome" and revealed that a statistically significant differences between the pretest and posttest in the level of knowledge of nursing students after application of high-fidelity simulation.

Also, **Parmar & Vaidya (2022)** agreed with the present study. They conducted "a comparative study of teaching approach nursing simulation vs group discussion on respiratory assessment in terms of knowledge and critical thinking abilities among nursing students of selected colleges of Kheda–Anand district" and showed that after implementation of simulation there was significant change in post-test knowledge and critical thinking abilities regarding respiratory assessment among the students.

The findings of the present study demonstrated that there was significant improvement in the knowledge regarding tracheostomy in E-training group immediately after training and one month after training course with a statistically significant difference within the group. This may be due to educational content was produced in small sections so, it is easier to memorize and could be easily saved on electronic devices and frequently repeated for refreshment of knowledge.

The current findings were consistent with **Shah & Stefaniak (2018)** who studied " A review of the effectiveness of e-learning on knowledge and skill acquisition in medical education" as they reported that there was a statistically significant effect of e-learning on the learners' knowledge.

Concerning total score of knowledge in simulation and E-training groups, the findings of the present study revealed that there was no significant difference existed between simulation and E-training groups immediately posttest and one month after teaching interventions. This can be attributed to the effectiveness of modern teaching methods in delivering knowledge easily and facilitating the process of storing information and preserve knowledge in long term memory.

This result was matched with **Moore (2016)** who studied "Interprofessional Patient Simulation Training Compared to Online Training for learning to use In-Line

Speaking Valves" and showed that interprofessional teams in online and simulation training groups gained equivalent knowledge across time without group differences.

Regarding students' practice related to tracheostomy care in simulation group, the current study revealed that all of student had satisfactory practice regarding tracheostomy care immediately after teaching strategy. This may be due to the positive effect of simulation as a teaching method on students' practice as it offered a high level of realism and enabled students to develop technical skills, improve teamwork and enhance confidence in a safe and controlled environment.

These results were supported by **Shah, Cusumano, Ahmed et al. (2020)** who studied "in situ simulation to assess pediatric tracheostomy care safety: a novel multicenter quality improvement program" and founded that in situ simulation can be used to identify and reassess latent safety threats related to pediatric tracheostomy management and thereby support quality improvement and educational initiatives.

Regarding students' practice related to tracheostomy care in E-Training group, the current study revealed that more than three quarters of the students had satisfactory practice and less than one quarter had unsatisfactory practice of tracheostomy care immediately after teaching strategy. This may be due to students had the opportunities to access content frequently. This

continuous learning approach contributes to better skill retention. Also, the availability of videos demonstrating the procedures enable repeated playback and review of the procedure.

The result of the present study was matched with **Guy & Lownes-Jackson (2015)** who conducted a study entitled "The use of computer simulation to compare students' performance in traditional versus distance learning environments" and reported that the majority of students were able to demonstrate the competency of their abilities with more than half of the sample population received a grade average of C or better on each application.

The finding of the present study revealed that there was statistically significant difference between simulation and E-training groups regarding students' practice related to tracheostomy care. A possible explanation of this result is that students in the simulation group benefitted from face-to-face lectures, demonstrations and redemonstration with the researcher and also because of sharing discussion and peer support during clinical training. These different methods of communication aren't available in the E-learning method.

This result was supported by **Guy & Lownes-Jackson (2015)** who found that there were significant differences in student performance when comparing the traditional format with the fully online method of instruction using computer and showed that students in the online

group did not perform as well as their counterparts in the traditional group. On the other hand, **Linder & Weissblueth (2023)** who studied "Impact of Simulation Training-Comparison Between Face-to-Face and Online Learning" weren't in the same line with the present study and founded that no significant differences were found in learning outcomes for face-to-face simulation and online simulation.

Concerning self-efficacy of students in simulation group the current study revealed that there was statistically significant improvement of students' self-efficacy in simulation group throughout immediate post and one month after training compared to pretraining phase. This explained as more knowledge and hands-on experience gained through simulation training contributed to skills proficiency and high self-efficacy.

This finding was supported with **Mohamed & Fashafsheh (2019)** who studied "the effect of simulation-based training on nursing students' communication skill, self-efficacy and clinical competence for nursing practice" and revealed that the mean scores on the self-efficacy scale were increased following the simulation in comparison to the baseline assessment.

On the other hand, **Karabacak, Unver, Ugur et al. (2019)** were contradicted with the present study as they conducted a study entitled "examining the effect of simulation-based learning on self-efficacy and performance of first-year nursing

students" and found that self-efficacy scores decreased in the post-simulation scenario and using standardized patients in simulation training enables new nursing students to meet a real patient and to identify their own true self-efficacy. Concerning self-efficacy of students in E-training group the current study revealed that there was statistically significant difference improvement of students' self-efficacy in E-training group throughout immediate post and one month after training course compared with pre training phase. This result may be attributed to the possibility of repetition of the videos and electronic content that helps to acquire, revise and retraining that promote self-efficacy of the students.

This result was supported by **Delita, Berutu, Nofrion et al. (2022)** who studied "Online learning: The effects of using e-modules on self-efficacy, motivation and learning outcomes " and showed that the using of e-module in online learning resulted in significant increases in self-efficacy, motivation, and learning outcomes also, the e-modules with the collaborative learning option was most effective teaching method.

The present study showed that there was statistically significant difference in the mean scores related to self-efficacy between simulation and E-training groups immediately after and one month after training course. These results may be due to that simulation method provides immersive and hand on experiences that closely mimic real scenarios.

This helps students develop confidence in their ability to perform task correctly. Unlike E-training which is often focused on theoretical knowledge and passive content delivery.

These results were in the same line with **Choi, Lee, Jeon et al. (2020)** who studied " efficacy of the computer simulation-based, interactive communication education program for nursing students" and revealed that the simulation-based education group significantly improved communication knowledge, learning self-efficacy, and communication efficacy compared to computer -based education and these effects were maintained at two weeks.

Regarding correlation between total knowledge and total practice related to tracheostomy care in both groups. The current study revealed that there was statistically positive correlation between total knowledge and total practice in both groups immediately and one month after training. It may be due to that simulation and E-training improved nursing students' knowledge and practice regarding tracheostomy care and promoted both knowledge retention and the practical application of skills.

A study of **Akl, Farrag, Gaber et al. (2023)** about "effectiveness of TRACHE care bundle implementation on the pediatric nurses' performance and improving pediatric tracheostomy management safety" were in the same line of the present study and found that a statistically significant positive

correlation between the total practice level and the overall degree of knowledge held by nurses.

#### **Conclusion:**

The study concluded that both simulation and electronic training effectively improve nursing students' knowledge and self-efficacy related to pediatric tracheostomy care. Simulation training was significantly more effective than E-training in improving students' skills.

#### **Recommendations:**

Based on the findings of the present study, the following recommendations are suggested:-

- Integration of E-learning with simulation training as a complementary modality, but not as a substitute.
- Simulation should be used as an evidence-based educational strategy to address and possibly reduce the theory practice gap for undergraduates during clinical practice.
- Establishing comprehensive staff development programs about simulation-based learning for students.

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## **Effect of Murottal Al-Qur'an Therapy and Finger Handheld Relaxation Technique on Postoperative Pain and Self-esteem among Women with Gynecological Cancers**

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**Background:** Gynecological cancers occur in millions of women of all ages. Its surgical treatment can result in pain and low self-esteem. Nonpharmacological measures, such as Murottal Al-Qur'an and finger handheld relaxation technique play a role in alleviating these problems. **Aim:** Evaluate the effect of Murottal Al-Qur'an therapy and finger handheld relaxation technique on postoperative pain and self-esteem among women with gynecological cancers. **Subjects and Method: Design:** A quasi-experimental research design was used. **Subjects:** A non-probability purposive sample of 100 postoperative gynecological cancers women was recruited from the Gynecologic Oncology Unit, department of Obstetrics & Gynecology at Mansoura University Hospitals, Egypt. **Tools:** Three tools were used: Assessment sheet, Numeric Pain Rating Scale, and Rosenberg's Self-Esteem Scale. **Results:** There was a significant reduction of pain among the intervention group on the 3<sup>rd</sup> day post-gynecological surgery, compared to the control group ( $1.88 \pm 1.29$  versus  $5.18 \pm 1.32$ ) with a highly statistically significant difference ( $p=0.001$ ). Self-esteem was also better among the intervention group compared to the control group ( $22.24 \pm 3.67$  versus  $13.54 \pm 5.99$ ) with a highly significant difference ( $p=0.001$ ). **Conclusion:** Murottal Al-Qur'an therapy and finger handheld relaxation technique were effective for relieving postoperative pain and increasing self-esteem among women with gynecological cancers. **Recommendations:** Treatment of women with gynecological cancers should incorporates Murottal Al-Qur'an therapy and finger handled relaxation techniques to reduce the severity of pain and enhance self-esteem.

**Keywords:** Gynecological cancers, Finger handheld, Murottal Al-Qur'an therapy, Postoperative pain, Self-esteem

## Introduction

Gynecological cancers are cancers that originate in different female reproductive organs (predominantly the uterus, cervix, and ovaries) due to rapid growth and spread of abnormal cells in one of these organs. They affect millions of women of all ages, and their prevalence varies according to ethnicity and geographic area (Somasegar et al., 2024).

The diagnosis of gynecological cancer radically changes the lives of women and their husbands. The women may experience pelvic pain, abnormal vaginal bleeding or discharge, increased need to urinate, constipation, sexuality changes, and body image disturbances that negatively affect women's lives (Dahar et al., 2024).

Treatment of gynecological cancers varies according to the size, type, and spread of the cancer (Centers for Disease Control and Prevention, 2022). It may include surgery, chemotherapy, and radiation. Surgical treatment is an operation of cancer tissue removal and distant spread evaluation. It may involve highly invasive procedures associated with various complications such as pain at the surgery site, bleeding, blood clots, infection, and low self-esteem. These complications are largely affected by surgical procedures and women's characteristics such as age, body weight, general health, and cancer stage (Singh et al., 2022).

Postoperative pain is a severe complication of surgical treatment of

gynecological cancers (National Cancer Institute, 2024). It occurs due to damage to normal cells and body tissue. The location and severity of pain depend on the type of surgical procedure. Postoperative pain is a common unpleasant experience that causes substantial physical and psychological burden and distress. It exerts a significant impact on women's well-being and quality of life. It reduces women's ability to recover and maintain self-care, increasing their need for palliative care, and reducing disease resistance (Rydmark & Carina, 2021; Dahar et al., 2024). Thus, early identification, assessment, and standardized management of such pain are crucial in reduction, prevention or delay of its progression and to improve the women's self-esteem and quality of life (Healy, 2024).

Surgical management can also affect women's self-esteem. A persistent feeling of helplessness may be the basic cause of a woman's suffering when she experiences chronic pain (Ohnesorge et al., 2020). It changes the way the woman feels about herself. She may feel unhappy with her body image or about scars from surgery (Aquil et al., 2021). Woman is frequently disappointed and unable to cope with the disease due to low self-esteem which implies a negative attitude toward the self. These feelings affect relationships with others, especially intimate relationship (Milad, et al., 2022).

Management of postoperative complications is essential not only to

alleviate pain intensity but also to reduce women's suffering and improve their self-esteem. There are several postoperative pharmacological and non-pharmacological approaches to manage pain. Pharmacological management includes medications and medical procedures. Non-pharmacological management includes massage therapy, physical therapy, guided imagery, and relaxation techniques such as Murottal Al-Qur'an therapy, and finger handheld relaxation (Wu et al., 2023).

Murottal Al-Qur'an therapy is a non-pharmacological management that has a healing effect through listening to the recitation of Al-Qur'an (Putri, Chairani, & Valentina, 2020). It can be used to decrease pain levels through the stimulation of alpha brain waves which activate natural endorphins, increase feelings of comfort, reduce stress, and divert patient attention (Wahyuningsih, et al., 2024). Al-Qur'an builds the self-esteem of women. It makes them remember Allah, not blame themselves for the disease, and convert their negative experiences to pleasant thoughts to deal with emotional distress (Milad et al., 2022).

Murottal Al-Qur'an therapy is a spiritual therapy that can be used to lower postoperative pain, remove negative emotions, and create a sense of relaxation (Moulaei et al., 2023). It provides women with a unique power to face the various challenges in their life. It also

improves their self-esteem by developing positive skills and habits such as being optimistic and grateful at happy times, being patient at hard times, avoiding comparing themselves with others, avoiding doing sins, helping others, telling the truth, spreading positivity, and being hygienic. High self-esteem helps women feel secure with themselves and form successful relationships with others (The Muslim Life Coach Institute, 2022).

Finger handheld relaxation is another non-pharmacological management that can be used to reduce postoperative pain intensity (Yunita, Idhayanti & Tunggadewi, 2022). It is a simple way to manage physical and emotional tension by grasping a finger while breathing deeply (relaxation) (Elnosary et al., 2024). Holding the finger warms the energy entry at located energy channels. Electricity waves are pumped to the brain and the nerves in the body organs that have interference. This blocks the energy path that reduces pain intensity. Besides that, finger handheld relaxation acts as a pharmacological postoperative pain therapy through its narcotic effect (Haniyah & Adriani, 2020).

Finger handheld relaxation depends on touching fingers (acupressure strategy) and breathing to balance energy in the body. It helps with the movement of all the joints, together with the auxiliary muscles of the palm, in a way that reduces the pain and makes the area more flexible (Calisanie & Ratnasari, 2021).

Nurses play an important role in helping women with gynecological cancers achieve sufficient control over their postoperative pain and self-esteem, as well as other physical and psychological symptoms. They also help them restore their autonomy rapidly in the postoperative phase through accurate pain assessment, implementing pain relief measures, guiding women and their families. So, nurses should possess expert knowledge and competent practice regarding pharmacological including analgesics and non-pharmacological strategies including Murottal Al Qur'an therapy and finger handheld relaxation technique to familiarize gynecological cancers' women with these techniques (Wu et al., 2023).

Women require unconditional self-acceptance with dignity depending on willingness to accept whatever happens. When they practice Murottal Al Qur'an therapy and finger handheld relaxation technique, these techniques can reduce their postoperative pain and improve self-esteem to pass the disease stages (Milad et al., 2022).

### **Significance of the study**

Gynecological cancers remain a prevalent cause of mortality among women (Priyadarshini et al., 2024). The global burdens of cancer, incidence and mortality are escalating rapidly. According to the Global Cancer Observatory report, gynecological cancers account for about 40% of all cancer cases and over 30% of all cancer-related deaths worldwide (Ferlay et al., 2021).

The total number of cases with gynecological lesions at Gynecologic Oncology Unit at Mansoura University Hospitals in the period between May 2022 to April 2023, was 137 cases: 47 (34.3%) endometrial, 37 (27%) cervical, 27 (19.7%) ovarian malignancies, 21 (15%) gestational trophoblastic neoplasia, and 5 (3.6%) vulvar and vaginal malignancies (Elkenawi et al., 2024).

Surgical treatment of gynecological cancers is associated with various complications including postoperative pain and low self-esteem (Singh et al., 2022).

Murottal Al-Qur'an audio therapy is safe, applicable, and has no harm. It has been applied in previous studies and has shown a positive therapeutic effect on heart rate, blood pressure, anxiety, depression, and stress (Nurhusna et al., 2020; Purnawan, et al., 2021). Finger handheld relaxation is also easy to do and does not have harmful effects (Calisanie & Ratnasari, 2021). It is used in hypertensive patients and postcesarean section women to decrease pain and anxiety levels (Handoyo & Hartati, 2021; Pongoh et al., 2020; Emara et al., 2022). Unfortunately, there is a limited number of research on using Murottal Al Qur'an therapy and finger handheld relaxation in gynecological cancer women in Egypt. This provokes the researchers to evaluate their effect on postoperative pain and self-esteem among women with gynecological cancers.

## Aim of the study

To evaluate the effect of Murottal Al-Qur'an therapy and finger handheld relaxation technique on postoperative pain and self-esteem among women with gynecological cancers.

## Research Hypotheses:

- Women with gynecological cancers who receive Murottal Al-Qur'an therapy and practice finger handheld relaxation technique experience lower postoperative pain than those who don't.
- Women with gynecological cancers who receive Murottal Al-Qur'an therapy and practice finger handheld relaxation technique experience higher postoperative self-esteem than those who don't.

## Operational Definitions:

**Murottal Al-Qur'an therapy** refers to listening to the recitation of Surah Ar-Rahman.

**Finger handheld relaxation** refers to touching each finger (index, middle, ring, and little) and applying gentle pressure at a time to the thumb.

## Subjects and Method

### Research design:

A quasi-experimental design (intervention and control groups) was used to evaluate the effect of Murottal Al-Qur'an therapy and finger handheld relaxation on postoperative pain and self-esteem among women with gynecological cancers.

## Study setting:

This study was conducted at the Gynecologic Oncology Unit, department of Obstetrics & Gynecology at Mansoura University Hospitals, Egypt.

## Subjects:

A non-probability purposive sample of 100 women was recruited from the previously mentioned setting. The total sample was divided into two groups, intervention and control group each included 50 women.

**Inclusion criteria:** (1) On the first day (< 8 hours) of postoperative gynecological cancers, (2) Muslims and conscious.

**Exclusion criteria:** (1) Women with hearing impairments, (2) Chronic medical diseases such as heart disease, diabetes mellitus, and kidney diseases, (3) Psychological disorders such as depression, and anxiety.

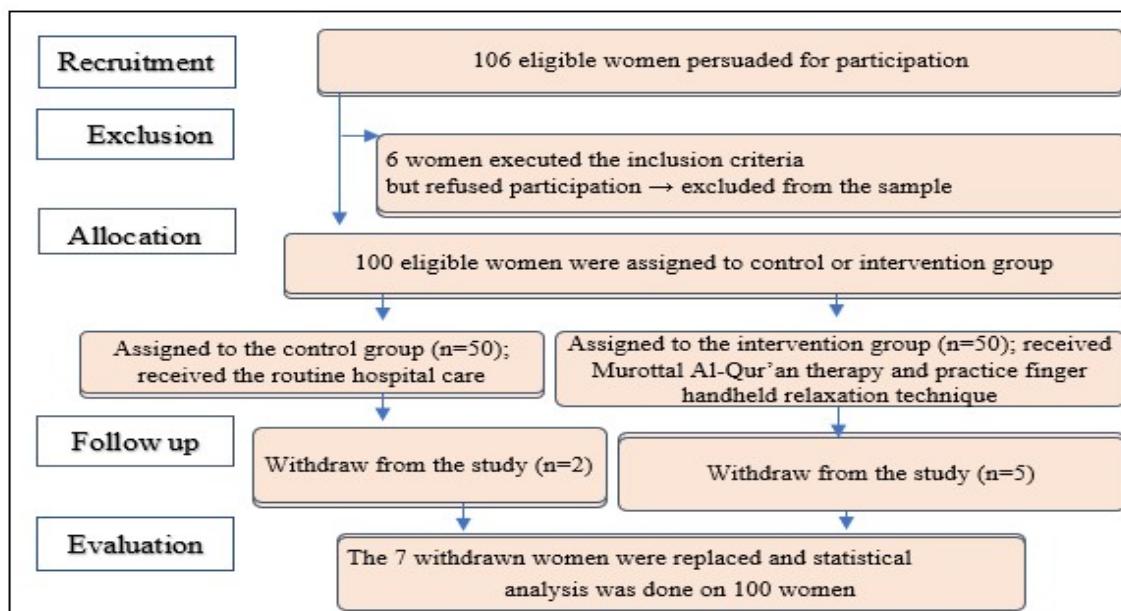
## Sample size calculation:

The sample size was calculated using ClinCalc.com/ calculating sample size using percentages (software) and according to the study of **Septianingrum et al., (2019)**. Where the mean of pain post-applying Murottal therapy for the intervention group was  $2.83 \pm 2.22$  vs. 4.08 in the control group with an alpha error of 5% (significant 95%), and a B error of 20% (study power of 80%). The sample size was 100 post-gynecological cancer women with 50 women for each group.

## Allocation to the groups

To enroll a total sample of 100 women, 106 eligible women were persuaded to participate in this study, 6 women refused participation. The 100 women were assigned either to the control or to the intervention group (n=50 per

group). The withdrawn women (2 in the control group and 5 in the intervention group) were replaced and the statistical analysis was done on 100 women. A consort flow diagram of the study participants is shown in **Figure (1)**:



**Figure (1):** A consort flow diagram of the study participants

## Tools:

To collect data, assessment sheet, Numeric Pain Rating Scale, and Rosenberg's Self-Esteem Scale were used:

**Tool I: Assessment sheet:** It was developed by researchers in 2 parts: part 1 included the demographic data of women such as age, occupation, education, residence, and the telephone number and part 2 included the medical profile and treatment as cancer site, duration of cancer, and treatment.

**Tool II: Numeric Pain Rating Scale (NPRS):** This scale was developed by **McCaffery & Beebe, (1989)** and was adopted in the present study to measure the current, best, and worst pain intensity levels over the past 24 hours. It is a horizontal line with 11 numbers (0-10).

### Scoring system:

Scores ranged from 0-10 points where 0 (no pain), 1-3 (mild pain), 4-6 (moderate pain), 7-9 (severe

pain), and 10 (worst pain imaginable). The higher scores indicate greater pain intensity. To represent the overall level of pain intensity, the average of the 3 ratings (1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> day) was used.

### **Tool III: Rosenberg's Self-Esteem Scale (RSES):**

This scale was developed by **Rosenberg, (1965)** and was adopted in the present study to measure the self-esteem of women. It is a standardized resource widely known and applied in clinical and research practice (**García, Olmos, Matheu, & Carreño, 2019**). It is a short structured, self-report 10-item that was answered on a 4-point scale.

#### **Scoring system:**

Scores ranged from 0 to 30 where strongly agree = 3, agree = 2, disagree = 1, and strongly disagree = 0. Items 2, 5, 6, 8, and 9 are negative items, while 1, 3, 4, 7, and 10 are positive. The total score of self-esteem was divided according to **Oancea et al., (2020)** into:

-0 to < 15 points: Low self-esteem  
-15 to < 25 points: Normal self-esteem

-25 to 30 points: High self-esteem

To represent the overall level of self-esteem, the average of the 3 ratings (1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> day) was used. The higher scores indicate higher self-esteem (**Vaupot & Železník, 2018**).

#### **Validity of the tools:**

Validity of data collection tools was tested by three specialists in the woman's health and midwifery nursing field. No modifications were recommended.

#### **Reliability of the tools:**

The reliability of the Numeric Pain Rating Scale and Rosenberg Self-Esteem Scale has been established by **McCaffery and Beebe, (1989); Rosenberg, (1965)** which were 0.96 and 0.95.

#### **Pilot study:**

It was performed on 10 women to assess the feasibility and applicability of the study tools and determine the time required for answering. No modifications were made. So, those women were included in the study sample.

#### **Ethical considerations:**

Official approval was obtained from the research ethics committee, Faculty of Nursing, Mansoura University (code No. P. 0375 on 1/2/2023) to conduct this study. After clarification of the study purpose and approach to women, informed written consent was signed. Privacy and confidentiality of women were assured. Women were told that there will be no harm in participating in the study, as well as their participation is voluntary, and they can withdraw from the study at any time.

#### **Research process:**

This study was implemented in the period from the beginning of March 2023 to the end of March 2024. Three phases were followed through this study: preparatory, implementation, and outcome evaluation.

#### **Preparatory phase**

The researchers reviewed the related literature regarding the study tools and the content of the educational

material. Official approvals from the research ethics committee of the Faculty of Nursing, Mansoura University, and the director of Mansoura University Hospitals were taken to carry out this study.

### **Implementation phase**

1. The study's aim was explained to the director of the gynecology unit and official permission was obtained to carry out the study.
2. In the morning, the researcher visited the Gynecologic Oncology unit 3 days weekly, introduced herself to the women, explained the aim of the study, and obtained their informed consent.
3. Before the intervention, the women's demographic data and medical profile were obtained using the assessment sheet. The pain level and self-esteem were assessed as baseline data using the Numeric Pain Rating Scale and Rosenberg's Self-Esteem Scale respectively.
4. The women were divided into two groups (intervention and control group). The control group received only the routine hospital care.
5. The intervention group received the routine care in combination with the Murottal Al-Quran therapy and finger handheld relaxation technique.
6. Surah Ar-Rahman (which is the most rhythm in the Holy Quran, reassures oneself, speaks about characteristics of the Holy Quran, and signifies the unity and power of Allah and the greatness of his graces for his creatures) was listened to by women in a relaxed position (sitting position is desirable) using the researcher's mobile phone connected to the earpieces (which disinfected by the researcher between each woman as infection control measure) at medium volume for 15 minutes once a day for 3 days.
7. The women taught by the researcher how to perform the finger handheld relaxation technique according to the following steps as in **Figure (2)**.
  - a. Assume a relaxed position, close both eyes, breathe slowly and deeply.
  - b. Touch the thumb with the index finger in an O shape while imagining that she feels healthy.
  - c. Touch the thumb with the middle finger while imagining that she feels happy.
  - d. Touch the thumb with the ring finger while imagining that she receives reward.
  - e. Touch the thumb with the little finger while remembering the best place ever visited.
  - f. In each step, hold (for 30-60 seconds) the palm straight with the fingers slightly apart and straight. The exercise can be repeated up to 4 times for each hand.
8. The women were instructed to perform the technique (at the time of pain) for 15 minutes twice daily for 3 days, document its frequency and duration.
9. An Arabic brochure and videos covering finger handheld relaxation technique were used as educational materials.

## Outcome evaluation phase

The pain level and self-esteem were reassessed on the first, second- and third-day post-operative using the same previous tools for both the intervention and control groups.



**Figure (2):** Finger handheld relaxation technique

Adopted from **Davis et al., (2008)**. The Relaxation and Stress Reduction Workbook, 6th Edition. Oakland, CA. New Harbinger.

### Statistical analysis:

"**IBM SPSS Statistics Version 23 for Windows Package Program**" was used to analyze the study's data. Numbers and percentages were used to represent categorical data. Mean  $\pm$  SD was used to explain numerical data. To compare between the studied groups, ( $X^2$ ) test was used for categorical data, and the t- test for numerical data. The reliability of the tools was tested using Pearson Correlation (test-retest). According to **Infanger and Schmidt-Trucksäss, (2019)**, p-value = 0.05 was used to determine significance differences.

### Results

**Table (1):** Shows 46% of the studied groups aged 47 years and more in both the intervention and control groups. In terms of educational

level, 40% of women in the intervention group can read and write compared to 34% of the control group. The table also, identifies that 82% and 88% respectively of women in the intervention and control groups are housewives, 72% of women in the intervention group were from rural areas compared to 66% of the control group. Finally, there were no statistically significant differences between the two groups ( $p > 0.05$ ). Which revealed the homogeneity of the studied groups.

**Table (2):** Explains that uterine cancer was found in 50% of the intervention group compared to 60% in the control group, 54 % of women in the intervention group diagnosed with cancer for 1 year compared to 46% in the control group, 46% of the intervention group underwent surgery to treat their cancer versus 40% in the control group. However, there were no significant differences between both groups in terms of medical profile and treatment ( $p > 0.05$ ).

**Table (3):** Summarizes that the mean and SD of pain on the 1<sup>st</sup> day postoperative gynecological surgery for the intervention group was  $8.44 \pm 1.39$  compared to  $8.78 \pm 0.95$  in the control group, while on the 3<sup>rd</sup> day, it was  $1.88 \pm 1.29$  versus  $5.18 \pm 1.32$  for the control group. A highly significant reduction of pain was found on the 2<sup>nd</sup> and 3<sup>rd</sup> day post.

**Figure (3):** Reveals that 16% of the intervention group had no pain compared to 0.0 % in the control group. Furthermore, 74% of the

intervention group complain of mild pain compared to 10% of the control group.

**Table (4):** Clarifies that the mean and SD for the intervention group regarding self-esteem on 1<sup>st</sup> day post-gynecological surgery was  $6.08 \pm 4.46$  compared to  $6.22 \pm 4.58$  for the control group without statistical differences between both groups ( $p > 0.05$ ).

**Table (5):** Demonstrates that the mean and SD for the intervention group regarding self-esteem on the 2<sup>nd</sup> day post-gynecological surgery was  $15.14 \pm 2.07$  compared to  $9.82 \pm 4.81$  for the control group, with a significant statistical difference in self-esteem in favor of the intervention group ( $p= 0.001$ ).

**Table (6):** Points the mean and standard deviation for the intervention group regarding self-esteem on the 3rd day post-gynecological surgery was  $22.24 \pm 3.67$  compared to  $13.54 \pm 5.99$  for the control group. Highly statistically significant differences were found in all items of self-in favor of the intervention group ( $p= 0.001$ ).

**Figure (4):** Highlights that 74% of the intervention group had normal self- esteem on the third day post gynecological surgery compared to only 6% of the control group. Else 26% of the intervention group had high self-esteem versus 12% of the control group.

**Table (1): Distribution of the studied groups related to their demographic data (N= 100)**

Demographic data	Intervention group (n=50)		Control group (n=50)		X <sup>2</sup>	P value
	No.	%	No.	%		
<b>Age (yrs)</b>						
21- < 39	16	32	12	24		
39- < 47	11	22	15	30	1.19	0.55
47 and more	23	46	23	46		
Mean ±SD	46.66 ± 13.39		49.54 ± 14.03		t= 1.05	0.30
<b>Educational level</b>						
Can't read and write	6	12	7	14		
Read and write	20	40	17	34		
Primary	10	20	14	28	1.16	0.89
Secondary	9	18	8	16		
Higher	5	10	4	8		
<b>Occupation</b>						
Working	9	18	6	12		
Housewife	41	82	44	88	0.71	0.40
<b>Residence</b>						
Urban	14	28	17	34		
Rural	36	72	33	66	0.42	0.52

X<sup>2</sup>: chi-square test, t: Student t- test.

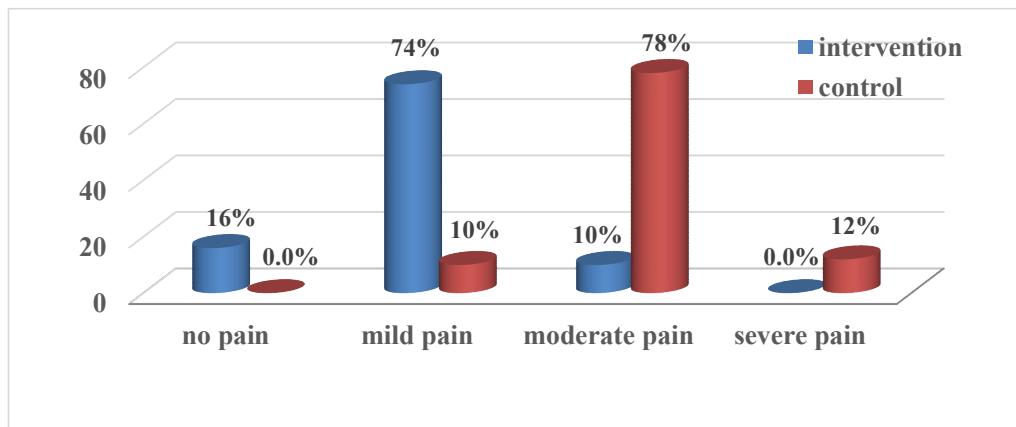
**Table (2): Medical profile and treatment between the intervention and the control group (N=100)**

Medical profile & Treatment	Intervention group (n=50)		Control group (n=50)		X <sup>2</sup>	P - value
	No.	%	No.	%		
<b>Cancer site</b>						
Cervix	10	20	8	16		
Ovaries	15	30	12	24		
Uterus	25	50	30	60		
<b>Duration of cancer</b>						
< 1 year	27	54	23	46		
1-5 yrs.	19	38	21	42		
> 5 yrs	4	8	6	12		
<b>Treatment</b>						
Surgery	23	46	20	40		
Chemotherapy & radiotherapy	10	20	13	26		
Surgery & chemotherapy	10	20	8	16		
Surgery & radiotherapy	4	8	6	12		
Surgery, chemotherapy & radiotherapy	3	6	3	6		

X<sup>2</sup>: chi-square test.**Table (3): Mean differences of pain between the studied groups on the 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> day post-operative gynecological surgery**

Intensity of pain	Intervention group (n=50)		Control group (n=50)		t- test	P- value
	Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD		
1 <sup>st</sup> day postoperative	8.44 $\pm$ 1.39		8.78 $\pm$ 0.95		1.43	0.16
2 <sup>nd</sup> day postoperative	5.92 $\pm$ 1.21		7.68 $\pm$ 0.98		8.001	0.001**
3 <sup>rd</sup> day postoperative	1.88 $\pm$ 1.29		5.18 $\pm$ 1.32		12.65	0.001**

\*\*Highly Statistical Significance at a (P-value  $\leq$  0.001).



**Figure (3): Distribution of the studied groups according to levels of pain on the third day post-operative gynecological surgery.**

**Table (4): Mean differences of self-esteem between the studied groups on the 1<sup>st</sup> day post-operative gynecological surgery (N= 100)**

Items	Intervention group (n=50)	Control group (n=50)	t- test	P value
	Mean $\pm$ SD	Mean $\pm$ SD		
<b>1- Overall, satisfaction with the self.</b>	0.60 $\pm$ 0.49	0.62 $\pm$ 0.49 $\pm$	0.20	0.84
<b>2- Not good at all.</b>	0.70 $\pm$ 0.61	0.74 $\pm$ 0.60	0.33	0.74
<b>3- Feeling of good qualities.</b>	0.52 $\pm$ 0.50	0.56 $\pm$ 0.50	0.40	0.69
<b>4- Ability to do things as well as most other people.</b>	0.58 $\pm$ 0.49	0.54 $\pm$ 0.50	0.40	0.69
<b>5- Feeling of proud.</b>	0.64 $\pm$ 0.56	0.68 $\pm$ 0.55	0.36	0.72
<b>6- Feeling useless at times.</b>	0.56 $\pm$ 0.50	0.52 $\pm$ 0.50	0.40	0.69
<b>7- Feeling of worth.</b>	0.76 $\pm$ 0.59	0.80 $\pm$ 0.61	0.33	0.74
<b>8-Having more respect for the self.</b>	0.54 $\pm$ 0.50	0.50 $\pm$ 0.51	0.40	0.69
<b>9- All in all, feeling of failure.</b>	0.62 $\pm$ 0.49	0.60 $\pm$ 0.49	0.20	0.84
<b>10-Positive attitude toward the self.</b>	0.56 $\pm$ 0.54	0.66 $\pm$ 0.56	0.37	0.71
<b>Total</b>	6.08 $\pm$ 4.46	6.22 $\pm$ 4.58	0.16	0.88

Statistically significant at a (P-value  $\leq$  0.05)

**Table (5): Mean differences of self-esteem between the studied groups on the 2<sup>nd</sup> day post-operative gynecological surgery (N= 100)**

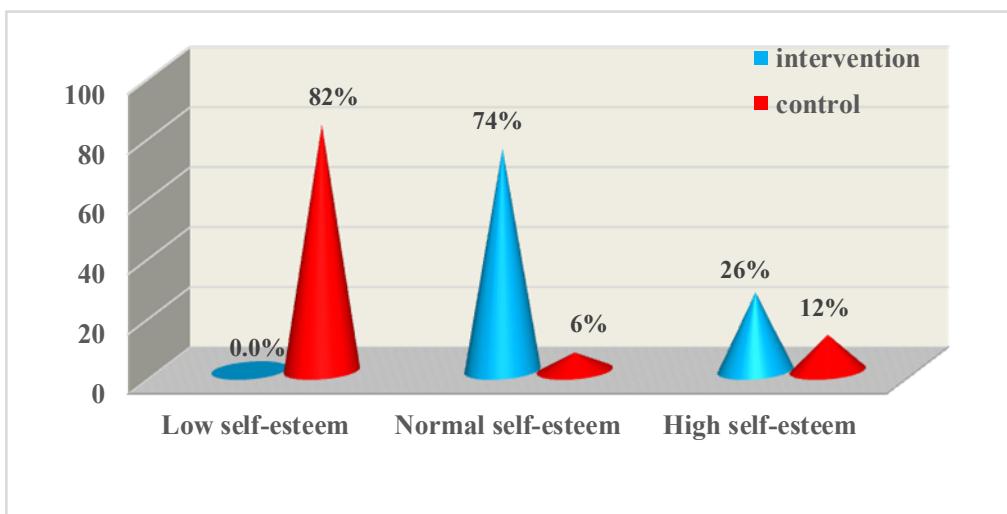
Items	Intervention group (n=50)	Control group (n=50)	t- test	P- value
	Mean ± SD	Mean ± SD		
<b>1- Overall, satisfaction with the self.</b>	1.40 ± 0.49	1.20 ± 0.40	2.21	0.03
<b>2- Not good at all.</b>	1.44 ± 0.50	0.92 ± 0.63	4.55	0.001**
<b>3- Feeling of good qualities.</b>	1.46 ± 0.50	0.86 ± 0.64	5.21	0.001**
<b>4- Ability to do things as well as most other people.</b>	1.50 ± 0.51	0.82 ± 0.59	6.16	0.001**
<b>5- Feeling of proud.</b>	1.66 ± 0.48	0.98 ± 0.62	6.13	0.001**
<b>6- Feeling useless at times.</b>	1.56 ± 0.50	0.88 ± 0.59	6.19	0.001**
<b>7- Feeling of worth.</b>	1.52 ± 0.50	1.04 ± 0.60	4.31	0.001**
<b>8-Having more respect for the self.</b>	1.54 ± 0.50	1.06 ± 0.47	4.93	0.001**
<b>9-All in all, feeling of failure.</b>	1.42 ± 0.49	0.96 ± 0.57	4.30	0.001**
<b>10-Positive attitude toward the self.</b>	1.64 ± 0.48	1.10 ± 0.51	5.45	0.001**
<b>Total</b>	15.14 ± 2.07	9.82 ± 4.81	7.19	0.001**

\*\*Highly Statistical Significance at a (P-value ≤ 0.001).

**Table (6): Mean differences between the studied groups regarding self-esteem on the 3<sup>rd</sup> day post-operative gynecological surgery (N= 100)**

Items	Intervention group (n=50)	Control group (n=50)	t- test	P value
	Mean ± SD	Mean ± SD		
<b>1- Overall, satisfaction with the self.</b>	2.16 ± 0.77	1.40 ± 0.81	4.83	0.001**
<b>2- Not good at all.</b>	2.30 ± 0.79	1.32 ± 0.74	6.40	0.001**
<b>3- Feeling of good qualities.</b>	2.22 ± 0.86	1.26 ± 0.72	6.03	0.001**
<b>4- Ability to do things as well as most other people.</b>	2.14 ± 0.83	1.30 ± 0.65	5.63	0.001**
<b>5- Feeling of proud.</b>	2.28 ± 0.81	1.36 ± 0.72	6	0.001**
<b>6- Feeling useless at times.</b>	2.20 ± 0.86	1.44 ± 0.67	4.93	0.001**
<b>7- Feeling of worth.</b>	2.24 ± 0.69	1.38 ± 0.78	5.85	0.001**
<b>8- Having more respect for the self.</b>	2.14 ± 0.83	1.46 ± 0.73	4.33	0.001**
<b>9- All in all, feeling of failure.</b>	2.18 ± 0.80	1.28 ± 0.70	5.98	0.001**
<b>10-Positive attitude toward the self.</b>	2.38 ± 0.78	1.34 ± 0.75	6.82	0.001**
<b>Total</b>	22.24 ± 3.67	13.54 ± 5.99	8.76	0.001**

\*\*Highly Statistical Significance at a (P-value ≤ 0.001)



**Figure (4): Frequency distribution regarding levels of self- esteem on the third day post-operative gynecological surgery for the intervention and the control group (N=100).**

## Discussion

The present study aimed to evaluate the effect of Murottal Al-Qur'an therapy and finger handheld relaxation technique on postoperative pain and self-esteem among women with gynecological cancers. The findings of this study reported that there was a highly statistically significant decrease in pain and an increase in self-esteem on the 2<sup>nd</sup> and 3<sup>rd</sup> day post-gynecological surgery in the intervention group compared to the control group. Therefore, the hypothesis "women with gynecological cancers who receive Murottal Al-Qur'an therapy and practice finger handheld relaxation technique had lower postoperative pain and higher self-esteem scores than those who don't.

This can be interpreted as, the positive effect of listening to the Murottal Al-Qur'an as Allah Almighty says, the Quran promotes healing and mercy to those who believe, and it increases and wrong doers nothing but loss (**Surah Al-Israa, verse: 82|, AL Quran Alkareem**), O humanity! Indeed, there has come to you a warning from your Lord, a cure for what is in the hearts, a guide, and a mercy for the believers (**Surah Younis, verse: 57, AL Quran Alkareem**).

Additionally, the sound of the Qur'an can reduce the intensity of pain, encourage calmness, relaxation, and comfort, as well as ease tension. When someone listens to Murottal Al-Qur'an, they feel physiological changes, such as the loss of sadness and the development of inner peace. This also affects a more stable emotional state. As stated by **Ghiasi and Keramat (2018)**, even if someone doesn't understand the

meaning of the Qur'an, reciting it might help them become more aware of Allah. Listening to the Quran stimulates alpha waves in the brain which promotes the release of endorphins so that it can increase the stress threshold, eliminate negative emotions, and create a sensation of calm (**Saleem & Saleem, 2021**).

Chanting is included into the verses of surah Al-Rahman, and because of its low tone, steady, regular rhythm, and absence of sudden changes, it has a relaxing impact on the body (**Septianingrum et al., 2019**).

**Else, Hadith Tirmidzi number 3479 (From Abu Hurairah, Prophet Muhammad)** (peace be upon him) said "praying to Allah with faith will be granted, Allah will not answer prayer from a careless heart." Thus, those praying for their pain were more likely to improve positively in pain behaviors, as the more pain, the more surrendering oneself to Allah. Moreover, Narrated Abu Sa'id Al-Khudri and Abu Huraira: **Prophet Mohamed** (peace be upon him) said, "No fatigue, nor disease, nor sorrow, nor sadness, nor hurt, nor distress befalls a Muslim, even if it were the prick he receives from a thorn, but that Allah expiates some of his sins for that" (**Sahih al-Bukhari 5641, 5642**).

This outcome was in line with study on the effects of Murottal Al-Quran Therapy on pain in women recuperating from caesarean sections carried out by **Millizia, Mardiati, and Syafridah, (2021)** at Abby Mother and Child Hospital in Lhokseumawe City, Indonesia. They revealed that after receiving Murottal Al-Qur'an therapy, none of the responders had moderate or

even severe discomfort. **Fadholi and Mustofa, (2020)** also studied how effectively Murottal Al-Qur'an therapy and virtual reality may reduce the intensity of pain in patients who had just had surgery. They demonstrated that after combining virtual reality with Murottal Al-Qur'an therapy, the intervention group's average pain level was lower than that of the control group. Additionally, **El-Sayed, Saadoon, and Saadoon, (2020)** studied the effects of Muslim primiparous women listening to the Holy Quran on the outcomes for both mothers and infants during the active phase of labor. They discovered that the Quran group experienced substantially different hemodynamic parameters, labor pain, and anxiety than the non-Quran group at the first, second, and third hours of the active phase of labor.

On the other hand, the finger handheld relaxation technique involves focused, repetitive squeezing of an object and may improve relaxation through tactile, rhythmic stimulation. This may explain the technique's effect on reducing the intensity of postoperative pain in gynecological women. By diverting their attention from their discomfort, reducing stress reactions, and triggering the parasympathetic nervous system, this exercise may help women relax and improve their ability to manage their pain. However, as it enhances warmth and permits energy to enter fingers' energy channels, holding fingers while taking a deep breath may help people feel calmer and more relaxed (**Haniyah & Novitasari, 2018**).

Furthermore, at Rumah Sakit Umum Daerah (RSUD) in Sorong Regency, Indonesia, **Ariani et al., (2020)**

investigated how finger grip relaxation can reduce the intensity of pain after cesarean surgery. They concluded that the statistical test findings, which demonstrated the impact of finger grip relaxation on changes in the patients' degrees of pain and exhaustion, guaranteed the efficacy of the intervention.

The findings of randomized controlled trial titled "Flexible buprenorphine of care for reducing opioid use in individuals with prescription opioid use disorder: An open-label, pragmatic, noninferiority randomized controlled trial" (**Jutras-Aswad et al., 2022**) also indicated that the handheld finger-grip relaxation technique was more effective in reducing pain in participants who received it as opposed to those who received a placebo.

Similarly, 100 patients were gathered by **Roberts et al., (2023)** for a randomized controlled trial study entitled "Is the future female for turtles? The sex ratios of freshwater species are predicted by climate change and wetland layout. The handheld finger-grip relaxation method was found to be effective in reducing anxiety and discomfort following surgery. **Ayed, Amin, and Elewa, (2023)** conducted another homogeneous investigation on the impact of the finger handed relaxation technique on children receiving chemotherapy in terms of weariness and pain severity. They showed that there was a substantial difference in pain levels between the two groups following chemotherapy, and that the children receiving chemotherapy in the study group experienced much less pain after the intervention.

The case study of the Finger Grip Relaxation intervention on lowering pain scale in appendicitis patients" by **Safariyah et al., (2022)** is also noteworthy. They postulated that a finger grip relaxation intervention could lessen pain in appendicitis patients and promotes relaxation based on subjective patient evaluations.

Regarding the impact of finger handed relaxation and Murottal Al-Quran on postoperative gynecological cancer patients' self-esteem. The results of this study showed that, when compared to the control group, the intervention group's self-esteem increased on the second and third days following gynecological surgery in a highly statistically significant way. This can be interpreted as Allah Almighty says; we will certainly test you with a touch of fear and famine and loss of property, life, and crops. Give good news to those who patiently endure, who say, when struck by a disaster, "Surely to Allah we belong and to Him we will 'all' return. They are the ones' who will receive Allah's mercy and blessings, and it is they who are 'rightly' guided (**Surah Al-Baqara, Verses: 155-157, Al- Quran Al-Kareem**).

Also, no calamity befalls 'anyone' except by Allah's Will. And whoever has faith in Allah, He will 'rightly' guide their hearts 'through adversity'. And Allah has 'perfect' knowledge of all things (**Surah At-Taghabun, Verse: 11, Al- Quran Al-Kareem**). But whoever turns away from My Reminder will certainly have a miserable life, then we will raise them up blind on the Day of Judgment (**Surah Taha, verse: 124, Al- Quran Al-Kareem**). In addition to ALLA Almighty says in " We send

down (stage by stage) to those who believe in the Quran what is a blessing and a mercy: to the unjust it causes nothing but loss after loss (**Surah Al-Israa, verse: 82, Al-Quran AL-Kareem**).

According to the results of this study, **Karimi et al., (2022)** conducted a quasi-experimental study in Iran that studied the effects of a spiritual care program based on the Holy Quran, Sahifa Sajjadieh, Nahj al Balaghah, Gharr al Hakam, Dar al Kalam, and some pertinent nursing and medical palliative texts on cancer patients' self-esteem. When compared to the control group, the intervention group's self-esteem significantly improved.

Additionally, research conducted in Mashhad, Iran by **Mozhdeh et al., (2020)** studied how spiritual care based on a sound heart affected the self-esteem of children with cancer. The findings demonstrated that in comparison to the control group, the intervention group's self-esteem considerably increased following treatment.

The results of **Shariatmadar and Amini, (2018)** about the effectiveness of religious education on primary school students' self-esteem revealed that spirituality-based instruction significantly influenced the development of several aspects of participants' self-esteem.

In line with the results of this study, a study by **Coelho, Mendes, Varajidás and Fonseca, (2024)** titled "Impact of physical exercise on quality of life, self-esteem, and depression in breast cancer survivors" found that the intervention group's self-esteem and depression scores differed statistically significantly

from the cancer survivors' post-exercise scores. According to similar research by **Tan et al., (2022)** on the effect of progressive muscle relaxation on health-related outcomes in cancer patients, self-esteem also increased in the intervention group as compared to the control group.

A randomized clinical trial titled "Effects of relaxation on self-esteem of patients with cancer" was carried out by **Harorani et al., (2020)**. They concluded that the experimental group's self-esteem levels considerably improved following the intervention, demonstrating the beneficial impact of relaxation. Additionally, a substantial difference favoring the relaxation group was noted across the groups following the intervention. Additionally, **Avazeh et al., (2015)** investigated how patients with myocardial infarction felt about themselves after using the progressive muscle relaxation approach. After eight weeks of intervention, they showed a substantial difference between the relaxation group's and the control group's levels of self-esteem.

Finally, the autonomic nerves can be balanced to induce relaxation with the use of finger handheld relaxation and Murottal Al-Qur'an therapy. To improve results, promote patient safety, and decrease the likelihood of complications or a worsening of preexisting diseases, it is crucial to use these noninvasive methods to alleviate pain, anxiety, and boost self-esteem after surgery.

### **Conclusion**

The current study findings concluded that Murottal Al-Qur'an therapy and finger handheld relaxation technique were effective methods for relieving

postoperative pain and increasing self-esteem among women with gynecological cancers.

### **Recommendations**

**Findings of the present study incite the following recommendations:**

- Educating women with gynecological cancers about the advantages of Murottal Al-Qur'an therapy and finger handheld relaxation technique in lowering postoperative pain and boosting self-esteem.
- Treatment of women with gynecological cancers should incorporate Murottal Al-Qur'an therapy and finger handled relaxation techniques to reduce the severity of pain and enhance self-esteem.
- Gynecological cancer women should understand Murottal Al-Qur'an therapy and finger handheld relaxation technique as applicable strategies to improve their health.
- Including Murottal Al-Qur'an therapy and handheld relaxation techniques as non-pharmacological strategies to lessen other postoperative gynecological cancer problems.

### **Further studies**

- Replication of the current study at more settings with a large sample size.
- Conducting in-service training programs for nurses and other healthcare providers regarding applying handheld relaxation technique and Murottal Al-Qur'an therapy for reducing pain intensity and promoting self-esteem among cancer women.

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