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Attitudes and Practices of Parents toward their Children Suffering from Hearing Impairment, using Hearing Aids and Challenges Facing them

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Abstract

Background: Hearing impairment (HI) is the commonest birth defect and it is usually difficult to be detected due to its invisible nature. It causes significant adverse effects on acquisition of speech and language, academic achievement as well as social and emotional development. **Aim:** to assess attitudes and practices of parents with children suffering from hearing impairment, using hearing aids and challenges facing them. **Subjects and Method: Design:** A descriptive study design was used. **Setting:** This study was conducted at the Hearing and Phonetics Outpatient Clinic at El Aeada El Shamla Tanta University Hospital. **Subjects:** A convenient sample of 350 parents (281 mother and 69 father) with children using hearing aid were attending the pervious setting and willing to participate in the study were included. **Tool:** A structured interview schedule was used to collect the needed data it included four parts **Part I:** Socio-demographic characteristics of parents and their children. **Part 2:** attitudes of parents. **Part 3:** Reported practical hearing aids skills of parents. **Part 4:** Challenges facing the parents. **Results:** the most of the studied parents were had negative attitudes and only less than one tenth of them were had positive attitudes toward their children suffering from hearing impairment and using hearing aids. About three quarters of the studied parents had reported in adequate practices related to hearing aids skills for their children hearing aids, while about one quarter of them had reported adequate practices. **Conclusion and recommendation**; There was statistically significant positive correlation between parent attitudes regarding their hearing impairment children, attitudes regarding use of their children for hearing aids and reported practical hearing aids skills with children using hearing aids. Psychosocial rehabilitation program should be held for parents with children suffering from hearing impairment, using hearing aids to meet the needs of their children and improve their quality of life in cooperation with school health nurse.

Keywords: Hearing impairment, Attitude, Practice, Challenges

Introduction

Hearing loss is one of the most prevalent preventable health issues in the world. According to World Health Organization (WHO) 2019, 466 million people worldwide (4.5% of the world's population) suffer from hearing loss, 432 million of whom are adults and 34 million of whom are children. The majority of them reside in nations with low and moderate income. Children's hearing loss is caused by preventable factors in 60% of cases [(1)]. Accurately estimating hearing loss in children in Egypt is difficult due to the recently established national hearing screening program and the reliance on academic studies conducted at hospitals. The prevalence of hearing loss in youngsters was previously reported to be 20.9% in the Egyptian neighbourhood of Shebin El-Kom. In order to ascertain the prevalence and risk factors for hearing loss in 6 randomly selected governorates in Egypt (Alexandria, Marsa-Matrouh, Dakahlia, Minia, Luxor, and North Sinai), a nationwide household survey was carried out. A hearing loss screening of 4,000 participants found that

16.0% of Egyptians have hearing impairment. This corresponds to more than 13 million people across all age groups. A significant prevalence (22.4%) was seen in children under the age of 4. In 60% of cases, circumstances that may be avoided are the cause of children's hearing loss [2, 3].

Children hearing loss may be acquired or congenital in origin. Congenital hearing loss refers to a hearing loss that was present at birth. It can be caused by inherited hearing loss or hearing loss brought on by other factors that were present during pregnancy or at the time of delivery (perinatal). Over 50% of all congenital hearing loss cases in children are thought to be genetic in nature. Autosomal dominant, autosomal recessive or X-linked genetic hearing loss are all possible. Other causes of congenital hearing loss include maternal infections such German measles, Cyto Megalo Virus (CMV), or herpes simplex virus, premature birth traumas, toxins, and difficulties related to the Rhesus (Rh) factor in the blood, maternal diabetes, and toxemia during pregnancy, and anoxia. However, acquired hearing loss that manifested later in life may be caused by specific infectious diseases, persistent ear infections, the use of specific medicines, and excessive loud exposure [4-6]. Children with hearing loss are impacted in four main ways: first, they develop their receptive and expressive communication abilities later (speech and language).

Second, learning issues brought on by the language barrier lower academic attainment. Children who have difficulty communicating may feel isolated, lonely, and low in self-esteem. Finally, it might influence career decisions. According to research, these detrimental effects can be reduced or avoided by early detection and action [7-8].

As a result, the Consensus Development Conference on Early Identification of Hearing Loss at the National Institutes of Health recommended that all infants get hearing tests, preferably before being discharged from the hospital and recommended using hearing aids. Hearing aids are small electronic or battery-operated devices that can amplify and change sound. They are used by children with hearing loss. A hearing aid has a microphone that receives sound and changes it into sound waves. The sound waves are then changed into electrical signals. Hearing aids can help improve hearing and speech, especially for children with a type of hearing loss called nerve deafness .This type of hearing loss may be caused by damaged hair cells (sensory receptor cells) in the inner ear. Or it may be from a damaged hearing nerve [9].

Parents have a critical role in hearing screening and intervention. The decisions they make surely are influenced by their knowledge and attitude. Their decisions about the infant's early detection and treatment of hearing loss could have a long-lasting effect. Parents of a child without disabilities have a duty to provide for their needs and create an environment that supports the child's typical growth. However, in addition to these obligations, parents of disadvantaged children are also in charge of imparting specific knowledge and carrying out rehabilitation strategies. As a result, parents of children with disabilities require more assistance [3]

However, parents who actively participate in the practice process might need direction and support because they might lack experience and training with regard to activities like removing the hearing aid from the child's ear, opening the battery door, testing and replacing the hearing aid's battery, performing a listening test, placing the hearing aid in the child's ear, repositioning the hearing aid when it beeps,

and putting procedures for storing the chimes into practise. [7].

They frequently need further information and expert assistance from an audiologist, a physician, or other specialists. While some parents find the hearing aid information offered to be minimal, others find the medical information to be confusing. The diagnosis and rehabilitation procedure needs to be made more transparent. According to the literature, it is often advantageous for parents of disabled children to interact with other parents who share their circumstances [10-13].

The parents' opinions are impacted by a variety of challenges. In general, a person's attitude is influenced by a variety of characteristics, such as their age, education, marital status, occupation, the number of children they have at home, and the order in which they were born. Everyone wants their child to be physically and developmentally flawless, which should go without saying. When this is lacking, the stigmatization and prejudice the child encounters in their environment affects how they feel about the parent. According to studies, parents of disabled children may feel a variety of emotions after learning about their child's condition, such as denial, guilt, fury and loss of control, hatred, or emotional worries [14-18].

This has an effect on how important a part parents play in their children's growth and development. The attitudes and behaviours of parents directly affect the attitudes and behaviours of their children, and the opposite is equally true. Unfortunately, attitudes drive behaviour, and in this situation, individuals will act in a way that is consistent with their attitude towards the hearing-impaired youngster [19,20].

Significance of the study

A number of stakeholders, such as school administration and organisations that offer special needs education, may find the study's findings to be significant. The study provides details on the various attitudes parents have towards their children who have hearing impairments and how those attitudes relate to other variables. Additionally, it is believed that the study's results may assist the school's administration in enhancing parent-teacher cooperation. Institutions that provide special needs education may use the study's results when developing or upgrading courses on how to help parents and teachers handle children with special needs, particularly parents' attitudes towards the child who is hearing impaired [21].

The research results can also have a big impact on the deaf community by helping parents get past the obstacles they encounter when raising kids with hearing impairments. Counselors may use the study's findings to guide parents with the challenges of raising children with hearing impairments. Not least of all, other researchers may find the study helpful when conducting their own research on perceptions of various specific sorts of impaired people. Consequently, a study was required to ascertain how parents felt about their hearing-impaired children [22].

The community health nurse is essential in the primary healthcare system, where initial medical consultations are carried out at clinics that are predominately nurse-driven. The nurse observes the infant's health and growth when the kid is at the immunization and wellness clinics, gathers information about the child's past, and should be aware of risk factors. She was therefore in a good position to impart knowledge and provide parents with access to trustworthy referral services. The nurse is also essential for planning first-level detection and intervention. Because any intervention that might be connected to social stigmatization or that violates cultural norms could result

in parents missing appointments or cancelling intervention services, community health nurses are frequently the best people to use communication and language to make parents feel at ease, confident, and respected for their choices [23,24].

Aim of the study

Assess attitudes and practices of parents with children suffering from hearing impairment, using hearing aids and challenges facing them.

Research question

1-What are the attitudes of parents toward hearing impairment?

2- What are the attitudes of parents regarding use of their children for hearing aids?

3- What is the level of practical hearing aids skills of parents with children using hearing aids?

4-what are the challenges that facing parents with children using hearing aids?

Subjects and method

Study design: -

In this research, a descriptive study design was employed.

Setting:-

This research was done in the Hearing and Phonetics Outpatient Clinic at El Aeida El Shamla Tanta University Hospital**.**

Subjects:-

A convenient sample of 350 parents (281 mother and 69father) with children using hearing aid were attending the pervious setting and willing to participate in the study were included.

Study tool

A structured interview schedule questioner was used to collect the needed data. it developed and used by the researcher. It included **four parts** as follow: -

Part I: - <u>Socio-demographic characteristics of parents and their children:</u>

<u>A-Socio-demographic characteristics of parents: -</u>

which include data, related to relation to the child, age, level of education, marital status, occupation, residence, family income, number of children, number of children with hearing impairment, family member using hiring aid and degree of relation.

<u>A-Characteristics of the child and history of using hearing aid:</u>

which include data, related to age, sex, degree of hearing impairment, duration of using hearing aid, amplification, and way of communication.

<u>Part (2):- Attitudes of parents with children suffering from hearing impairment and using hearing aids:-</u>

A-Attitudes of parents regarding their hearing impairment children: It was developed by/ Wanjiru, T. N (2014) [25] It consists of 30 statement that was adapted by researcher to 25 positive and negative statement which covering **cognitive or belief, feelings and possible behaviors attitudes of parents regarding their hearing impairment children**

Scoring system of attitude scale: -

Three-point Likert scale was used to given response as agree take 3-point, uncertain take 2 point & disagree take 1 point. in positive statement and agree take 1-point, uncertain take 2 point & disagree take 3 points. In negative statement. Total scale score ranges from 1 to 75 points

Total attitude score was classified as follow

-Positive attitude > 70% of total attitude score.

-Negative attitude < 70% of total attitude score

B-Attitudes of parents regarding use of their children for hearing aids. It consists of 5 negative statements.

Scoring system of attitude scale: -

Three-point Likert scale was used to given response as agree take 1-point, uncertain take 2 point & disagree take 3 points. Total scale score ranges from 1 to 15 points

Total attitudes score was classified as follow

-Positive attitude > 70% of total attitude score.

-Negative attitude < 70% of total attitude score

Part (3): - Reported practical hearing aids skills of parents with children using hearing aids: - It consists of 8 statements related to practical hearing aids skills of parents.

Scoring system

Done procedures take one point, whereas incomplete ones earn zero. The total score for the practices ranged from 0 to 8.

Total practices score was classified as follow

Adequate practices > 60% of total **practices** score.

In adequate practices < 60% of total **practices** score

Part (4): - Challenges facing the parents with children suffering from hearing impairment and using hearing aids: -

It consists of 26 statements covering challenges facing the parents as lack of information, lack of family and social support, lack of child care and community services, financial problems and difficulty of using child hearing aids.

Method

The operation of this study was carried out as follows:

1-Obtaining approvals: --Before beginning the study, the ethics committee of Tanta University's nursing department gave its official consent to the project .

-The management of El Aeiada El Shamla, an outpatient clinic connected to Tanta University Hospital, was granted official authorization to perform the study by the dean of the nursing faculty.

2-Ethical and legal considerations

-were taken into account throughout all study phases as follows:

-Informed consent was gained from each study participant after a thorough description of the investigation's goals .

Every participant was made aware of his ability to leave the study whenever he desired .

-The complete sample did not experience any pain or harm as a result of the study's nature.

-Reassured the individuals that the information they provided would be kept private and confidential and indicated that it would only be utilized for research purposes

1-Developing of the tools

-The researcher created the study tool (parts one, three, and four) after reviewing pertinent literature [6-10].

Five professionals in the fields of public health & community medicine and community health nursing evaluated the study tool to assess its face and content validity. It was calculated and determined that the validity of the interview sheet based on expert opinions was 97%. The prior tool was subjected to the reliability test using the Cronbach's Alpha test.:

-For **the sheet in total it was 0.951** which indicates high reliability of the study tools.

4-The pilot study

-To ensure the tools' clarity, applicability, and comprehension, identify potential roadblocks during data collection, and gauge the time required to collect the data, the researcher conducted a pilot study on 35 parents, or 10% of the study subjects .

Those parents were left out of the study's sample.-Data was collected over six months starting from 1st July 2022 to 31st December 2022.

-Statistical analysis:

The collected data were organized, tabulated and statistically analyzed using SPSS

software (Statistical Package for the Social Sciences, version 26, SPSS Inc. Chicago, IL, USA). For quantitative data, the range, mean and standard deviation were calculated. For qualitative data, which describe a categorical set of data by frequency, percentage, or proportion of each category. For comparison between means of two groups of parametric data of independent samples, t-test was used. For comparison between more than two means of parametric data, F value of ANOVA test was calculated. For correlation between variables was evaluated using Pearson's correlation coefficient (r). Significance was adopted at P <0.05 for interpretation of results of tests of significance, highly significance was adopted at P <0.001 for interpretation of results of tests of significance (26).

Results

Table (1) represents the distribution of the studied subjects according to their socio demographic characteristics. The table revealed that the majority (80.3%) of the studied parents were mothers, less than one quarter (19.7%) of them were fathers. About half (47.7% and 48.3%) of the studied parent's age their age ranged from 20-29 years old, and their income was not enough. Only 12.3% of them their ages were 40 years or more. As regards to level of education, it was found that only 10.5% of the studied parents were illustrated or just read and write, more than half (60%) of them were primary or secondary educated. More than quarter (26.9%) of them were university educated. In relation to the marital status, the majority (86.3%) of them were married and only 7.7% of them were widow. the table also illustrated that nearly one third (30.9%) of the studied parents were craft worked. In terms of where they lived, it was discovered that nearly a third of the parents surveyed (30.9%) lived in urban regions, compared to more than half (69.1%) who resided in rural areas .

Table (1): Continuo. This table represented that more than half (50.6%) of the studied parents have three children and only 2.0% of them had four children while, more than half (54.0%) of them have one child with hearing impairment and only 7.7% of them had three or more children with hearing impairment. The table also showed that more than half (56.3%) of the studied parents had other family member or relative uses hearing aid. As regards to the relation to the child, it was found that less than half (45.2%) of the studied parents were fathers and less than one third of them (27.9%) were grandmothers while, only 7.1% of them were mothers and uncle

Table (2) represents the characteristics of the studied children and their history of using hearing aid. The table revealed that their mean age ranged from 1 – 16 years old, with Mean ± SD 6.967 years ± 3.53. Of them, more than half (60.9%) were women and more than a third (39.1%) were men. Regarding the degree of hearing impairment and the duration of using it, it was found that more than half (56.0% and 53.1% respectively) of the studied children had moderate degree of hearing impairment and used the hearing aid more than 3 years. Also, it was found that more than three quarters (77.7%) of the studied children use hearing aids and less than one quarter (22.3%) of them have cochlear implant. As regards to their method of communication, the table revealed that more than half (61.7%) of them use the spoken and sign language. Only 17.7% of them use sign language and less than quarter (20.6%) of them use a spoken language

Table (3): Distribution of attitudes of parents with children suffering from hearing impairment and using hearing aids. It showed that the most (92.0%) of the studied

parents were had negative attitudes and only 8.0 % of them were had positive attitudes toward their children suffering from hearing impairment and using hearing aids

Table (4): It presents distribution of the challenges facing the parents with children suffering from hearing impairment and using hearing aids. The table showed that more than half (62.00% and 57.4%) of the studied parents faced challenges related to lack of information regarding how to use hearing aids and lack of family & social support related to not accepting their hearing impairment child by their families. Nearly three quarters (74.6%) of the studied parents reported that they faced with challenges related to Lack of childcare and community services as difficulty in transportation. While the majority (83.1% and 82.0%) of them suffer from financial challenges as more money needed for paying hearing aids and from difficulty of using child hearing aids as falling of the device from their child head / ear

Figure (1): distribution of total score of reported practical hearing aids skills of parents with children using hearing aids. It showed that about three quarters (74.00%) of the studied parents were had in adequate practices while, only about one quarter of them (26.00%) were had adequate practices related to hearing aids skills for their children using hearing aids .

Table (5): Represent the correlation between parent attitudes regarding their hearing impairment children, attitudes regarding use of their children for hearing aids and reported practical hearing aids skills with children using hearing aids. It illustrates that there was a significant positive correlation between parent attitudes regarding their hearing impairment children, attitudes regarding use of their children for hearing aids and reported practical hearing aids skills with children using hearing aids

Table (6): Correlation between socio-demographic data for parent, their attitudes regarding their hearing impairment children, and reported practical hearing aids skills with children using hearing aids. It demonstrated that there was a highly statistically significant positive correlation between parents' perceptions of their hearing-impaired children and their socio demographic characteristics, including their relationship to the child, child's age, place of residence, family income, and the number of their children who have hearing impairment. ($P<0.05$) . Additionally, there was a highly statistically significant positive association between the parents' reported socio demographic traits and their children's reported parents' practical hearing aids skills. regarding (the relation to the child, and the number of their children having hearing impairment and if there was any other family member or relative uses any hearing aid) ($P<0.05$)

Part I: Socio demographic characteristics of the studied parents with children suffering from hearing impairment and using hearing aids

Table (1): Distribution of the studied parents according to their socio demographic characteristics.

Socio-demographic characteristic	The studied parents (n=350)	
	No.	%
Relation to the child		
Mother	281	80.3
Father	69	19.7
Age		
Less than 20 years	48	13.7
20 – 29	167	47.7
30 – 39	92	26.3
40 years and above	43	12.3
Level of education		
Illiterates / read and write	37	10.5
Primary	110	31.4
Secondary	100	28.6
University	94	26.9
Postgraduates	9	2.6
Marital status		
Married	302	86.3
Divorced	21	6.0
Widow	27	7.7
Occupation		
Professional work	98	28.0
Craft work	108	30.9
Manual work	61	17.4
Private work	83	23.7
Residence		
Rural	242	69.1
Urban	108	30.9
Family income		
Enough	147	42.0
Enough and saving	34	9.7
Not enough	169	48.3

Table (1): Continuo

Socio-demographic characteristic	The studied parents (n=350)	
	No.	**%**
Number of children		
One	53	15.1
Two	113	32.3
Three	177	50.6
Four	7	2.0
Number of children with hearing impairment		
One	189	54.0
Two	134	38.3
Three or more	27	7.7
Other family member or relative uses any hearing aid (Excluding relatives with hearing loss due to old age)		
Yes	197	56.3
No	153	43.7
If yes, (Relation to the child) **#**	**(n=197)**	**%**
Father	89	45.2
Mother	14	7.1
Uncle	**14**	**7.1**
Aunt	20	10.2
Grandmother	19	9.6
Grandfather	55	27.9

 # More than one answer

Table (2): Distribution of characteristics of the child and history of using hearing aid.

Characteristics of the child and history of using hearing aid	The studied parents (n=350)	
	No.	**%**
Child age (years)		
< 5	101	28.9
5 - < 10	175	50.0
10 - < 15	62	17.7
≥ 15	12	3.4
Range	**1 - 16**	
Mean ± SD	**6.967 ± 3.53**	
Gender		
Male	137	39.1
Female	213	60.9
Degree of hearing impairment		
Mild	25	7.1
Moderate	196	56.0
Severe	118	33.7
Profound	11	3.2

Duration of using hearing aid		
6 months to one year	90	25.7
One year to ≤ 3 years	73	20.9
More than 3 years	186	53.1
Other	1	0.3
Amplification		
Hearing aids	272	77.7
Cochlear implant	78	22.3
Communication		
Spoken	72	20.6
Spoken & signs	216	61.7
Signs only	62	17.7

Part (2): - Attitudes and practices of parents with children suffering from hearing impairment and using hearing aids

Table (3): distribution of attitudes of parents with children suffering from hearing impairment and using hearing aids

Attitudes of parents with children suffering from hearing impairment and using hearing aids	The studied parents (n=350)	
	No.	%
A- Attitudes of parents regarding their hearing impairment children		
Levels of attitudes of parents related to cognitive or belief		
Positive attitude > 70% (15 – 21)	86	24.5
Negative attitude < 70% (7 - 14)	264	75.5
Levels of attitudes of parents related to feelings		
Positive attitude > 70% (19 – 27)	40	11.4
Negative attitude < 70% (9 - 18)	310	88.6
Levels of attitudes of parents related to possible behaviors		
Positive attitude > 70% (19 – 27)	53	15.1
Negative attitude < 70% (9 - 18)	297	84.9
Levels of total attitudes of parents regarding their hearing impairment children		
Positive attitude > 70% (53 – 75)	35	10.0
Negative attitude < 70% (25 - 52)	315	90.0
B-Attitudes of parents regarding use of their children for hearing aids		
Levels of total attitudes of parents regarding use of their children for hearing aids		
Positive attitude > 70% (11 – 15)	39	11.1
Negative attitude < 70% (5 - 10)	311	88.9
Levels of total attitudes of parents with children suffering from hearing impairment and using hearing aids		
Positive attitude > 70% (63 – 90)	28	8.0
Negative attitude < 70% (30 - 62)	322	92.0

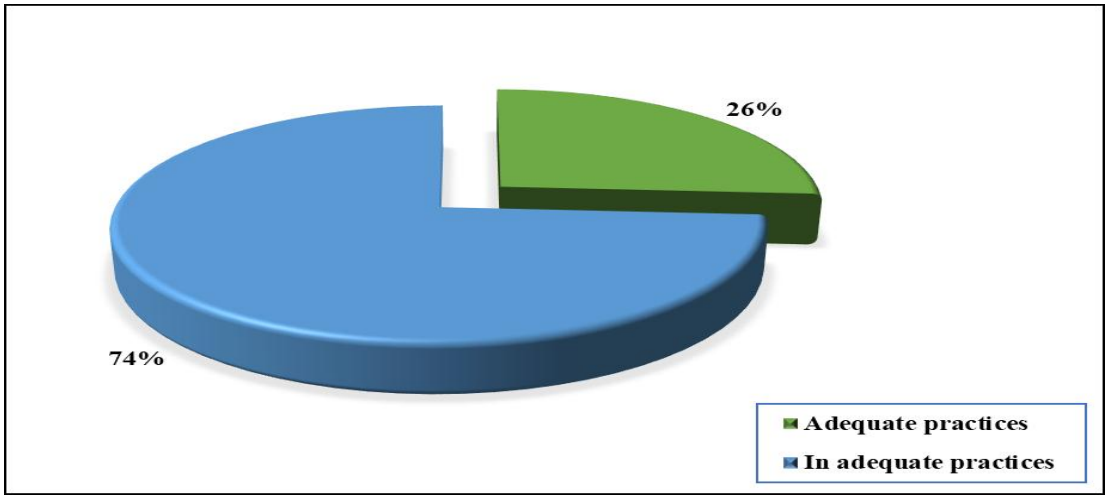

Figure (1): distribution of total score of reported practical hearing aids skills of parents with children using hearing aids.

Part (III): - Challenges facing the parents with children suffering from hearing impairment and using hearing aids: -

Table (4): Distribution of the challenges facing the parents with children suffering from hearing impairment and using hearing aids

The challenges Items	The studied parents (n=350)			
	Yes		No	
	No.	%	No.	%
Lack of information about:				
1. How child growth and develop	201	57.4	149	42.6
2. How to play or talk with my child	212	60.6	138	39.4
3. How to handle by child's behavior	187	53.4	163	46.6
4. Parent support groups	163	46.6	187	53.4
5. Other conditions my child may have	204	58.3	146	41.7
6. How using hearing aids.	217	62.0	133	38.0
Lack of family and social support as:				
1. Inability talking with someone in my family, or a friend, about my concerns	197	56.3	153	43.7
2. Lack of opportunities to meet with other parents of children who are using hearing aids.	150	42.9	200	57.1
3. Lack of more time for myself	172	49.1	178	50.9
4. The family not accept my hearing impairment child	201	57.4	149	42.6
Lack of child care and community services as:				
1. Difficulty in found good baby-sitters for my child	168	48.0	182	52.0
2. Difficulty in found a day-care program for my child	156	44.6	194	55.4
3. Difficulty in meeting with a counselor who specializes in hearing loss issues	200	57.1	150	42.9

4. Difficulty in transportations	261	74.6	89	25.4
Financial problems as:				
1.More money needed for paying hearing aids	291	83.1	59	16.9
2.Too expensive to pay for batteries, ear molds and device repair	273	78.0	77	22.0
3. More money needed for therapy	271	77.4	79	22.6
4. More money needed for child care/respite care	223	63.7	127	36.3
5. More money needed for other special equipment my child needs	232	66.3	118	33.7
Difficulty of using child hearing aids as:				
1- How to keep it on	284	81.1	66	18.9
2-Falling off of the device from my child head / ear	287	82.0	63	18.0
3-Fear of losing or damaging of the device	257	73.4	93	26.5
4-Rejection of the child to put the device on	271	77.4	79	22.6
5-Device is not work	254	72.6	96	27.4
6-Fear of my child being harmed by the device as: Putting it in his / her mouth	216	61.7	134	38.3

Table (5): Correlation between parent attitudes regarding their hearing impairment children, and reported practical hearing aids skills with children using hearing aids (n=350)

Variables	The studied parents (n=350)					
	Parent attitudes regarding their hearing impairment children					
	Attitudes regarding their hearing impairment children		Attitudes regarding use of their children for hearing aids		Total attitude score	
	R	P	r	P	R	P
Reported practical hearing aids skills with children using hearing aids.	**0.233**	**0.0001****	**0.413**	**0.0001****	**0.312**	**0.0001****

**** Highly Statistically significant difference at (P<0.001)**

Table (6): Correlation between socio-demographic data for parent, their attitudes regarding their hearing impairment children, and reported practical hearing aids skills with children using hearing aids

Socio-demographic characteristic	The studied parents (n=350)							
	Parent attitudes regarding their hearing impairment children						Reported practical hearing aids skills with children using hearing aids	
	Attitudes regarding their hearing impairment children		Attitudes regarding use of their children for hearing aids		Total attitude score			
	r	P	r	P	r	P	r	P
Relation to the child	**0.208**	**0.0001****	**0.109**	**0.041***	**0.217**	**0.0001****	**0.353**	**0.0001****
Age	**0.145**	**0.007****	0.024	0.661	0.140	**0.009****	**0.117**	**0.029***
Level of education	0.097	0.071	**0.218**	**0.0001****	**0.133**	**0.013***	**0.122**	**0.031***

Marital status	0.099	0.064	0.060	0.165	0.104	0.051	-0.053	0.322
Occupation	-0.083	0.119	0.087	0.104	0.061	0.254	-0.005	0.928
Residence	**0.126**	**0.018***	**0.187**	**0.0001****	**0.155**	**0.004****	0.098	0.068
Family income	**-0.171**	**0.001****	**-0.119**	**0.0001****	**-0.199**	**0.0001****	-0.067	0.214
No. of children	0.018	0.737	-0.048	0.367	0.007	0.890	0.015	0.782
No. of children with hearing impairment	**-0.149**	**0.005****	**-0.256**	**0.0001****	**-0.190**	**0.0001****	**-0.206**	**0.0001****
If there is any other family member or relative uses any hearing aid.	-0.021	0.056	0.024	0.656	-0.091	0.089	**0.143**	**0.007****

*Statistically significant difference at (P<0.05)

** Highly Statistically significant difference at (P<0.001)

Discussion

Deafness or hearing loss is a serious handicap that affects millions of people globally. Positive parental attitudes lead to the child's impairment being accepted and enable treatment development. Families, the general public, and people with disabilities themselves all have attitudes that help turn deficiencies into disabilities. This study revealed that parents' attitudes and feelings towards raising a kid with hearing loss varied. Being hard of hearing, this was not unexpected. Children that have developmental delays in several areas are viewed as abnormal because of this. Children who have hearing loss may face stigma and social exclusion. Therefore, it is not unusual for parents of children who have this severe disability to have sentiments of despair, self-blame, and other behavioural attitudes. Other authors have reported similar results. [27,28]. So the aim of this study was to assess attitudes and practices of parents with children suffering from hearing impairment, using hearing aids and challenges facing them.

According to the results of the current study, moms made up the majority of the investigated parents, which makes sense given that mothers spend more time caring for their children than fathers. Fewer than a fifth of them had children. In terms of age, the current survey showed that around half of the parents were between the ages of 20 and 29. Less than 25% of them were 40 years of age or older. (Table 1). The results of Frank-Briggs A.'s (2012) study, "Childhood Hearing Impairment: How do Parents Feel about It?" are similar to these findings. thirty-seven parents were examined in Nigeria, and it was discovered that the gender ratio was 0.6:1, with 23 (62.16%) females and 14 (37.84%) males. Participants ranged in age from 24 to 53, with a mean age of 33 5.2 years [29].

The results of this study were inconsistent with Wanjiru T.'s (2014) study, "Parental Attitudes Towards Children with Hearing Impairment and Academic Performance: A Case of Kambui School for the Deaf, Githunguri District, Kiambu County, in Kenya," which found that of the 65 parents who filled out the questionnaire, 34 were between 30 and 39 years old, accounting for more than half of all respondents, 16 were between 20 and 29, and those who were 40 years old made up the remaining The outcome suggests that

most of the parents were older than 30. [30].

The current study demonstrated that almost half of the investigated parents' income was insufficient and that they were engaging in craft labor based on the family income and occupation of the study participants (table 1). This finding was consistent with research conducted by Frank-Briggs A (2013) in Nigeria on the topic of "Childhood hearing impairment: How do parents feel about it," which discovered that the majority (67.57%) of parents whose children were affected have low socioeconomic level and unskilled jobs. Poor socioeconomic conditions in a family are viewed as contributing to the late detection and correction of hearing loss [29].

The majority (67.57%) of the parents whose children were affected were from low socioeconomic class and had unskilled jobs, according to a study by Frank-Briggs A., (2013). According to the researcher, those who are less fortunate have more hearing loss because they cannot afford the preventive and routine care required to stop hearing loss due to infections and other causes, as well as the hearing aids needed to manage the handicap.

As regards to level of education of the studied group, the current study found that less than one quarter of the studied parents were educated or just read and write, more than half of them were primary or secondary educated. More than quarters of them were university educated. This finding was in contrast with the study done by Al Khaier (2008) entitled (Quality of life among deaf and hearing impaired school students in Alexandria) who reported that nearly half of mothers were illiterate or just read and write [31]. According to this perspective, the educational level of the parents has a significant impact on the family's level of commitment to the child's educational model, their level of involvement in their child's education, and their capacity to assign roles in advancing their goals for the child related to outcomes for children with hearing loss. This might influence the way they seek care.

The results of this study concurred with those of Wanjiru T. (2014), who noted that out of 65 respondents, 35.38 percent of the parents had a primary certificate of education, 27.69 percent had a secondary education certificate, 18.46% had a college-level certificate, 10.77 percent had no primary certificate, and only 7.69 percent had a university degree. The findings show that the majority of respondents had only pursued primary-level schooling [30].

Additionally, the current survey found that the majority of the parents were married, with only 7.7% being widowed and 6.0% divorcing. This outcome was consistent with Wanjiru T.'s (2014) study, which found that of 65 respondents, 67.7% (44 parents) were married, 13.8% (9 parents) were not married, 7.7% (5 parents) were widowed, 6.2% (4 parents) were separated, and 4.6% (3 parents) were divorced [30].

As regards to parental attitudes towards hearing impairment, the current study revealed that most of the studied parents were had negative attitudes and only 8.0 % of them were had positive attitudes toward their children suffering from hearing impairment and using hearing aids.

Additionally, there was a strong positive link between the examined parents' entire attitudes concerning hearing loss and their educational degrees. This finding contrasted with that of a study by Frank

Briggs A. (2013), which indicated that most of the parents under study had both positive and negative attitudes towards the handicap, and that two (5.40%) of them had no opinion. In contrast, Ouda W.'s (2016) assessment of mothers' knowledge and attitudes towards their children with hearing impairment revealed that nearly two-thirds of the mothers under study (65.5%) have neutral attitudes towards their children with hearing impairment, while 14.5% of them have negative attitudes [(32)].

Wanjiru T. (2014) also noted that. Across all educational levels, there was no discernible difference in parents' attitudes concerning hearing loss [(30)]. According to the study, these variations may result from the parents' lack of social and community support.

Regarding the parents' reported practical hearing aid skills when their kids wear hearing aids. According to the current study, just around one-fourth of the parents with children who were being studied had sufficient hearing aid practises, while roughly three-quarters lacked such practises. According to the study, adherence to proper practises by parents can depend on a number of variables, including parental levels of dedication, access to and proximity to support services, educational attainment, and financial means.

According to this study's findings, more than half of the parents of children who use hearing aids and have hearing impairments face difficulties related to a lack of knowledge about how to use them as well as issues with a lack of family and social support because their hearing-impaired child is not accepted by their families.

Almost three quarters of the parents who participated in the study said they had trouble getting to community services and childcare centres. While the majority of them experience financial difficulties due to the increased cost of hearing aids as well as the difficulty of wearing child hearing aids due to the device sliding off the child's head or ear. From the perspective of all these difficulties, particularly among mothers, causes a delay in the detection and management of hearing loss in addition to appropriate health-seeking behaviour.

The results of the current study are in line with earlier research by Dhanshre R., et al. (2022), who examined the daily interactions between parents and children who have hearing loss. They discovered that there were practical issues with parents' communication challenges, as well as their lack of knowledge, information, and support. The current study also describes the kind of support that parents would like to get when raising a child who has hearing loss [(33)] .

The results are also in line with those reported by Marschark M. (2012), who studied (Educating Deaf Children: Language, Cognition, and Learning), as he shows parents having difficulty picking up sign language in order to improve communication with their child who has a hearing loss. This could help parents feel less guilty and ashamed about their child's hearing loss. From the perspective of the researcher, feelings of guilt and shame may lead to feelings of insecurity about their inability to interact with their child properly, which may have significant effects on effective parenting [(34)].

Regarding the correlation between the socio-demographic information of the parents, their attitudes towards the use of hearing aids on their children, and the overall attitude score. The current study showed that, with the exception of marital

status and parents' occupation, there was a substantial positive association between the participants' overall attitude score and all of their socio demographic factors. This result was consistent with Marc M's (2006) findings that the demographic variable and the studied subject's attitude were somewhat positively correlated and that there was a significant association with posttest score at the 0.01 level [35].

Conclusion

Based on the finding of our study, it can be concluded that the most of the studied parents were had negative attitudes and only less than one tenth of them were had positive attitudes toward their children suffering from hearing impairment and using hearing aids. About three quarters of the studied parents had reported in adequate practices related to hearing aids skills for their children hearing aids, while about one quarter of them had reported adequate practices. There was statistically significant positive correlation between parent attitudes regarding their hearing impairment children, attitudes regarding use of their children for hearing aids and reported practical hearing aids skills with children using hearing aids.

Recommendations.

1- Early intervention programs for infants. Babies who are evaluated within the first few months of life and whose parents participate in successful early intervention programs for children with hearing impairment are off to a good start with hearing aids.

2- In collaboration with the school nurse, a psychosocial rehabilitation program should be held to satisfy the requirements of the kids who are deaf or have hearing loss and to enhance their quality of life.

3- To improve their knowledge, practices, attitudes, and quality of life, parents of children with hearing loss and deafness should continue to receive health education.

4- More study on hearing loss and deafness is required, particularly in the areas of psychological, social, and long-term perspectives on their lives.

References

1. World Health Organization (WHO) updated in (2019). Deafness and hearing loss. Available from : https://www.who.int/health-topics/hearing-loss#tab=tab_1.
2. Morgan A, El-Ghor S, Khafagy M, Zaghloul H. Prevalence of Hearing Loss among Primary School Children in El-Mahalla El-Kubra District, Egypt .Egyptian Journal of Ear Nose Throat and Allied sciences.2021;22(22):1-6. DOI: 10.21608/ejentas.2021.94765.14
3. Moeller M. Early intervention and language development in children who are deaf and hard of hearing. Journal of Pediatrics, 2000; 106 (3).
4. Szarkowski A, Brice P. Hearing Parents' Appraisals of Parenting a Deaf or Hard-of-Hearing Child: Application of a Positive Psychology Framework. Journal of deaf studies and deaf education. 2016; 21(3):249-58. doi: 10.1093/deafed /enw007. Epub 2016 Mar 14
5. Alduhaim A, Purcell A, Cumming S, Doble M. Parents' views about factors facilitating their involvement in the oral early intervention services provided for their children with hearing loss in Kuwait. Int J Pediatr Otorhinolaryngol. 2020; 128:109717. doi: 10.1016/j.ijporl.2019.109717.
6. Steinberg A, Kaimal G, Bain L, Krantz I, Li Y. Parental narratives on genetic testing for children with hearing loss: a qualitative inquiry. Am J Med Genet A

2007;143 (14):1533-45 doi: 10.1002/ajmg.a.31731.

7. Barker B, Scharp K, Chandler K, Bowman E. Exploring the Types of Stories Hearing Parents Tell About Rearing their Children Who Use Cochlear Implants.
Ear Hear. 2021;42(5):1284-1294. doi:10.1097/AUD.00000000000010
8. Manyisa N, Adadey S, Wonkam-Tingang E, Yalcouye A, Wonkam. Hearing Impairment in South Africa and the Lessons Learned for Planetary Health Genomics. 2022 Jan; 26 (1):2-18. doi: 10.1089/omi.2021.0181.
9. Elbeltagy R , Bakry H , Waly E. Hearing loss-related knowledge and attitude toward neonatal hearing screening among Egyptian parents. The Egyptian Journal of Otolaryngology: 2019; 35 (2): 207–212 DOI: 10.4103/ejo.ejo_112_18
10. World Health Organization (WHO). Childhood Hearing Loss, Strategies for prevention and care.2016. Available from: https://www.who.int/docs/default-source/imported2/childhood- n
11. Shojaei A, Jafari Z, Gholami M. Effect of Early Intervention on Language Development in Hearing-Impaired Children: Iranian Journal of Otorhinolaryngol. 2016; 28(84): 13–21.
12. Sharma A, Bhatarai P,Kunwar S, Praphu P . Knowledge and attitude of nurses about newborn hearing screening in Nepal. Journal of Neonatal Nursing.2022;6 (28):420-424.
13. Ayas M, Yassin H. Knowledge and Attitudes of Parents towards Childhood Hearing Loss and Pediatric Hearing Services in Sharjah, United Arab Emirates. International Journal of Environmental Res Public Health. 2021; 18(12): 6188.
14. Scarinci N, Erbasi E, Moore E, Ching T, Marnane V .The Parents' Perspective of the Early Diagnostic Period of their Child with Hearing Loss: Information and Support. International Journal of Audiol. 2018; 57(2): 14. doi: 10.1080/14992027.2017.130168
15. Wanjiru t. Parental attitudes towards children with hearing impairment and academic performance: a case of kambui school for the deaf, Githunguri district, Kiambu county, Kenya. A thesis submitted in partial fulfillment for the award of the degree of master of education (early childhood studies) of Kenyatta university.2014
16. Nelliah W, Sabina M , Peter A . Parental Role in the Learning Process of Children with Hearing Impairment. International Journal Advances in Social Science and Humanities. 2015; .3 (9:43-51. ISSN: 2347-7474
17. Erbasi E, Scarinc N, Hickson L, Ching T. Parental Involvement in the Care and Intervention of Children with Hearing Loss. International Journal Audiol. 2018; 57(2): S15–S26.
18. World Health Organization (WHO) ,(2017). Hearing loss-related knowledge and attitude toward neonatal hearing screening among Egyptian parents. Available at: http://www.who.int/mediacentre/factsheets/fs300/en/
19. Zandile M, Lavanithum N. Parental views on informational counseling provided by audiologists for children with permanent childhood hearing loss. South African Journal of Communication Disorders.2021; 68(1):799.
20. American Speech-Language-Hearing Association, Guidelines for Audiologists Providing Informational and Adjustment Counseling to Families of Infants and Young Children with Hearing Loss Birth to 5 Years of Age (Guidelines), (2008).

Available from https://www.asha.org/policy/

21. De Andrade V. 'We do not understand each other': The experience of. Caregivers of deaf children in a rural South African setting [PhD thesis]. Johannesburg: Faculty of Humanities, University of the Witwatersrand (2015).
22. Alderon R. Parental involvement in deaf children's education programs as a predictor of child's language, early reading, and social-emotional development.
Journal of Deaf Studies and Deaf Education, (2000) ;5(2), 140–155.https://doi.org/ 10.1093/deafed/5.2.140
23. American Speech-Language-Hearing Association (ASHA). Guidelines for audiologists providing informational and adjustment counseling to families of infants and young children with hearing loss birth to 5 years of age. (2008). Retrieved from: http://www.asha.org/ policy/GL2008-00289/:
24. Gilliver M, Ching T, Sjahalam-King J. When expectation meets experience: Parents' recollections of and experiences with a child diagnosed with hearing loss soon after birth. International Journal of Audiology, 52 Suppl. (2013); 2(2), 10–16.
25. Wanjiru T. Parental attitudes towards children with hearing impairment and academic performance: A case of Kambui school for the deaf, Githunguri District, Kiambu County, Kenya. Unpublished master‟ s thesis. Kenyatta University, 2017.
26. White S. Reading the medical literature: Basic & Clinical Biostatistics. Lange Medical Book/ McGraw – Hill. Medical Publication Division, New York. 5th ed., Ch. 3-10, PP 20 - 233, 2019
27. Sinead A, Nakita L, Sumaya M, Ambroise W.Perceptions of parents of children with hearing loss of genetic origin in South Africa. Journal of Community Genetics .2019;10(3): 325–333
28. Syed I, Awan W, Sayeda U. Caregiver Burden among Parents of Hearing Impaired and Intellectually Disabled Children in Pakistan. Iran Journal of health.2020;49(2): 249–256.
29. Frank-Briggs A. Childhood Hearing Impairment: How Do Parents Feel About It?. The Nigerian Health Journal.2013;13(2): 108-112.
30. Wanjiru T. Parental attitudes towards children with hearing impairment and academic performance: a case of kambui school for the deaf, githunguri district, kiambu county, Kenya. A thesis submitted in partial fulfilment for the award of the degree of master of education (early childhood studies) of kenyatta university.2014.
31. Alkhaier G. (2008): Quality of life among
deaf and hearing-impaired school students in
Alexandria. Journal of nursing science Benha University. PP: 55-59.
32. Ouda W.,Mahmoud F.,Salam A,Abdullah R. Assessment of Mothers' Knowledge and Attitudes towards their Children Suffering from Hearing Impairment, Egyptian Journal of Health Care. 2016; 7 (2):146-155.
33. Dhanshree R, Rohit R., Carlie D, Stress among Parents of Children with Hearing Loss and How They Deal with It: A Systematic Review. International Arch Otorhinolaryngology. 2023. Jan; 27(1): 166–177.

34. Marschark M.,Knoors H. Educating Deaf Children: Language, Cognition, and Learning. Deafness and Education International Journal. 2012. 14(3):136-160.

35. Marc M. Language Comprehension and Learning by Deaf Students. Journal of Deaf Studies and Deaf Education. 2006; 11(4):421-37.

Relation between Head Nurse' Assertiveness and Their Decision Making Abilities at Tanta University

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Abstract

Background: Assertiveness plays an important role in all head nurses' activities and in reaching high abilities of making decision. **Aim**: The present study aimed to assess the relation between head nurses' assertiveness and their decision making abilities at Tanta University Hospitals. **Research design**: Descriptive correlational research design was used in this study. **Setting:** The study was conducted at Tanta University Hospitals (The Main, Emergency and Ophthalmic Hospitals). **The study subjects**: Consisted of 115 head nurses and a representative sample of 673 staff nurses working at Tanta University Hospitals. **Tools**: Three tools were used to collect data **Tool I**: Assertiveness Structured Questionnaire Sheet. **Tool II:** Head Nurse' Assertiveness as perceived by staff nurses. **Tool III:** Head Nurses' Decision Making Abilities Questionnaire. **Results**: As total, majority (98.3%) of head nurses and more than three quarters (77.6%) of staff nurses reported that head nurses had high level of assertiveness. Regarding head nurses' overall decision making abilities, majority (93.0%) of head nurses had high level of decision making abilities**. Conclusion**: There was a positive correlation between head nurses' assertiveness, head nurses' assertiveness as perceived by staff nurses and head nurses 'decision making abilities. **Recommendations:** Head nurses need to support continuously of newly developed assertive behavior to solidify the new pattern of communication

***Keywords*:** Assertiveness, Decision making abilities, Head nurses, Staff nurses.

Introduction

Challenges and demands brought by the changes in current nursing management have motivated head nurses to become more assertive to deal with complex human relations situations [(1)]. Assertive behavior is a behavior which directly expresses head nurses' true, basic feelings, needs, desires, opinions and personal rights in a positive, productive way without denying the rights of others [(2)]. It is characterized by the ability to express head nurses' ideas, interests, thoughts, feelings, beliefs, and needs freely, clearly, confidently, and honestly, without denying or violating others' rights [(3)].Head nurses' assertiveness has six dimensions including verbal and non-verbal style, active orientation behavior, work habits, control of anxiety and fear, assertiveness relating to nursing staff, and negotiating the system [(4)].

Verbal style of assertiveness is that assertive head nurses always use the word "I" in every statement, have ability to saying" no", showed respect for others, showed their feelings and wants clearly, listen well without interrupting, maintain control on self, communicating with others with good eye contact [(5)]. Nonverbal style of assertiveness is defined as a variety of communicative behaviors that do not carry linguistic content and are the messages transmitted without using any words. Head nurses can act as a counter measure or an adjunct to verbal messages, they use different modalities, including; physical and environmental objects, touch, form of movement of the body, physical appearance (body type and clothing), space and distance, aspects of the voice and silences speaking

calmly[6] . Active orientation means that assertive head nurses think creatively and critically of the circumstances faced, use reflection, engage in analytical thinking, take greater responsibility for their own actions as organization members, allow staff nurses to discover new ways of working together that they experience as more effective[7]. Work habits require head nurses to use assertive behavior effectively and becoming more assertive in the workplace to effectively establish good teamwork, manage complex situations, deal with the challenges in their workplace, and aid in the development of confidence[8]. Assertiveness relating nursing staff is the head nurses' ability to show staff nurses at first hand, manage work issues, evaluate their needs, solve their problems, communicate effectively, demonstrate how to work and live by values and beliefs, enhance desire to training and learning, motivating them toward achievement, develop and provide them with the necessary tools to continue to improve and achieve quality in the work place [9]. Assertiveness in negotiating the system is that head nurses allow both parties to maintain self-respect, pursue happiness and satisfaction of their needs, and defend their rights and personal space – all without abusing or dominating them and motivate both parties to work together toward a common goal rather than framing the conflict [10]. Assertiveness, self-confidence, and self-esteem are linked together and being competent and self-confident are the most important personal factors influencing job-related decision-making ability [11]. Head nurses' decision making ability is the ability to make decisions based on professional judgment, and act on these decisions within their own sphere of practice [12]. Decision making is defined as the process of selecting a logical choice from the available options[13] .It is widely agreed that the heart of management is the process of making decisions that include establishing a positive decision making environment, generating potential alternatives, evaluating the alternatives, deciding (choosing the alternative), checking the decisions and implementing the decisions [14]. Establishing a positive decision making environment is head nurses' ability to ascertain that working environment must be safe, healthy and well-equipped to attract them to their decision making ability's mainstream[15] .Generating potential alternatives is the ability to generate greater number of alternatives by increasing number of staff nurses working on problem to reach sound final decision. In evaluating the alternative step, the head nurses weigh the positives and negatives of each option, forecast the outcome of each option, determine which option is the best of that special situation and consider all the alternatives [16]. Deciding (choosing the alternatives) is the next step in the process of decision making in which head nurses have the ability to visualize and anticipate even reserve flexibility, think strategically, willing to work with others for making decisions to achieve common goals [17]. Checking the decisions is the head nurses' ability to consider the results of any decision they made and bear responsibility for the consequences of their decisions [18]. Finally, implementing the decisions is the ability of head nurses to put a plan for the implementation of decision, rely on argument, persuasion and logic to implement decision and then value the chosen solution[19] .

Significance of the Study

Under the circumstantial of currently changing environment, both good decision making and appropriate assertiveness are essential for successful leader [20]. So, head nurses require being assertive to

communicate staff needs, ensure that performance issues are addressed constructively and to have the ability to look at problems objectively and make effective decisions. Where, unassertive head nurses are defensive without taking proper decision, tend to internalize tensions and feeling and can't face problems [7]. It is expected that such study examine head nurses' assertive behavior and their ability to make decisions will help to accomplish workplace tasks in a highly stressful situations.

Aim of the study

The aim of study is to:

Assess the relation between head nurses' assertiveness and their decision making abilities at Tanta University Hospitals**.**

Research Questions:

- What are the levels of assertiveness among head nurses at Tanta University Hospitals?
- What are the decisions making abilities among head nurses at Tanta University Hospitals?
- Is there a relation between head nurses' assertiveness and their decision making abilities?

Subjects and Method

Subjects

Research design

Descriptive correlational research design was used in this study.

Setting

The study was conducted at Tanta University Hospitals (The Main, Emergency and Ophthalmic Hospitals). **Subjects**

The study subjects consisted of two groups as follows:

- All (n= 115) available head nurses who were working in previously mentioned settings.
- A representative sample (n = 673) of staff nurses was included from total subjects (N= 2245). The sample size and power analysis was calculated using Epi-Info software statistical package [21]. The criteria used for sample size calculation were as follows:

- Study design was descriptive cross sectional.
- 95% confidence limit.
- Expected correlation between head nurses' assertiveness and their decision making abilities at 75% with a margin of 70%-80%.
- The sample size based on the previously mentioned criteria was N= (673), from main hospitals (n=343), ophthalmic hospitals (n=90), and emergency hospitals (n= 240).

Tools of data collection

To achieve the aim of present study, the following tools were used;

Tool I: Assertiveness Structured Questionnaire Sheet (appendix I).

This tool developed by researcher and guided by **Khalil (2014)** [2] and recent related literature [22, 23, 24] to assess levels of head nurses' assertiveness. It consisted of two parts as follows:

Part 1: Head nurses' personal characteristics: age, years of experience, department, marital status and qualification).

Part 2: Head Nurses 'Assertiveness Questionnaire. This part consisted of 55 items classified into 6 dimensions as follows:

1. **Verbal and nonverbal styles** as frankly express their opinion.
2. **Active orientation** as love the work they do**.**
3. **Work habits** as organize daily work and activities
4. **Control of anxiety and fear** as organize some routine procedures as not to impede them from their main duties.
5. **Relating to nursing staff** as evaluate the performance of subordinates. .
6. **Negotiating the system** as work and cooperate with others without causing any embarrassment to them.

Scoring system:

Head nurses' responses were measured on three points Likert Scale ranged from 1-3

where (1) not done (2) sometime done and (3) always done. The total score was statistically calculated based on cut off point by summing of all categories and high scored factor indicated high assertiveness level.

- High Level of assertiveness ≥75%.
- Moderate level of assertiveness 60% - <75%.
- Low level of assertiveness <60%.

Tool II: Head Nurse' Assertiveness as perceived by staff nurses questionnaire (appendix II).

It consisted of two parts as follow;

Part 1: Staff nurses 'personal characteristics: age, years of experience, department, marital status and qualification.

Part 2: Head nurses' assertiveness scale: the same subscales of tool I was used to assess head nurses' assertiveness levels from the view point of staff nurses.

Tool III: **Head Nurses' Decision Making Abilities Questionnaire (appendix III).**

This tool was developed by researcher guided by **Marquis & Huston (2014)** [25] and other recent related literature [26, 27, 28] to assess head nurses' decision making abilities. This tool included six subscales as follow;

1. **Establishing positive decision making environment** as define real problem before starting the decision making process.
2. **Generating potential alternatives** as tend to brainstorming to find multiple solutions to problems
3. **Evaluating the alternatives** as get help of the views of relevant expertise when it is difficult to make their own decision.
4. **Choosing the alternative** as have a good ability to focus precisely.
5. **Checking the decision** as do not leave the work they started until it is finished
6. **Implementing the decision** as put a plan for the implementation of the decision.

Scoring system:

Head nurses' responses were measured on a five points Likert Scale ranged from 1-5 where (1) never to (5) always. The total score was statistically calculated based on cut off point by summing of all categories into levels of head nurses' decision making ability:

- High Level of decision making ability ≥ 75%.
- Moderate level of decision making ability 60% - <75%.
- Low level of decision making ability <60%.

Method

1. Official permission to conduct the study was obtained from Faculty of Nursing administrators of Tanta University Hospital and was submitted to the responsible authorities of the selected settings.
2. **Ethical consideration**:

- Approval of the ethical committee at faculty of nursing was obtained.
- The researcher introduced herself to the participants, a full explanation of the aim and method of the study was done to obtain their acceptance and cooperation as well as their informed consent.
- The right to terminate participation at any time was accepted.
- Assuring the nursing staff about the privacy and confidentiality of the collected data and explain that it was used for the study purpose only.

3. The study tools were developed and designed by researcher based on review of the related literature
4. The tools were translated into Arabic and reviewed with the supervisors and submitted to five experts in the area of specialty to check their content validity and clarity of questionnaire. The experts were; three assistant professor of Nursing Service Administration, two assistant professor of Psychiatric Mental Health Nursing from Faculty of Nursing, Tanta University.

5. The experts' responses were represented in four points rating scale ranging from (4-1); 4=strongly relevant, 3=relevant, 2= little relevant, and 1=not relevant. Necessary modification were done including; clarification, omission of certain items and adding others and simplifying work related words.

- The face validity value of **tool(I) part2**: Head nurses' assertiveness questionnaire =98.5%.**Tool (2) part 2**: head nurses' assertiveness as perceived by staff nurses =98.5%.**Tool 3 part (2)**: head nurses' decision making questionnaire = 99.7% **(appendix IIII)**

6. A pilot study was carried out on a sample (10%) of the subject (n=67), and they excluded from the main study sample during actual collection of data. A pilot study was carried out after the expert's opinions and before the actual data collection. The pilot study was done to test the clarity; sequence of items, applicability, and relevance of question and to determine the needed time to complete the questionnaire. According to feedback from pilot study, the tools were modified by the researcher. The estimated time needed to complete the questionnaire item from staff nurses was 15-20 minutes.

7. Reliability of tools was tested using Cronbach Alpha Coefficient **(appendix IIII)** .

- Reliability of **tool(I) part2**: Head nurses' assertiveness questionnaire=(0.909), **tool(II) part 2**: head nurses' assertiveness as perceived by staff nurses =(0.853)and reliability of **tool(III) part (2)**: head nurses' decision making questionnaire =(0.954)

8. **Tool I** was used to collect data from the head nurses about their assertiveness, **tool II** was used to collect data from the staff nurses viewpoints about their head nurses' assertiveness and **tool III** was used to collect data about the head nurses' decision making ability.

9. **Data collection phase**: the data was collected from head nurses and staff nurses by the researcher. The researcher distributed the questionnaire on their work setting individually and they completed the questionnaire in the presence of the researcher to ascertain that all questions were answered. The data was collected over period of two months started from March 2020 until June 2020**.**

Statistical analysis

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

The used tests were

1 - Chi-square test

For categorical variables, to compare between different groups.

2 - Monte Carlo correction

Correction for chi-square when more than 20% of the cells have expected count less than 5.

3 - Mann Whitney test

For abnormally distributed quantitative variables, to compare between two studied groups.

4 - Pearson coefficient

To correlate between two normally distributed quantitative variables.

Results

Table (1): Shows distribution of head nurses' personal characteristics including age, years of experience, marital status, qualification, and hospitals. The age of head nurses were ranged between 29 - 55 years old with mean age 42.10 ± 5.84. Head nurses' years of experience ranged between 7.0 - 32.0 years with mean years 19.24 ±

5.79.High percent (73.9%) of head nurses had from15 - 30years of experience, less than one quarter (22.6%) of head nurses had from5 - 15 years of experience. Around two fifth (40%) of head nurses were working in emergency hospital, while the lowest percent (6.1%,5.2%,3.5%,2.6%,1.7%)were working in neuropsychiatric, cardiac CU ,neonatal ICU, oncology ,gynecology and obstetrics and endemic hospitals respectively. Majority (92.2% and86.1%) of head nurses were married as well as had bachelor degree in nursing, respectively**.**

Table (2): Shows distribution of staff nurses' personal characteristics including age, years of experiences, marital status, qualification, and departments of hospitals. The age of staff nurses were ranged between 20.0 –57.0 with mean age 13.73 ± 11.24. Staff nurses' years of experience were ranged between 0.0 – 38.0 with mean years 13.73 ± 11.24. More than one third 35.5% of staff nurses were from emergency hospitals while the lowest percent (8%, 7.7%, 6.1%, 4.2%, 3.1%, 3.0%, and 2.2%) were from neuropsychiatric, gynecology and obstetrics, internal medicine, neonatal ICU, oncology, cardiac CU and endemic hospitals). High percent 74.6% of staff nurses were married. Around half of staff nurses (44. 6%) had diploma degree and nearly one third of them (31. 5%) had technical health institute. Majority87. 8% of staff nurses hadn't attended training session.

Figure (1): Illustrates that the majority (98.3%) of head nurses reported high level of assertiveness while none of them reported low level of assertiveness.

Figure (2): Reveals that more than three quarters (77.6%) of staff nurses reported that their head nurses had high level of assertiveness, while minority (6.8%) of them reported that their head nurses had low level of assertiveness.

Figure (3): Shows that the majority (93%) of head nurses had high level of decision making abilities, while minority (7%) of them had moderate level of decision making abilities.

Table (3): Represents correlation between head nurses' assertiveness and their decision making abilities. The table showed that head nurses' overall assertiveness had a statistically significant positive correlation with head nurses' overall decision making abilities at ($p<0.001^{*}$, $r=0.409^{*}$).

Table (4): Represents correlation between head nurses' assertiveness as perceived by staff nurses and head nurses' decision making abilities. The table showed statistically significant correlation between head nurses' overall assertiveness as perceived by staff nurses with head nurses' overall decision making abilities ($r= 0.080^{*}$, $p= 0.037^{*}$).

Table1:Distribition of headnurses according to their personal charecterstics (N=115)

Personal characteristics	No.	%
Age (years)		
<30	1	0.9
30 – 40	41	35.7
40-50	61	**53.0**
≥50	12	10.4
Min. – Max.	29.0 – 55.0	
Mean ± SD.	42.10 ± 5.84	
Years of experience		
5-15	26	22.6
15-30	85	73.9
≥30	4	3.5
Min. – Max.	7.0 – 32.0	
Mean ± SD.	19.24 ± 5.79	
Departments		
Pediatric	16	13.9
Internal medicine	12	10.4
Oncology	4	3.5
Endemic	2	1.7
Gynecology and obstetrics	3	2.6
Neonatal ICU	6	5.2
Neuropsychiatric	7	6.1
Cardiac CU	7	6.1
Ophthalmology	12	10.4
Emergency	46	**40.0**
Marital status		
Single	9	7.8
Married	106	**92.2**
Qualification		
Bachelor degree	99	**86.1**
Master's degree	13	11.3
Doctoral degree	3	2.6
Attended training sessions		
No	115	**100.0**

Table2: Distribution of staff nurses according to their personal characteristics (n=673)

Personal characteristics	No.	%
Age (years)		
<30	283	**42.1**
30 – 40	198	29.4
40-50	110	16.3
≥50	82	12.2
Min. – Max.	20.0 – 57.0	
Mean ± SD.	34.15 ± 10.24	
Years of experience		
<5	146	21.7
5 – 15	246	**36.6**
15 – 30	160	23.8
≥30	93	13.8
Min. – Max.	0.0 – 38.0	
Mean ± SD.	13.73 ± 11.24	
Departments		
Pediatric	113	16.8
Internal medicine	41	6.1
Oncology	20	3.0
Endemic	15	2.2
Gynecology and obstetrics	52	7.7
Neonatal ICU	28	4.2
Neuropsychiatric	54	8.0
Cardiac CU	21	3.1
Ophthalmology	90	13.4
Emergency	239	**35.5**
Marital status		
Single	171	25.4
Married	502	**74.6**
Qualification		
Diploma degree	300	**44.6**
Technical health Institute	212	31.5
Bachelor degree	160	23.8
Master's degree	1	0.1
Attended training sessions about assertiveness		
No	591	**87,8**
Yes	82	12,2

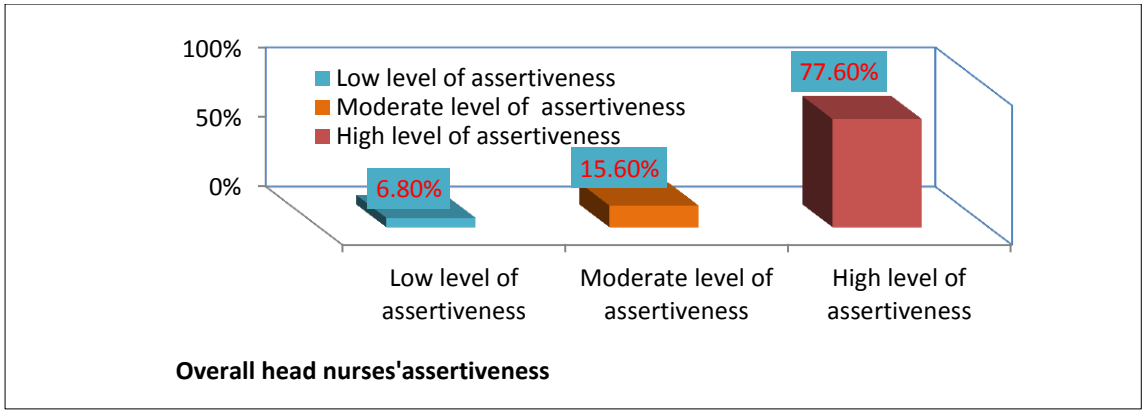

Figure 1: Overall head nurses assertiveness

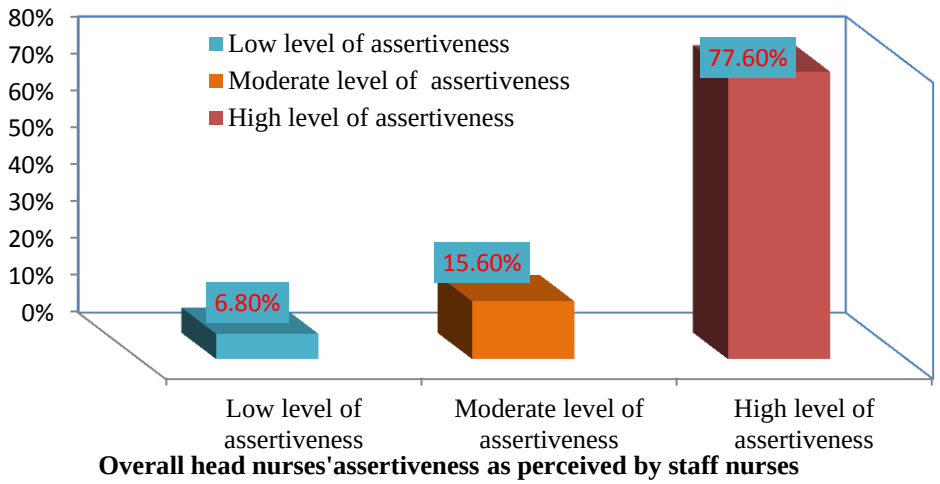

Figure 2: Overall headnurses assertiveness as perceived by staff nurses

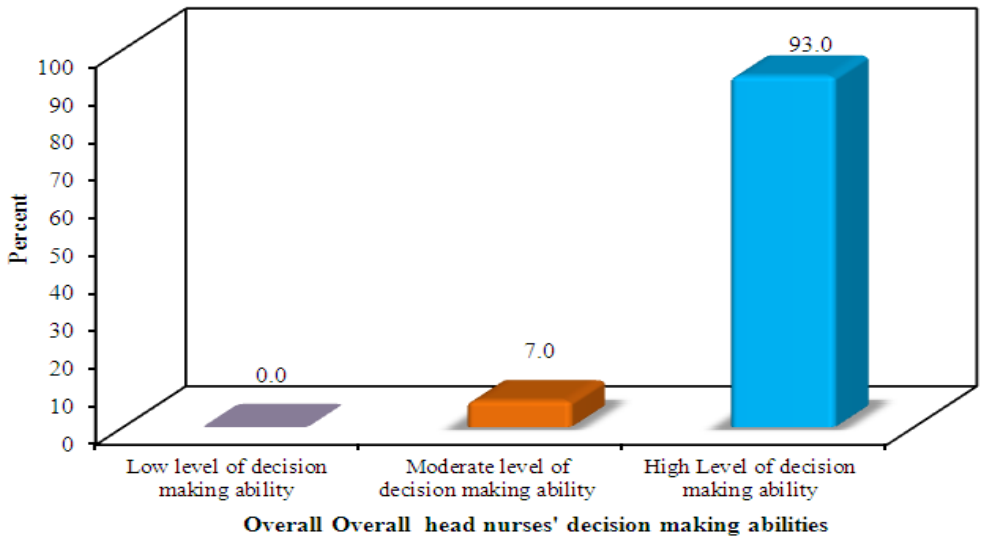

Figure 3: Overall head nurses decision making abilities

Table 3: Correlation between head nurses' assertiveness and their decision making abilities (n = 115)

		Verbal and non-verbal style.	Active orientation.	Work habits.	Control of anxiety and fear.	Relating co-workers	Negotiation the system.	Overall head nurses 'assertiveness
Establishing positive decision making environment	**R**	0.257*	0.139	0.084	0.287*	0.165	0.061	0.363*
	P	0.006*	0.139	0.371	0.002*	0.078	0.519	**<0.001***
Generating potential alternatives	**R**	0.114	0.158	0.054	0.250*	0.242*	-0.038	0.295*
	P	0.224	0.091	0.566	0.007*	0.009*	0.686	0.001*
Evaluating the alternatives	**R**	-0.060	-0.017	0.046	0.150	-0.012	0.097	0.100
	P	0.521	0.861	0.623	0.110	0.900	0.304	**0.290**
Deciding(choosing the alternative)	**R**	0.223*	0.181	0.046	0.180	0.025	0.159	0.274*
	P	0.017*	0.053	0.625	0.054	0.793	0.089	**0.003***
Checking the decision	**R**	-0.028	0.102	0.106	0.193*	0.107	0.044	0.204*
	P	0.765	0.279	0.260	0.039*	0.254	0.640	**0.029***
Communicating and implementing the decision	**R**	0.078	0.209*	0.120	0.110	0.043	0.040	0.197*
	P	0.409	0.025*	0.203	0.243	0.649	0.668	**0.034***
Overall head nurses' decision making abilities	**R**	0.176	0.213*	0.121	0.335*	0.166	0.105	**0.409***
	P	0.060	0.022*	0.199	<0.001*	0.076	0.266	**<0.001***

Table 4: Correlation between head nurses' assertiveness as perceived by staff nurses and head nurses' decision making abilities

		Verbal and non-verbal style.	Active orientation.	Work habits.	Control of anxiety and fear.	Relating co-workers	Negotiation the system.	Overall Head Nurses 'Assertiveness
Establishing positive decision making environment	**r**	0.060	0.020	0.048	0.056	0.074	-0.008	0.058
	p	0.121	0.597	0.211	0.149	0.055	0.837	0.135
Generating potential alternatives	**r**	0.081*	0.075	0.072	0.113*	0.135*	0.055	0.116*
	P	0.036*	0.053	0.063	0.003*	<0.001*	0.151	0.003*
Evaluating the alternatives	**r**	0.084*	0.039	0.058	0.031	0.097*	0.003	0.062
	p	0.030*	0.312	0.131	0.417	0.012*	0.946	0.110
Deciding(choosing the alternative)	**r**	0.097*	0.054	0.076*	0.062	0.104*	0.014	0.085*
	p	0.012*	0.160	0.050*	0.107	0.007*	0.710	0.027*
Checking the decision	**r**	0.011	0.001	0.027	0.020	-0.011	0.003	0.015
	p	0.781	0.973	0.482	0.597	0.778	0.928	0.705
Communicating and implementing the decision	**r**	-0.007	0.005	-0.008	0.022	-0.004	-0.009	0.005
	p	0.850	0.906	0.840	0.566	0.924	0.816	0.890
Overall Head Nurses' Decision Making Abilities	**r**	0.079*	0.046	0.066	0.069	0.095*	0.013	0.080*
	p	0.040*	0.235	0.088	0.073	0.014*	0.729	0.037*

Discussion

Assertiveness is one of the most important skills head nurses can learn today. It can be used in almost any situation at work as well as in their home and social life. Assertiveness changes the way head nurses communicate, changes the way they deal with conflict and changes their own relationships with themselves. It is the gateway to confidence, respect and making effective decisions [29]. So, this study aimed to study the relation between head nurses' assertiveness and their decision making abilities at Tanta University Hospitals. This study's discussion categorized under five parts; head nurses' assertiveness, head nurses' decision making abilities, correlation between head nurses' overall

Head nurses 'overall assertiveness.

The present study results revealed that the majority of head nurses and staff nurses reported that head nurses had high level of assertiveness .This study result may be due to those head nurses aware of verbal and non verbal communication, control their emotions and behavior, communicate the needs without threatening, frightening and pay attention to the feelings and needs of other nursing staff.

This finding is supported by, **Qtait (2023) [30]** showed that the majority of the nurse managers working at Ain-Shams university hospitals were assertive. Also, **Immanuel & Muo (2022) [31]** reported that the highest percentage of head nurses was assertive. Moreover, in congruence with this, **Beattie et al., (2019) [32]** reported that the greater number of studied subjects at general hospital in United Status had assertive behavior Similarly, **Mostafa et al., (2019) [33]** and **Mohamed (2018) [34]** who found that majority of nursing staff had high assertiveness. Conversely, these results are disagreed with **Nemati et al. (2022) [35]** who found that nearly one third of nurses had average level of assertiveness.

Head nurses' overall decision making abilities.

The present study results revealed that the majority of head nurses had high level of decision making abilities. This finding may be related to head nurse visualize and anticipate even preserve flexibility, think strategically, willing to work with others for making decisions that would reinvent the institution.

This finding is similar with **Abd El Ghaffar, (2018) [36], Olague, (2017) [37]** and **Puseljic, Skledar & Pokupec., (2015) [38]** who reported that the greater number of study participants had high level of decision making abilities. On the other hand, this finding is disagreed with findings of **Mohammed and Amer (2022)[39]** result who showed that the total level of decision making among the study head nurses was somewhat lower than half of head nurses had a low level of decision making and near to quarter had a high level. **Also, kartoshkina, (2016) [40]** reported that the highest percent of study participants had moderate level of decision making ability.

Correlations between study variables

The present study results revealed that there was a statistically significant positive correlation between head nurses overall assertiveness and their decision making abilities. This finding may be related to assertiveness enhancing head nurses' leadership skills, job satisfaction and achieving real independence, professional accomplishment, power and determination, and increased efficiency during the changes in condition and finally making decision more appropriately.

This result is congruent with the study done by **Sibiya (2018) [41]** who explained that the head nurse can use verbal methods as questioning, facilitation, empathic statements, clarification, and summarizing in an appropriate instructive communication for effective decisions. Also, **Brewer (2018)[42]** concluded that nurses' communication skills in reporting clinical events were associated with their effective decision making and facilitated the determination of needed interventions and the management of a patient's condition.

Conclusion

Majority of head nurses at Tanta university hospitals reported high level of assertiveness. Also, more than three quarters of staff nurses reported that their head nurses had high level of assertiveness. Majority of head nurses reported high level of verbal and non verbal while, majority of

staff nurses reported that their head nurses had high level of negotiation system. Regarding to head nurses' decision making abilities, majority of head nurses had high level of decision making abilities. There is a statistically positive correlation between communication as a proactive measure to address conflict issues and moving toward resolution. head nurses' assertiveness and their decision making abilities.

Recommendation

Based on the result of the present study the following recommendations were suggested for

For hospital administration

- Conduct workshops for nurses about communication skills and how to be a good communicator and decision maker with staff nurses and other co workers.
- Set up policies and guidelines to encourage assertiveness
- Putting pre-established criteria for selecting of head nurses at the hospitals based on decision making levels.
- Support head nurses when deciding and provide the resources required to implement the decision .
- Head nurses have to be represented in hospital committees, sharing and participating in decision making about patients` problems and hospital policies
- Encouraging head nurses to use and apply strategies that enhance decision making abilities.

For head nurses

- Conduct self evaluation for head nurses performance by themselves.
- Activate the communication system between all staff nurses and encourage work team to complete the work effectively.
- Evaluate regularly staff nurses' performance, establish a system of incentives, reward good performance and give them feedback describing the desirable behaviors and their impact on the outcome of patient care for effective performance.
- Encourage periodic staff meeting by head nurses to allow them express their feeling, seeking opinion, exchange their experiences during different situation and getting feedback and support .
- Give staff nurses the opportunity to assert themselves and maintain high self -esteem and at the same time to be a role model as regard to assertiveness.
- Continuous support of newly developed assertive behavior need to be encouraged to solidify the new pattern of communication and ensure enduring change.
- Need to be equipped with skills to help them to tackle new and complex problems.Periodical systematic assessment of nurse's level of self-esteem, assertiveness and decision making.
- Implement continuous staff development activities to improve head nurses knowledge, skills and attitude regarding assertiveness behavior.

For further researches

- Investigate the socio cultural circumstances that may hinder or enhance head nurses to be assertive.
- Measure the extent of staff nurses involvement in decision making and challenges facing them in decision making process.
- Determine the relation between emotional stability and decision making abilities.
- Study the effect of decision-making development strategies on their work achievement.

References

1. Saeed Ahmed Abd-Elrhaman E, Ghoneimy Hasanin Ghoneimy A, Ibrahem Ismael Z. Creative Management and Mindfulness among Head Nurses and its Relation to Nurses' Work Thriving and

Professional Nursing Autonomy. Journal of Nursing Science Benha University. 2023 Jan 1; 4(1):730-50.

2. **Parray WM, Kumar S**. The Effect of Assertiveness Training on Behaviour, Self esteem, Stress, Academic Achievement and Psychological Well-Being of Students: A Quasi-Experimental Study. Research & Development. 2022; 3(2):83-90.

3. **Alberti R, Emmons M.** Your perfect right: Assertiveness and equality in your life and relationships. New harbinger publications; 2017 Mar 1.

4. **Gilani F. Ilyas U. and Afzal M.** Assertive Behavior of Nurses and Head Nurses in Government. International journal of graduate research and review. 2018; 4 (3):196

5. **Boynton B.** Successful Nurse Communication Revised Reprint: Safe Care, Healthy Workplaces & Rewarding Careers. FA Davis; 2022 Dec 12.

6. **van Niekerk V.** Relationship, helping and communication skills. In: van Rooyen, D, Jordan PJ, editors. Foundations of Nursing Practice: Fundamentals of Holistic Care. African Edition. 2nd ed. Edinburgh: Mosby Elsevier; 2016. pp. 181-207. ISBN: 978-0-7020-6628-3.

7. **Nyavor KD.** Collaborative Action Research in a Community of Practice to Nurture Sociocultural Teaching Innovations Among Teacher Educators in Ghana (Doctoral dissertation, Université 'Ottawa/University of Ottawa), 2023.

8. **Miller KQ, Wahl ST.** Business and Professional Communication: KEYS for Workplace Excellence. SAGE Publications; 2023 Feb 14.

9. **Mohamed Abd El-Monem A, Elsayed Rashed S, Ghoneimy Hasanin A.** Artificial Intelligence Technology and its Relation to Staff Nurses' Professional Identity and Problem Solving Abilities. International Egyptian Journal of Nursing Sciences and Research. 2023 Jan 1; 3(2):144-64. 14.

10. **Boothby EJ, Cooney G, Schweitzer ME.** Embracing Complexity: A Review of Negotiation Research. Annual Review of Psychology. 2023;74.

11. **Buerkner JF.** Understanding the Impact of Future Social Self-Concepts on Newcomer Adjustment. Junior Management Science. 2022 Dec 23; 7(5):1270-88.

12. **Abate HK, Birhanu Y, Gebrie MH.** Clinical decision making approaches and associated factors among nurses working in a tertiary teaching hospital. International Journal of Africa Nursing Sciences. 2022 Jan 1; 17:100432.

13. **Madhav AV, Tyagi AK.** Explainable Artificial Intelligence (XAI): connecting artificial decision-making and human trust in autonomous vehicles. In Proceedings of Third International Conference on Computing, Communications, and Cyber-Security 2023 (pp. 123-136). Springer, Singapore.

14. **Anthony C, Bechky BA, Fayard AL.** "Collaborating" with AI: Taking a System View to Explore the Future of Work. Organization Science. 2023 Jan 9.

15. **Snyder A.** Consensus process in the decision-making of a North American alternative brass band. InEthnomusicology Forum 2023 Jan 12 (pp. 1-24). Routledge.

16. **Hezam IM, Mishra AR, Rani P, Saha A, Smarandache F, Pamucar D.** An integrated decision support framework using single-valued neutrosophic-MASWIP-COPRAS for sustainability assessment of bioenergy production technologies. Expert Systems with Applications. 2023 Jan 1; 211:118674.

17. **Asatiani A, Copeland O, Penttinen E.** Deciding on the robotic process automation operating model: A checklist

for RPA managers. Business Horizons. 2023 Jan 1; 66(1):109-21.

18. **Moritz D.** Children's Developmental (Im) maturity: Aligning Conflicting Decisional Capacity Assessment Approaches in Australia. Laws. 2023 Feb; 12(1):10.

19. **Hasselgren B, Chrysoulas C, Pitropakis N, Buchanan WJ**. Using Social Media & Sentiment Analysis to Make Investment Decisions. Future Internet. 2023 Jan; 15(1):5.

20. **Brasier AR, Burnside ES, Rolland B.** Competencies supporting high-performance translational teams: A review of the SciTS evidence base. Journal of Clinical and Translational Science. 2023; 7(1):e62.

21. **Gowda N, Ranasinghe P, Phan P, Cullen T, Lushniak B, Miller B.** Organizational Culture and Staffing Models at the Centers for Disease Control and Prevention. Available at SSRN 4362543. 2023 Feb 17.

22. **Weld N.** Applying the Therapeutic Function of Professional Supervision: Attending to the Emotional Impacts of Human Service Work. Taylor & Francis; 2023 Mar 10.

23. **Ulutasdemir, N.** ursing: Effective Communication in Nursing. 1st edition.London. Intech Open, 2018

24. **Strutt AM.** Foundational Curriculum and Core Guidelines for Training in Latinx/a/o-Hispanic Cultural Neuropsychology Across the Lifespan. Archives of Clinical Neuropsychology. 2023 Mar 29:acac108. study. Nurse Education Today.; 39(1): 72-8.

25. **Nakamura, Y. & Tanoue, H.**Development and evaluation of a modified brief assertiveness training for nurses in the workplace: a single-group feasibility study.BMC Nursing, 2017, 16(29).

26. **Mohamed H, Elrais H**. Factors affecting decision making among nurse managers and its relation to decision making styles. Port Said Scientific Journal of Nursing. 2017; 4(2): 241.

27. **Banakhar M., Ragab A, and Alaseerie A.** Factors Influencing Nurses' Decision-Making Process: An Integrative Literature Review. Journal of Nursing and Health Science.2019; 8(4):36.

28. **MacDonald B, Berrios-Siervo GM, Díaz-Santos M, Sánchez O, Suárez P, Diaz AL, Moss N, Strutt AM.** Foundational Curriculum and Core Guidelines for Training in Latinx/a/o-Hispanic Cultural Neuropsychology Across the Lifespan. Archives of Clinical Neuropsychology. 2023 Mar 29:acac108.

29. **Ilhan N, Sukut O, Akhan U, Batmaz M. 2016**, The effect of nurse education on the self-esteem and assertiveness of nursing students: a four-year longitudinal study. Nurse Education Today.; 39(1): 72-8.

30. **Qtait M.** Head Nurses' Leadership Styles and Nurses' Performance systematic review. International Journal of Africa Nursing Sciences. 2023 Mar 25:100564.

31. **Immanuel EU, Muo FC.** Marital Status, Religion and Gender as factors in Assertiveness. Zik journal of multidisciplinary research. ZIK. 2022 Aug 26; 5(1).

32. **Beattie J, Griffiths D, Innes K, Morphet J.** Workplace violence perpetrated by clients of health care: A need for safety and trauma-informed care. Journal of clinical nursing. 2019 Jan;28(1-2):116-24.

33. **Mostafa S, Hamouda S, Zahran S, Obied H.** Effect of assertiveness educational program on conflict

handling styles for nursing staff at intensive care unit. International Journal of Novel research in Healthcare and Nursing; 2019**;** 6(2): 1729-1739.

34. **Mohamed N.** Effect of assertiveness training program on self-esteem and self efficacy of faculty nursing students at Zagazig University. Doctoral Thesis. Faculty of Nursing. Zagazig University. 2018; 58-68.
35. **Nemati Z, Maghsoudi S, Mazlom SR, Kalatemolaei M.** Evaluating effect of assertive training program on assertiveness communication and Self-Concept of nurses. Journal of Sabzevar University of Medical Sciences. 2022 Jul 11; 29(2):243-54.
36. **Abd El Ghaffar, M.** Assessment of decision making ability among head nurses and its influence on their job satisfaction at Benha University Hospital. Unpublished Master thesis. Faculty of Nursing, Benha University; 2018.
37. **Olague, R.** The decision making abilities of bilinguals and monolinguals facing an adaptability scenario. Published doctorate thesis, Texas A&M University-Kingsville, 2017. 10845638.
38. **Puseljic, M., Skledar, A & Pokupec, I.** Decision making as a management function. Interdisciplinary management research, Josip Juraj Strossmayer University of Osijek, Faculty of Economics, Croatia. 2015; 11(3): 234-244.
39. **Mohammed K, Amer H.** Emotional Intelligence and Decision Making among Head Nurses' at Fayoum University Hospitals. Published Master Thesis, Fayoum University Hospitals, 2022. Available from: https://www.researchgate.net.
40. **Kartoshkina, Y**. Exploring decision making and metacognition of faculty teaching abroad. Published doctorate thesis, University of North Dakota. . 2016.
41. **Sibiya M.** Effective Communication Skills in Nursing. 6th edition. 2018. DOI: 10.5772/intechopen.74995.
42. **Brewer CC.** Clinical trials, ototoxicity grading scales and the audiologist's role in therapeutic grading scales and the audiologist's decision making. International journal of audiology. 2018 Aug 24; 57(sup4):S19-28.

Staff Nurses' Perception toward Leadership Effectiveness and Its Relation to Innovative Work Behavior at selected hospital

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Abstract

Background: In recent years, innovation is considered necessary for organizations to adapt to the changing environment and increase need for effective nurse leader for enhancing leadership qualities, supportive work environment that is critical for staff nurses innovation. **The study aimed to:** assess staff nurses' perception toward leadership effectiveness and its relation to innovative work behavior. **Design:** A descriptive correlational design was utilized to conduct this study. **Setting:** the study was conducted in all ICUs at emergency hospital which is affiliated to Cairo University Hospitals. **Subjects:** A convenience sample of 73 staff nurses who volunteered to participate in this study was included. **Tools:** three tools were used for data collection as follows: (a) personal characteristics sheet (b) Leadership Effectiveness Questionnaire, (c) Innovative Work Behavior Questionnaire. **Results:** the study results revealed that more than half (61.6%) of staff nurses had high perception level regarding leadership effectiveness. also the highest percentage (76.7%) of them had high perception level regarding innovative work behavior. **Conclusions:** data of the present study concluded that there was statistically significant positive correlation between overall perception of leadership effectiveness and innovative work behavior of staff nurses. **Recommendations:** Raise the nursing leaders' awareness regarding their role in building trust relationships with their followers and in creating healthy work environment that enhance their innovations.

Keywords: Leadership Effectiveness, innovations, Work Behaviors, and Staff Nurses

Introduction

Since ancient times of history, man has known that the difference between success and failure is mainly due to the effectiveness of leadership, whether in wars or in various fields of human life. Every group and organization need effective leadership, as it constitutes the vital axis that underpins various activities in both public and private organizations. (1) Leadership is one of the most crucial elements of organizational success, as it would direct all resources towards achieving the goals. The level of achieving the goals is commensurate with the level of leadership effectiveness in utilizing the staff energies by raising their motivation and revealing their latent energies to reach a high level of organizational commitment. (2)

For improving quality and care integration, management and leadership of healthcare workers are essential. Leadership is the behavior of guiding and coordinating the activities of a team or group of people towards a shared goal. It is also defined as the relationship between the individual who led and those who choose to follow. (3) Leadership has also been described in terms of the power dynamic that exists between leaders and followers. According to this perspective, leaders have power and utilize it to influence others. Others see leadership as a transformational process that inspires

followers to go above and beyond what is often expected of them. Finally, some academics approach leadership from the perspective of competencies. This viewpoint emphasizes the capacities (knowledge and skills) that enable effective leadership. [4]

Leadership effectiveness begins with the intrinsic ability to believe in oneself. It involves a level of maturity, principle and competence that changes into the determination, direction, and clarity of vision that armored leaders with confidence needed to take the responsibility of fostering motivation, self-esteem, and teamwork. Leaders concentrate on developing a thorough awareness of the surrounding conditions. They must make sure that the surrounding conditions are suitable for carrying out the tasks and activities. [1] The effective leaders should be capable of facilitating changes that result in efficient growth and development. They believe in promoting the improvement of human resources. They adopt the perspective that the organization can effectively expand and flourish only if its human resources are treated as basic assets. [5]

In order to understand the characteristics of effective leadership, it is necessary to take into consideration the intrinsic characteristics, namely physical capacity, energy level and stress tolerance. These traits enable the leaders to take control over stress and other types of difficult situations, even though they are overloaded with work tasks. Effective leaders should be aware with time management skills and provide enough time for all duties and activities; also require physical vitality and emotional intelligence. [6] Secondly, it requires the capability of removing any potential barriers and offering answers to various challenges. The development and promotion of communication skills is necessary for effective leadership to communicate with their subordinates, empower their team, manage, and assign tasks, listen to feedback, and have the flexibility to address problems in a workplace that is constantly changing. [7]

In response to the rapid advancements and progress in technology and communications aspects over the recent decades, innovation became mandatory for organizations survival, growth, and competition especially in health care organizations. [8] Innovation is a change that results from new idea generation and adaptation. Creativity occurs with novel ideas relying on the institution management and individuals producing novel ideas. The knowledge and experience of nurses are required to create innovative solutions to solve the novel problem. [9] Nurses' innovative behavior in the work environment is seen as a crucial requirement for organizational survival. Additionally, the evolving economic environment, globalization, and rising competing demands have also increased the need of innovation and innovative behaviors. [10]

Innovative work behaviors is described as an individual 's behavior to achieve the inception and intentional introduction of novel and valuable ideas, procedures, methods or products. [11] Furthermore, innovative work behavior is all individual behaviors that aim to generate, process, apply, or implement new ideas about how to do things, including new product concepts, techniques, processes, or work procedures, with the intention of enhancing the effectiveness and organization success. [12] It is also presented as a cognitive and motivating process that entails coming up with ideas, looking for novel ones, sharing

them, initiating application activities, including others, and overcoming hurdles. [3] Innovative work behavior is not a part of nurses' main responsibilities. It is excessive responsibility that is outside the scope of nurses' job description for attempts to help in achievement of the organizational goals. [9] Idea generation, coalition building, and implementation are the three phases of innovative work behavior. In the first phase (idea generation), innovation starts with problem identification, problem definition and solution discovery for managing the problem. Solution discovery is based on a novel idea or a novel application of existing ideas. In the second phase (coalition building), the innovator searches for support for his novel ideas. As innovation involves both change and resistance to change, the innovator should form alliances to support the noel ideas and ensure their commitment for the innovation. In the third phase (idea implementation), the innovation ideas have to be transformed into practice. Persistence is required in the implementation process to control over change resistance and ensure the achievement of desired outcomes. [12]

Significance

The functionality of nursing staff in healthcare organizations is greatly influenced by leadership effectiveness. An incompetent leader can diminish employee morale, creativity, and lead to job dissatisfaction. [13] Zawawi et al. (2020) [14] found that one of the hindering factors that impede organizational success is ineffective leaders. So, it is necessary to assess and identify the competencies or skills required for effective nursing leaders to adequately deal with organizational challenges and to enhance staff competitiveness and performance efficiency.

In Egypt, it was noted that the current healthcare systems do not offer a supportive working condition that enhance staff nurses innovative work behaviors. Also, it was noted that studies on the relationship between leadership effectiveness and work innovative behavior in the health care sector are scarce.

The current study would grasp the attention of study nurses and their organization to the importance of innovative work behaviors and stay away from routine and bureaucracy. Moreover, the healthcare organizations in Egypt are facing intense competitive market which requires a great care to create positive working environment for the advancement and utilization of beneficial and effective ideas of their staff. It is clear that innovative behavior of nursing staff is a significant need for an organization's innovation, productivity and sustainability. Therefore, the purpose of this study sought to assess staff nurses' perception toward leadership effectiveness and its relation to innovative work behavior.

Aim of the Study

This study aimed to assess staff nurses' perception toward leadership effectiveness and its relation to innovative work behavior at selected hospital.

Research Questions

To fulfill the aim of the study, the following research questions were formulated:

1- What is the staff nurses' perception toward leadership effectiveness?
2- What is the staff nurses' level of innovative work behaviour?
3- Is there a relationship between staff nurses' perception of leadership effectiveness and their level of innovative work behaviour?

Subjects and Methods

Research Design

A descriptive correlational research design was utilized to achieve the aim of the present study.

Setting

This study was conducted in all intensive care units (surgical, neurology, medical, chest and cardiac unit) at New Emergency and Burn Hospital (185) which is affiliated to Cairo University Hospital, in Egypt which provide free services. It has 7 floors and the total bed capacity is120.

Study Sample

A convenience sample of 73 staff nurses who are working in the previously mentioned study settings and available during the time of data collection was constituted the study sample. All staff nurses should have at least one year's experience, working full-time and providing direct nursing care activities for the patients.

Tools of Data Collection:

For the purpose of the current study, three tools were used for data collection:

1st tool: personal characteristics data Sheet

It was developed by the researchers to assess the personal characteristics of the study subjects such as age, educational qualification, unit, and years of experience.

2nd tool: leadership effectiveness questionnaire

It is self-administered; structured questionnaire was developed by the researcher through review of recent related literature. [15, 16]

It was used to assess the staff nurses' perception toward head nurses' leadership effectiveness. The questionnaire consisted of 33 items categorized under ten main dimensions namely: Effective communication (5 items), team building (3 items), Change management (5 items), Conflict management (2 items), Negotiation (2 items), Management of organisational climate and culture (2 items), Inspiration (3 items), trust and credibility (3 items), Professionalism (6 items) and Commitment to customers (2 items).

Scoring System: the staff nurses' responses were checked against three-point Likert scale ranging from; (1) disagree, (2) average and (3) agree. According to the total scores of nurses' responses, the head nurses' leadership effectiveness was classified as follow:

- High effectiveness: ≥ 75%
- Moderate effectiveness: 60-<75%.
- Low effectiveness: <60% [16]

3rd tool: innovative work behavior questionnaire

It is self-administered; structured questionnaire was developed by De Jong, (2007) [17] and modified by the researchers. It was used to assess the staff nurses' perception toward their innovative work behaviors. It consisted of (11) items categorized under four dimensions, namely: Idea exploration (4 questions), Idea generation (2 questions), Idea championing (2 questions) and Idea implementation (3 questions).

Scoring system: the staff nurses' responses were checked against three-point Likert scale ranging from; (1) never, (2) sometimes and (3) always. According to the total scores of staff nurses' responses, the level of innovative work behaviours was classified as follow:

- High level of innovative work behaviours: ≥ 75%.
- Moderate level of innovative work behaviours: 65 - < 75%.
- Low level of innovative work behaviours: < 65% [17]

Validity of the study tools

The study tools were submitted to a panel of five experts in the field of nursing administration. They asked to judge the content`s coverage, clarity, wording, length, format, and overall appearance of the study tools. The two tools were translated into Arabic to match staff nurses' level of education. Double English –Arabic- English translation was done.

Based on experts` comments and recommendations, necessary modifications were done as correcting some grammatical errors and rephrasing of some sentences.

Reliability of the study tools

Internal consistency reliability of the study tools was determined by using Cronbach's alpha coefficient for independent variable. Internal consistency using Cronbach's alpha was 0.97 for leadership effectiveness questionnaire and was 0.95 for innovative work behavior questionnaire.

Procedure

Upon receiving the agreement of both medical and nursing directors of study hospital, the researchers proceeded with the data collection. Researchers met the staff nurses during two shifts (morning and afternoon) in their units to explain the purpose of the study and invited them to voluntary participate and gain their acceptance by formal written consent. The study questionnaires were distributed individually by the researchers to staff nurses with giving them instructions about how they will be filled, the time required to fill the questionnaires was from 15 to 25 minutes. The filled questionnaires were collected at the same time and revised to check their completeness to avoid any missing data. The data were collected over 2 months, from May to June2022.

Ethical Consideration

Before conducting the study, the preliminary approval was received from the Faculty of Nursing, Cairo University's scientific research ethics committee. Also, an official agreement was obtained from the medical and nursing directors of the study hospital to conduct the study. Participation in this study was completely voluntary; each participant had the option to accept or decline participation in the study. Informed consent was obtained from the study`s nurses. Every participant had the choice to withdraw from the study at any time, and subjects were informed that their data would not be utilized in another study without their consent. Anonymity and confidentiality were ensured through the coding of the data. The ethical issues considerations include explaining the purpose and nature of the study, participation was protected from any risk. Collected data were used for the purpose for the research.

Statistical Design

After the data collection was finished, the "statistical package for the social science" (SPSS), version 21 was used to score, tabulate, and analyze the data. Descriptive statistics such as frequency mean, and standard deviation was utilized in analyzing data pretended in this study. Relative statistical tests of significance, such as (independent t-test, correlation coefficient) were used to identify the relations among the study variables. The p value is the degree of significance, and the significance level of all statistical analysis was at ≤0. 05 (P-value) while, the p value > 0.05 indicates non-significant result.

Results

Table (1) shows that about half (50.7%) of nurses were in the age group that ranged between (21<30) years old with mean ±SD. (32.3±8.2). As for educational level, the highest percentage of staff nurses (63.0%) having nursing diploma. While the highest percentage (28.8%) of nurses worked in surgical ICU. In addition, about half (50.7%) of them had 1to < 10 experience years with mean ±SD (32.3±8.2).

Table (2): It is clear from the above table that staff nurses had perceived a high total leadership effectiveness (81%) .Data in the same table indicates that the highest mean percentage scores (84.5% & 84.3%) of staff nurses' perception toward the leadership effectiveness dimensions were related to commitment to patients and trust and credibility. While the lowest mean percentage score (77.2%) was related to the change management dimension.

Figure (1): shows that more than half (61.6%) of staff nurses had high perception level regarding leadership effectiveness.

Table (3) It is obvious from the above table that staff nurses had high level of innovative work behavior: (85.2%). Moreover, the highest mean percentage scores (87.5% & 86.0%) of staff nurses' perception toward the innovative work behaviors dimensions was related to idea generation and idea implementation dimensions. While the lowest mean percentage score (83.9%) was related to idea exploration dimension.

Figure (2): Illustrates that the highest percentage (76.7%) of staff nurses had high level regarding their innovative work behaviors.

Table (4): shows that there were highly significant positive correlations (r=.55*, p .0001) between staff nurses' total perception toward leadership effectiveness and total perception of their innovative work behaviors.

Table (5): illustrates that there was significant statistical relation between staff nurses' age and experiences and total perception of innovative work behaviors. While there was no statistical relation between nurses' age, experiences and education level and total perception of leadership effectiveness.

Table (6): depicts that the neurological ICU had the highest mean for total leadership effectiveness and total innovative work behavior. Also, the table shows that there was significant positive correlation between staff nurses' working units and both study variables.

Table (1): Frequency distribution of staff nurses' personal characteristics data (n= 73)

Staff nurses' personal characteristics data	Frequency (N)	%
Age		
21 to < 30	37	50.7
30 to < 50	20	27.4
≥ 50	16	21.9
Mean ±SD 32.3±8.2		
Educational level		
- Technical diploma in nursing	46	63.0
- Associate technical diploma	26	35.6
- Bachelor degree in nursing	1	1.4
Unit		
- Surgical ICU	21	28.8
- Medical ICU	19	26.0
- Cardiac ICU	11	15.1
- Chest ICU	12	16.4
- Neurological ICU	10	13.7
Years of Experience		
- 1to < 10 years	37	50.7
- 10 to < 20	20	27.4
- ≥ 20	16	21.9
Mean ±SD12.9±9.3		

Table (2): Mean percentage of staff nurses' perception toward leadership effectiveness dimensions (n=73).

Leadership effectiveness dimensions	Minimum score	Maximum score	Mean	Sd	Mean %
Effective communication	5	15	12.29	2.96	81.9
Team building	3	9	7.45	2.02	82.8
Change management	5	15	11.58	3.15	77.2
Conflict management	2	6	4.71	1.40	78.5
Negotiation	2	6	4.73	1.36	78.8
Management of organizational climate and culture	2	6	4.67	1.49	77.8
Inspiration	3	9	7.12	2.06	79.1
Trust and credibility	3	9	7.59	1.98	84.3
Professionalism	6	18	15.01	3.60	83.4
Commitment to patient	2	6	5.07	1.27	84.5
Total	33	99	80.22	17.50	81

(High effectiveness: ≥ 75% - Moderate effectiveness: 60-<75% - Low effectiveness: <60%)

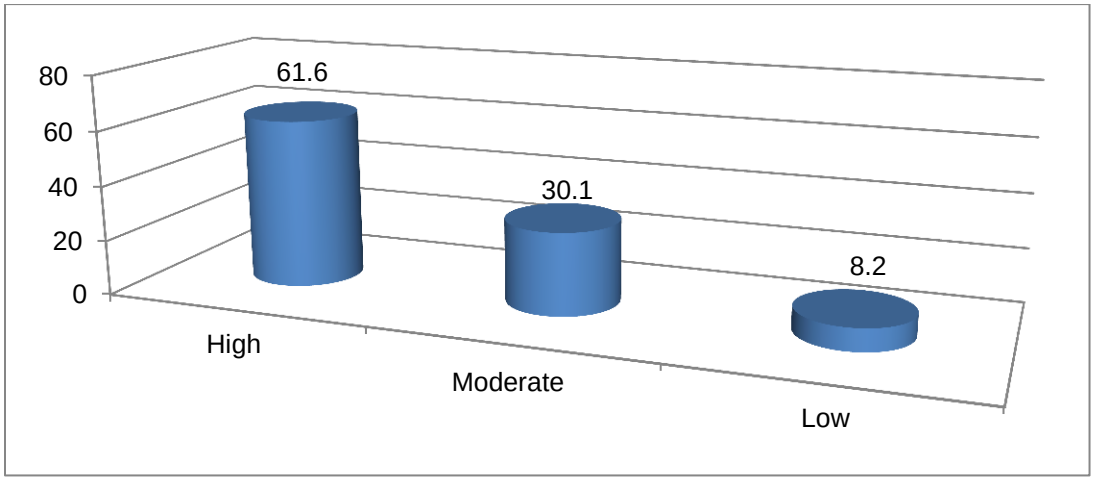

Figure (1): Total levels of staff nurses' perception regarding the leadership effectiveness (n=73)

Table (3): Mean percentage of staff nurses' perception toward innovative work behaviors dimensions (n= 73).

Innovative work behaviors dimensions	Minimum score	Maximum score	Mean	SD	Mean %
Idea exploration	4	12	10.07	2.21	83.9
Idea generation	2	6	5.25	1.11	87.5
Idea championing	2	6	5.06	1.25	84.3
Idea implementation	3	9	7.74	1.72	86.0
Total	11	33	28.11	5.70	85.2

High level of innovative work behaviour: ≥ 75% - Moderate level of innovative work behaviour : 65 - < 75% - Low level of innovative work behaviour: < 65%.

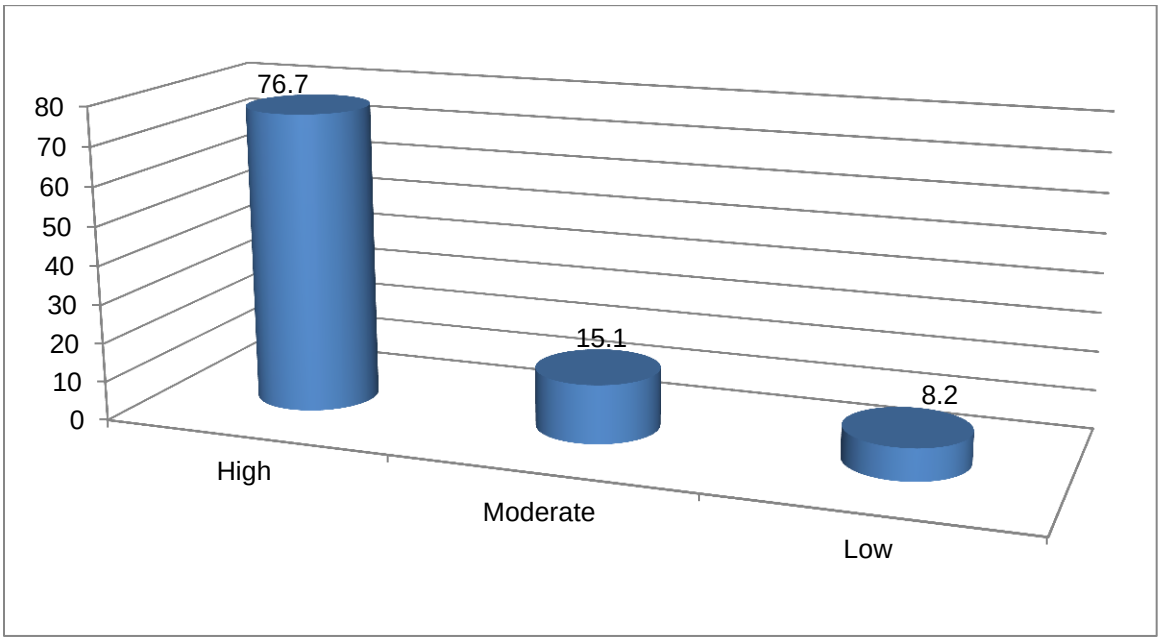

Figure (2): staff nurses' levels regarding the innovative work behaviors (n=73)

Table (4): Correlation between leadership effectiveness dimensions and innovative work behaviors dimensions (n=73).

leadership effectiveness dimensions	innovative work behaviors dimensions								Total	
	Idea exploration		Idea generation		Idea championing		Idea implementation			
	r	p	r	p	r	p	r	p	R	P
Effective communication	.4	.0001*	.41	.0001*	.4	.0001*	.43	.0001*	.45	.0001*
Team building	.28	.01	.28	.01	.29	.01	.32	.008	.32	.005*
Change management	.48	.0001*	.48	.0001*	.47	.0001*	.49	.0001*	.53	.0001*
Conflict management	.39	.001*	.18	.11	.37	.001*	.37	.001*	.38	.001*
Negotiation	.27	.02*	.28	.01*	.37	.001*	.33	.004*	.34	.003*
Management of organizational climate and culture	.41	.0001*	.41	.0001*	.32	.005*	.4	.0001*	.43	.0001*
Inspiration	.46	.0001*	.31	.007	.35	.002	.4	.0001*	.44	.0001*
Trust and credibility	.43	.0001*	.47	.0001*	.32	.008	.33	.004	.43	.0001*
Professionalism	.51	.0001*	.54	.0001*	.54	.0001*	.51	.0001*	.58	.0001*
Commitment to patients	.43	.0001*	.48	.0001*	.37	.001	.37	.001	.45	.0001*
Total	.51	.0001*	.49	.0001*	.48	.0001*	.5	.0001*	.55	.0001*

*significant at p-value<0.05

Table (5): Relationship between staff nurses' perception of total leadership effectiveness and work innovative behaviors and their Age, Experiences and educational level (n=73).

Demographic data	Leadership effectiveness		Work innovative behaviors	
	F	p	F	P
Age	.12	.3	.31	.007*
Experience	.07	.55	.23	.04*
Education level	.03	.77	.03	.77

*significant at p-value<0.5

Table (6): Relationship between staff nurses' total perception of leadership effectiveness and innovative work behaviors and their working unit (n=73).

Dimensions	Units										F	P
	Surgical ICU		Medical ICU		Cardiac ICU		Chest ICU		Neurological ICU			
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Leadership effectiveness	86.19	16.82	80.26	18.65	72.82	11.75	69.58	18.38	88.50	13.47	3.0	.02*
Innovative work behavior	31.44	2.48	27.79	5.30	24.18	3.76	23.67	8.04	31.57	2.79	8.2	.0001*

*significant at p-value<0.5

Discussion

Effective leadership is frequently viewed as a crucial component and aspect of management that affects the level of employee commitment within the organization and has the potential to increase organizational effectiveness, creative work behaviors, job satisfaction among staff nurses and a sense of confidence about problem-solving in order to achieve organizational goals. [18] Therefore, the aim of this study was to assess staff nurses' perception toward leadership effectiveness and its relation to innovative work behavior.

As regards staff nurses' perception toward leadership effectiveness, the findings of the present study indicated that more than half of staff nurses had high perception level regarding leadership effectiveness dimensions with the highest mean percentage for both commitment to patients, trust and credibility. While the lowest mean percentage was related to the change management. These findings could be due to that nursing leaders' credibility and honesty are as necessary as food and water for staff nurses as it considered as a binding promise between any leader and their followers. Overall, it emerges as the single most important attribute in the leader constituent relationship. First and foremost, the presence of effective nursing leader and even all the health care team is intended to serve the patient and provide the highest possible quality of care, so the nursing leader commitment to patient is inevitable issue for the leadership effectiveness that should be accomplished.

These findings were in harmony with Mostafa & EL-Sayed, (2021) [19] who reported that the highest nurses' perception level of leadership effectiveness dimensions was related to trust and healthier work environments which allow good relation with others. As well as Abd El Muksoud et al, (2022) [20] who investigated leadership behaviors and innovative work behaviors among nurses at ministry of health in Egypt; the study revealed that staff nurses had a positive perception of the transformational leadership behaviors.

Regarding to staff nurses' perception toward innovative work behavior, the findings of the present study revealed that the highest percentage of staff nurses had high perception level regarding innovative work behavior dimensions with the highest mean percentage for both idea generation and idea implementation. While the lowest mean percentage was related to idea exploration. From the researchers' point of view, the potential explanation for these findings may be attributed to the fact that the innovation behavior and Innovation climate nowadays are receiving great attention and support from the hospital leaders and managers to enhance these behaviors in their organizations. Additionally, the nursing leaders in the study hospital may give the chance for their staff to freely communicate with them regarding work-related problems and share other techniques to solve these problems via generation, contribution, and implementation of innovative ideas.

The current study findings go in the same line with that of a study conducted by Mahgoub, Shazly, & El-sayed, (2019) [21] who found that the highest percentage of staff nurses had

high perception level regarding innovative work behaviors with the highest mean percentage for idea championing and idea implementation. As well as, this result is supported by Shama & Ahmad, (2021) [22] who conducted a study to investigate the relationship between nurse's innovative work behavior and their job satisfaction, found that the highest percentage of the studied participants' had positive innovative behavior with the highest agreement upon the dimensions of nurses' support for innovation, nurses' vision, monitoring and work communication respectively.

Moreover, Kamel& Aref (2017) [9], pointed out that about half of staff nurses had a highly perception level toward innovative work behaviors; the results showed that about half of studied nurses always generate original solutions to solve problems and about two thirds of them always systematically introduce innovative ideas into work practices.

On the contrary, the previous findings were incongruent with the results of a study done by Ahmed, Ata & Abd Elhamid, (2019) [23] who revealed that about half of the nurses have a high perception level of innovative work behaviors. Furthermore, the previous findings were inconsistent with Abd El-Fattah, (2017) [24] who conducted a study about innovation behaviors levels and its relation with TIGER-based nursing informatics competencies among critical care nurses; that pointed out that more than half of participants had a moderate level of innovative work behaviors. Additionally these findings were incongruent with Jung &Yoon, (2018) [25] who revealed that participants showed a moderate perception level of innovative behavior.

Concerning the relationship between the leadership effectiveness dimensions and work innovative behaviors dimensions, the present study showed highly statistically significant positive correlations of staff nurses' perception toward leadership effectiveness and innovative work behaviors. This finding highlighted the significance of effective leadership and its crucial role in fueling the employees' innovative behaviors. As effective leaders focus on creating suitable social and working environment to achieve the organizational goals and caring for the needs of employees which positively affects organizational reputation. [26] Thus, employees may experience higher work performance and positive affect when they strongly identify with their effective leaders and moral organizations, which improves the likelihood that they will engage in creative activities. [27]

The previous result supported with a study done by Kul& Sonmez, (2021) [7] who demonstrated that, there was highly statistically positive correlation between leadership behaviors and nurses' innovative behaviors and job performance. Also, this finding was congruent with Dong & Zhong, (2021) [28] who reported that there was positive correlation between the responsible leadership and fostering the innovative behavior of employees through enhancing employees' self-esteem and subsequently motivate them to be more willing to exert creative endeavors.

In addition, this finding goes in the same line with Islam, Furuoka & Idris, (2020) [29] who revealed that there was a significant correlation between

transformational leadership and the employee's readiness for change and creativity. Also, this finding was congruent with Wang, Shen, Chen & Carmeli, (2021) [30] who reported that environmentally responsible leaders drive environmental innovation by developing a sense of collective environmental identification, which facilitates employees' engagement in the organizational innovation behavior.

Regarding to relation between staff nurses' Age, Experiences and educational level with both study variables, the current study indicated that there was significant statistical relation between staff nurses' age and experiences and total perception of innovative work behaviors. These results could be explained by familiarity and knowledge of expert and old nurses with work environment norms, rules, policies and procedures that qualify them to create innovative solutions and generating new ideas for solving the new problems. This finding was consistent with Mahgoub, Shazly, & El-sayed, (2019) [21] who clarified the presence of statistically significant relations between staff nurses' innovative behavior and their age and experience. Also the previous finding was in agreement with Bunpin, Chapman, Blegen,& Spetz, (2016) [31] who found that there was statistically significant difference between the nurses innovative behavior and their personal characteristics.

On the other hand, the previous finding was incongruent with Shama & Ahmad, (2021) [22] who revealed that there were no statistically significant differences between nurses' age, gender, and years of experience and their total innovative behavior respectively. Although the same study was in agreement with the current study finding that showed insignificant relation between the nurses educational level and their innovative behavior.

Moreover, the present study showed that there was no significant relation between staff nurses' educational level and innovative work behavior. This finding was incongruent with Mostafa & EL-Sayed, (2021) [19] who demonstrated that there was a statistically significant relationship between nurses' level of innovative work behaviors and their educational level. Also Bunpin, Chapman, Blegen, & Spetz, (2016) [31] who explored the connection between innovative work behaviors, work satisfaction, work engagement and burnout in Greece, and they revealed a significant relationship between nurses' levels of creative work behaviors and their educational backgrounds.

As regards to relationship between leadership effectiveness dimensions and personal characteristics of staff nurses, the study results demonstrated absence of statistically significant relation between staff nurses' perceptions of leadership effectiveness and their personal characteristics. This result was consistent with the result of Boerrigter, (2015) [32] who indicated that there is no direct relationship between leaders' age and leader effectiveness. Also, this finding was in the same line with Mohanty, Ara Begum, & Kar, (2016) [33] who found that age and work experience were negatively related to the leadership effectiveness. While this finding was incongruent with Ahmed, Ata& Abd Elhamid, (2019) [23] who revealed a statistically significant correlation

between nurses' perception of leadership behavior and their education and years of experience.

Conclusion

The present study concluded that nurses highly perceived leadership effectiveness and innovative work behaviors. There was statistically significant correlation between the total perception of staff nurses toward leadership effectiveness and their total perception of innovative work behaviors.

Recommendations:

- Raise the nursing leaders' awareness regarding the importance of building trust relationship with their followers.
- Nurse leaders must realize their crucial role in creating healthy work environment that allow nurses to think more creatively and generate new ideas
- Hospital administrators should support the nurse leaders and empower them and ensure the availability of needed resources to enhance their effectiveness.
- The nurse leaders should provide feedback and appreciate the nurses innovative efforts.
- Further research studies are recommended to detect the possible moderating factors that enhance the nurses innovative work behavior.

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Conflicts of interest

There are no conflicts of interest.

References

1. Ali BJ, Anwar G. Strategic leadership effectiveness and its influence on organizational effectiveness. International Journal of Electrical, Electronics and Computers. 2021 Mar 28;6(2).
2. Madanchian M, Hussein N, Noordin F, Taherdoost H. Leadership effectiveness measurement and its effect on organization outcomes. Procedia Engineering. 2017 Jan 1;181:1043-8.
3. Masood M, Afsar B. Transformational leadership and innovative work behavior among nursing staff. Nursing inquiry. 2017 Oct;24(4):e12188.
4. Cherian S, Karkada S. A review on leadership in Nursing. International journal of nursing research and practice. 2017;4(1):58-66.
5. Javed B, Khan AK, Quratulain S. Inclusive leadership and innovative work behavior: examination of LMX perspective in small capitalized textile firms. The Journal of psychology. 2018 Nov 17;152(8):594-612.
6. Ardueser C, Lehenbauer K. Traits of Effective Leaders: A Literature Review. In Proceedings of the 19th International RAIS Conference, October 18-19, 2020 Oct (No. 021al). Research Association for Interdisciplinary Studies.
7. Kül S, Sönmez B. The effect of nurse managers' servant leadership on nurses' innovative behaviors and job performances. Leadership & Organization Development Journal. 2021 Aug 11;42(8):1168-84.
8. Blank S. McKinsey's three horizons model defined innovation for years. Here's why it no longer applies. Harvard Business Review. 2019 Feb 1:1-5.
9. Kamel FF, Aref MA. Staff nurses' perception toward organizational culture and its relation to innovative work behavior at critical care units. American journal of nursing science. 2017 Jun;6(3):251-60.
10. Bani-Melhem S, Zeffane R, Albaity M. Determinants of employees' innovative

behavior. International Journal of Contemporary Hospitality Management. 2018 Mar 19.

11. Chatchawan R, Trichandhara K, Rinthaisong I. Factors affecting innovative work behavior of employees in local administrative organizations in the South of Thailand. International Journal of Social Sciences and Management. 2017 Jul 27;4(3):154-7.
12. Choi WS, Kang SW, Choi SB. Innovative behavior in the workplace: An empirical study of moderated mediation model of self-efficacy, perceived organizational support, and leader–member exchange. Behavioral Sciences. 2021 Dec;11(12):182.
13. Niinihuhta M, Häggman-Laitila A. A systematic review of the relationships between nurse leaders' leadership styles and nurses' work-related well-being. International Journal of Nursing Practice. 2022 Oct;28(5):e13040.
14. Zawawi AM, Kee DM, Sauking AS, Annis AW, Mustafa AN, Dehrab A, Chandel N. Factors Affecting Organizational Success: A Case Of Body Glove. Journal of the Community Development in Asia (JCDA). 2020 Jan 20;3(1):54-62.
15. Aarons GA, Ehrhart MG, Farahnak LR. The implementation leadership scale (ILS): development of a brief measure of unit level implementation leadership. Implementation Science. 2014 Dec;9:1-0.
16. Avolio BJ, Gardner W, Walumbwa FO. Authentic leadership questionnaire (ALQ). Default journal. 2007.
17. De Jong JP, Den Hartog DN. How leaders influence employees' innovative behaviour. European Journal of innovation management. 2007 Jan 30;10(1):41-64.
18. Abasilim UD, Gberevbie DE, Osibanjo OA. Leadership styles and employees' commitment: Empirical evidence from Nigeria. Sage Open. 2019 Jul;9(3):2158244019866287.
19. Abdel Azem Mostafa H, Hassan EL-Sayed Mahfouz H. Head nurses' leadership effectiveness, communication skills and mindfulness: It's' relation to staff Nurses' innovative work behavior. Egyptian Journal of Health Care. 2021 Mar 1;12(1):1011-32.
20. Abd El Muksoud NO, Metwally FG, Ata AA. Leadership Behaviors and Innovative Work Behaviors among Nurses. Zagazig Nursing Journal. 2022 Jul 1;18(2):1-4.
21. Mahgoub AE, Mostafa Shazly M, Mohammed El-sayed S. Relationship between work environment and innovative behavior among staff nurses. Egyptian Journal of Health Care. 2019 Sep 1;10(3):64-76.
22. Shama SS, Ahmad GM. The Relationship between Nurse's Innovative Work Behavior and Their Job Satisfaction. International Journal of Novel Research in Healthcare and Nursing. 2021, 8 (1), 596-606.
23. Ahmed AK, Ata AA, Abd-Elhamid ZN. Relationship between the leadership behaviors, organizational climate, and innovative work behavior among nurses. American Journal of Nursing Research. 2019;7(5):870-8.
24. Abd El MA. Innovation behavior levels and its relation with TIGER-based nursing informatics competencies among critical care nurses. Egyptian Nursing Journal. 2017 May 1;14(2):59.
25. Jung HS, Yoon HH. Improving frontline service employees' innovative behavior using conflict management in the hospitality industry: The mediating

role of engagement. Tourism Management. 2018 Dec 1;69:498-507.

26. Javed M, Ali HY, Asrar-ul-Haq M, Ali M, Kirmani SA. Responsible leadership and triple-bottom-line performance—do corporate reputation and innovation mediate this relationship?. Leadership & Organization Development Journal. 2020 May 4;41(4):501-17.
27. Voegtlin C, Frisch C, Walther A, Schwab P. Theoretical development and empirical examination of a three-roles model of responsible leadership. Journal of Business Ethics. 2020 Dec;167:411-31.
28. Dong W, Zhong L. Responsible leadership fuels innovative behavior: The mediating roles of socially responsible human resource management and organizational pride. Frontiers in psychology. 2021 Dec 10;12:5885.
29. Islam MN, Furuoka F, Idris A. Transformational leadership and employee championing behavior during organizational change: the mediating effect of work engagement. South Asian Journal of Business Studies. 2020 Oct 9;11(1):1-9.
30. Wang Y, Shen T, Chen Y, Carmeli A. CEO environmentally responsible leadership and firm environmental innovation: A socio-psychological perspective. Journal of Business Research. 2021 Mar 1;126:327-40.
31. Bunpin JJ, Chapman S, Blegen M, Spetz J. Differences in innovative behavior among hospital-based registered nurses. The Journal of Nursing Administration. 2016 Mar 1;46(3):122-7.
32. Boerrigter CM. How leader's age is related to leader effectiveness: Through leader's affective state and leadership behavior. Bachelor's thesis, University of Twente.2015.
33. Mohanty J, Ara Begum J, Kar B. Nuances of Leadership Effectiveness: Challenges of Context and Demographics. International Journal on Leadership. 2016;4(1):15.

Effect of Self-Learning Intervention on Knowledge, Attitudes and Care Provided among Nurses Caring for HIV\ AIDs Patients in Fever Hospitals

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Background: Self-directed learning is important for the ongoing professional education of nurses. Caring is one of the most attributes of nurses providing care for the patients with AIDS. So they are expected to have the knowledge, accurate practices, and positive attitudes toward such patients who have no chance to cure. **Aim:** Evaluate effect of self-learning intervention on knowledge, attitudes and care provided among nurses caring for HIV\ AIDs patients in fever hospitals. **Design:** Quasi-experimental study research. **Setting:** Tanta and Alexandria fever hospitals. **Subjects**: **79** nurses who provide direct care to HIV/ AIDS patients in previous settings **Tools:** Tool I: HIV knowledge Questionnaire **(HIVKQ 20**) which was developed by Carey and Schroder (2002); Tool II: **AIDS Attitude Scale** which was developed by Forman et al, (1992); Tool III: **Observation checklist** to assess practice of nurses dealing with HIV/ AIDS patients. **Results:** 54.4% of the studied nurses had low Knowledge scores and this percentage decreased to 5.1% post-self-learning program. The percentage of the nurses who had positive attitudes increased from 3% to 27.8 % in post-self- learning. The majority (92.4%) of them had unsatisfactory practice in pre-self-learning and this decreased to only 17.7% post-self-learning. Statistically significant correlation was found between total knowledge and attitude scores. **Conclusion and recommendation:** Self learning had a significant positive effect on knowledge, attitudes and different care aspects among studied nurses. So its recommended to encourage continuous learning and training among nurses working with AIDS patients with emphasize on maintaining positive attitudes and patients right to take optimal care regardless to his disease.

Keywords: Self-learning, Knowledge, Practices, Attitudes, HIV/ AIDS**.**

Introduction

Acquired immunodeficiency syndrome (AIDS) and the human immunodeficiency virus (HIV) is a global public health concerns. AIDS is one of the biggest challenges to our health system. Because more than 97.0% of infections occur in developing countries and are increasing every year, this epidemic is a threat to the South Pacific area. Egypt is reported to have the fastest-growing epidemic in the Middle East and North Africa Region. (1)

Acquired Immune Deficiency Syndrome is a syndrome that develops when the host's immune system has been compromised by the Human Immunodeficiency Virus. The first reported case of AIDS was in the mid of 1981 in the USA. In 2018 an estimated 37.7 million people were living with HIV with a global HIV prevalence of 0.7% among adults. In 2019 and 2020 an estimated 37.9 million people were living with HIV (including 1.8 million children), with a global HIV prevalence of 0.8% among adults. Since the start of the epidemic, an estimated 79.3 million people have become infected with HIV and 36.3 million people have died of AIDS-related illnesses (2-3).

In Egypt 2022, the MinistryHealth and population stated that, there was a gap between the number of HIV positive cases and the number of registered AIDS patients; the percentage of new cases of HIV- positive was increasing every year by 25%-30%, which is seen as a worrying sign that point toa dire need for increased investments to avoid further epidemic growth. In 2019, the average number of new cases of HIV in Egypt was (2470 per year). According to UNAIDS's 2021 statistics, there are about 28,000- 34,000 adults and children living with HIV in Egypt (4,5, 6)

There are two types of HIV that exist; HIV-1 which is common worldwide, and HIV-2 is only common in West Africa. HIV is spread from person to person through blood, breast milk, or other bodily fluids. This may occur through blood transfusions, hypodermic needles, or sexual contact. Mothers who have HIV while they are pregnant may spread the infection to their unborn children. UNICEF reported that HIV cases were concentrated among people who inject drugs and men who have sex with men in Cairo and Alexandria (7).

HIV-positive" refers to a person whose blood contains the retrovirus. HIV infection causes AIDS when the immune system is significantly damaged. Each individual experiences different types and levels of symptom severity. The HIV infection process has three stages. (8)

Stage1 is the stage which the person had after the entrance of the infection in to the body. It includes flu like symptoms such as: fever, sore throat, body ache, headache, muscle pain, swollen glands, rash, and upset stomach joint **(9)** **Stage 2** in which a lot of people may feel better for many years with no symptoms appear. However the virus is still be active and starts to infect new cells and making copies of itself. If the patient had no treatment, the immune system will affected by severe damage caused by HIV infection. (10) **Stage 3; in** which the person's immune system is severely damaged and the person's body cannot fight off the disease or infection. These infections are known as 'opportunistic infections: This stage include many symptoms that may appear such as weight

loss, night sweats, persistent fever, chronic diarrhea, skin problems, cough, serious illness and regular infections. The earlier a person is diagnosed with HIV and starts treatment, the better their health will be over time. (11)

Antiretroviral therapy (ART) is the treatment of HIV\ AIDS affected people with medications that suppress the replication of the virus. HIV diagnostics have a remarkable central role in assessing the progress in staging, initiating, and monitoring of infected individuals on life-saving antiretroviral therapy. In achieving epidemic control, the detection of HIV-specific antibodies and virus antigens was used. Antibodies to HIV-1 and HIV-2 are detected by (ELISA) test. (12)

Nurses have a main effective role in public health worldwide efforts that being directed toward AIDS pandemic **Community health nurse** roles may include direct caregiver, health educator, case manager, and advocate. Program planner, program coordinator, and policy advocate. (13)

Community health nurses play a major important role in prevention activities directed toward people who are living with HIV, by educating patients how to prevent transmission to the others who are HIV-negative.; Encourage persons living with HIV to reduce risk practices (sexual and/or substance use behaviors). Nurses play a vital role in caring for HIV/AIDS patients. (14)

Nurses 'role includes not only managing antiretroviral therapy but also providing counseling and education through explaining the mode of transmitting of HIV virus, especially for eligible couples, help HIV positive woman to understand the impact of infection and disease on pregnancy and breastfeeding; when necessary, linking mothers with child protection agencies to provide support and direction for HIV positive women, understanding the client's support systems, understand the implications of the aging process of clients, provide continuous support through ongoing reinforcement. Ensure that all processes are in place for patient follow-up e.g. primary care and public health supports. Also identify high-risk groups and patients contacts and educate them regarding HIV spread and its consequences and the importance of pre-prophylaxis for high-risk groups and screening for pregnant mothers at least twice. (15)

The person with HIV / AIDS is biologically, psychologically, socially, and spiritually affected when faced with the disease and communicates with youths and motivates talk regarding their sexual problems or STDs, so effective participation in nursing care for HIV / AIDS patients, is implied assistance in meeting emotional and spiritual needs. Nurses should consider all these aspects when providing care to HIV-infected patients (16)

Self-directed learning is important for the ongoing professional education of nurses. The benefits of self-directed learning include professional autonomy and independence besides motivation and increased choice. (17-18)

Nurses play a significant role in HIV-infected patients' prevention, care, and support. Nurses should follow all infection control precautions to protect themselves and protect their patients. They should follow all blood and body fluid precautions and injection and sharps precautions. Nurses' level of self-protection and level of comfort are positively influenced by higher levels of

knowledge about HIV/AIDS and more positive attitudes towards persons with HIV/AIDS. Discriminating attitudes of nurses toward HIV/ AIDS patients are identified by several studies. Healthcare workers stigmatizing attitudes against patients with HIV infection had been reported to be responsible for decreased retention in care, decreased medication adherence, and an increase in the number of new HIV infections. [19]

Significance of the study:

As a result of increasing HIV-positive cases annually in Egypt, UNICEF in collaboration with the Egyptian Ministry of Health and Population (MOHP) and National AIDS Program (NAP) recommended supplying Chain Magangemt System and Updating health professions HIV training Package (Information, Education and Communication) (IEC).

Self-learning education is important for nurses to acquire a set of guidelines that can potentially improve their knowledge and their practices when caring for and communicating with positive HIV cases and their contacts. Self-learning can be an attempt to improve the quality of care rendered to HIV-positive patients. They can provide optimal care for the patient and their contacts. Besides they can remove the misconception that they may have about the disease. [20]

The aim of this study was to determine the effect of self-learning intervention on knowledge, attitude, and care provided among nurses caring for HIV\ AIDS patients in fever hospitals

Research questions

What is the effect of self-learning intervention on nurses' knowledge, attitudes and care provided for patients with human immunodeficiency virus/AIDS in fever hospitals?

Subject and Methods

The quasi-experimental study research design was utilized in this study.

Setting

The study was conducted at the AIDS department in Tanta Fever Hospital and Alexandria Fever Hospital, which are affiliated with the Ministry of Health. The capacity of the AIDS department in Tanta fever hospital was 12 beds and in Alexandria fever hospital was 24 beds**.**

Subjects

A convenient sample of all 79 nurses who provide direct care to HIV/AIDS patients in previous settings was involved in the study; 37 nurses from Tanta fever hospital and 42 nurses from Alexandria fever hospital.

Tools of study

The researchers used three tools to collect the required data for this study

Tool (I): Structured Interview schedule

Which was used to assess the biosocial data and knowledge of nurses regarded HIV/AIDS; it included two-part as following; -

Part I: it included items related to socio-demographic data such as age, sex, marital status, education level, and years of experience working with HIV/AIDS patients and previous training courses related to HIV /AIDS.

Part (2); Nurses' knowledge regarding HIV/AIDS **which measured by using the nursing Human Immunodeficiency Virus Knowledge Questionnaire (HIVKQ 21) which was developed by** Carey and Schroder (2002) [21] and adapted by the researcher to measure nurse's knowledge of HIV. It includes 21 item covering (Causes, Risk factors,

Transmission, Prevention, Treatment and How to cope with HIV)

The scoring system of nurses regarding HIV knowledge

Each question was scored (1) point for the correct answer and (0) for in correct/false answers. The total score is equal to 21 and the nurse's level of **total knowledge** score was classified as follows: -

Low knowledge —<60% of the total knowledge score. (<13degrees)

Moderate knowledge —60-80% of the total knowledge score. (13-17 degrees)

High knowledge —>80% of the total knowledge score. (>17 degrees)

Tool (II): Nurses' attitudes toward HIV/AIDS **patients which is measured by using AIDS Attitude Scale (AAS)**

AIDS Attitude Scale was developed by Forman et al, (1992) [22] and adopted by the researcher. It is used for measuring the attitude of nurses toward HIV/AIDS patients. This scale consists of 21 statements and is based on a three-point Likert scale "disagree" "natural" and. "agrees". The questionnaire is composed of two correlated subscales; including the statement number which describes questions that denote therapeutic and positive viewpoints toward HIV/ AIDS which are fourteen empathetic items (6-14, 16-19, and 21). And other seven avoidant items were described as negative responses (Non-empathetic statements).

The total score of nurse's attitudes about HIV statement was calculated according to the nurse's answers as follows: -

The scoring of the statements was done through a three-point Likert scale agree (3), uncertain (2), and disagree (1), for positive empathetic statements. (1 agree, 2 uncertain, 3 for disagree for negative Non- empathetic statements.

The total attitude Score was calculated by summation of all items and classified into two categories as follows: -

Positive attitude: ≥75% of total attitude score (≥ 47degree)

Negative attitude: < 75% of total attitude score (<47 degrees)

Tool III Nurses' Practice Checklist (NPC):

An observation checklist was developed by the researcher to measure nurses' performance in caring for HIV/AIDS patients based on a literature review [23-25,].

It consisted of 48 practice items covering direct care proved to HIV/AIDS patients and clinical management which include:

1-Infection control measures which included (12) items.

2-Protective measures which included (8) items.

3-Injection and sharps disposal, which included (5) items.

4-counseling, which included (10) items.

5-Communication with HIV patients, which included (3) items

6-Managing antiviral therapy (ART), which included (7) items.

7-Health Education about HIV/ADIS, which included (3) items

The scoring system of nurse's performance regarding caring for HIV/AIDS patients:

The items which were done by nurses correctly took one point and those incorrectly done took zero. The total level of practice was calculated by summation of all items and classified as followed:

-Satisfactory practice: ≥80% of the total score. (≥38).

-Unsatisfactory practice: <80% of the total score (<38**)**.

Method

-Administration process

An official permission was obtained from the Dean of the Faculty of Nursing, Tanta University to the manager of fever hospitals in Tanta and Alexandria cities to facilitate the work of the researcher inside the hospital.

Ethical considerations

- An approval of the ethical committee of the faculty of Nursing, at Tanta University was obtained to conduct this study.

-the researcher will put confidentiality and privacy regarding the data collected into consideration.

- Nature of the study did not cause any harm or pain for the entire sample.

-Every nurse was informed about the purpose, nature, and benefits of the study, informed consent was obtained from all study nurses after providing an appropriate explanation about the purpose of the study, and each nurse was informed that she has the right to withdraw from the study at any time she wants.

- **The pilot study** was done on 10% of nurses to test clarity, applicability, and relevance and identify obstacles that may be encountered during data collection. Accordingly, the necessary modification was done. Those nurses were excluded from the sample.

-Validity and reliability

The study tools were tested for content validity by a jury of eight experts in the field of community health nursing and public health. The content validity index is 97.5 % according to the opinions of experts.

The reliability test was applied to the study tools using Cranach s alpha test and it was found to be = (.935).

Data collection

The collection of data was continued over a period of four months from the start of March 2021the to the end of June 2021.

The study was conducted throw three phases

1- **Initial assessment**: - in which the study nurses' knowledge, attitude, and practice were assessed study tools to develop the educational interventions based on nurses' assessment needs.

- Every participant nurse was observed individually, for her practices, throughout performances of caring for HIV/ADIS patients, using tool III, (via concealed observations). The observations were carried out throughout the three morning, evening, and night shifts.

- The participant nurses were interviewed, to collect data related to their knowledge and attitude about HIV/ADIS patients using tools (I) and (II) after explaining the purpose of the study.

The interviews were carried out throughout the break shift, and the answers were recorded in the tool.

2- Planning Phase: The related self- learning educational interventions were developed by the researcher\ based on the results of the assessment phase as well as a review of the related literatures. The developed self-learning educational interventions were prepared in Arabic language and were prepared

in a booklet in the Arabic language. The educational interventions booklet included essential information related to theoretical and practical as follows:

- **Theoretical content of the educational intervention:**

- An overview on, (Definition, Causes of HIV infection, risk factors of Human Immunodeficiency Virus, Ways of transmission of HIV disease, Important of nutrition and good lifestyle)

-Infection prevention and control practice, (Hand hygiene, personal protective equipment, safe injection practices, cleaning and disinfection of environment surface, waste management, sharps disposal, and linin management, screening /routine serologic testing and, as well as immunization of patients and health-care personnel, Prevention of HIV disease, and Treatment used for HIV infection.

- **Practical content of the educational intervention:**

- Direct care provided to HIV/AIDS patients and clinical management such as; Take complete medical history, Physical examination Laboratory evaluation, Counseling and communication with the patient and Managing anti-retroviral therapy (ART), The benefits of antiretroviral therapy (ART) for the patient's health and Preventing transmission of infection t o other through using universal blood and body fluid precautions at nurses workplace using personal protective equipment (PPE), Injection and sharps disposal measures.

Phase III: Implementation phase:

-In which the self-learning educational booklet was introduced to each participant nurse after conducting the initial assessment. Any explanations or clarifications about the content were provided.

- After 3 weeks, the researcher conducts a post-assessment to assess the effect of self-learning on nurses' level of knowledge, attitude, and practices toward HIV/AIDS patients using the study tools (Tool I part 2, tool II, and toll 3).

Phase IV: Evaluation phase: To determine the effectiveness of the educational interventions through self-learning.

- First evaluation (pretest) was carried out using all study tools for every nurse to evaluate their knowledge, attitudes, and practices before introducing the self-learning booklet.
- Second evaluation (posttest) was carried out 3 weeks after introducing the self-learning education intervention booklet.

Statistical analysis:

Data were fed to the computer and analyzed using IBM SPSS software package version 20.0**. (**Armonk, NY: IBM Corp**)** Qualitative data were described using numbers and percentages. The Kolmogorov-Smirnov test was used to verify the normality of distribution. Quantitative data were described using range (minimum and maximum), mean, standard deviation, and median. Pearson coefficient was used to correlate between two normally distributed quantitative variables. The significance of the obtained results was judged at the 5% level.

Results

Table 1: represents socio-demographic characteristics of the studied nurses. It shows that the mean age of the studied nurses was (39.61 ± 10.39) years and

30.4% of the studied nurses aged 40 – <50 years. More than half (57. %) of them were females and married. and nearly three-fifths (59.5%) of them were from rural areas. More than half (51.9%) of the studied nurses were bachelor's degree graduates, while 32.9% of them were graduates of nursing secondary school and the rest 15.2% of them were graduates of a nursing technical institute. The table shows also that, the mean years of experience was (6.25 ± 9.35) years. Slightly less than two thirds (60.8%) of them had 15 years of experience. Nearly two-thirds (64.6%) of studied nurses attended training courses related to human immunodeficiency virus, and 35.4% of them reported they didn't attend any training courses related to human immunodeficiency virus.

(Figure 1): shows the distribution of the studied nurses according to their total knowledge score regarding human immunodeficiency virus pre- and post-self-learning program implementation. The figure clarifies that pre-implementation of the self-learning program, more than half (54.4%) of the studied nurses had low Knowledge scores and this percentage decreased to 5.1 post-self-learning. On the other hand, in post – self-learning program implementation the percentage of nurses who had a moderate level of Knowledge increased from 45.6 to 89.9 post-self-learning. There was a statistically significant improvement occurring post-self-learning program implementation than pre-self-learning implementation ($p<0.05$).

Table 2: shows the distribution of the studied nurses according to their Attitude toward HIV/AIDS per and post-self-learning. It shows that a lot of misconceptions were identified among the studied nurses and this changed significantly post-self-learning. Their belief that homosexuality should be illegally changed from 69.6 to 100% after the self-learning intervention. 96.2% of nurses reported dealing with AIDS patients in a caring manner after self-learning compared to 58.2% pre-self-learning. About three-quarters (73.4%) of nurses had a sympathetic sensation toward the misery that people with AIDS experience compared to 49.49 pre-self-learning intervention. However, about two-thirds of 62.0% of them thought that patients who are positive should isolated in separate rooms and not be put in rooms with other patients, and this increased to 98.7 % after the self-learning intervention.

Moreover, the table shows also that, Feeling more sympathetic toward people who get AIDS from blood transfusions than those who get it from IV drug abuse post-self-learning changed from 68.4% to 100% after the self-learning intervention. Making something to help people with AIDS having easier life, is increased from 60.8% pre self-learning to 92.8% after self-learning. The table shows also changes in thoughts nurses have. Nurses who reported worrying about putting their families and friends at risk of contracting the disease If they were assigned to a patient with AIDS increased from 62 %to 84.8%, after the intervention and their thoughts that patients with HIV\AIDS have the right to the same quality of care as any other patients increased from 43.0% to 94.9%. After the intervention

(Figure 2): percent distribution of the studied nurses according to their total attitude scores regarding human immunodeficiency virus pre- and post-

self-learning program implementation. The table pointed out that post the implementation of the self-learning program the nurses' who had negative attitude scores decreased from 93.7% to 72.2%. On other hand, the percentage of nurses whom had positive attitudes improved from 3% to 27.8% in post self-learning ($p<0.001$). A significant improvement occurred in post self – learning program intervention than pre-self-learning ($p<0.001$).

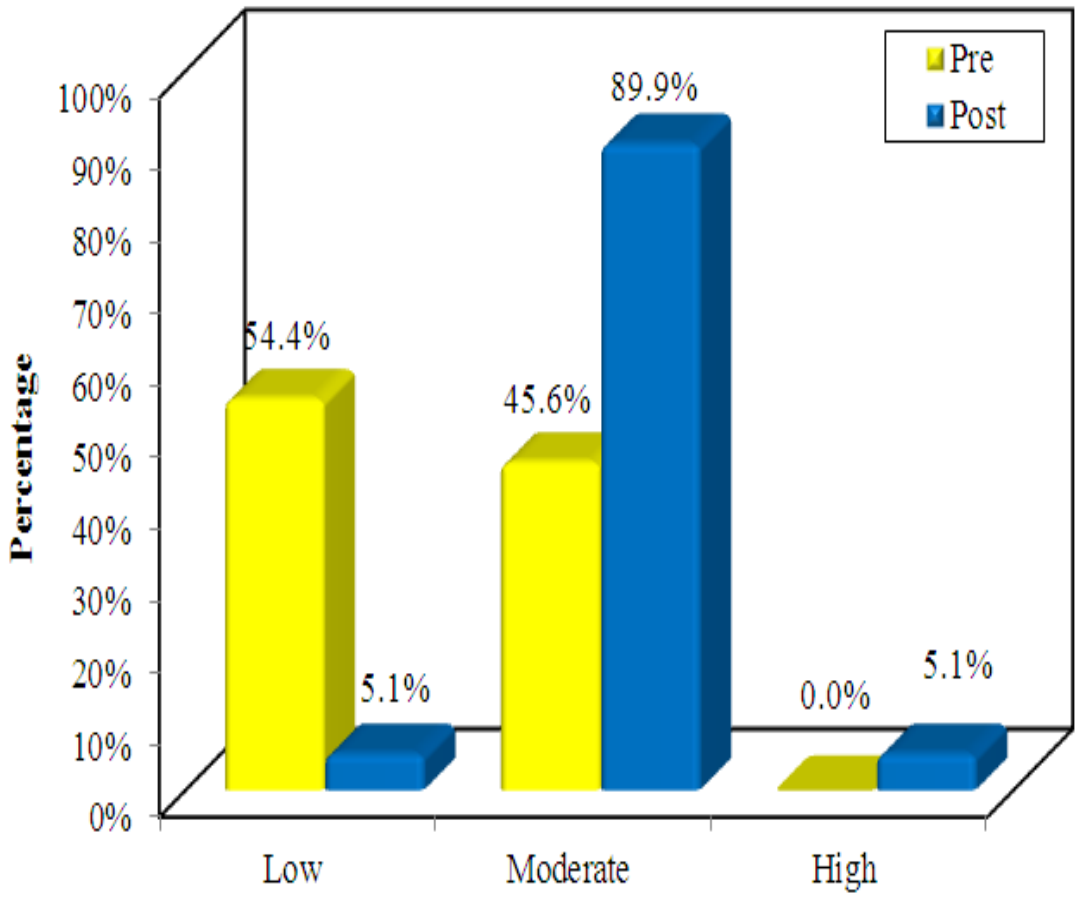
Table 3: shows percent distribution of the studied nurses according to their total score of practice items pre- and post-self-learning intervention. There was a statistically significant improvement in the total score of all practices regarding HIV/AIDS patient care. including infection control measures, injection procedures, sharps disposal pretest, counseling, communication with HIV patients, management of antiretroviral therapy (ART), and health education about HIV($p<0.001$). **The table and Figure (3)** shows also that, there was a statically significant improvement in the overall practice score of studied nurses in post-self-learning than pre-self-learning ($P<0.001$). The majority (92.4%) of the studied nurse had unsatisfactory practice in pre-self-learning and this decreased to only 17.7% post-self-learning. Satisfactory level of practice increased to 82.3% post-self-learning compared to 7.6% pre-self-learning

Table 4: displays the correlation between nurses' total knowledge, attitude, and practice scores post-self-learning. It reveals that there was a statistically significant correlation between nurses' total knowledge score and their attitude score post-self-learning implementation ($r=0.332$, $p=0.003$). However, there was not a significant correlation found between nurses' practice scores and their knowledge and attitude scores ($P=0.106$ and 0.341) respectively.

Table (5): shows the relationship between studied nurses' total knowledge, attitude, and practice scores regarding HIV/AIDS and their socio-demographic characteristics pre and post self – learning. The table shows a statistically significant relationship between the sex of the studied subject and the total knowledge and attitude scores of studied nurses and between nurses' resident and their practice scores. However, no significant relationship was found between other items of socio-demographic characteristics and total knowledge, practice, or attitude scores.

Table (I): Distribution of the studied nurses according to socio-demographic characteristics (n=79)

Socio-demographic characteristics	No.	%
Sex		
Male	34	43.0
Female	45	57.0
Age (years)		
<30	18	22.8
30 – <40	21	26.6
40 – <50	24	30.4
≥50	16	20.3
Range	22.0 – 58.0	
Mean ± SD.	39.61 ± 10.39	
Median	40.0	
Marital status		
Single	19	24.1
Married	45	57.0
Widower	5	6.3
Divorced	10	12.7
Residence		
Rural	47	59.5
Urban	32	40.5
Education		
Nursing Diploma	26	32.9
Technical Institute	12	15.2
Bachelor of Nursing	41	51.9
Number of years of experience		
<5	16	20.3
5 – <15	15	19.0
≥15	48	60.8
Range	1.0 – 35.0	
Mean ± SD.	16.25 ± 9.35	
Median	18.0	
Attended training workshop on HIV		
Yes	51	64.6
No	28	35.4



(Figure 1): Distribution of the studied nurses according to their total knowledge scores regarding HIV/AIDS pre and post self- learning (n=79)

Table (2): Distribution of the studied nurses according to their Attitude toward HIV/AIDS per and post-learning (n= 79)

Q	AIDS Attitude Scale (AAS)	Pre						Post					
		Disagree		Natural		Agree		Disagree		Natural		Agree	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	Most people who have AIDS have only themselves to blame	32	40.5	36	45.6	11	13.9	34	43.0	17	21.5	28	35.4
2	Most people who have AIDS deserve what they get	24	30.4	29	36.7	26	32.9	31	39.2	9	11.4	39	49.4
3	. Patients who are HIV-positive should not be put in rooms with other patients	1	1.3	29	36.7	49	62.0	1	1.3	0	0.0	78	98.7
4	. If I were assigned to a patient with AIDS, I would worry about putting my family and friends at risk of contracting the disease	18	22.8	12	15.2	49	62.0	9	11.4	3	3.8	67	84.8
5	Young children should be removed from the home if one of the parents is HIV positive	28	35.4	21	26.6	30	38.0	15	19.0	10	12.7	54	68.4
6	I think patients with AIDS have the right to the same quality of care as any other	31	39.2	14	17.7	34	43.0	3	3.8	1	1.3	75	94.9
7	. It is especially important to work with patients with AIDS in a caring work manner.	16	20.3	17	21.5	46	58.2	1	1.3	2	2.5	76	96.2
8	I think people who are IV drug users deserve to get	13	16.5	15	19.0	51	64.6	0	0.0	2	2.5	77	97.5

	AIDS												
9	I think women who give birth to babies who are HIV-positive should be prosecuted for child abuse	45	57.0	19	24.1	15	19.0	56	70.9	10	12.7	13	16.5
10	Homosexuality should be illegal	11	13.9	13	16.5	55	69.6	0	0.0	0	0.0	79	100
11	. I feel more sympathetic toward people who get AIDS from blood transfusions than those who get it from IV drug abuse	13	16.5	12	15.2	54	68.4	0	0.0	0	0.0	79	100
12	A homosexual patient's partner should be accorded the same respect and courtesy as the partner of a heterosexual patient	14	17.7	14	17.7	51	64.6	1	1.3	0	0.0	78	98.7
13	Patients with AIDS should be treated with the same respect as any other patient	2	2.5	3	3.8	74	93.7	1	1.3	0	0.0	78	98.7
14	If I found out that a friend of mine was a homosexual, I would not maintain the friendship	24	30.4	15	19.0	40	50.6	3	3.8	3	3.8	73	92.4
15	I'm worried about getting AIDS from social contact with someone	31	39.2	21	26.6	27	34.2	24	30.4	13	16.5	42	53.2
16	I am sympathetic toward the misery that people with AIDS experience	31	39.2	9	11.4	39	49.4	12	15.2	9	11.4	58	73.4
17	I would like to do something to make life easier for people with AID	5	6.3	26	32.9	48	60.8	0	0.0	6	7.6	73	92.4
18	I would do everything I could to give the best possible care to patients with AIDS	7	8.9	27	34.2	45	57.0	0	0.0	13	16.5	66	83.5
19	Children or people who get AIDS from blood transfusions are more deserving of treatment than those who get it from IV drug abuse	40	50.6	5	6.3	34	43.0	40	50.6	5	6.3	34	43.0
20	I would be worried about my child getting AIDS if I knew that one of his teachers was a homosexual	7	8.9	13	16.5	59	74.7	0	0.0	0	0.0	79	100
21	I have little sympathy for people who get AIDS from sexual promiscuity	56	70.9	16	20.3	7	8.9	70	88.6	5	6.3	4	5.1

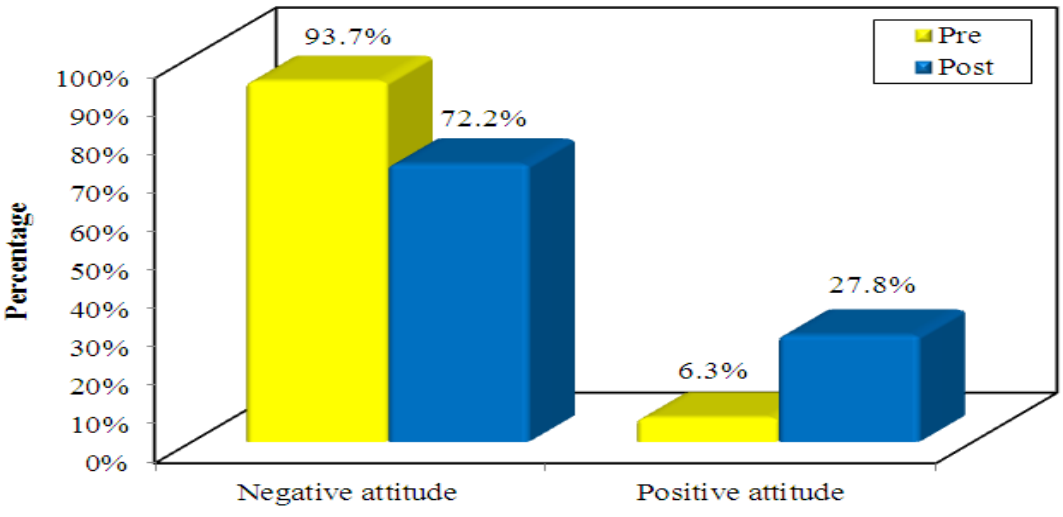


Figure (2): Distribution of the studied nurses according to their total Attitude score toward HIV/AIDS pre- and post-self-learning (n=79)

Table (3): Distribution of the studied nurses according to total Nurses' Practice scores pre and post self -learning (NPC) (n= 79)

Tool III Nurses' Practice Checklist (NPC)	Pre		Post		McNp
	No.	%	No.	%	
I. Practice related to following Infection control measures					
Unsatisfactory practice (<80%)	69	87.3	33	41.8	<0.001*
Satisfactory practice (≥80%)	10	12.7	46	58.2	
II. Practice related to injection procedures					
Unsatisfactory practice (<80%)	65	82.3	29	36.7	<0.001*
Satisfactory practice (≥80%)	14	17.7	50	63.3	
III. Practice related to Sharps Disposal					
Unsatisfactory practice (<80%)	43	54.4	8	10.1	<0.001*
Satisfactory practice (≥80%)	36	45.6	71	89.9	
IV. Practice related to Pretest counseling					
Unsatisfactory practice (<80%)	56	70.9	1	1.3	<0.001*
Satisfactory practice (≥80%)	23	29.1	78	98.7	
Counseling					
Unsatisfactory practice (<80%)	41	51.9	2	2.5	<0.001*
Satisfactory practice (≥80%)	38	48.1	77	97.5	
VI. Practice related to Communicating with HIV patients					
Unsatisfactory practice (<80%)	52	65.8	25	31.6	<0.001*
Satisfactory practice (≥80%)	27	34.2	54	68.4	
VII. Practice related to initiated and management of antiretroviral therapy (ART)					
Unsatisfactory practice (<80%)	50	63.3	7	8.9	<0.001*
Satisfactory practice (≥80%)	29	36.7	72	91.1	
VIII. Practice related to Health Education about HIV					
Unsatisfactory practice (<80%)	32	40.5	4	5.1	<0.001*
Satisfactory practice (≥80%)	47	59.5	75	94.9	
Overall practice					
Unsatisfactory practice (<80%)	**73**	**92.4**	**14**	**17.7**	**<0.001***
Satisfactory practice (≥80%)	**6**	**7.6**	**65**	**82.3**	

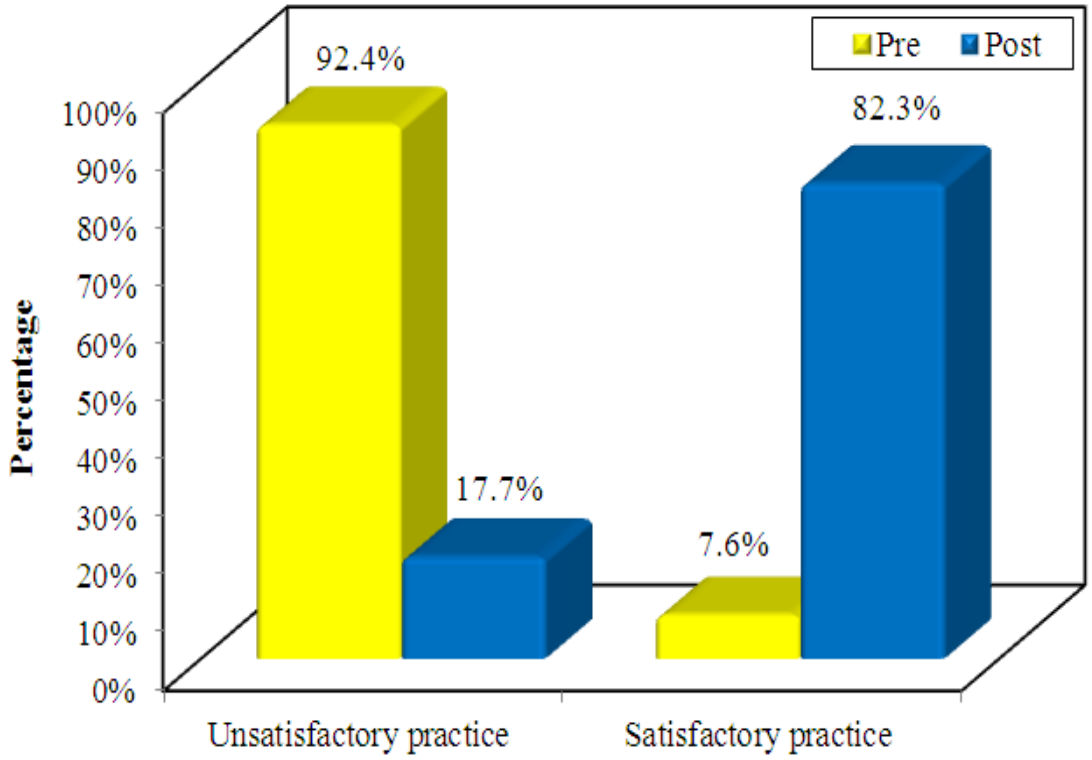


Figure (3): Distribution of the studied nurses according to total Nurses' Practice score pre and post self -learning (NPC) (n= 79)

Table (4): Correlation between total knowledge, attitude, and practice scores post-self-learning (n =79)

		Human Immunodeficiency Virus Knowledge	AIDS Attitude Scale (AAS)	Nurses' Practice Checklist (NPC)
Human Immunodeficiency Virus Knowledge	**R** **p**		0.332* 0.003*	0.183 0.106
AIDS Attitude Scale (AAS)	**R** **p**			0.108 0.341

r: Pearson coefficient

*: Statistically significant at $p \leq 0.0$

Table (5): Relationship between sociodemographic characteristics of the studied nurses and their total knowledge attitude, and practice scores regarding HIV/AIDS post self–learning (n = 79)

Socio-demographic characteristics	Overall Human Immunodeficiency Virus Knowledge						χ^2	MCp	Overall AIDS Attitude Scale (AAS) post-self-learning				χ^2	p	Overall total Nurses' Practice score (NPC)				χ^2	p
	Low (<60%) (n = 4)		Moderate (60 – 80%) (n = 71)		High (>80%) (n = 4)				Negative attitude (< 75%) (n = 57)		Positive attitude (≥75%) (n = 22)				Unsatisfactory practice (<80%) (n = 14)		Satisfactory practice (≥80%) (n = 65)			
	No.	%	No.	%	No.	%			No.	%	No.	%			No.	%	No.	%		
Sex																				
Female	4	100.0	26	36.6	4	100.0	11.011*	0.001*	19	33.3	15	68.2	7.863*	0.005*	5	35.7	29	44.6	0.372	0.542
Male	0	0.0	45	63.4	0	0.0			38	66.7	7	31.8			9	64.3	36	55.4		
Age (years)																				
<30	1	25.0	16	22.5	1	25.0			13	22.8	5	22.7			6	42.9	12	18.5		
30 – <40	1	25.0	20	28.2	0	0.0	6.289	0.265	15	26.3	6	27.3	0.091	0.993	3	21.4	18	27.7	3.417	MCp= 0.346
40 – <50	0	0.0	21	29.6	3	75.0			17	29.8	7	31.8			3	21.4	21	32.3		
≥50	2	50.0	14	19.7	0	0.0			12	21.1	4	18.2			2	14.3	14	21.5		
Marital status																				
Single	0	0.0	19	26.8	0	0.0			16	28.1	3	13.6			5	35.7	14	21.5		
Married	4	100.0	37	52.1	4	100.0	4.197	0.584	34	59.6	11	50.0	6.357	MCp= 0.083	8	57.1	37	56.9	1.779	MCp= 0.655
Widower	0	0.0	5	7.0	0	0.0			2	3.5	3	13.6			0	0.0	5	7.7		
Divorced	0	0.0	10	14.1	0	0.0			5	8.8	5	22.7			1	7.1	9	13.8		
Residence																				
Rural	2	50.0	45	63.4	0	0.0	6.150*	0.032*	34	59.6	13	59.1	0.002	0.964	4	28.6	43	66.2	6.751*	0.009*
Urban	2	50.0	26	36.6	4	100.0			23	40.4	9	40.9			10	71.4	22	33.8		
Education																				
Nursing Diploma	1	25.0	22	31.0	3	75.0			20	35.1	6	27.3			5	35.7	21	32.3		
Technical Institute	2	50.0	10	14.1	0	0.0	5.905	0.136	7	12.3	5	22.7	1.456	0.483	0	0.0	12	18.5	3.066	MCp= 0.204
Bachelor of Nursing	1	25.0	39	54.9	1	25.0			30	52.6	11	50.0			9	64.3	32	49.2		
Number of years of experience																				
<5	0	0.0	15	21.1	1	25.0			12	21.1	4	18.2			5	35.7	11	16.9		
5 – <15	2	50.0	13	18.3	0	0.0	3.131	0.513	10	17.5	5	22.7	0.401	MCp= 0.884	3	21.4	12	18.5	3.057	MCp= 0.201
≥15	2	50.0	43	60.6	3	75.0			35	61.4	13	59.1			6	42.9	42	64.6		
Attended courses on HIV																				
Yes	3	75.0	47	66.2	1	25.0	2.818	0.513	35	61.4	16	72.7	0.890	0.346	6	42.9	45	69.2	3.502	FEp= 0.073
No	1	25.0	24	33.8	3	75.0			22	38.6	6	27.3			8	57.1	20	30.8		

Discussion

Nurses play a pio-vital role in HIV-infected patients' care and support. A higher level of HIV/AIDS knowledge significantly impacts the nurses' level of comfort and self-defense and is favorable to more accepting attitudes toward people with the disease. [26] This study aims to evaluate the effect of self-learning intervention on nurses' knowledge, attitudes, and care provided to HIV\AIDS patients.

The present study reported that more than half of the studied nurses were females, married and their mean age was (39.61 ± 10.39) years, 30.4 % of them belonged to the age group of 40 – <50. More than three-fifths of them had ≥ 15 years of experience (**Table 1)**. This result agrees with **Abd El-aty et al., (2021) [27]** who conducted a study at the outpatient clinics of Zagazig Fever and Chest Hospital. They mentioned that the average age of the nurses in their study sample was 33.34 ± 7.99 and 91% of them were females and married. Their mean of work experience was 11.11±7.9 with slightly more than two-fifths having from12-<13 years of experience.

Regarding educational status, our study findings reported that more than half of the studied nurses were bachelor's degree graduates **(Table 1)**. **This result may be due to that nurse students insisting to complete their university degree, especially in rural areas.** This result agrees with **Yakin, et al (2021) [28]** who studied the knowledge of and attitude toward AIDS and what the variables predict them among Turkish university students who studying in Izmir and reveled that more than half (59.6 %) of their participants were registered in state universities.

Regarding the Attended training workshop on HIV/AIDS, the present study reveals that nearly two-thirds of the studied nurses attended training courses related to human immunodeficiency virus **(Table 1)**. This result disagrees with **Ibrahim et al (2019)** [29] who elaborates that their studied sample hasn't participated in AIDS training workshops, and 90.9% did not perform any training workshop about AIDS. **Our study result reflects the attention to in-service training in Tanta and Alexandria fever hospitals.**

The current study found that pre-implementation of the self-learning program, more than half of the studied nurses had low Knowledge scores and this percentage decreased to 5.1 in post-self-learning. On the other hand, in post –self-learning program implementation the percentage of nurses who had a moderate level of Knowledge increased from 45.6 to 89.9 post-self-learning **(Figure 1).** There was a statistically significant improvement in the total knowledge score post-self-learning program implementation. **This emphasized the importance of encouraging self-learning and offering guidance written material to nurses in this clinical area and the readiness of studied subjects to accept and retain the information through clinical practice with HIV patients.**

This result is contracting with **Ali et al., (2020)** [30] who study the nursing students' knowledge and attitude about HIV/AIDS in Sohag, Egypt, and found that nurses show good overall knowledge about HIV/AIDS. Most of the respondents (78.4%) had good knowledge. **This may be due to that his participants were nursing students and still had recent information about the disease.**

On the other hand, this result is in agreement with **Rai et al., (2016)** [31] who study the effect of educational intervention on knowledge regarding HIV/AIDS among nursing assistant students of Shree Birendra Hospital, Nepal,

and showed that there was also a significant change in knowledge in post-self-learning program implementation regarding knowledge about HIV. Also, **Al-Salihy et al. (2017)** [32] evaluate healthcare workers' HIV-related awareness and attitude of in Baquba Teaching Hospital as it consider as an important pillar in dealing with and managing an AIDS patient. The participant generally has good levels of knowledge

Also, **Mukherjee, et al (2016)** [33] who conducted a study at a tertiary care hospital in eastern India, reported also a statistically significant improvement in AIDS knowledge and attitudes. In a similar vein, **Abul-Fotouh et al. (2013)** [34] studied trends toward AIDS among Saudi nursing and predictions of readiness to provide care to patients in Saudi Arabia and reported a high level of knowledge among their participants after receiving the intervention.

Regarding nurses' attitudes toward HIV /AIDS, the present study illustrated that about two-thirds of studied nurses thought that patients who are HIV positive should not be put in rooms with other patients and this increased to 98.7 % after the self-learning intervention. **This may be explained that studied nurses may think that it is protection for the patients themselves from attracting further infections because of low immunity.**

Also, nurses' belief that homosexuality should be illegally changed from 69.6 to 100% after the self-learning intervention. Most of the nurses agree to work with in a caring work manner when caring of patients with AIDS after self-learning compared to half of them pre-self-learning; about three-quarters of them post-self-learning were feeling sympathetic toward the misery that people with AIDS experience compared to less than half of them pre-self-learning. Most of the studied nurses agree that AIDS patients have the same right to quality of care and respect (**Table 2**).

These results are in agreement with **James et al**., (2018) [35] who stated that .most participants reported a positive attitude toward people living with HIV. Also, the present study results are in agreement with **Boakye, et al., (2019)** [36] who study the determinants of knowledge, attitude, and practices of Ghanaian nurses towards persons living with HIV and AIDS in Kumasi and showed that the nurses have positive attitudes, with the majority showing greater agreement with positive statements, and more disagreement with negative statements about people living with HIV. The majority of the nurses strongly agreed with the statements 'patients with HIV/ AIDS have the right to the same quality of care as any other patient' and 'patients with HIV/AIDS should be treated with the same respect as any other patient.

The present study result revealed also that more than one-third of studied nurses agree that most people having AIDS have only themselves to blame and most of them diverse what they get after the self-learning program **(table 2)**. This result is in the same line as **Lui et al., (2014)** [37] who study attitudes and beliefs among nursing students about HIV and AIDS and explored that the majority (77.6%) indicated that they were afraid of contracting HIV through clinical practice. About a third of them believed that HIV and STIs are a punishment for immoral behavior.

Concerning studied nurses' total attitude score**,** the present study shows that most of the studied nurses had negative attitude scores and this percentage decreased to 72.2% in post – self-learning program implementation. On the other hand, the percentage of nurses who had positive attitudes increased from 6.3% to 27.8 % in post-self-learning. A statistically

significant positive change occurred in post self -learning program implementation **(Figure 2). This makes attention toward that HIV/AIDS patients still need to face discrimination in Egypt in society's health care system.**

The present study results are in agreement with **Yakin, et al., (2021)** [28] who reported that his participants have less discriminatory social attitudes toward people with HIV/AIDS and a negative attitude toward contact with people with AIDS

The present study results are also in agreement with **Eman, et al, (2011)** [38] who found that negative attitudes towards HIV-positive individuals were observed however, even after the intervention more than half of the study sample overall would avoid HIV-positive individuals at work or in public. **Abolfotouh et al (2013)** [34] who discover an overall negative attitude that the nursing students had toward AIDS, as, more than one-half of them negatively agreed that treating people living with HIV puts health workers at high risk with regard to attitude to precautionary measures. Also, the majority of students negatively agreed that AIDS patients and/or carriers be isolated from other patients (83.0%), have their care in specialized hospitals (89.6%), and not allowed to share a room with non-infected patients (81.8%).

Tern et al., (2015) [39] **who assessed** knowledge, attitudes, and practices on HIV/AIDS and the prevalence of HIV in the general population of Sucre, Bolivia found also that, the prevalence of attitudes of discrimination towards persons living with HIV/AIDS was very high. All these are important to be considered when designing preventive strategies as **it has been acknowledged that attitudes toward people living with HIV reduce the effectiveness of programmers and services**.

As regards to studied nurses' total practice score, the present study results show that most studied nurses had unsatisfactory total practice in the pre-self-learning phase while the majority of them had satisfactory total practice in the post-self-learning. There were highly statistically significant differences between the pre and post-test total practice scores **(figure 3)**. **This result may be because a significant proportion of them haven't participated in training workshops. Also, about half of the studied nurses are from rural areas where fields to earn health education are very narrow. On the other hand, this directed attention toward importance of encouraging self-learning among nurse caring for HIV\AIDS patients.**

This result agrees with **Ibrahim.et al (2019)** [29] who found that the majority of the participants had satisfactory total practice in the post-test and there were highly statistically significant differences between the pre-and post-phases regarding total practice scores.

The present study shows also that, there was an improvement in counseling, initiating and management of antiretroviral therapy, teaching patients how to correctly take their medications, assessment of side effects during ART, and teaching patients modes of transmission and causes of HIV/AIDS **in post-self-learning** than pre-self-learning (**Table 3**). Also, astatically significant improvement occurred in the most defective points of nurses' practices related to the prevention of the spread of HIV infection including wearing personal protective requirements, washing hands disposing of gloves, covering all wounds, using single-dose vials, and using single-dose vials **(Table 3).**

This result is in accordance with that of **Boakye et al (2019)** [36] in Ghana who reported that their participant had satisfactory practice

toward safety measures and that wearing gloves the last time they took a blood sample is reported by most of the them. **Ekundayo, et al (2018)** [40] found also that the percentage of nurses who were recapping needles at the time of the study was remarkably high, which became reduced after the intervention. Also, **Lui, et al., (2014)** [37] reported that the majority of participants stated that they would wear gloves to touch a patient who had or was suspected of having HIV and when changing the sheets of a patient with HIV.

Regarding infection control measures, nurses under study have a satisfying practice of safety measures regardless of educational level and years of experience. **(Table 3). This result may be due to the hospital's application of infection control standards as reported by nursing staff.** This result is supported by **Magdi, et al., (2013)** [41] who studied the nursing adherence to safety measures in Egypt and reported that 70% of the studied participants adhere to infection control measures and explored that the infection control team were adherence to managerial supervision.

Concerning communication skills, there were about one-quarter of the studied nurses had unsatisfactory communication practices. There was a statistically significant improvement in the total score of communication practices with HIV/AIDS patients occurring post-self-learning. The present study result is in agreement with **Lima et al. (2011)** [42] who studied communication between student nurses and AIDS patients and explored that it was difficult for nursing students to establish effective communication with HIV/AIDS patients. Also, **Magdi, et al., (2013)** [41] found that the communication skills of nurses under study were unsatisfying, however, nurses with bachelor's degrees had average good scores in communication skills.

The present study revealed that there was a statistically significant relationship between the total knowledge and attitude scores of studied nurses and their sex, however, there was no significant relationship found between total knowledge score and the other socio-demographic items including age, marital status, or education **(table 4).**

This result is a disagreement with **Okpala, et al. (2017)** [43] who assessed nurses' knowledge and attitude toward the care of HIV/AIDS patients in South East, Nigeria and found that there were significant relationships between age, marital status, and their level of knowledge. **This can be explained by knowledge and attitudes gained through experience and contact with the world around us.**

The present study revealed that there was a statistically significant relation between the residence of studied nurses and their total practice and knowledge scores. However, there wasn't a significant relationship between other socio-demographics **(Table 4**). This result is in the same line with **Ibrahim, et al (2019)** [29] who found that there was a statistically significant association between the place of family living of the studied sample with their total practice throughout the pre and post-test.

The present study revealed that there was a statistically significant relationship between nurses' total knowledge score and their attitude score post-self-learning implementation **(Table 5). This finding indicates that knowledge has an effective role in attitude, as knowledge increases attitudes become more positive and concepts are changed to the best.**

The present study is in the same line with **Said, et al., (2018)** [44] who found that there is a positive correlation between knowledge and attitude which indicates that the level of

knowledge can influence the attitude of the respondents. The results revealed that the relationship was statistically significant. **The results revealed that an increased level of knowledge led to a positive attitude toward people living with HIV Thus, knowledge via education is vital to change the perception and attitudes of nurses toward HIV Infection.**

On the other hand, the result of the present study disagrees with **Hafeez, et al., (2017) [45]** who conduct a study among tertiary care hospitals' healthcare providers in Lahore, Pakistan", and revealed that; (there is no significant relationship between knowledge and attitude of healthcare providers toward HIV/AIDS where they not affected by each other) as doctors have biased attitude mainly with contamination, however, they have high knowledge.

The present study is also disagreement with **Ali et al (2020) [30] who** revealed that there is no significant association was found between the knowledge and attitude of the studied students regarding HIV/AIDS. This means that the attitude and knowledge of studied nurses are built independently and explore the importance of focusing the attention of the faculty authorities on building better nurse-to-patient relationships that are based on developing confident skillful nurses that can deal and cope with HIV patients.

The present study revealed also, there was no statistically significant correlation between nurses' practice scores and their knowledge and attitude scores **(Table 12**).

This result agrees with **Nubed, C et al (2016) [46]** who assess Knowledge, attitudes, and practices regarding HIV/AIDS among senior secondary school students in Fako Division, South West Region, and Cameroon and found that a negative correlation was found to exist between knowledge and behaviors/practices but this was not significant.

However, regarding studied nurses who are already providing care for HIV/AIDS the present study results assure that encouraging continuous self-learning is essential to refresh their knowledge and changing their attitudes in the appositive direction toward such patients to improve nursing care provided to HIV/AIDS patients and helping them to improve their quality of life as possible.

Conclusion: Based on the findings of the present study, it can be concluded that nurses showed a significant improvement in their knowledge, practice, and extent attitudes toward patients with HIV/AIDS after the implementation of the self-learning program. There was a statistically significant positive correlation between nurses' total knowledge score and their attitude score.

Recommendations:

1-Develop educational interventions and continuous in-service training programs for fever hospitals nurses to improve their knowledge, attitude, and practices regarding HIV /AIDS.

2 Training should stress offering high-quality patient care and support **regardless of** the disease and assuring patients' rights and proper communications.

3-Stigma-reduction programs among healthcare workers are urgently needed to improve the quality of provided care, uphold human rights to healthcare, increase access to healthcare services, and maximize investments in HIV prevention and treatment.

4. Further research should be done regarding AIDS to promote the attitudes of HCWs, especially nurses to decrease the stigma toward caring for HIV /AIDS patients.

References

1-Nugraha A, Triyono E, Prahasanti C, Sufiawati I, Prasetyo R, Ernawati D. The

correlation of pathognomonic periodontal manifestation with CD4+ level in people live with Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome in a Tertiary Hospital, Surabaya, Indonesia. *Journal of International Oral Health*, 2019; *11*(3): 137

2-Dada S, Olanrewaju T, Aderibigbe A, Chijioke A, Rafiu M, Ajayi A. Prevalence of chronic kidney disease in newly diagnosed patients with human immunodeficiency virus in Ilorin, Nigeria. *Brazilian Journal of Nephrology*, 2015; *(37*): 177-184.3-World Health Organization Global Progress Report on HIV, viral hepatitis and sexually transmitted infections, 2021: accountability for the global health sector strategies 2016–2021: actions for impact.

4-El-Ghitany E, Farghaly A, Alkassabany Y. Prevalence and risk factors of HBV and HCV co-infection among people living with HIV in an Egyptian setting. *Current HIV Research*, 2021;*19*(6): 514-524.

5- El-sayed H. Ministery of Health and Population Report:people living with AIDS in Egypt. Available at: https://english.ahram.org.eg>News, 2021.

6- UNAIDS. Country Fact Sheets, Egypt 2021 HIV and AIDS estimates. Available at:- https://www.unaids.org>countries

7-Khalid K, Padda J, Khedr A, Ismail D, Zubair U, Al-Ewaidat O, Jean-Charles G. HIV and messenger RNA (mRNA) vaccine. *Cureus*, 2021*;13*(7).

8-Prabhu S, van Wagoner N. Human Immunodeficiency Virus Infection and Acquired Immunodeficiency Syndrome (HIV/AIDS): An Overview. *Sexually Transmissible Oral Diseases*, 2023; 51.

9- Crakes K, Jiang G. Gut microbiome alterations during HIV/SIV infection: implications for HIV cure. *Frontiers in microbiology*, 2019; *(10*): 1104.

10- Coghill A, Han X, Suneja G, Lin C, Jemal A, Shiels M. Advanced stage at diagnosis and elevated mortality among US patients with cancer infected with HIV in the National Cancer Data Base. *Cancer*, 2019; *125*(16): 2868-2876.

11- Deeks S, Overbaugh J, Phillips A, Buchbinder S. HIV infection. *Nature reviews Disease primers*, 2015; *1*(1): 1-22.

12-Santosa W, Staines-Urias E, Tshivuila-Matala C, Norris S, Hemelaar J. Perinatal outcomes associated with maternal HIV and antiretroviral therapy in pregnancies with accurate gestational age in South Africa. *Aids*, 2019; *33*(10): 1623-1633.

13-Rouleau G, Richard L, Côté J, Gagnon M , Pelletier J. Nursing practice to support people living with HIV with antiretroviral therapy adherence: a qualitative study. *The Journal of the Association of Nurses in AIDS Care*, 2019; *30* (4): e20.

14-Shamu S, Slabbert J, Guloba G, Blom D, Khupakonke S, Masihleho N, Nkhwashu N. Linkage to care of HIV positive clients in a community based HIV counseling and testing programme: a success story of non-governmental organizations in a South African district. *PloS one*, 2019*;14*(1): 0210826.

15-Vandali V. Nurses role in prevention of HIV/AIDS. *Journal of Clinical and Nursing Research*, 2020; *4*(2).

16- Mashallahi A, Rahmani F, Gholizadeh L, Ostadtaghizadeh, A. Nurses' experience of caring for people living with HIV: a focused ethnography. *International nursing review*, 2021;*68*(3): 318-327

. 17-Bihari A, Choudhari S, Srivastava A. Effectiveness of problem-based learning approach for teaching-learning biostatistics among medical students. *Journal of Education and Health Promotion*, 2021: *10*.

18-Shirke R, Rawat A, Chandar V, Walia J, Wasim S, Bhat N. Evaluation of the self-directed learning readiness of medical

undergraduates in pediatrics department: A study from medical college in Uttarakhand state of India. *Int J*, *5*, 2610.

19-Ali R. Knowledge and attitude of nursing students about HIV/AIDS in Sohag, Egypt. *Journal of High Institute of Public Health*, 2020*;50* (2): 80-86.

20-Herek G, Saha S, Burack J. Stigma and psychological distress in people with HIV/AIDS. In *Social Psychological Perspectives on Stigma* 2016; (49-62). Routledge

21- Carey M, Schroder K. Development and psychometric evaluation of the brief HIV knowledge questionnaire AIDS Education and Prevention. 2002; (14) 174-84

22-Froman R, Owen S, Daisy C. Development of a measure of Attitudes Toward Persons with AIDS. Journal of Nursing Scholarship. 1992;(24): 149-152.

23-Maura H. 6 Ways Nurses Can Provide Better Care for Patients Living with HIV/AIDS. Available from http//www.Florance – Health.com. December 2, 2019.

24-Geneviève R, , José CôtéR, Marie-Pierre G, Jérôme P. Nursing practice to support people living with HIV with antiretroviral therapy adherence: A Qualitative Study. J Assoc Nurses AIDS Care, 2019; 30(4): 20–37.

25-LindgrenT, Reyes D, Eller L, Wantl, D, and Portillo C. Reflect on HIV-related stigma through photo voice. Journal of the Association of Nurses in AIDS Care, 2016; 27(4): 404-418.

26-Wang Y, Yang Y, Shi X, Mao S, Shi N. The spatial distribution pattern of human immunodeficiency virus/acquired immune deficiency syndrome in China. *Geospatial health*, 2016; *11*(2).

27- El-aty A, Saad N, Mahmoud S. Effect of educational intervention on nurses' knowledge, practices and attitudes regarding human immunodeficiency virus/acquired immunodeficiency syndrome. *Assiut Scientific Nursing Journal*. 2021; *9*(25.0): 12-27.

28- Yakin I, Aydemir N. Knowledge of and attitude toward AIDS among Turkish University Students in Izmir. *J Comm Med and Pub Health Rep*.2021; *2*(1):

29- Ibrahim N, Shehab , Mossad A, Eleshabory, N. E. *Effect of AIDS education program on nursing students ' knowledge , attitude and practice at Faculty of Nursing at Port Said University*. *June*2019. https://doi.org/10.9790/1959-0802120817

30- Ali R. Knowledge and attitude of nursing students about HIV/AIDS in Sohag, Egypt. *Journal of High Institute of Public Health*,2020; *50*(2): 80-86.

31- Rai P, Adhikari A, & Bajracharya M. Effect of educational intervention on knowledge regarding HIV/AIDS among nursing Assistant students of Shree Birendra Hospital, Nepal. *Medical Journal of Shree Birendra Hospital*, 2016*; 15*(1): 9-16.

32- Al-Salihy S, Enad O. Knowledge and attitude of health care workers in Baquba Teaching Hospital toward HIV/AIDS infection. *Age*.2017; *25*(35): 118.

33- Mukherjee A, Dutta D, Banerjee S, Ringø E, Breines E, Hareide, Ghosh K. Potential probiotics from Indian major carp, Cirrhinus mrigala. Characterization, pathogen inhibitory activity, partial characterization of bacteriocin and production of exoenzymes. *Research in veterinary science*, 2016; *108* (8): 76-84.

34- Abolfotouh M, Al Saleh S, Mahfouz A, Abolfotouh S, Al Fozan H. Attitudes of Saudi Nursing Students on AIDS and Predictors of Willingness to Provide Care for Patients in Central Saudi Arabia. International Journal of Nursing, 2013; (2):13-24

35- James B, Kawano R, Sunday E, Chullapant K. Knowledge, Attitudes, and Practices on HIV/AIDS among College Students in Pampanga, Philippines. *Acta Medica Philippina*, 2022;*56*(17).

36- Boakye D, Mavhandu-Mudzusi A. Nurses knowledge, attitudes and practices towards patients with HIV and AIDS in Kumasi, Ghana. *International Journal of Africa Nursing Sciences*, 2019; *1* (*1)*: 100147.

37- Lui P, Sarangapany J, Begley K, Coote K, Kishore K. Medical and nursing students perceived knowledge, attitudes, and practices concerning human immunodeficiency virus. *International Scholarly Research Notices, 2014*.

38- Taher E, Abdelhai R. Nurses' knowledge, perceptions, and attitudes towards HIV/AIDS: Effects of a health education intervention on two nursing groups in Cairo University, Egypt. *Journal of Public Health and Epidemiology*, 2011;*3*(4): 144-154.

39- Terán Calderón C, Gorena Urizar D, González Blázquez C, Alejos Ferreras B, Rubio O, Bolumar Montrull, F, del Amo Valero J. Knowledge, attitudes and practices on HIV/AIDS and prevalence of HIV in the general population of Sucre, Bolivia. *Brazilian Journal of Infectious Diseases*, 2015 *;(19*):369-**375**.

40-Ekunday A, Alausa O, Amoran O, Adekunle M. Comparative effects of educational intervention on knowledge, attitude and practice regarding HIV/AIDS among hospital orderlies in two Tertiary Hospitals. *Annals of Health Research*, 2018; *4*(2):108-119

41- Magdi H, Abd El-Fatah S,Nawal A, Afefe A. Knowledge, attitudes and practice of nurses working with HIV/AIDS patients. *Egypt J Health Care*, 2013 ;(*4*):1-14

42-Lima I, Galvão M, Costa E, Freitas J. and Freitag L. Communication between Nursing Students and Patients with AIDS, 2011; Revista da Escola de Enfermagem da USP. 2011; 45(2):419-24 available at: http://www.scielo.br/pdf/reeusp/v45n2/en_v45n2a17.pdf

43- Okpala P, Uwak R, Nwaneri A, Onyiapat J, Emesowum A, Osuala E, Adeyemo F. Nurses' knowledge and attitude to the care of HIV/AIDS patients in South East, Nigeria. *Int J Community Med Public Health*. 2017; *4*(2): 547-53

44- Said N, Ab Hamid M. HIV knowledge, attitude, and perception among university students. *Environment-Behaviour Proceedings Journal*, 2018; (7) 3:153-160.

45-Hafeez T, Riaz S, Ali I, Irum N. A study of knowledge and attitude of health care providers working at tertiary care hospitals of Lahore, Pakistan (having HIV/AIDS treatment facility) towards HIV/AIDS. *Acta Medica International*, 2017; *4*(1):124.

46- Nubed C, Akoachere J. Knowledge, attitudes and practices regarding HIV/AIDS among senior secondary school students in Fako Division, South West n, Cameroon. *BMC public health*, 2016*; 16*(1): 1-10. Regio

Pancreaticoduodenectomy: Effect of Nursing Instructions and Oral Postoperative Nutritional Supplementation on Patients Outcomes

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Abstract

Background: Adequate dietary oral intake is important to maintain nutritional status for patients after pancreaticoduodenectomy. **Aim:** This study was conducted to evaluate the effect of nursing instructions and oral postoperative nutritional supplementation on outcomes of patients following pancreaticoduodenectomy. **Patients and methods:** Research design: Quasi experimental (non-randomized) design. Sample and setting: Thirty-four adult patients diagnosed with pancreatic cancer and underwent pancreaticoduodenectomy. Patients were assigned non-randomly into 2 groups. Admitted patients during the first six months in hepatobiliary surgical unit at Al-Rajhi Liver and Gastroenterology Assiut University Hospital were included as control group (16 patients), while patients admitted during the next six months were included as study group (18 patients). Tools: Patient assessment sheet, short-form mini nutritional assessment scale, and Clavien-Dindo classification of surgical complications. **Results:** Study finding revealed a statistical significant difference ($p = 0.0001$) with improvement in study group after 3 months postoperatively regarding nutritional status and albumin and protein levels. Reduced length of hospital stay for study group 10 (55.6%) less than 10 days compared to control group 10 (62.5%) from 10-15 days. Complications did not occur in about one-third of study group 6 (33.3%) compared to 3 (18.8%) in control group. **Conclusion:** Nursing instructions and oral postoperative nutritional supplementation reduced hospital stay, improved nutritional status, albumin and protein levels and reduced postoperative complications. **Recommendation:** Nursing instructions (educational booklet) and oral postoperative nutritional supplementation should be utilized in all liver and gastroenterology hospitals as teaching guide for patients undergoing pancreaticoduodenectomy.

Keywords: Nursing instructions; Oral postoperative nutritional supplementation; pancreaticoduodenectomy; Patients outcomes

Introduction

Pancreatic cancer is considered the fourth common cause of cancer death despite advancement in the medical and surgical care. Pancreatoduodenectomy is a surgical procedure for removal of tumors of the pancreatic head and the other periampullary structures. It is also known as the Whipple procedure. This surgical operation poses immense difficulties to surgeons as a result of complex as well as the highly difficult intra-abdominal dissection and repair of digestive system [1,2].

Pancreaticoduodenectomy is a complex operation that is associated with many potential postoperative complications. Many patients undergoing pancreaticoduodenectomy are malnourished due to their medical condition or difficulty eating in the face of abdominal pain or obstruction from pancreatic disease[3].

Most common postoperative complications of pancreaticoduodenectomy includes pancreatic leak/fistula, bile leak, intra-abdominal abscess, delayed gastric emptying, pulmonary complications, gastrointestinal complications, or postoperative hemorrhage require blood transfusion or reopening. Other postoperative complications related to surgical site include delayed wound healing, wound infection or dehiscence [4,5].

Malnutrition is shown to be a risk factor for postoperative complications following pancreatoduodenectomy. In addition, patients undergoing pancreatoduodenectomy, as patients with chronic pancreatitis or pancreatic cancer often are malnourished. The best route for postoperative nutrition following pancreatoduodenectomy remains unknown [6].

The nutritional aspect after pancreatoduodenectomy is an essential component of management and therefore nutritional assessment is recommended before and after pancreatoduodenectomy. Early initiation of oral intake with high protein supplement is recommended. However, there is no standardized protocol of nutrition progression after pancreatoduodenectomy [7].

Nurses should provide nutritional requirements essential to neutral balance and not favor metabolic and protein catabolism, it is so relevant in pancreatoduodenectomy. The addition of oral postoperative nutritional supplementation to diet should be considered once intake is tolerated, as it can aid in meeting nutritional needs and avoid use of artificial nutrition [8,9]. Dietary assessment should be the standard of care. Nursing management should directed to proper assessment of patients` nutritional status, weight, and symptoms. Patients should be monitored for nausea, liquid balance and weight loss. Medical and nursing team must ensure proper assessment of dietary status before and after surgery. Nurses should support patients before and after discharge and encourage patients to take active role in their own recovery. Patients education about postoperative nutrition/diet following pancreatoduodenectomy has a vital role in improving postoperative nutritional status. Patients should be informed about recommended and not recommended diet, nutritional supplementations, and necessary nutritional instructions to improve their recovery [10].

Significance of the study

Patients following pancreaticoduodenectomy is suspected to develop many potential nutritional problems and postoperative complications. However, there is no supporting data for widespread postoperative nutritional supplementation. The current study is conducted in an attempt to provide guide supporting the integration of appropriate oral postoperative nutritional support into overall management of patients following pancreaticoduodenectomy and define how appropriate oral postoperative nutritional support should be prescribed to provide optimal outcome.

Aim of the study

This study aimed to evaluate the effect of nursing instructions and oral postoperative nutritional supplementation on outcomes of patients following pancreaticoduodenectomy.

Research Hypothesis

This study hypothesized that patients undergoing pancreaticoduodenectomy will exhibit improvement in their outcomes post application of nursing instructions concerning proper nutrition and provide nutritional support; oral postoperative nutritional supplementation.

Operational definition

Patients outcomes: complications (Clavien-Dindo Classification), length of hospital stay, nutritional status (short-form mini nutritional assessment scale), weight, protein level and albumin level.

Subjects and Methods

Research design

Quasi-experimental design (non-randomized) was used.

S**etting**

The study was conducted in hepatobiliary surgical unit at Al-Rajhi Liver and Gastroenterology Assiut University Hospital.

Sample

Thirty-four adult male and female patients diagnosed with pancreatic cancer and underwent pancreaticoduodenectomy "through a period of one year". Patients assigned non-randomly into "study and control groups". Admitted patients during the first six months were included as control group (16 patients), while patients admitted during the next six months were included as study group (18 patients).

Inclusion Criteria:

- Patients diagnosed with pancreatic cancer and underwent pancreaticoduodenectomy.
- Aged 18-65 years.
- Able to tolerate oral intake.
- Malnourished or at risk of malnutrition (as defined by score less than 12 on short-form mini nutritional assessment scale).

Exclusion Criteria:

- Protein allergy.
- Dependent on artificial enteral feeding.
- End-stage renal disease undergoing dialysis.
- Pregnancy.

Sample size

G power software was used to calculate the study sample size as thirty patients (fifteen per group). Power 95 percent, effect size 0.8, and error 0.05 was used to test differences between two independent means two tailed.

Data collection tools:

Tool I. Patient assessment sheet

This tool was developed by the researchers after reviewing relevant literature and used to assess patients` demographic and medical data.

Part 1: Demographic data which included age and gender.

Part 2: Medical data: height, weight, body mass index (BMI), comorbidities, albumin

level and protein level, readmission and adjuvant therapy.

Tool II. The short-form mini nutritional assessment scale

It was designed by **Rubenstein et al., (2001)** [11] a six-item scale with scores ranging from "0 to 14" points. It used to assess nutritional status. Anthropometric measurements (weight loss and BMI), global assessment (mobility), and dietary questionnaire and subjective assessment (food intake, neuropsychological problems and acute disease). Score (12-14) = normal nutritional status, (8-11) = at risk of malnutrition, (0-7) = malnourished.

Tool III. Clavien-Dindo grading system for the classification of surgical complications:

It was developed by **Clavien et al., (2009)** [12] then reevaluated and modified by **Dindo et al., (2004)** [13]. It is used to classify postoperative complications rely on its life-threatening conditions, interventions required and disability. It scored as 0 = no complications, I = any deviations from normal postoperative course without pharmacological management, II = require pharmacological management, III a = require surgical, endoscopic or radiological management without general anesthesia, III b = the same as III a but require general anesthesia, IV a = life threatening complications necessitate admission to intensive care unit (single organ dysfunction), IV b = the same as 4a but with multiple organ dysfunction, V = death. Grade (I-II) is considered low grade while (III-V) considered high grade.

Tools validity

Content of this study reviewed and also approved by five experts (three medical-surgical nursing and two hepatobiliary surgery staff) to ensure validity of the current study content. Minor modifications were performed for the current study content according to the experts' opinion. The experts` opinion was concluded as the study content were valid and can be recommended. It was calculated and found tobe very beneficial = (0.36).

Tools reliability

Reliability for (tool II: the short-form mini nutritional assessment scale) using internal consistency (Cronbach's α) was 0.61. Interrater reliability for (tool III: Clavien-Dindo grading system for the classification of surgical complications) was high ranged from "0.88 to 0.91".

Pilot study

It done on (10 percent "6 patients") of the current study sample to test tools "clarity" and "feasibility" and estimate time needed to fill out. Minor modification was done, so pilot study sample (patients) included in present study sample.

Ethical considerations

Official approvals were obtained from faculty of nursing research ethical committee, as well as director of hepatobiliary surgical unit and outpatients clinic. The studied patients know their right regarding refusing to participate or withdrawing from study at any time. Patients assured of confidentiality of all data and privacy was maintained. Aim of study explained to every patients prior to data collection. Oral consent for participation was taken from every patient after reassurance about confidentiality and privacy.

Fieldwork description

Data collection was carried out through a period of one year in addition to 3 months follow up in the hepatobiliary surgical unit and outpatients clinic at Al-Rajhi Liver and Gastroenterology Assiut University Hospital.

Procedure

The present study proceeded using the following phases:

Assessment phase

Preoperatively, the researchers met selected eligible patients; control and study groups, each patient in the two groups was informed with aim and nature of current study and patients' agreements were obtained.

Assessments of all patients were established to collect baseline data.

The researchers prepared the training place, teaching aids and media (pictures, handouts; educational booklet) according to patients` needs. Also, the researchers arranged the teaching schedule based on the contents of the educational booklet and time availability.

Implementation phase

Each patient in both groups was interviewed by researchers with the attendance of one family member/caregiver who caring for patients. The time needed for filling out study tools was "25 - 30 minutes" rely on patients` responses.

Patients of control group received the routine hospital care/instructions without oral postoperative nutritional supplementation while patients of study group received the routine hospital care/instructions and the educational booklet developed by the researchers included instructions with illustrated photos and the recommended oral postoperative nutritional supplementation.

The researchers provide the study group patients with brief description to the surgery; pancreaticoduodenectomy and detailed explanation about common gastrointestinal problems following pancreaticoduodenectomy, necessary instructions concerning nutrition following pancreaticoduodenectomy and the recommended oral postoperative nutritional supplementation.

Nursing instructions about proper nutrition for patients following pancreaticoduodenectomy (educational booklet):

It was developed by the researchers in simplified Arabic language with illustrated photos after reviewing available resources, related literature and according to patients` needs. The researchers educate study group patients about necessary instructions concerning proper nutrition following pancreaticoduodenectomy and the recommended oral postoperative nutritional supplementation to improve their conditions. It consisted of information concerning:

Nursing instructions

- Definition of pancreaticoduodenectomy.
- Common gastrointestinal problems following pancreaticoduodenectomy.
- Instructions concerning proper nutrition following pancreaticoduodenectomy:
- Recommended oral postoperative nutritional supplementation:
- High protein supplement (whey protein), 60 gram total protein per day, administered via 3 times daily (20 gram protein per serving) in addition to amino acids, vitamins and minerals.
- Recommended and not recommended diet during the first 4-6 weeks following pancreaticoduodenectomy.
- Management of common gastrointestinal problems following pancreaticoduodenectomy.

The study group patients received "3 sessions daily" through hospitalization; in morning and afternoon shifts:

The first session: educate patients about definition of pancreaticoduodenectomy and the common gastrointestinal problems and

its management following pancreaticoduodenectomy. The time required was 35-40 minutes.

The second session: educate patients about instructions concerning nutrition following pancreaticoduodenectomy: recommended oral postoperative nutritional supplementation [high protein supplement (whey protein), 60 g total protein per day, administered via 3 times daily (20 g protein per serving) in addition to amino acids, vitamins and minerals]. The time required was 20 - 30 minutes.

The third session: educate patients about instructions concerning nutrition following pancreaticoduodenectomy: Recommended and not recommended diet during the first 4-6 weeks following pancreaticoduodenectomy. The time required was 30-40 minutes.

The study group patients were instructed to follow the instructions. They were given the "educational colored booklet" in simplified Arabic language with illustrated photos. Every patient in study group was given a copy of the illustrated booklet.

Oral postoperative nutritional supplementation (nutritional support):

The study group patients administered oral postoperative nutritional supplementation in the form of high protein supplement (whey protein), 60 gram total protein per day, administered via 3 times daily (20 gram protein per serving) in addition to amino acids, vitamins and minerals.

Evaluation phase

Patients were evaluated through a period of 3 months following pancreaticoduodenectomy for length of hospital stay, readmission, and adjuvant therapy (tool: I, part 2) and for postoperative complications (tool III: Clavien-Dindo grading system for the classification of surgical complications). After 3 months, patients were evaluated for weight, BMI, protein and albumin levels (tool: I, part 2) and for nutritional status (tool II: the short-form mini nutritional assessment scale) to evaluate the effect of nursing instructions and oral postoperative nutritional supplementation on patients outcomes.

Statistical analysis

Categorical variables described by [number and percent "N, %"], where continuous variables described by [mean and standard deviation "Mean, SD"]. Chi-square test or Fisher's exact test were used as appropriate to compare between categorical variables where compare between continuous variables by "independent-samples t-test" or "paired-samples t-test" as appropriate. A two-tailed "$p < 0.05$" considered statistically significant. Pearson correlation was used to show the association between variables. Analysis of data performed with "IBM SPSS 26.0 software

Results

Table (1): distribution of demographic and medical data of the studied groups. It shows no statistical significant difference between the two groups of patients regarding demographic data; age, gender [p.value = 0.980, 1.000 respectively] and medical data; comorbidities, readmission, adjuvant chemotherapy [p.value = 0.663, 0.932, 0.347 respectively]. Study group patients showed less length of hospital stay than control group patients with no statistically significant difference (p.value = 0.069).

Table (2): comparison between study and control groups as regard height, weight and body mass index preoperative and after 3 months postoperatively. It clarifies no statistically significant difference between patients of study and

control groups regarding preoperative weight and BMI (p. value = 0.112, 0.823 respectively) and after 3 months postoperatively (p. value = 0.325, 0.747 respectively). Both groups suffered from postoperative weight loss after 3 months.

Table (3): comparison between study and control groups as regard protein level, albumin level and the short-form mini nutritional assessment scale preoperative and after 3 months postoperatively. It shows no statistically significant difference between the study and control groups regarding preoperative protein level (p. value = 0.669), albumin level (p. value = 0.100) and the short-form mini nutritional assessment scale (p. value = 0.360). A statistically significant difference between the study and control groups after 3 months postoperatively regarding protein level (p. value = 0.029) and albumin level (p. value = 0.039). Highly statistically significant difference was found after 3 months postoperatively regarding the short-form mini nutritional assessment scale (p. value <0.001). Protein level, albumin level and the short-form mini nutritional assessment scale scores were increased and showed significant improvement in study group patients than control group patients.

Table (4): comparison between preoperative and after 3 months postoperative regarding weight and body mass index for patients of study and control groups. It clarifies that significant reduction in weight and BMI after 3 months postoperatively was found in both study and control groups patients. A highly statistically significant difference (p. value 0.0001) was found between the mean preoperative weight, BMI (63.7±9.2, 24.78±2.67 respectively) and the mean weight, BMI after 3 months postoperatively (59.02±9.8, 22.92±3.2) for study group patients. A statistically significant difference (p. value 0.0001) was found between the mean preoperative weight, BMI (71.35±17.29, 25.06±4.55 respectively) and the mean weight, BMI after 3 months postoperatively (63.85±17.71, 22.47±4.91) for control group patients.

Table (5): comparison between preoperative and after 3 months postoperative

protein level and albumin level for patients of study and control groups. It clarifies highly statistical significant difference (p. value 0.0001) between the preoperative and after 3 months postoperative mean scores of protein level (71.44±2.38, 75.91±3 respectively), and albumin level (34.06±2.82, 8.89±1.32 respectively) for study group patients. A highly significant improvement was obvious in protein level, and albumin level after 3 months postoperatively in patients of study group. Patients of control group showed no statistically significant difference between the preoperative and after 3 months postoperative mean scores of the protein level (71.88±3.4, 73.78±2.34 respectively), and albumin level (36.19±4.43, 35.85±3.06 respectively) for control group patients. Reduction was found in the protein level and albumin level mean scores after 3 months postoperatively.

Figure (1): relationship between preoperative and after 3 months postoperative short-form mini nutritional assessment scale for patients of study and control groups. It illustrates that highly statistically significant difference (P. value = 0.004) was found between preoperative and after 3 months postoperative short-form mini nutritional assessment scale scores for study group patients. More than half of study group patients were

malnourished in preoperative assessment while the majority of them were at risk of malnutrition after 3 months postoperatively. No statistically significant difference (P. value = 0.156) was found between preoperative and after 3 months postoperative short-form mini nutritional assessment scale scores for patients of control group; more than half of them were at risk of malnutrition in preoperative assessment while two-third of them were at malnourished after 3 months postoperatively.

Table (6): frequency distribution of the studied patients as regard Clavien-Dindo grading system for the classification of surgical complications. It clarifies that study group patients were having less postoperative complications than control group patients with no statistical significant difference between both groups of patients (p. value 0.809).

Figure (2): correlation between albumin level and protein level for study group patients. It illustrates that positive correlation was found between albumin level and protein level for study group patients with statistically significant difference (r = 0.477, p. value = 0.045). The albumin level increased with increased protein level.

Figure (3): correlation between protein level and the short-form mini nutritional assessment scale for study group patients. It illustrates that positive correlation was found between protein level and the short-form mini nutritional assessment scale for study group patients with statistically significant difference (r = 0.581, p. value = 0.012). The short-form mini nutritional assessment scale scores increased with increased protein level.

Figure (4): correlation between albumin level and the short-form mini nutritional assessment scale for study group patients. It illustrates that positive correlation was found between albumin level and the short-form mini nutritional assessment scale for study group patients with statistically significant difference (r = 0.659, p. value = 0.003). The short-form mini nutritional assessment scale scores increased with increased albumin level.

Table (1): Distribution of demographic and medical data of the studied groups

P. value	Study group (n=18)		Control group (n=16)		X^2	P. value
	No	%	No	%		
Age						
Less than 50 years	4	22.2	4	25.0	0.040	0.980
From 50 > 60 years	8	44.4	7	43.8		
60 - 65 years	6	33.3	5	31.3		
Mean±SD	54.2±12.4		57.9±9.1		**T**=0.981	0.334
Gender						
Male	12	66.7	10	62.5	0.064	1.000
Female	6	33.3	6	37.5		
Comorbidities						
None	6	33.3	7	43.8	4.976	0.663
Diabetes mellitus	4	22.2	4	25.0		
Hypertension	4	22.2	2	12.5		
Cardiac disease	1	5.6	0	0.0		
Pulmonary disease	0	0.0	1	6.3		

Diabetes mellitus and hypertension	2	11.1	1	6.3		
Hypertension and pulmonary disease	0	0.0	1	6.3		
Length of hospital stay						
Less than 10 days	10	55.6	3	18.8	5.34	0.069
From 10- 15 days	5	27.8	10	62.5		
More than 15 days	3	16.7	3	18.8		
Readmission						
No	17	94.4	15	93.8	0.01	0.932
Yes	1	5.6	1	6.3		
Did the patient start adjuvant chemotherapy?						
Yes	15	83.3	15	93.8	0.89	0.347
No	3	16.7	1	6.3		

Independent-samples t-test Chi-square test and Fisher's exact test

Non significant p > 0.05

Table (2): Comparison between study and control groups as regard height, weight and body mass index preoperative and after 3 months postoperatively

	Preoperative				**After 3 months postoperatively**			
	Study group (n=18)	**Control group (n=16)**	**T**	**P.value**	**Study group (n=18)**	**Control group (n=16)**	**T**	**P.value**
	Mean±SD	**Mean±SD**			**Mean±SD**	**Mean±SD**		
Height	160.39±7.6	167.88±7.78	-2.82	0.008**	160.39±7.6	167.88±7.78	-2.82	0.008**
Weight	63.7±9.2	71.35±17.29	-1.64	0.112	59.02±9.8	63.85±17.71	-1.00	0.325
Body mass index	24.78±2.67	25.06±4.55	-0.23	0.823	22.92±3.2	22.47±4.91	0.33	0.747

Independent-samples t-test Non significant p > 0.05

Significant p < 0.01

Table (3): Comparison between study and control groups as regard protein level, albumin level and the short-form mini nutritional assessment scale preoperative and after 3 months postoperatively

	Preoperative				After 3 months postoperatively			
	Study group (n=18)	Control group (n=16)	T	P.value	Study group (n=18)	Control group (n=16)	T	P. value
	Mean±SD	Mean±SD			Mean±SD	Mean±SD		
Protein level	71.44±2.38	71.88±3.4	-0.43	0.669	75.91±3	73.78±2.34	2.29	0.029*
Albumin level	34.06±2.82	36.19±4.43	-1.69	0.100	38.01±2.77	35.85±3.06	2.15	0.039*
The short-form mini nutritional assessment scale	7.33±1.19	7.69±1.01	-0.929	0.360	8.89±1.32	6.5±1.75	4.518	<0.001**

Independent-samples t-test Significant p < 0.01

Table (4): Comparison between preoperative and after 3 months postoperative regarding weight and body mass index for patients of study and control groups

	Study group (n=18)				Control group (n=16)			
	Preoperative	After 3 months Postoperatively	T	P.value	Preoperative	After 3 months Postoperatively	T	P.value
	Mean±SD	Mean±SD			Mean±SD	Mean±SD		
Weight	63.7±9.2	59.02±9.8	5.65	0.0001**	71.35±17.29	63.85±17.71	8.40	0.0001**
Body mass index	24.78±2.67	22.92±3.2	5.95	0.0001**	25.06±4.55	22.47±4.91	8.49	0.0001**

Paired-samples t-test Significant p < 0.001

Table (5): Comparison between preoperative and after 3 months postoperative protein level and albumin level for patients of study and control groups

	Study group (n=18)				Control group (n=16)			
	Preoperative	After 3 months Postoperatively	T	P.value	Preoperative	After 3 months Postoperatively	T	P.value
	Mean±SD	Mean±SD			Mean±SD	Mean±SD		
Protein level	71.44±2.38	75.91±3	-4.83	0.0001**	71.88±3.4	73.78±2.34	-2.02	0.062
Albumin level	34.06±2.82	38.01±2.77	-6.85	0.0001**	36.19±4.43	35.85±3.06	0.23	0.818

Paired-samples t-test Significant p < 0.001

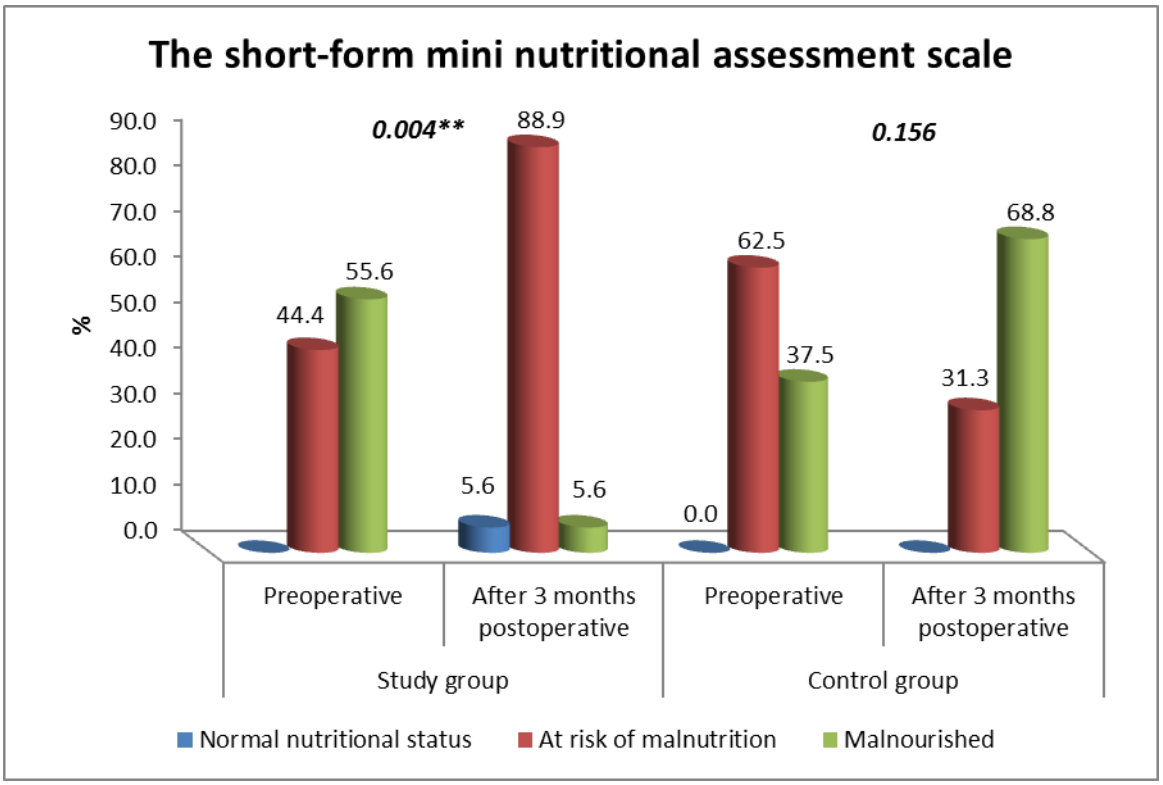

Figure 1. Relationship between preoperative and after 3 months postoperative short-form mini nutritional assessment scale for patients of study and control groups

Table (6): Frequency distribution of the studied patients as regard Clavien-Dindo grading system for the classification of surgical complications

	Study group (n=18)		Control group (n=16)		X^2	P. value
	No	%	No	%		
Clavien-Dindo postoperative complications						
Pancreatic fistula	1	5.6	1	6.3	3.00	0.809
Biliary fistula	0	0.0	1	6.3		
Chyle leak	3	16.7	1	6.3		
Pulmonary (pneumonia)	2	11.1	2	12.5		
Impaired wound healing	2	11.1	2	12.5		
Gastrojejunostomy leak and Chyle leak	0	0.0	1	6.3		
Chyle leak and gastrointestinal complications	1	5.6	1	6.3		
Grades						
No complications	6	33.3	3	18.8	1.03	0.905
Grade I (low grade)	3	16.7	4	25.0		
Grade II (low grade)	6	33.3	6	37.5		
Grade III a (high grade)	2	11.1	2	12.5		
Grade III b (high grade)	1	5.6	1	6.3		

Chi-square test and Fisher's exact test Non significant p > 0.05

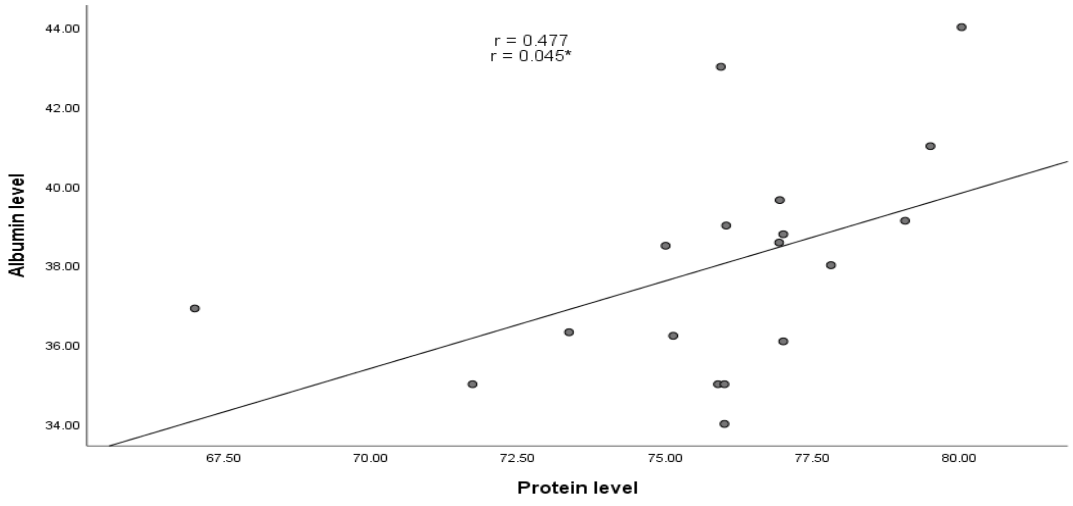

Figure 2. Correlation between albumin level and protein level for study group patients

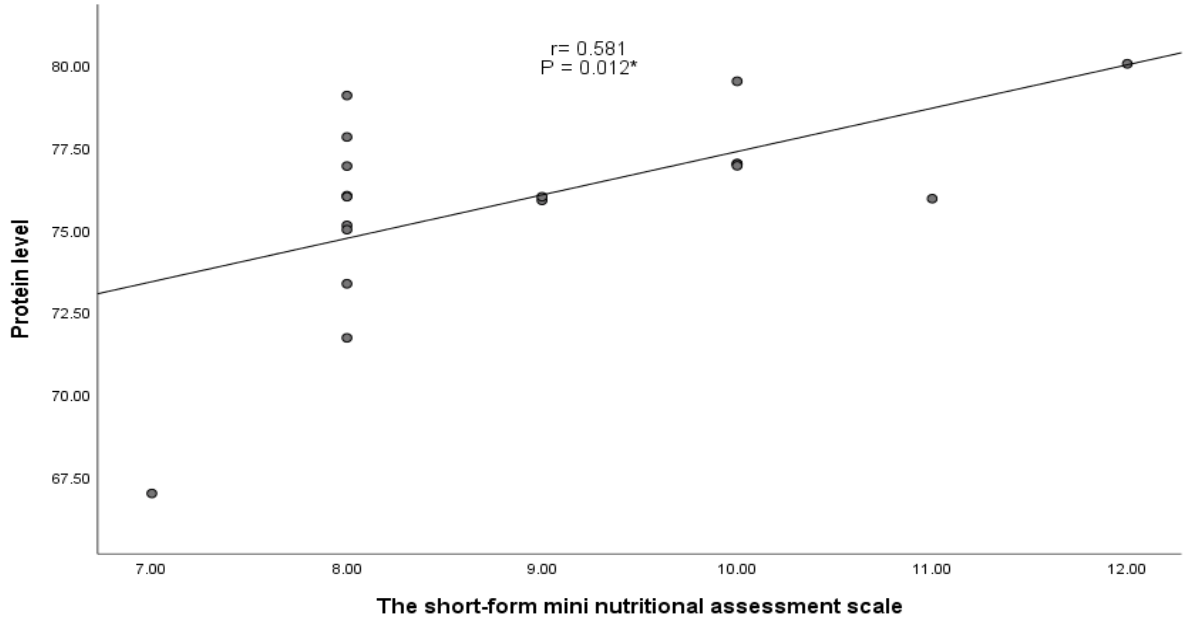

Figure 3. Correlation between protein level and the short-form mini nutritional assessment scale for study group patients

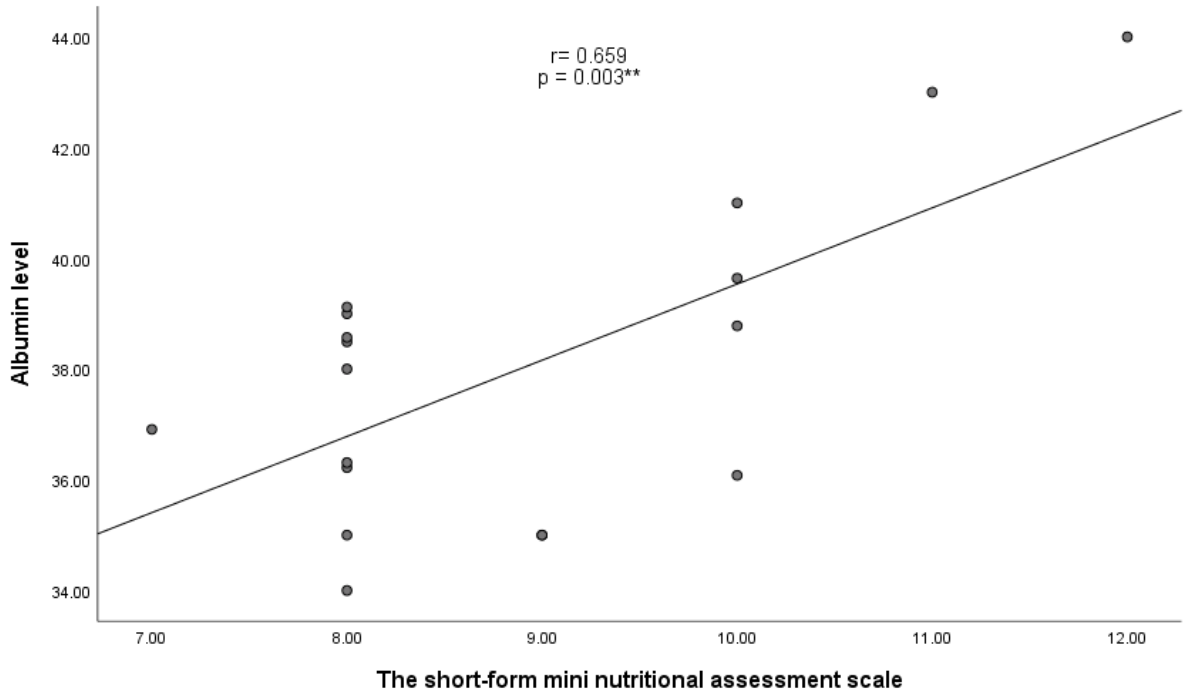

Figure 4. Correlation between albumin level and the short-form mini nutritional assessment scale for study group patients

Discussion

Patients who underwent pancreaticoduodenectomy mainly experience impairment in digestive function which affect nutritional status. Consequences of malnutrition in the preoperative and postoperative periods influence postoperative outcomes of patients including hospital day, complications, and survivals [(14)]. Improvement of postoperative outcomes of patients can lead to improving patients` nutritional status, reducing postoperative complications and cost savings for hospital. Advanced practitioners must be aware of the need for prompt and early nutritional consultations for those patients [(15)]. So, this study aimed to evaluate effect of nursing instructions and oral postoperative nutritional supplementation on outcomes of patients following pancreaticoduodenectomy

In the current study, no statistically significant difference was found between patients of study and control groups regarding medical data included comorbidities, adjuvant chemotherapy, preoperative weight, BMI, protein level, albumin level and the short-form mini nutritional assessment scale scores. More than half of patients in both groups suffered from preoperative malnutrition. Fewer percent of patients had hypertension, diabetes mellitus, cardiac disease and/or pulmonary diseases. The majority of patients in both groups received adjuvant chemotherapy.

In the same line, **Wang et al., (2022)** [(16)] conducted study on three hundered- forty four patients who underwent pancreaticoduodenectomy reported no statistical significant difference regarding comorbidities, adjuvant chemotherapy and preoperative BMI and albumin level. Some patients were having hypertension, diabetes mellitus, hyperlipidemia, pulmonary diseases or coronary artery disease, congestive heart failure. Some patients received adjuvant chemotherapy or radiotherapy. Patients suffered from preoperative poor nutritional status, low albumin level and BMI.

From researchers' point of view, preoperative malnutrition considered common health problem in patients with pancreatic cancer and this closely due to immunosuppression and inflammatory activity and the majority of those patients may require adjuvant chemotherapy/radiotherapy after surgery. This opinion was supported by **Song et al., (2019)** [(17)] who stated that preoperative malnutrition is common health problem in cancer patients as a result of immunosuppression and inflammatory activity produced by the disease. In addition, study of **Morita et al., (2019)** [(18)] reported that postoperative chemotherapy was recommended for many pancreatic cancer patients.

In the current study, study group patients showed less length of hospital stay than patients in control group. More than half of patients in study group (fifty-five percent) hospitalized for less than ten days while more than half of patients in control group (sixty-two percent) hospitalized from ten to fifteen days. Also, no statistical significance difference was found regarding readmission to hospital.

A study conducted by **Gerritsen et al., (2014)** [(19)] on one hundred and two consecutive patients undergoing pancreaticoduodenectomy supported the result of the current study as they stated that introduction of early oral nutrition/feeding after pancreaticoduodenectomy reduced hospital stay.

From researchers' point of view, a shortening of hospital stay through the introduction of nursing instructions and oral postoperative nutritional supplementation reduced the length of hospital stay for study group patients.

In the current study, no statistically significant difference was found between patients of study and control groups regarding weight and BMI after 3 months postoperatively. Both groups suffered from postoperative weight loss after 3 months postoperatively with statistically significant difference.

The current study supported by the study of **Morita et al., (2019)** [18] who stated that weight loss and low BMI was obvious among patients after pancreaticoduodenectomy and explained that adjuvant chemotherapy after pancreaticoduodenectomy significantly influence patients prognosis led to significant reduction in weight and BMI. Body weight (≥10 %) after pancreaticoduodenectomy is predictive of chemotherapy discontinuation and recommended that adequate nutritional is necessary for patients receiving adjuvant chemotherapy.

The findings of current study demonstrated that protein level, albumin level and the short-form mini nutritional assessment scale scores showed significant improvement in study group patients than control group patients after 3 months. The majority of study group patients were at risk of malnutrition after 3 months postoperatively while two-third of control group patients were malnourished after 3 months postoperatively. Also, the findings illustrated positive correlation between albumin level, protein level, and the short-form mini nutritional assessment scale for study group patients with statistical significant difference.

In this regard, a study of **Rungsakulkij et al., (2019)** [20] reported that albumin level is objective indicator of nutritional status which associated with postoperative outcomes for patients with pancreaticoduodenectomy.

Hypoalbuminemia associated with decreased survival in patients underwent pancreaticoduodenectomy.

The current study supported by study of **Ward-Boahen and Wallace-Kazer, (2014)** [15] who stated that nutritional status for patients with pancreatic cancer and underwent pancreaticoduodenectomy should include assessment of weight, diet, protein and albumin levels. Improvement in postoperative outcomes of patients can translate into significant improvement in patients` nutritional status, reducing postoperative complications and cost savings for hospital. Advanced practitioners must be aware of the need for prompt and early nutritional consults for those patients.

From researchers' point of view, the slight increase in the albumin and protein levels, and the short-form mini nutritional assessment scale scores after 3 months postoperatively compared to preoperative assessment for study group patients might be due to the effect of nursing instructions and oral postoperative oral supplementation which provided to the study group patients.

According to the current study finding, study group patients showed less postoperative complications than control group patients with no statistical significant difference. Postoperative complications did not occur in about one-third of study group patients while less than one-third of control group patients did not have postoperative complications. Postoperative complications included pancreatic fistula, biliary fistula, chyle

leak, pulmonary (pneumonia), Impaired wound healing, gastrojejunostomy leak and/or gastrointestinal complications.

A study of **Gerritsen et al., (2014)** [19] who conducted on one hundred and two consecutive patients underwent pancreaticoduodenectomy supported the finding of present study which stated that introduction of early oral nutrition after pancreaticoduodenectomy reduced length of hospital stay and there was no statistical difference in the incidence of postoperative complications of Clavien-Dindo between the two groups of patients.

The current study finding supported by study of **Karim et al., (2018)** [4] who stated that pancreaticoduodenectomy has high rate of postoperative complications. Higher rate of postoperative wound infection and bleeding was found. Other complications included pancreatic leak and fistula, pulmonary complications, and intra-abdominal collections.

From the researchers point of view, nutritional status and postoperative complications are key factors that affect recovery of pancreatic cancer patients who underwent pancreaticoduodenectomy. So, oral nutritional support provided to patients of study group helped in improving nutritional status of patients and reducing postoperative complications.

Finally, consequences of malnutrition on patients` postoperative outcomes included higher rate of postoperative complications, increased length of hospital day and poor survivals. So, nutritional intervention for patients with pancreatic cancer and underwent pancreaticoduodenectomy was recommended to lower the impact of malnutrition on patients` outcomes and to offer hope for prolonged survival [14,21,22].

Study limitations

1. Small sample size.
2. The present study covered a short observation/follow up period.

Conclusions

The study findings implied that nutritional status of patients following pancreaticoduodenectomy was associated with postoperative outcomes. Oral postoperative adequate nutritional supplementation was important to improve postoperative outcome of patients underwent pancreaticoduodenectomy. Nursing instructions and oral postoperative nutritional supplementation improved patients` outcomes; lessen postoperative hospital stay, improve nutritional status, increased albumin and protein levels and fewer postoperative complications.

Recommendations

The current study recommends that:

1. Nursing instructions and oral postoperative nutritional supplementation should be provided for all patients underwent pancreaticoduodenectomy to reduce length of hospital stay, improve nutritional status, albumin and protein levels, and reduce postoperative complications.
2. Nursing instructions and oral postoperative nutritional supplementation should be started as early as possible and encouraged as a routine practice for patients underwent pancreaticoduodenectomy.
3. The educational booklet, which contained detailed nursing instructions with illustrated photos and the recommended oral postoperative nutritional supplementation should disseminating to all patients underwent pancreaticoduodenectomy.
4. For further studies, the researchers recommend conducting future studies to examine whether preoperative/postoperative malnutrition affects long-term survival for patients underwent pancreaticoduodenectomy.

References

1. Jiang Y, Zhang R, Zhou Y. Comparison of overall survival and perioperative outcomes of laparoscopic pancreaticoduodenectomy and open pancreaticoduodenectomy for pancreatic ductal adenocarcinoma: a systematic review and meta-analysis. BMC cancer. 2019 Dec;19:1-9.
2. Strobel O, Neoptolemos J, Jäger D, Büchler M. Optimizing the outcomes of pancreatic cancer surgery. Nature reviews Clinical oncology. 2019 Jan;16(1):11-26.
3. Weismann A, Braga M Carli F, Higashiguchi T, Hübner M, Klek S, Singer P. ESPEN guideline: clinical nutrition in surgery. Clinical nutrition. 2017. 36(3), 623-650.
4. Karim S, Abdulla K, Abdulkarim Q, Rahim FH. The outcomes and complications of pancreaticoduodenectomy (Whipple procedure): Cross sectional study. International Journal of Surgery. 2018 Apr 1;52:383-7.
5. Uysal A, Unal E, Karaosmanoglu A, Arellano R, Ciftci T, Akinci D, Akhan O. The role of interventional radiology in the treatment of patients with pancreatic cancer. The British Journal of Radiology. 2021 Feb 1;94(1118):20200702.
6. Joliat G, Martin D, Labgaa I, Melloul E, Uldry E, Halkic N, Fotsing G, Cristaudi A, Majno-Hurst P, Vrochides D, Demartines N. Early enteral vs. oral nutrition after Whipple procedure: Study protocol for a multicentric randomized controlled trial (NUTRIWHI trial). Frontiers in oncology. 2022;12.
7. Gianotti L, Paiella S, Frigerio I, Pecorelli N, Capretti G, Sandini M, Bernasconi DP. ERAS with or without supplemental artificial nutrition in open pancreatoduodenectomy for cancer. A multicenter, randomized, open labeled trial (RASTA study protocol). Frontiers in Nutrition. 2023 Mar 27;10:491.
8. Qiao P. Improving Diagnosis of Pancreatic Ductal Adenocarcinoma Through Magnetic Resonance Molecular Imaging of the Extracellular Matrix (Doctoral dissertation, Case Western Reserve University), 2022
9. Mesa E, Figueroa C, Llanos J, Pereda P, Gómez M. Nutrition management in enhanced recovery after abdominal pancreatic surgery. Cirugía Española (English Edition). 2017 Aug 1;95(7):361-8.
10. Takagi K, Domagala P, Hartog H, van Eijck C, Groot Koerkamp B. Current evidence of nutritional therapy in pancreatoduodenectomy: Systematic review of randomized controlled trials. Annals of gastroenterological surgery. 2019 Nov;3(6):620-9.
11. Rubenstein L, Harker J, Salvà A, Guigoz Y, Vellas B. Screening for undernutrition in geriatric practice: developing the short-form mini-nutritional assessment (MNA-SF). The Journals of Gerontology Series A: Biological Sciences and Medical Sciences. 2001 Jun 1;56 (6):M366-72.
12. Clavien P, Sanabria J, Strasberg S. Proposed classification of complications of surgery with examples of utility in cholecystectomy. surgery. 1992 May 1;111(5):518-26.
13. Dindo D, Demartines N, Clavien P. Classification of surgical complications: a new proposal with evaluation in a cohort of 6336 patients and results of a survey. Annals of surgery. 2004 Aug 1;240(2):205-13.

14. Jin J, Xiong G, Wang X, Peng F, Zhu F, Wang M, Qin R. The impact of preoperative and postoperative malnutrition on outcomes for ampullary carcinoma after pancreaticoduodenectomy. Frontiers in Oncology. 2021:5004.
15. Ward-Boahen D, Wallace-Kazer M. Improving surgical outcomes in pancreatic surgery with preoperative nutrition. Journal of the Advanced Practitioner in Oncology. 2014 Mar;5(2):100.
16. Wang X, Littau M, Fahmy J, Kisch S, Varsanik M, O'Hara A, Pozin J, Knab L, Abood G. The impact of immunonutrition on pancreaticoduodenectomy outcomes. Surgery in Practice and Science. 2022 Sep 1;10:100106.
17. Song C, Cao J, Zhang F, Wang C, Guo Z, Lin Y, Shi Y, Hu W, Ba Y, Xu H, Li W. Nutritional risk assessment by scored patient-generated subjective global assessment associated with demographic characteristics in 23,904 common malignant tumors patients. Nutrition and cancer. 2019 Jan 2;71(1):50-60.
18. Morita Y, Sakaguchi T, Kitajima R, Furuhashi S, Kiuchi R, Takeda M, Hiraide T, Shibasaki Y, Kikuchi H, Konno H, Takeuchi H. Body weight loss after surgery affects the continuity of adjuvant chemotherapy for pancreatic cancer. BMC cancer. 2019 Dec;19:1-0.
19. Gerritsen A, Wennink R, Besselink M, van Santvoort H, Tseng D, Steenhagen E, Rinkes I, Molenaar I. Early oral feeding after pancreatoduodenectomy enhances recovery without increasing morbidity. HPB. 2014 Jul 1;16(7):656-64.
20. Rungsakulkij N, Tangtawee P, Suragul W, Muangkaew P, Mingphruedhi S, Aeesoa S. Correlation of serum albumin and prognostic nutritional index with outcomes following pancreaticoduodenectomy. World Journal of Clinical Cases. 2019 Jan 1;7(1):28.
21. Deftereos I, Yeung J, Arslan J, Carter V, Isenring E, Kiss N, Cardamis A, Dorey A, Ottaway A, Maguire B, Cleeve B. Adherence to ESPEN guidelines and associations with postoperative outcomes in upper gastrointestinal cancer resection: results from the multi-centre NOURISH point prevalence study. Clinical Nutrition ESPEN. 2022 Feb 1;47:391-8.
22. Phillips M, Hopper A, Leeds J, Roberts K, McGeeney L, Duggan S, Kumar R. Consensus for the management of pancreatic exocrine insufficiency: UK practical guidelines. BMJ open gastroenterology. 2021 Jun 1;8(1):e000643.

Efficacy of Murdoch Bowel Protocol on Constipation among Patients with Hip and Pelvic Surgery

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Abstract

background Constipation is a troubling condition that can happen to anyone, but it has much concern in patients with limited physical mobility as patient with orthopedic disorder. **Aim of the study was To** evaluate the efficacy of Murdoch bowel protocol on constipation among patients with hip and pelvic surgery ***Study design***: was Quasi- experimental. ***Setting***: The study conducted in Tanta International Teaching Hospital. **Subjects**: The sample included 80 patients who were adults (21- 60 years), conscious and newly admitted to orthopedic department. ***Tools:*** Three tools were enrolled in the study for data collection: **Tool (I)** patients' sociodemographic sheet and health relevant data ", **Tool II:** Bristol Stool Form Scale. **Tool III**: Constipation Assessment Scale. ***Results:*** shows that the majority of patients 86.4% in study group and three quarters 75% of control group patients had constipation at the beginning of the study but at the end of study period after application of Murdoch bowel protocol only 11.1 %of study group had constipation compared to less than three quarters of control group patient. ***Conclusion:*** The Murdoch bowel protocol had great effect in prevention and management of constipation for patients with hip or pelvic surgery with a highly statistically significant difference between study and control group through period of the study as P value =0.000*. ***Recommendation:*** implementation of Murdoch bowel protocol for all orthopedic patients in orthopedic department for assessment and management of constipation.

Key words: constipation , hip or pelvic surgery, Murdoch

Introduction

The Pelvic fractures is widely considered to be one of the most complex and fatal lesions, accounting for 2–8% of all skeletal injuries with mortality rate of 5to16% [(1)]

Patients hospitalized in orthopedic units for management of hip or pelvic fracture are at risk of constipation due to different factors as enforced immobility, receiving of contributory medical treatment as opioids , reduced dietary and fluid intake, use of bad pans in the period following surgery and long- term hospitalization, which can lead to other complications, including fatal bowel obstruction [(2)] Constipation is defined as difficult, incomplete, or irregular bowel movements or have defecation less than three bowel a week. It is associated with bowel symptoms such as hard or infrequent stool passage with feeling of incomplete evacuation and difficulty in passing stool.[(3)].

The prevalence of constipation in the general population worldwide ranges from 0.7 to 79% with median 16%[(4)]Its incidence in post-operative orthopedic patients is about 40% – 60% [(5)]. Patients with constipation may have complications such as fecal impaction, and hemorrhoids, and others syndromes such as mental confusion, urine retention, intestinal obstruction and even vasovagal syncope[(6)].

Nurses are first-line professionals in implementing non pharmacological interventions that improve constipation amongst adults in long-term care settings. Therefore, a multi-disciplinary team developed the Murdoch Bowel Protocol which is a bowel management tool depend on general best practice guidelines for constipation and including the Bristol Stool Chart which is a standardized instrument used to record stool type and classify it into seven types. Murdoch Bowel protocol is applied according to day of admission and type of stool in for the patient [(7)]

Significance of the study

Early exploration of constipation and its risk factors among hospitalized orthopedic patients has gained the attention of researchers worldwide[(8)]. so the aim of this study was to evaluate the efficacy of Murdoch bowel protocol on constipation among patient with hip and pelvic surgery.

The aim of the study

To evaluate the efficacy of Murdoch bowel protocol on constipation among patients with hip and pelvic surgery

Research Hypothesis

Patients who receive Murdoch bowel protocol post hip and pelvis surgery will exhibit improvement of bowel function with minimal complication related to constipation.

Subjects and Method

Study design

A quasi- experimental design was utilized in this study.

Setting: The study was conducted at orthopedic department at Tanta University Teaching Hospital. The department has two parts for male and female; male ward have 6 rooms 3 of them have 6 beds in each. and other 3 rooms have 3 beds in each and have 3 single rooms .The female part have 3wards each of them have 3 beds and one single room .Total number of bed is(40).

Subjects

The sample of this study consisted of: A convenient sample of 80 adult patients of both sexes admitted to the above mentioned setting and diagnosed with hip or pelvic surgery were included in this study.

The study subjects were divided into two equal groups

Group (1): Study group: - 40 patients who managed by Murdoch bowel protocol of care by the researcher.

Group (2): Control group: - 40 patients who managed according to routine bowel management in hospital by nursing staff by giving laxative in case of patients complain.

Inclusion criteria :patients were Adult (21-60 years),patients were Conscious , Newly admitted to orthopedic department and on enteral feeding .

Exclusion criteria :Patients on parenteral nutrition, patient with bowel disorder such as(inflammatory bowel disease or peptic ulcer), Patients who had chronic constipation (doesn't respond to dietary fiber or simple therapeutic meals)

Tools of data collection

Three tools were used in this study to collect pertinent data related to the study purpose as follow **:**

Tools of the study:

Tool (1) Patients' sociodemographic sheet and health relevant data:

This tool was constructed by the researcher and developed in Arabic language after reviewing relevant recent literatures to collect baseline data pertinent to the current study. It was consist of two parts as follow:

Part I- Sociodemographic Data This part concerned with patients' age, gender, marital status, educational level, occupation and residence.

Part II- Health relevant data: This part concerned with

1. patients' past medical history as heart diseases, diabetes, neurological disorder , liver diseases or other.
2. present medical history which include :*medical diagnosis*: **hip surgery**(hip fixation ,hip arthroplasty), **pelvic surgery** (pelvic fixation, pelvic bone debridement)and **hip and pelvic surgery**.
3. Date of operation , date of discharge ,duration of hospital stay
4. patient normal bowel habit which divided into (every day ,day after day or every two day)
5. current medication as(opioid analgesic ,hormonal replacement therapy, muscle relaxant).
6. graduation of dietary intake post operatively from full liquid ,soft then regular diet .
7. quality of diet (low fiber or high fiber diet)
8. level of mobility: The researcher depended on bedside mobility assessment tool to classify patient level of mobility. It is validated tool which developed by (Boynton ,2003) and was used to determine patients' current mobility status and standardize safe patient handling and mobility equipment use. It was divide level of mobility as level one(site and shake) level two(stretch and point) level three (stand) level four (walk, march in place and advancestep).it include **tasks** preformed by patient with or without researcher assistance after explanation of this tasks ,then patient give score as **pass** the level to transfer to following level .or **fail** and stay in this level. [9,10]

Tool II: Bristol Stool Form Scale (BSFS): This tool was developed by (Heaton and Lewis) at the University of Bristol and was first published in the Scandinavian Journal of Gastroenterology **(Heaton & Lewis, 1997)**[11]and it is adopted by **(Abd-Elraheem.2020)** [12]and has been used by the researcher. It is diagnostic tool used to classify human stool into seven types to assess daily bowel habit and presence of constipation or diarrhea as:

Type1 separate hard lumps, like metal, hard to pass **Type 2** sausage shaped but lumpy

Type 3 like sausage but with cracks on its surface **Type 4** like sausage or snake, smooth and soft **Type 5** soft blobs with clear cut edges passed easily **Type 6** fluffy pieces with ragged edges, a mushy stool, **Type 7** watery, no solid pieces.

The scoring system of this scale was as the following:

Type 1 and 2 indicate constipation, Type 3 and 4 are the ideal stools and Type 5, 6 and 7 indicate diarrhea.

Tool III: Constipation Assessment Scale

This tool has been used to assess severity of constipation. It was developed by **Millan and Williams (1989)[13]** and is adopted by (**Abd-Elraheem,in 2020)**[12] and it has been used by the researcher .This tool included eight items that focus on the symptoms of constipation that are the most universal, these items are

- Abdominal distension or bloating,
- Change in amount of gases passed rectally
- Less frequent bowel movement
- Oozing liquid stool
- Rectal fullness or pressure
- Rectal pain with bowel movement
- Smaller stool size,
- Urge but inability to pass stool.

The scoring system of this tool was as the following: Each symptoms had assessment score **0 no problem 1 some problem 2 sever problem** .then add the score to calculate total score.

The total score range between 0 and 16. score from 2 to 6 indicates mild constipation, score from 7 to 10 indicates moderate constipation, while the score from 11 or more indicates severe constipation.

Method

1. An official permission to carry out the study was obtained from the responsible authorities of faculty of nursing and the head of the Tanta orthopedic department.

2. Ethical consideration:

- An approval of the ethical committee of the faculty of nursing about the study was obtained
- Consent was obtained from every patient included in the study after explanation of the aim of the study and assuring them of confidentiality of collected data.
- Confidentiality and anonymity were maintained by the use of code number instead of name and the right of withdrawal was reserved.
- Privacy of the studied patients was maintained.
- Nature of the study was not causing any harm or pain to the entire sample.
- any unexpected risks appeared during the course of the research was cleared to participants and the ethical committee on time

3-Tool (I) was developed by the researcher after reviewed the relevant literatures [1-8].

Tool II , III.: Bristol Stool Form Scale (BSFS) and Constipation Assessment Scale (CAS):was adapted by researcher and they are translated into Arabic

4- All tools were tested for content validity and reliability by five jury of experts in the field of medical-surgical nursing at the faculty of nursing, orthopedic field professor at the faculty of medicine

5- the Pilot study was conducted before the actual study on 8 patients undergoing hip and pelvic surgery after taking their written approval in order to test the clarity, feasibility , relevance of the tool used, and applicability of the different items of the determinant tools. And those patients were excluded from the study sample due to modification occur in tool 1 by adding assessment of patients daily bowel habit .

6-The suitable statistical test was used for testing tools reliability.

7- Data were collected over a period of 6 months started from Jun to December 2022

Field of work

The study was conducted at four phases which include: assessment, planning, implementation and evaluation.

1) Assessment phase:

- in second day post hip or pelvic surgery that patient who meet inclusion criteria was interviewed by researcher and all purpose, nature and follow up schedule was explained to patients and after obtaining informed consent, initial assessment was carried out by the researcher for all the study subjects in both the control and study groups to collect baseline data pertinent to the current study by using tool I, II and III throughout the period of the study

Planning phase:

- Based on data of assessment phase and literature review. The researcher planned to use Murdoch bowel protocol for patient from second day post hip or pelvic surgery . Priorities and outcomes were formulated

General objective

The patient improve bowel function with minimal complication related to constipation

Specific objective

1. The patient demonstrate no sign of constipation
2. The patient report proper bowel care in case of constipation
3. The patient list minimal complication of constipation

3- Implementation phase

The Murdoch bowel protocol was implemented from second day until ten day post-operative as the following:

On Days 2 and 3

Type1 or 2 of stool (constipation) : the following guidelines were discussed and demonstrated by the researcher for patients then the Arabic colorful booklet was given for patient and it was include the following

- full liquid or High fiber diet according to patient graduation of diet (soft or regular), the different types and sources of high fiber diet were discussed and listed into illustrative picture in the booklet .
- the patient was educated about fluid importance and increasing fluids intake for 2to 3liter per day
- mobilization was Encouraged according to patient mobility level ,range of motion exercise and strength exercise were demonstrated by the researcher then performed by the patient and was listed into illustrative picture in the given booklet as the following:
- **The exercise** protocol for hip or pelvic surgery consisted of 10 basic isometric and AROM exercises commonly performed during the acute phase of recovery from THA. These exercises consisted of ankle pumps, thigh squeezes (quadriceps sets), buttock squeezes (gluteal sets), leg roll out and in, heel slides (hip and knee flexion), leg slides (abduction/adduction), lying kicks (short arc quadriceps), straight leg raises, and sitting kicks (long arc quadriceps) which were implemented individually.**(14)**
- Each session took about 30 to 35 minutes, where each exercise was performed from 5-10 sets at morning time till performance was found satisfactory under supervision of researchers and then instructed to repeat the exercises at afternoon and evening times (3 repetitions per day) independently during their hospital stay. Then, patients were recommended to continue practicing these exercises at home in the following days, using colorful booklet as a guide.

-Commence laxative as doctor order (lactulose 15cm or food spoon three times a day) and reducing specific medications (e.g. Opioids)

-Type, 3 or 4 (normal stool): high fiber Diet, increased fluids intake & exercise as above, Continued laxative.

-Type 5, 6 or 7 (loose stool or diarrhea) Diet, fluids & exercise as above and stopped laxative **If the patient on Days 4 and 5**

- Type 1 or 2 (constipation). • High fiber diet, increased fluids & exercise as per Day 2, Commence laxative as doctor order and *Administer enema with laxative*
- Type, 3 or 4 (normal stool) : Diet, fluids & exercise as above and Continue laxative.
- Type, 5, 6 or 7 (loose stool or diarrhea): Diet, fluids & exercise as above and *stop laxative*
- **If the patient on Days 6 and 7**
- Type 1 or 2 (constipation). High fiber diet, increased fluids intake & exercise as per Day 2 encourage mobilization if possible , Commence laxative as doctor order *and referral to internal medicine or dietician*
- Type, 3 or 4 (normal stool**)** : Diet, fluids & exercise as above and Continue laxative
- Type, 5, 6 or 7 (loose stool or diarrhea) : Diet, fluids & exercise as above and stop laxative
- **If the patient on Days (8, 9 and 10)**
- Type 1 or 2 stool (constipation).: High fiber diet, increased fluids intake & exercise as per Day 2 encourage mobilization if possible , Commence laxative as doctor order , *provide care*

according to advice of internal medicine or dietician.

- Type, 3 or 4 (normal stool): Diet, fluids & exercise as above .Continue laxative
- Type, 5, 6 or 7 (loose stool or diarrhea) : Diet, fluids & exercise as above and *stop laxative with referral to dietician*

4- Evaluation phase

- The patients in both group were evaluated by tool**(I)** part 1and 2 in the second day only and for four time during implementation of Murdoch bowel protocol using tool**(I)** part 2 (quality ,graduation of diet and level of mobility) and tool (***II***, **III**) on the second ,forth ,sixth and tenth day post operative to determine if patient passed stool or not and type of passed stool according to his normal bowel habit and level of constipation severity for constipated patients during period of hospitalization and telehealth including phone calling and watssapp media were used to continue follow up for patients after discharge from hospital during period of study .

Statistical analysis

Data were analyzed using Statistical Program for Social Science (SPSS) version 22.0 Quantitative data were expressed as mean± standard deviation (SD). Qualitative data were expressed as frequency and percentage. Independent-samples t-test of significance was used when comparing between two means. A one-way analysis of variance (ANOVA) when comparing between more than two means. Chi-square (X2) test of significance was used in order to compare proportions between two qualitative parameters.. The level of significant was adopted at $p < 0.05$

Results

Table (1): presents sociodemographic characteristics of studied groups undergoing hip and pelvic surgery. It reveals that more than one third (37.5%) of the control group and about one third (30%) of the study group, were in age group of 50-60 years with Mean±SD (**39.65±14.036**, **42.58±11.05**) respectively. **Regarding gender** more than three quarters of the study group and about three quarters of the control group (77.5%,75%) respectively were males.

. **Table (2):** show distribution of the studied patients regarding their health relevant data. **In relation to medical diagnosis** more than half of study and half of control group(52.5%,50%) respictivly under going hip surgery and more than two third of study group and about two third of control group (66.7,%60%)who were under going hip surgery were had hip replacement.

According to current medication the majority (92.5%,90%)of patient in study and control group respectively were have opioid analgesic

Table (3): show Distribution of the studied patients according graduation of dietary intake, quality of diet and their level of mobility among the studied groups throughout periods of study: It shows

- highly statistical significant differences between both groups regarding level of mobility ,graduation of diatery intake and quality of diet with p =0.000*

Table (4): show Distribution of the studied patients regarding their level of Bristol stool form (BSFS) among the studied groups throughout periods of study it show that in the **second day** three quarter (75%) of patient in control group and the majority (86%) of study group who passed stool were ***constipated***,. While in the **10th day**less than three quarter (72.4%) of patients in control group were **constipated, compared** with the minority (11.1%) of patients in study group were constipated

Table (5): show Distribution of the studied patients regarding constipation severity level among the studied groups

throughout periods of study. It present that there were highly statistically significant difference between the two group p= 0.000* .And statistically significant difference between patients in the study group regarding their level of constipation throughout period of the study . p=0.005*

Table (6) show Effect of sosio-demographic characteristics and health relevant data of the studied patients on their Bristol stool form (BSFS) among the studied groups in the2edand10th day. Regarding age there was statistically significant effect of age in studied patients regarding their Bristol stool scale . p=0.001*

Concerning to gender there is statistically significant effect of gender in studied patients regarding their Bristol stool scale as more than half of constipated patient were female p=0.017 *

Table (7) show Effect of health relevant data of the studied patients on their Bristol stool form (BSFS) among the studied groups in the2edand10th day

concerning quality of diet there was statically significant effect of patients quality of diet on Bristol stool scale In study group as about three quarteres of constipated patients were have low fiber diet

As regard level of mobility there was statically significant effect of patient level of mobility on Bristol stool scale In study group as more than two third of constipated patient (75%) at level one p= 0.001*

Table (1): Distribution of the studied patients undergoing hip and pelvic surgery regarding their sociodemographic data (n=80).

Characteristics	The studied patients (n=80)				χ^2 P
	Control group (n=40)		Study group (n=40)		
	N	%	N	%	
Age (in years)					
▪ (21-<30)	13	32.5	6	15.0	
▪ (30-<40)	8	20.0	11	27.5	7.094
▪ (40-<50)	4	10.0	11	27.5	0.069
▪ (50-60)	15	37.5	12	30.0	
Range **Mean ± SD**	**(21-59)** **39.65±14.036**		**(21-60)** **42.58±11.05**		t=1.036 P=0.304
Gender					
▪ Male	30	75.0	31	77.5	FE
▪ Female	10	25.0	9	22.5	1.00

Marital status					
▪ Single	8	20.0	9	22.5	
▪ Married	29	72.5	28	70.0	1.276
▪ Divorced	1	2.5	0	0.0	0.735
▪ Widow	2	5.0	3	7.5	
Occupation					
▪ Employee	5	12.5	8	20.0	
▪ Manual work	23	57.5	23	57.5	2.492
▪ Housewife	8	20.0	8	20.0	0.477
▪ Other	4	10.0	1	2.5	
Educational level					
▪ Illiterate	9	22.5	12	30.0	
▪ Basic school	4	10.0	4	10.0	2.802
▪ Secondary school	20	50.0	13	32.5	0.423
▪ High education	7	17.5	11	27.5	
Residence					
▪ Rural	26	65.0	22	55.0	FE
▪ Urban	14	35.0	18	45.0	0.494

Table (2): Distribution of the studied patients regarding their health relevant data among the patients undergoing hip and pelvic surgery.

Health relevant data	**The studied patients (n=80)**				**χ^2 P**
	Control group (n=40)		**Study group (n=40)**		
	N	**%**	**N**	**%**	
Diagnosis					
Hip surgery	**(20)**	**(50.0)**	**(21)**	**(52.5)**	
▪ Hip replacement	12	60.0	14	66.7	
▪ Hip fixation	8	40.0	7	33.3	0.196
Pelvic surgery	**(12)**	**(30.0)**	**(13)**	**(32.5)**	0.658
▪ Pelvic bone fixation	8	66.7	10	76.9	
▪ Pelvic bone debridement	4	33.3	3	23.1	
Hip and pelvic surgery	**(8)**	**(20.0)**	**(6)**	**(15.0)**	
#Current medication					
▪ Opioid analgesic	36	90.0	37	92.5	0.313
▪ Hormonal replacement therapy	3	7.5	3	7.5	0.576
▪ Muscle relaxant	1	2.5	3	7.5	

More than one answer was chosen

Table (3): Distribution of the studied patients according graduation of dietary intake, quality of diet and their level of mobility through period of study.

	The studied patients (n=80)																
	Control group (n=40)								χ^2 P	Study group (n=40)								χ^2 P
	2nd day		4th day		6th day		10th day			2nd day		4th day		6th day		10th day		
	N	%	N	%	N	%	N	%		N	%	N	%	N	%	N	%	
Graduation of Dietary Intake																		
▪ Full liquid diet	38	95.0	2	5.0	0	0.0	0	0.0		29	72.5	0	0.0	0	0.0	0	0.0	
▪ Soft diet	2	5.0	26	65.0	22	55.0	19	47.5	**229.18 0.000***	11	27.5	7	17.5	5	12.5	3	7.5	**139.53 0.000***
▪ Regular diet	0	0.0	12	30.0	18	45.0	21	52.5		0	0.0	33	82.5	35	87.5	37	92.5	
Gp1 Vs G2 χ^2, P	**FE 0.000***		**49.015 0.000***		**FE 0.000***		**FE** 0.000*											
Quality of diet																		
▪ Low fiber diet	38	95.0	33	82.5	20	50.0	13	32.5	**50.23 0.000***	37	92.5	24	60.0	7	17.5	3	7.5	**57.12 0.000***
▪ High fiber diet	2	5.0	7	17.5	20	50.0	27	67.5		3	7.5	16	40.0	33	82.5	37	92.5	
Gp1 Vs G2 χ^2, P	**FE 0.000***		**FE 0.000***		**FE 0.000***		**FE 0.003***											
Level of mobility																		
Level 1 (Sit and shake)	40	100.0	22	55.0	12	30.0	15	37.5		40	100.0	15	37.5	11	27.5	3	7.5	
Leve2 (Stretch and Point)	0	0.0	9	22.5	15	37.5	10	25.0	**52.562 0.000***	0	0.0	7	17.5	4	10.0	3	7.5	**86.072 0.000***
Leve3 (Stand)	0	0.0	9	22.5	10	25.0	11	27.5		0	0.0	13	32.5	15	37.5	18	45.0	
Level4(walk and advance step)	0	0.0	0	0.0	3	7.5	4	10.0		0	0.0	5	12.5	10	25.0	16	40.0	
Gp1 Vs G2 χ^2, P	-		**7.302 0.063**		**11.182 0.011***		**20.658 0.000***											

Table (4): Distribution of the studied patients regarding their level of Bristol stool form (BSFS) among the studied groups throughout periods of study

Level of Bristol Stool Form (BSFS)	The studied patients (n=80)																	
	Control group (n=40)								χ^2 P	Study group (n=40)								χ^2 P
	2nd day (n=24)		4th day (n=26)		6th day (n=27)		10th day (n=29)			2nd day (n=22)		4th day (n=32)		6th day (n=34)		10th day (n=36)		
	N	%	N	%	N	%	N	%		N	%	N	%	N	%	N	%	
▪ Constipation	18	75.0	20	76.9	22	81.5	21	72.4	2.693 0.260	19	86.4	12	37.5	6	17.6	4	11.1	**27.836 0.000***
▪ Ideal stools	6	25.0	5	19.2	4	14.8	6	20.7		3	13.6	18	56.3	24	70.6	26	72.2	
▪ Diarrhea	0	0.0	1	3.8	1	3.7	2	6.9		0	0.0	2	6.3	4	11.8	6	16.7	
Gp1 Vs G2 χ^2 P	0.394 0.695		**13.695 0.000***		**15.646 0.000***		**19.09 0.000***											

Table (5): Distribution of the studied patients regarding constipation level among the studied groups throughout periods of study.

Total constipation level	The studied patients (n=80)																	
	Control group (n=40)								χ^2 P	Study group (n=40)								χ^2 P
	2nd day N=18		4th day N=20		6th day N=22		10th day N=21			2nd day N=19		4th day N=12		6th day N=6		10th day N=4		
	N	%	N	%	N	%	N	%		N	%	N	%	N	%	N	%	
▪ Mild constipation	3	16.66	1	5.0	1	4.54	2	9.52	**5.186 0.520**	1	5.26	8	66.66	4	66.66	3	75.0	**18.332 0.005***
▪ Moderate constipation	5	27.77	7	35.0	8	36.36	3	14.28		6	31.57	2	16.66	1	16.66	1	25.0	
▪ Severe constipation	10	55.55	12	60.0	13	59.09	16	76.19		12	63.15	2	16.66	1	16.66	0	0.0	
Range Mean ± SD	**(2-16) 9.5±3.4**		**(4-14) 10.2±3.1**		**(6-13) 11.24±3.5**		**(6-16) 12.5±3.7**		**F=2.944 P=0.035***	**(2-16) 11.9±3.7**		**(2-11) 7.5±2.7**		**(2-11) 5.3±2.1**		**(2-7) 4.5±1.8**		**F=6.120 P=0.001***
Gp1 Vs G2 χ^2 P	0.651 0.517		**13.510 0.001***		**15.522 0.000***		**22.57 0.000***											

(2–6) Mild constipation (7–10) Moderately constipation ≥11 Severe constipation

Gp1: **Control group** **Gp2**: **Study group** * Statistical significant at level P<0.05

Table (6): Effect of sosio-demographic characteristics and Health relevant data of the studied patients on their Bristol stool form (BSFS) among the studied groups in the2^{ed}and10th day.

Characteristics	The studied patients (n=80) Bristol stool form (BSFS)																							
	Control group												study group											
	2^{ed} day						10th day						2^{ed} day						10th day					
	Constipation N=18		Ideal stool N=6		Diarrhea N=0		Constipation N=21		Ideal stool N=6		Diarrhea N=2		Constipation N=19		Ideal stool N=3		Diarrhea N=0		Constipation N=4		Ideal stool N=26		Diarrhea N=6	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Age (in years)																								
▪ (21-<30)	0	0	3	50	0	0	0	0	3	50	1	50	0	0	2	66.7	0	0	0	0	5	19.2	1	16.7
▪ (30-<40)	0	0	3	50	0	0	2	9.5	2	33.3	0	0	0	0	1	33.3	0	0	0	0	9	34.6	1	16.7
▪ (40-<50)	4	55.5	0	0	0	0	7	33.3	1	16.7	1	50	17	36.8	0	0	0	0	1	25	8	30.8	1	16.7
▪ (50-60)	14	77.8	0	0	0	0	12	57.1	0	0	0	0	2	63.2	0	0	0	0	3	75	4	15.4	3	50
χ^2 P value	**24.001 0.001***						**17.952 0.006***						**22.001 0.001***						**8.662 0.194**					
Gender																								
▪ Male	8	44.4	6	100	0	0	14	66.7	5	83.3	1	50	10	52.6	3	100	0	0	3	75	19	73.1	5	83.3
▪ Female	10	55.6	0	0	0	0	7	33.3	1	16.7	1	50	9	47.4	0	0	0	0	1	25	7	26.9	1	16.7
χ^2 P value	**5.712 0.017***						**0.973 0.617**						**2.402 0.121**						**0.273 0.872**					

Table (7): Effect of Health relevant data of the studied patients on their Bristol stool form (BSFS) among the studied groups in the2^{ed}and10th day.

	The studied patients (n=80) Bristol stool form (BSFS)																							
	Control group												study group											
	2^{ed} day						10th day						2^{ed} day						10th day					
	Constipation N=18		Ideal stool N=6		Diarrhea N=0		Constipation N=21		Ideal stool N=6		Diarrhea N=2		Constipation N=19		Ideal stool N=3		Diarrhea N=0		Constipation N=4		Ideal stool N=26		Diarrhea N=6	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Quality of diet																								
▪ Low fiber diet	18	100	4	66.7	0	0	13	61.9	0	0	0	0	17	89.5	2	66.7	0	0	3	75	0	0	0	0
▪ High fiber diet	0	0	2	33.3	0	0	8	38.1	6	100	2	100	2	10.5	1	33.3	0	0	1	25	26	100	6	100
χ^2 **P value**	6.551 0.011*						0.973 0.617						1.142 0.285						26.176 0.001*					
Level of mobility																								
▪ Level 1 (Sit and shake)	18	100	6	100	0	0	7	33.3	1	16.7	0	0	19	100	3	100	0	0	3	75	0	0	0	0
▪ Leve2 (Stretch and Point)	0	0	0	0	0	0	13	61.9	4	66.7	1	50	0	0	0	0	0	0	1	25	2	7.7	0	0
▪ Leve3 (Stand)	0	0	0	0	0	0	1	4.8	0	0	0	0	0	0	0	0	0	0	0	0	10	38.5	4	66.7
▪ Level4(walk and advance step)	0	0	0	0	0	0	0	0	1	16.7	1	50	0	0	0	0	0	0	0	0	14	53.8	2	33.3
χ^2 **P value**	- -						9.182 0.164						- -						31.052 0.001*					

Discussion

The most common treatment of pelvic and hip fractures is the surgical treatment but most of cases are accompanied with complications such as shock, pain, **constipation**. due to different factors as enforced immobility, receiving of opioids , reduced dietary and fluid intake, use of bad pans in the period following surgery and long- term hospitalization.[1,7] So, the current study aimed to evaluate the effect of implementing Murdoch bowel protocol on occurrence of constipation in patients with hip and pelvic surgery.

Concerning socio-demographic characteristics of patients undergoing hip and pelvic surgery. the findings of the present study revealed that Mean±SD for age of control and study group were nearly forty years old (**40.65±13.036**, **42.58±11.05**) respectively with no significant difference between the two groups. In this regard, this finding may be related to that the young adult is economically productive and they are prone to traffic accident , pedestrians, motorcyclists, and cyclists, work and sports accidents. And with increase age they are prone to osteopenia and osteoporotic condition

This finding was in agreement with (**He. C. et al ,2021 [15]**who stated that the mean age of studied groups were 50.61±10.30 47.58±10.31 in addition this result supported by **(Wang. P,2019)**[16] who said that the mean age of studied groups were 44.2 + 13.8 .on the other hand, this finding was in contrast with (**Herath SC ,2019)[17]** who reported that the mean age of studied groups were 58.6 6 21.6 years

As regard to sex, the present study showed that the majority of the studied patients were males with no significant difference between the two groups. This finding may be related to risk taking behavior in male ,high energy trauma as traffic accident and cycling and engage into heavy manual work ,smoking and drug addiction This findings was similar with (**Strøm Rönnquist S,2022**)[18] who noted that more than two third of studied groups were male. On the other hand this outcomes was in contrast with**(Lundi N, 2021) [19]**who observed that The majority of the fractures occurred in females this finding could be related to large number of older women suffering from this fracture

Regarding health relevant data this study showed that the majority of the studied patients were undergoing hip surgery ,and about two third of hip surgery patients in control group and more than two third in study group were treated by hip replacement surgery .in the researcher opinion this may be due to that the hip fracture require low energy trauma **as** sliding ,falling or

hitting which is most common causes in young adult and effect of osteoarthritis or osteoporosis with increasing age . this result in line with **Schultz BV et al 2023**[20] who said more than half of studied patient with lower limp fracture had femoral neck fracture .similar with **Stockton DJ et al 2019**[21]Who noted that the majority of patients with hip fracture had total hip replacement in his study . in contrary this findings disagreed with **Somersalo A et al 2016**[22], who noted that the majority of patient with lower extremity fracture were had leg fracture . **In regard to current used medication** ,the majority of patients in control and study group used opioids analgesic especially in the first and second day post operative. This may be due to sever pain post orthopedic surgery at wound site with low tolerance of patients. This conclusion were supported by (**Cozowicz C et al , 2022)**[23] who said that the majority of patient undergoing total hip arthroplasty used opioid in first 24 hour post operative. In contrary this result contradicted with (**Moutzouros V,2020)**[24] who stated that the more than half of the studied patients with orthopedic surgery weren't use opioids in postoperative period.

Regarding graduation of dietary intake and quality of diet postoperatively .this study show that majority of the studied patients in the second day had full liquid low fiber diet. This finding may be due to that most of patients prefer full liquid diet which low in fiber in the days post operative due to effect of anorexia caused by anesthesia and sever pain ,to rest intestine until return of peristalsis and fear of distention or post operative ileus.this conclusion was in line with **(Rattray M.2019)**[25]who found that all orthopedic patient had full diet in post operative day and first solid meal was low fiber soft diet after first 24hors . But in the tenth day more than half of patients have regular diet with high fiber. while the majority of patient in the study group had regular high fiber diet with gradual improvement in their graduation of dietary intake . This may be due to instruction were explained to study group patients about increase fiber intake in their regular diet and notify them about its different sources

Concerning to patient level of mobility all patients in study and control group in the second day was at level one of mobility. This limited mobility may be related to effect of drowsy caused by surgical anesthesia, sever pain, presence of fixation devices and physician instruction of bed rest to allow wound healing. this result supported by **Abd El Kader & Youssef, 2022**[26] who noted that the majority of patient had restricted physical

mobility post orthopedic surgery .while In the tenth day less than two fifth of patients in control group at level one and the minority at level four but in study group two fifth of patient at level four and the minority at level one of mobility .in the researcher point of view the improvement in study group may be due to encouragement by the researcher to patients about early mobility and the performance of exercise to strength muscle and improved general health for patients . this observation were similar to (**Zhang X et al 2022)**[27] finding who observed that the strength exercise were had large effect on patients mobility after hip fracture .in contrary this result contradicted with (**Hulsbæk S et al 2022)**[28] who said that there were no statistically significant relation between physical therapy and level of mobility in his study

As regard to Bristol stool form the finding of this study revealed that in the second day post operative three quarters of patients who passed stool in control group and the majority of patients in the study group had constipation .in the researcher point of view this may be related to effect of type of anesthesia used in operation ,preoperative fasting ,and peristalsis movement not return to normal yet . . this finding was supported by **(Celik B and Bilik Ö 2022**)[29]observation which include more than three quarters of patient with hip fracture developed constipation . Also this result agreed with **Jing D, Jia L ,2019)** [30]who stated that the majority of studied patient had constipation postoperatively in their study . In contrary with . **Arli,ŞK.2019**[31].who said that the majority of studied postoperative patients had no constipation. Moreover this result contradicted by **Abd El Kader & Youssef, 2022**[26] who said that about a quarter of the patient in orthopedic had constipation during their stay in the hospital for more than five days.

In tenth day less than three quarters of patients who passed stool in control group were had constipation while 11.1% only of study group patients were had constipation .This finding may be justified by that the percentage of constipation still high in control group due to decrease fiber intake, low level of mobility, excessive use of opioid analgesic in management of pain ,effect of bed ban toilet and withholding behavior by patient due to lack of privacy and patient embracement .in contrast with study group the improvement may be due to Murdoch bowel protocol instruction given to patients about increased level of mobility, doing exercise, high fiber diet ,fluid intake, lactulose therapy ,and decrease opioids intake. This result were supported by **Abd-**

ElraheemM2020 [12] who used Murdoch bowel protocol in critical patients and discovered that more than one fifth of patients in study group had constipation compared with less than three quarters of patients in control group in the tenth day .Moreover this findings were supported by (**Ross-Adjie, 2012)**[7] who said that about two thirds of the patients with hip and knee arthroplasty who received Murdoch Bowel Protocol had normal bowel function by the fifth day compared with one quarter of patients in control group.

concerning to constipation assessment scale this present study showed that more than half and more than two third of constipated patient had sever level of constipation in the second day .this is may be due to immobility ,low fiber diet and effect of anesthesia on peristalsis movement. meanwhile in the tenth day more than three quarters of patients in control group had sever level of constipation while there was no one had sever constipation in the study group and three quarters of constipated patient had mild constipation .this finding is justified by that constipation is neglecting problem by staff and most of patient felt embraced to notify about presence of constipation which lead to delay management of this problem so the severity of constipation increase along with other factors as increasing duration of immobility, low fiber diet and opioids intake. In contrast with study group as the severity of constipation decrease to 0% sever constipation at the end of study period .this may be due to rapid assessment by the researcher for presence of constipation and its severity with proper management by application of Murdoch bowel protocol guidelines which mentioned before. This finding supported with (**Nouhi E et al.2022)**[32] who saied that mean score of CAS decline from 10.74 to 4.51 after intervention in studied patient . also this conclusion in line with **Sajadi M et al 2020** [33] who said that the mean score of severity of constipation among studied patient decreased from 14.39 to 6.39 in study group after intervention but still worsen in control group from 14.8 to 14.97 in the fifth day. In contrary this result contradicted with (**Noiesen E et al 2014**)[34]who noted that 7%of studied patients were have sever level of constipation at admission .

Regarding relation between sociodemographic data and BSFS the finding of this study showed that with increasing age increase level of constipation as more than half of constipated patient in the control group and three quarters of constipated patient in the study group were between age of (50-60) years old .in my opinion

this may be due to lack of normal bowel movement with aging with decrease physical activity and poor denture or dentation problem leading to impaired in nutrition. This finding agreed with **Farahat et al., (2019)**[35]who studied " Risk factors for constipation among elderly attending family health center in Damietta District and reported that the prevalence of constipation increased with increasing age, where most of elderly population experienced constipation. This finding inconsistent with(**Mansouri et al.2018**)[36]who reported that there was no significant relationship between constipation and age.

Concerning gender there were statistically significant relation between gender and constipation as more than half of constipated patient in control group were female this finding may be due to effect of female sex hormone as in the luteal phase of the menstrual cycle, progesterone lead to increase the risk of constipation. This result supported by **Yurtdaş G,et al .2020** [37] who noted in his study about risk factors for constipation in adult that females were more expected to have constipation than males. this conclusion were contradicted by **E bling et al 2014**[38] who Saied that constipation in male were more than female **.**

As regarded to relation between *BSFS and quality of diet* the majority of constipated patient in study and control group had low fiber diet . this result justified by fiber intake maintain adequate water in stool that assist in stool bulking and facilitate defecation. The result consistent with **Van Der Schoot A 2022**[39] who observed that increase dietary fiber to 10g/d improve response to treatment of chronic constipation . but this result inconsistent with **Kang SJ et al 2021** [40]who noted that bran did not show significant increases in the number of bowel movements or decreased the use of laxatives in the studied patients .

Regarding *level of mobility* and BSFS in this study all the constipated patients in study and control group were at level one of mobility .this observation justified by effect of immobility on gastric transit time as it lead to slow transit time .and slow peristalsis movement which lead to hardening of stool and constipation. the finding agreed with **Ashrafi A,2021** [41]who observed that more than two third of constipated patient had low level of physical mobility .also the result in line with(**Hidayati N 2019**)[42] who said that two third of patient developed constipation after three days of immobility due to effect of hospitalization with stroke

Conclusion: The Murdoch bowel protocol had great effect in prevention and management of constipation for patients with hip or pelvic surgery with a highly

statistically significant difference between study and control group throughout the period of the study as P value =0.000*.

Recommendation: implementation of Murdoch bowel protocol for all orthopedic patients in orthopedic department for assessment and management of constipation.

References

1. Adly M, Elzahed H . Traumatic Pelvic Fractures Hospitalized In Kasr Al-Ainy Hospital In . Egypt J. 2019;19 (4): 145-165
2. Hertz K, Santy-Tomlinson J. Fragility Hip Fracture. Orthopaedic and Trauma Nursing: An Evidence-based Approach to Musculoskeletal Care. 2023 Feb 10:268-87.
3. Mathews, S. C., Izmailyan, S., Brito, F. A., Yamal, J. M., Mikhail, O., & Revere, F. L.). Prevalence and financial burden of digestive diseases in a commercially insured population. Clinical Gastroenterology and Herpetology.(2021 ;20(7):1480
4. Ali M , Almuqat B , Alhasnani H , Alfahmi T ,et al .The prevalence and risk factors of constipation among the general population in Makkah, Saudi Arabia. International Journal of Medicine in Developing Countries. 2021;5(12):2108–2114.
5. MNgSc o, MOWAT R, COOK C . Effectiveness of early mobilisation versus laxative use in reducing opioid induced constipation in post-operative orthopaedic patients: an integrative review .Australian Journal of Advanced Nursing. 2020;39(2) .392.410
6. Bhat, M. J., Alkorbi, S. M. A., Alnaem, N. M. M., Alqarni, A. O. M., Alamri, S. A. A., Asiri, L. G., & Alsaiari, K. A. A. The Prevalence of Constipation and Its Associated Complications in Aseer Region by Using Wexner Scale. Middle East Journal of Family Medicine.(2022) ;7(10):90-95.
7. Ross-Adjie, G. The effect of an evidence based bowel protocol on time taken to return to normal bowel function in post operative total hip and total knee replacement patients. Doctoral thesis, The University of Notre Dame. 2015 ;48(10): 74-112
8. Trads, M., & Pedersen, P. U). Constipation and defecation pattern the first 30 days after hip fracture. International journal of nursing practice. (2015 ;21(5):598-604
9. Rose A, Carter N, Vann C, Lloyd-Penza M, Andrusko M. Implementing Bedside Mobility Assessment Tool to Improve Patient Outcomes and

Staff Communication. Medsurg Nursing. 2022;31(1):32-6.

10. Boynton T, Kumpar D, VanGilder C. The bedside mobility assessment tool 2.0. Am Nurse J. 2020;15:18-22.
11. Lewis S. J. , Heaton K. W. Stool Form Scale as a Useful Guide to Intestinal Transit Time. Scandinavian Journal of Gastroenterology.1997;15 (36) : 1502-7708ul 1;122(7):46-52
12. . Abd-Elraheem M . Ali Z , Khalil N , Mohamed D . Effect of Implementing Murdoch Bowel Protocol on the occurrence of Constipation among Critically Ill Patients. Egyptian Journal of Health Care. 2020 ; 11 (4):135-155
13. McMillan, S. C., & Williams, F.A. Validity and reliability of the constipation assessment scale. Cancer Nursing J, 1989 ;12:183-188
14. Ali M , Abo El-Fad N. Effect of Evidence Based Progressive Exercise Program on Functional Outcomes for Patients after Total Hip Replacement Surgery .2021;Vol. 8, Issue 1, pp: (336-351),
15. He C, et al .Comparison of the clinical efficacy of a femoral neck system versus cannulated screws in the treatment of femoral neck fracture in young adults BMC Musculoskeletal Disorders (2021) 22:994 Page 2 of 8
16. Wang P, Kandemir U, Zhang B, Wang B, Li J, Zhuang Y, Wang H, Zhang H, Liu P, Zhang K. Incidence and risk factors of deep vein thrombosis in patients with pelvic and acetabular fractures. Clinical and Applied Thrombosis/Hemostasis. 2019 Apr 22;25:1076
17. Herath SC, Pott H, Rollmann MF, Braun BJ, Holstein JH, Höch A, Stuby FM, Pohlemann T. Geriatric acetabular surgery: Letournel's contraindications then and now—Data from the German pelvic registry. Journal of orthopaedic trauma. 2019 Feb1;33:S8-13.
18. Strøm Rönnquist S, Viberg B, Kristensen MT, Palm H, Jensen JE, Madsen CF, Åkesson KE, Overgaard S, Rogmark C. Frailty and osteoporosis in patients with hip fractures under the age of 60—a prospective cohort of 218 individuals. Osteoporosis International. 2022 May;33(5):1037-55.
19. Lundin N, Huttunen TT, Berg HE, Marcano A, Felländer-Tsai L, Enocson A. Increasing incidence of pelvic and acetabular fractures. A nationwide study of 87,308 fractures over a 16-year period in Sweden. Injury. 2021 Jun 1;52(6):1410-7.

20. Schultz BV, Watt K, Rashford S, Wylie J, Bosley E. Epidemiology of open limb fractures attended by ambulance clinicians in the out-of-hospital setting: A retrospective analysis. Australasian Emergency Care. 2023 Jan 6.
21. Stockton DJ, O'Hara LM, O'Hara NN, Lefaivre KA, O'Brien PJ, Slobogean GP. High rate of reoperation and conversion to total hip arthroplasty after internal fixation of young femoral neck fractures: a population-based study of 796 patients. Acta Orthopaedica. 2019 Jan 2;90(1):21-5.
22. somersalo A, Paloneva J, Kautiainen H, LÖNnroos E, HEinÄNen M, Kiviranta I. Increased mortality after lower extremity fractures in patients< 65 years of age. Acta orthopaedica. 2016 Nov 1;87(6):622-5.
23. Cozowicz C, Zhong H, Illescas A, Athanassoglou V, Poeran J, Reichel JF, Poultsides LA, Liu J, Memtsoudis SG. The perioperative use of benzodiazepines for major orthopedic surgery in the United States. Anesthesia & Analgesia. 2022 Feb 18;134(3):486-95.
24. Moutzouros V, Jildeh TR, Khalil LS, Schwartz K, Hasan L, Matar RN, Okoroha KR. A multimodal protocol to diminish pain following common orthopedic sports procedures: Can we eliminate postoperative opioids?. Arthroscopy: The Journal of Arthroscopic & Related Surgery. 2020 Aug 1;36(8):2249-57.
25. Rattray M, Marshall A, Desbrow B, Roberts S. Feeding Practices and Nutrition Intakes Among Non-Critically Ill, Postoperative Adult Patients: An Observational Study. Nutrition in Clinical Practice. 2019 Jun;34(3):371-80.
26. Abd El Kader AI, Youssef N. Constipation Prevalence and Related Risk Factors among Orthopedic Patients. International Egyptian Journal of Nursing Sciences and Research. 2022 Jan 1;2(2):202-11.
27. Zhang X, Butts WJ, You T. Exercise interventions, physical function, and mobility after hip fracture: a systematic review and meta-analysis. Disability and Rehabilitation. 2022 Aug 28;44(18):4986-96.
28. Hulsbæk S, Juhl C, Røpke A, Bandholm T, Kristensen MT. Exercise therapy is effective at improving short-and long-term mobility, activities of daily living, and balance in older patients following hip fracture: a systematic review and meta-analysis. The Journals of Gerontology: Series A. 2022 Apr;77(4):861-71.

29. Celik B. Bilik. Ö . Postoperative Constipation Incidence and Effects of Selected Risk Factors on Constipation Development in Elderly Patients With Hip Fracture Orthopaedic Nursing .2022 ;Vol 41 (6):396-398.
30. Jing D, Jia L. Assessment of patients' psychological state and self-efficacy associated with postoperative constipation after thoracolumbar fracture surgery. Journal of International Medical Research. 2019 Sep;47(9):4215-24
31. Arlı ŞK. Evaluation of constipation risk among inpatients in surgery and internal medicine wards. Turkish Journal of Colorectal Disease. 2019 Mar 1;29(1):19
32. Nouhi E, Mansour-Ghanaei R, Hojati SA, Chaboki BG. The effect of abdominal massage on the severity of constipation in elderly patients hospitalized with fractures: A randomized clinical trial. International Journal of Orthopaedic and Trauma Nursing. 2022 Nov 1;47:100936
33. Sajadi M, Davodabady F, Naseri-Salahshour V, Harorani M, Ebrahimi-Monfared M. The effect of foot reflexology on constipation and quality of life in patients with multiple sclerosis. A randomized controlled trial. Complementary therapies in medicine. 2020 Jan 1;48:102270.
34. Noiesen E, Trosborg I, Bager L, Herning M, Lyngby C, Konradsen H. Constipation–prevalence and incidence among medical patients acutely admitted to hospital with a medical condition. Journal of clinical nursing. 2014 Aug;23(15-16):2295-302.
35. Farahat, T. M., El-Esrigy, F. A., & Salama, W. E. S. I. (2019). Risk factors for constipation among elderly attending family health center in Damietta District, Damietta Governorate, Egypt. Menoufia Medical Journal, 32(1), 145.
36. Mansouri, A., Shahraki-Vahed, A., Shadadi, H., Sanchooli, H. N., &Arbabisarjou, A. (2018). The effect of prune on the severityof constipation in elderly women. Bali Medical Journal, 7(1), 141-145.
37. Yurtdaş G, Acar-Tek N, Akbulut G, Cemali Ö, Arslan N, Beyaz Coşkun A, Zengin FH. Risk factors for constipation in adults: a cross-sectional study. Journal of the American College of Nutrition. 2020 Nov 16;39(8):713-9.
38. Ebling B, Gulić S, Jurcić D, Martinac M, Gmajnić R, Bilić A, Pribić S, Levak MT. Demographic, anthropometric and socioeconomic characteristics of

functional constipation in Eastern Croatia. Coll Antropol 2014; 38: 539-546

39. Van Der Schoot A, Drysdale C, Whelan K, Dimidi E. The effect of fiber supplementation on chronic constipation in adults: An updated systematic review and meta-analysis of randomized controlled trials. The American Journal of Clinical Nutrition. 2022 Oct;116(4):953-69.
40. Kang SJ, Cho YS, Lee TH, Kim SE, Ryu HS, Kim JW, Park SY, Lee YJ, Shin JE, of the Korean CR. Medical management of constipation in elderly patients: Systematic review. Journal of Neurogastroenterology and Motility. 2021 Oct 10;27(4):495.
41. Ashrafi A, Arab AM, Abdi S, Nourbakhsh MR. The association between myofascial trigger points and the incidence of chronic functional constipation. Journal of Bodywork and Movement Therapies. 2021 Apr 1;26:201-6.
42. Hidayati N, Sukartini T, Padoli P. Comparison of two turning regimens (1 Versus Every 2 Hours) in the prevention of constipation in patients with stroke. Belitung Nursing Journal. 2019 Oct 30;5(5):192-6

The Lived Experience of Hospitalized Women Undergoing Hysterectomy: A Phenomenological Study

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Abstract

Background: Hysterectomy is one of the main gynecological procedures which affect a woman's life in numerous ways, including physically, psychologically, socially, and sexually. Following hysterectomy, these effects on the women's physical and mental health are contradictory, despite improvements in their biopsychosocial function. **The aim of the current study** is to explore the lived experience of hospitalized women undergoing hysterectomy. **Design:** A phenomenological qualitative research design was utilized to achieve the aim of the study. **Sample**: A purposive sample of fifteen women who had a hysterectomy. **Tools for data collection:** three tools were used for data collection; a structured interviewing questionnaire; an unstructured interviewing questionnaire; the digital voice recorder and field notes. **Setting**: The interview was conducted at the high-risk pregnancy unit and gynecological inpatient department at Obstetrics and Gynecological Hospital which is affiliated with Cairo University Hospitals. **Results:** The overall experience as perceived by the participants could be described, within a framework of time sequences, as the following: 1) The immediate reaction towards hysterectomy was reflected by different feelings such as acceptance of the diagnosis, shock, sadness, and depression; 2) Early post-procedure suffering due to physical and psychological factors; 3) Expected later concerns and actual needs such as concern about family and children, sexual concern, need for affections and support from husband, needs for education; 4) Late post-procedures complaints due to fatigability, weight loss, social effects, loss feminine role, anxiety, altered sexual behavior and excitement. **Conclusion:** The current study concluded that hysterectomy has negative physical, psychological, and social impacts on women's lives in this study sample. **Recommendation:** Before women are discharged from the hospital, healthcare professionals in postoperative departments must address these potentially distressing psychological and physical consequences of hysterectomy.

Keywords: *hysterectomy, lived experience, physical, psychological, sexual, and social impacts.*

Introduction

The uterus represents a great value in the life of every woman, as it is considered a symbol of femininity and fertility. Its removal can be a difficult process for women to face, especially as it involves emotional, psychological, and cultural factors. It may affect the female identity as they perceived change in the body image, the feeling of mutilation of their body, emptiness, and feeling different from other women [1]. Hysterectomy is considered the second most common gynecological surgery in the world among women of reproductive age. Worldwide statistics have shown that the prevalence of hysterectomy across 21 states and the United States ranged from 0.2% to 6.3%. While in Egypt, a retrospective study indicated that the incidence of emergency peripartum hysterectomy in Ain-Shams University Maternity Hospital was 149 of 66,306, or 2.24 per 1,000 deliveries. The main

indications for this type of surgery included benign gynecologicall diseases such as prolapse, abnormal uterine bleeding, fibroids, pelvic pain, abnormal placentation, uterine atony, uncontrolled postpartum hemorrhage and uterine rupture [2,3&4].

A hysterectomy may be performed via a vaginal, abdominal, or laparoscopic approach. In a total hysterectomy, the uterus and cervix are removed. In some cases, both fallopian tubes and ovaries are removed along with the uterus, which is a hysterectomy with bilateral salpingo-oophorectomy. In a subtotal hysterectomy, only the uterus is removed. In a radical hysterectomy, the uterus, cervix, ovaries, oviducts, lymph nodes, and lymph channels are removed. The type of hysterectomy performed depends on the reason for the procedure. In all cases, menstruation permanently stops and a woman loses the ability to bear children[5].

Hysterectomy may be experienced differently by women. It may have positive or negative implications for physical and psychosocial health. It may provide immediate relief from dysfunctional uterine bleeding and pelvic pain or discomfort but affect women's self-image, marital, and social relationships [6]. The research findings showed divergent effects of hysterectomy on women's lives. Some studies revealed general improvements in mental and sexual desire, while other studies revealed negative outcomes on physical, psychological, sexual, and social functioning [7]. Research about the effect of hysterectomy on women's sexual function concluded that most sexual disorders improve after hysterectomy for uterine benign diseases and that most of the women who were sexually active before the surgery experienced the same or better sexual functioning after the surgery. The purpose of the current study is to explore the lived experience of hospitalized women undergoing hysterectomy [8].

Significance of the study

Hysterectomy is a major surgical procedure that brings with it significant physiological and psychological complications; it may affect women's self-perceptions, self-esteem, and female identity. Based on the literature, there are few studies in Egypt that assess the lived experience of hospitalized women undergoing hysterectomies. The findings of the current study add to the body of knowledge in this neglected area. The results of this study may improve our understanding of this condition and provide women with the adequate support they need. Also, understanding the lived experience of the women undergoing hysterectomy is essential for the health care provider to support the women and design appropriate nursing plans and interventions when caring for such a group.

Aim of the study

The aim of the current study is to explore the lived experience of hospitalized women undergoing hysterectomy.

Research Question

What is the lived experience of hospitalized women undergoing hysterectomy?

Guiding questions

1. What was your experience with a hysterectomy? How did it look?
2. How was the process of hysterectomy experience proceeding?
3. What are the consequences of a hysterectomy?

Unstructured(open-end) in-depth interviews questions

1. Describe your feelings towards undergoing a hysterectomy?
2. Tell me about your experience with this procedure.
3. What are your concerns and needs after this procedure?
4. How did hysterectomy affect your life (self-image, marital, and social relations)?

Subjects and Methods

Research Design

A qualitative research design using the phenomenological approach was used to explore the lived experience of hospitalized women undergoing hysterectomy. Phenomenology is the study that fits well to detect people's experience of a specific phenomenon and is focusing on seeking the essence of human experienced phenomena through the analysis of verbal explanations from the viewpoint of the participants [9].

Setting

The study was conducted at the high-risk pregnancy unit and gynecological inpatient department at the Obstetrics and Gynecological Hospital, Kasr El Ainy, which is affiliated with Cairo University Hospitals. Those units included 4 rooms, two rooms for each with 46 beds, 23 for each, and received approximately 7.974 pregnant and non-pregnant women per year, 3987 for each, with different diagnosis such as diabetes, cardiac disease, hypertensive disorder during pregnancy, autoimmune diseases such as systemic lupus and antiphospholipid syndrome, which cause recurrent abortions, hyperemesis gravidarum, placenta abnormalities such as placenta previa and placenta accreta, uterine bleeding, hysterectomy, and ovarian cyst.

Sample

A purposive sample of hospitalized women undergoing hysterectomy who were willing to participate in the current study was included in the study participants for this research. The predetermination of the number of participants in qualitative studies is almost impossible, as the sample size in qualitative designs is not determined by the number of participants but by achieving saturation of data, which is evidenced when no new information is heard about the study phenomenon.

Inclusion criteria: Egyptian hospitalized women underwent hysterectomy with no specific age and voluntarily accepted to participate in the study and giving written informed consent.

Tools for Data Collection

Three tools were utilized for data collection:

Tool (1)-Structured interviewing questionnaire, which included data related to: (a) socio-demographic data which included age, educational level, occupation residence and marital status. (b) Obstetric history and cause of doing a hysterectomy. (c) Medical history. (d) Gynecological history

Tool (2)-Unstructured interviewing questionnaire that included seven open-ended questions related to the lived experience of hospitalized women undergoing hysterectomy.

Tool (3)- The digital voice recorder and field notes. It is an instrument by cell phone (personal mobile phone), as it plays an important role in data collection in qualitative studies. In the case of refusing the audio-digital recording by the participants, handwritten recording by the researcher was used.

Tool validity and reliability

The tools of data collection were given to 5 experts in the field of maternity nursing to test the content validity of the tool and clarify the sentences as well as the appropriateness of the content. Modification of the tools was done accordingly. The reliability of the tools was tested using Cronbach's alpha test, and the score was highly reliable (0.89) for tools (2), which check the tools for relevance, comprehensiveness, and clarity. The reliability of the tools was tested using split-half methods (r = 0.88). This method was used to evaluate the homogeneity of the tool.

Ethical Considerations

Upon receiving the formal approval from the Research Ethics Committee of the Faculty of Nursing at Cairo University (Ethics code, 2020-38), the researcher introduce herself to women who met the inclusion criteria and inform them about the purpose of this study in order to obtain their acceptance to participate in this study. Written consent was obtained from the women who agree to participate in the study. Also, anonymity and confidentiality are assured through coding the data. Participants were assured that their personal data was not used for other research purposes without their permission

Procedures

Once permission was granted to proceed with the proposed study, women who met the inclusion criteria of the study were interviewed. Direct face-face contact was initiated through individual interviews; every participant was interviewed individually three times. And the final interview was through a telephone call three months after discharge from the hospital. Each interview session ranged from 35 to 40 minutes and was conducted in the native language of the participants. The data collection lasted one year from September 2020 to August 2021. A quiet place in the high-risk pregnancy unit and gynecological department in the conference room was used to conduct the interviews.

The first individual interview session concentrated on a verbal explanation of the nature and purpose of the study, as well as signing written informed consent for voluntary participation and using the digital voice recorder. Data related to demographic characteristics, obstetrics, medical and gynecological history was obtained. The second and third interviews were guided by open-ended questions. 1. Describe your feelings towards undergoing a hysterectomy.2. What about your experience during the procedure. 3. What are your concerns and needs after the procedure? The final interview was through telephone call after three months to answer this question (4). How did hysterectomy affect your self-image, marital, and social relations.

Field notes using pen and notes were used for recording any observations that the researcher performed during the interview sessions. Interviews ended when participants exhausted their descriptions of their experience and no new data, categories, or themes were emerging, as well when there were repeated similar observations among participants (data saturation). The researcher contacted each participant after the completion of data analysis through telephone call to review the data interpretation (member checking).

Data Analysis

The data analysis for the current study is based on Colaizzi's 1978 phenomenological method. In this study, the transcription of the audiotape was done by the research investigator in handwriting, word by word, after each interview. The researcher went through the transcripts line by line and word by word very closely, extracting significant statements and coding each of them. Then the codes were merged into categories, which were then clustered together into subthemes, and finally major themes. The integration of the major themes into an exhaustive description of the phenomenon and validating the identified structure and nature of the phenomenon from the participants' descriptions are then done as a final step.

Results

Table (1) represents the participants' socio-demographic characteristics in this study (n = 15). The age range of the participants was 33-49 years, with a mean of 42.60 ± 7.10 years old; more than half of them (66.7%) were living in rural areas, twelve participants out of fifteen completed preparatory and secondary education. Two-thirds of them (73.3%) were working.

Table (2): shows the obstetric history of the participants: 86.6 % of them were multigravida and 53.3% of them were para from (3-4). About, 60% had history of abortion. 80% had living children. Near half of the participants had complication during previous delivery as; postpartum hemorrhage (26.6 %), placenta previa (20%) and obstructed labor (6.7%).

Table (3) represents the participants' medical history. (26.6%) of them had hypertension, (26.6%) had anemia, (20%) had cardiac disease, diabetes mellitus (20%), autoimmune disease (13.3%), and anemia (13.3%).

Table (4) represents the participants' gynecological history, the most common gynecological history was uncontrolled bleeding, fibroid, pelvic infection, uterine prolapsed, and endometriosis (100%, 86.6%, 86.6%, 33.3% and 13.3 % respectively). The most common indications for hysterectomy were uncontrolled bleeding, history of fibroid, and placenta accrete (100%, 86.6%, and 20%) respectively.

Figure (1) showed four major themes according to lived experience among women with hysterectomy and13 subthemes.

Theme (1) Immediate reaction towards hysterectomy

Removal of the uterus is a tragic matter that has multiple consequences for the biopsychosocial health of the women undergoing hysterectomy. The reactions of the women towards hysterectomy differ from one another; some women accept the diagnosis of hysterectomy, while others are shocked by the diagnosis.

Sub-theme 1.1: Acceptance of the Diagnosis

The women who accept the diagnosis often suffer from extreme pain or frequent bleeding, which interferes with their social lives and sexual activities. They are in desperate need of a hysterectomy because they are unable to tolerate the heavy bleeding, extreme pain of gynecological conditions and fear of the negative consequences of the gynecological conditions (fibroid) if it left without treatment. "I accepted hysterectomy as many doctors confirmed the diagnosis and informed me if the tumor left without any intervention; it would be enlarged and had

negative consequences on my health" (P1); "…I accepted the diagnosis as I heard that the fibroid may spread to different places in my body" (P15).

Other women accepted the diagnosis as their daily activities were affected by the heavy bleeding and severe pain, and the women wanted to get rid of the heavy bleeding. "When the doctor told me about a hysterectomy, I accepted it because I felt tired from the heavy bleeding that caused anemia for me and affected my daily activities" (P8). Also, some women reported that heavy bleeding affected their sexual relationship with their husbands and their social relationship, so they were eager to have the operation to improve their sexual lives. "I was annoyed because the heavy bleeding affected my sexual activities with my husband, so I want to get rid of the bleeding and pain as I couldn't live my life due to this bleeding" (P15). Other accepted the diagnosis as they no longer need for child due to death of husband or that she was divorced "I accepted the diagnosis as I was divorced since 1992 and living with my family and didn't think about re marriage again or having children. My brothers and sisters had children who loved me, and I loved them. If I was women who want to get marriage again or had children, I will be sad" (P2)

Sub theme (1.2) Feeling of shock

On the other hand, for the women who are still of reproductive age and desire children, and who are exposed to emergent removal of the uterus due to postpartum hemorrhage resulting from placental abnormalities, hysterectomy was considered a crisis, as the womb is culturally a symbol of femininity and fertility, and its removal leads to infertility. "..I was shocked and couldn't imagine what was happening to me when the doctor told me about a hysterectomy, as I didn't suffer from any disease before, and suddenly after delivery there was severe bleeding due to placental abnormalities. I felt like I was in a dream, and I couldn't believe the diagnosis" (P8); "It was a very difficult feeling that I couldn't describe. The moment in which the doctor told me about the hysterectomy I felt that the world turned black in my eyes" (P13).

Sub theme (1.3) sadness, and depression

Hysterectomy is considered a very important organ for any women, and removal of it can cause complex emotional changes, including depression, anxiety, and sadness. "My psychological status was destroyed, as I always hear in my rural area when a woman has a hysterectomy, her husband will marry another woman" (P10); "I felt down when the doctor told me about hysterectomy as I was afraid for my husband to yearn for children and marry again" (P13).

Theme (2) Early post-procedure suffering

Immediately after hysterectomy, the women expressed multiple post-operative suffering due to physical causes such as incisional pain, poor appetite, insomnia, didn't pass flatus and wound infection. Also, some participants suffered post- procedure due to negative emotions such as fear of changing the husband- wife relationship.

Sub theme 2.1: Post-procedure suffering due to physical condition

The common suffering for the majority of the participant in the early postoperative period was severe pain at the site of the surgery (Incisional pain). "When people heard about hysterectomy they were scared, but actually I didn't feel scared; the only

thing that scared me; it was the first time to undergo an operation. The doctor gave me general anesthesia; he excised the uterus. After the operation, I felt severe pain in the abdomen and back" (P2). Other participants suffered from poor appetite, didn't pass flatus, and insomnia; this may be due to severe pain. Also, wound infection was another cause of suffering after hysterectomy. "When I came out of the operation, I was in an unpleasant condition. I felt like I was dead, I couldn't move from my bed even I couldn't move my hand. I stayed four days without passing flatus. I stayed six days without eating anything. My sleep pattern was disrupted, and my family was sad for me" (P6); "I was hospitalized for 24 days after the hysterectomy because the incision was infected and I had to care for the wound three times per day" (P1).

Sub-theme 2.2: Post-procedure suffering due to a psychological condition (disturbed marital relationship)

The common cause of this type of suffering was that women were afraid of changing their intimacy with their husbands. "Immediately after giving birth, I had massive bleeding and I felt that there was something wrong; after a clinical round with a lot of doctors discussing my condition, one of them told me that I should have a hysterectomy due to placental disruption. At this time, I felt my heart stop as I was only 34 years old. My husband signed the consent, and then I entered the operation room. After recovery from the operation, I didn't know what was going on around me, and I suffered a lot at that time. I thought about my husband, and how he could deal with me" (P6); "I was overthinking our sexual relationship with my husband. Can he ever again be as joyful as we were before? Can I fulfil him the same way as before? Will I experience any discomfort or pain during our relationship? Will I be able to sexually please my husband?" (P3).

Theme 3: Expected later concerns and actual needs

Hysterectomy can have a significant impact on a woman's life and husband relation so receiving support from family and friends affected and strengthened women's confidence in accepting hysterectomy. Need for affections and support from husband was the first need for the women after hysterectomy.

Sub theme 3.1: Concern about family and children

Multiple participants expressed concern regarding their children after hysterectomy, as the limited number of children is stressful for these mothers. The participant and her family had high hopes for their existing children, leading to high levels of fear and stress. "I wanted to go back to my home to see my newborn and other children" (P5); "I was not worried about my self, my first concern was my children, who care about them in my absence" (P1).

Sub- theme 3.2: Sexual concern

In the absence of uterus fear of losing sexual identity and pleasure was from the main concerns of participants after hysterectomy "I need my husband to feel pleasure during sexual intercourse" (P3); " I was afraid that the operation would have an effect on sexual relations, so I asked the doctor many times about this, and he answered no" (P11).

Sub- theme 3.1: Need for affection and support from the husband

"I need to feel that my husband supported me; he was not as I expected" (P5); "the

most thing I was overwhelmed with after hysterectomy, I show my husband would deal with me. As our relationship was already disturbed before the hysterectomy due to heavy bleeding, all the time my clothes were soaked with blood, and I was very embarrassed. After hysterectomy, I desperately need my husband, especially after losing my important organ" (P3). Some women felt alone and abandoned after having a hysterectomy because their spouses did not provide them with enough support. Women's emotional status with their spouses was hurt by their lack of support, leading to an emotional breakdown between them. "The most important thing for me is to feel that my husband understands me, as I became very sensitive after the operation" (P14).

Sub theme 3.3; Needs for Education

The participants suggest a need for increased awareness with special topics such as (if there is any special diet postoperative, when they can do daily home responsibility and question about sexual relation). "I heard that the incidence of bone weakness increases after the operation. So, I wanted to know if there was a specific diet to avoid this problem. when can I take shower, can I do my daily home responsibility, the belt that I wear when I can take it off, for how long I should wear the elastic stock" (P3); "I wanted to know the optimal time for healing the wound, for how long the pain will continue and when I go back to my home, can I breast feed my baby or there is any contraindication for breastfeeding" (P5).

Theme 4: Late post-procedure complaints

By one month to two months following surgery using telephone call, the participant reported loss of energy, couldn't do the routine work s usual, some participant suffered from Weight loss

Sub-theme 4.1: Fatigability

"I feel that I have no energy; I'm drowsy all the time" (P2); "I feel fatigued; I couldn't do my routine work as usual" (P3).

Sub-theme 4.2: Weight loss

"I lost weight after the operation, which may be due to a loss of appetite" (P1); "All my family observed that I lost body weight after the operation" (P12).

Sub- theme 4.3: Social Effect

The majority of the participants reported that hysterectomy affect their social relation.

" I was eager to do the operation to get rid of the bleeding, but it affected our relationship as I feel I lost something. I'm in complete, I'm sitting with my kids, I can't feel with them" (P3); "I see myself as incomplete, I afraid that my neighbour knows that I removed the uterus; I feel that I lost my femininity as compared to women" (P4); "I'm depressed I feel insecure when dealing with my husband's family; I'm trying to stay away from anyone who bothers me" (P5).

Sub-theme 4.4: Loss of Feminine Role

Hysterectomy had a negative impact on the body image and self-esteem of the participants, as the female womb is a representation of femininity and fertility. In her own eyes, losing it makes her a "deficient being; in the eye of herself and the people around her. "The hysterectomy had a great effect on my psychological status. I was depressed and I couldn't see myself as any women, I alerted my family not to tell anyone that I had a hysterectomy, as I feel I am not a female anymore" (P3).

Sub-theme 4.5: Anxiety

Multiple participants expressed changing in their psychological status as following:

"I become very tense than before, I get nervous by any little word from my husband" (P3); "I became very sensitive and down. I can't control my temperament" (P12).

Sub-theme 4.6: Altered sexual behaviors and excitement

Only the young age participants who were caring with the sexual relation, after one to two months by telephone call four participants reported changing in the sexual activity and desire, while two participants reported no changing in the sexual activity and the other didn't care with such activity. "I haven't felt desire or arousal during a sexual act; I think this may be due to my high level of anxiety" (P3); "After my hysterectomy I suffered from many sexual problems: no desire, no excitement, no orgasm, and no pleasure" (P5).

Table 1: Distribution of the Participants According to their demographic characteristics(N=15)

Participants Code	Age	Residence	Educational level	Occupation	Marital status
1	47	rural	Can't read and write	Working	Widow
2	46	rural	primary education	Working	divorced
3	39	rural	preparatory education	Working	Married
4	46	rural	preparatory education	House wife	Married
5	33	rural	secondary education	House wife	Married
6	34	rural	preparatory education	House wife	Married
7	47	rural	secondary education	House wife	Married
8	49	urban	secondary education	Working	Married
9	49	rural	Can't read and write	Working	Married
10	39	urban	secondary education	Working	Married
11	48	urban	preparatory education	Working	Married
12	35	rural	preparatory education	Working	Married

Participants Code	Age	Residence	Educational level	Occupation	Marital status
13	39	rural	preparatory education	Working	Married
14	42	urban	secondary education	Working	Married
15	36	urban	secondary education	Working	Married

Table(2): Distribution of the Participants According to their obstetric history (N= 15)

Variables	N	%
Gravidity		
Nulligravida	1	6.7
Primigravida	1	6.7
Multigravida	13	86.6
Parity		
Nullipara	1	6.7
Para from (1-2)	6	40
Para from (3-4)	8	53.3
Abortion		
No	6	40
Yes	9	60
Living children		
No	3	20
Yes	12	80
Complications during previous delivery		
None	7	46.7
Obstructed labor	1	6.7
Placenta previa	3	20
Postpartum hemorrhage	4	26.6

Table (3): Distribution of the Participants According to their medical history (N= 15)

Items	N	%
No	2	13.3
Diabetes Mellitus	3	20
Hypertension	4	26.6
Cardiac Disease	3	20
Autoimmune Disease	2	13.3
Anemia	2	26.6

*the number is mutual exclusive

Table (4): Distribution of the Participants According to gynecological history (N=15)

Items	N	%
- History of fibroid	13	86.6
- Uncontrolled bleeding	15	100
- History of uterine prolapse	5	33.3
- History of pelvic infection	13	86.6
- History of endometriosis	2	13.3

N.B: The numbers are not mutually exclusive.

Hysterectomy Experience: Time sequence reaction

Immediate reaction toward hystrectomy	Early post procedure suffering	Late post procedures complaints
• Acceptance of The Diagnosis • Feeling of Shock • Sadness, and Depression	• physical suffereing (incisional pain, loss of appetite, insomnia, wound infection) • psychological suffering (disturbed marital relationship	• Fatigability • Weight loss • Social effects • Loss feminine role • Anxiety • Altered sexual behavior and excitement

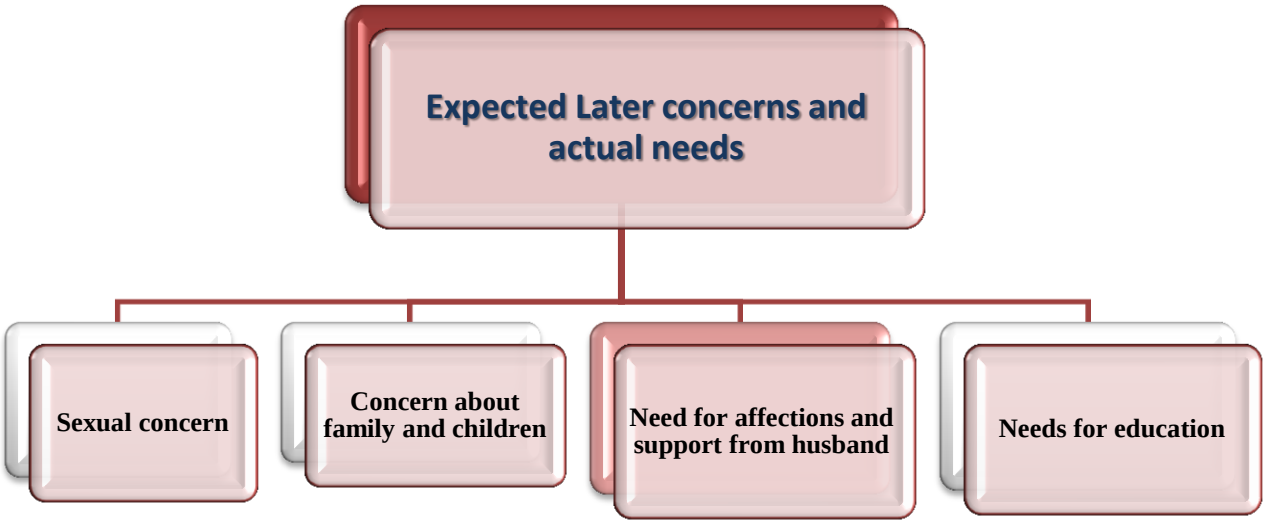

Figure (1) Themes and subthemes of the qualitative analysis

Discussion

The uterus is considered a symbol of femininity and fertility for any woman. Removal of the uterus may be a challenging task for a woman as it encompasses psychological, emotional, and cultural influences. The participants' experiences before and after the hysterectomy varied from one participant to another. The immediate experience toward hysterectomy in this study differed as follows; some participants accepted the diagnosis with satisfaction; others experienced feelings of shock, sadness, and felt depressed. The women who accepted the diagnosis was due to get rid of the bleeding and severe pain which affected their daily activities, sexual and social relation, afraid of the negative consequences of the tumor if left without treatment and no longer need a child due to death of the husband or divorce. The current results are consistent with the study of Janda et al, who found that the majority of women (>96%) did not regret having had the hysterectomy and more than two third of the participants agreed or strongly agreed that they made the right decision to have a hysterectomy[10].

Also consistent with Li, et al [11], who clarified the main consideration before hysterectomy that affects the decision for undergoing hysterectomy as the following disease factors to treat gynecological diseases, fertility factor which affects negatively the decision for undergoing hysterectomy, it can limit young women, especially those who want children, the opportunity to become mothers., and the women may be left out or even abandoned by their husbands because they cannot have children. Bossick et al[12] clarified that one aspect of the presurgical experience was decision making (personal goals for surgery).The women were accepting the surgery despite a long history of symptoms due to fibroid tumors, especially pain and discomfort, years of abdominal distension, and heavy menstrual bleeding[12].

Findings of the current study reported that the participants who expressed feelings of shock, sadness, and depression were the women who underwent emergency hysterectomy due to postpartum hemorrhage resulting from a placental abnormality. This feeling may be due to the surprising situation, as they didn't expect the loss of the uterus. This loss leads to permanent infertility, which causes these women to be divorced or abandoned by their husbands. This result differs from Pilli, Sekweyama, and Kayira[13], who identified women's experiences following emergency peripartum hysterectomy as joy for being alive but also expressed a loss of womanhood and loss of marital safety.

Regarding the short-term experience immediately after the hysterectomy, the results revealed that the participant suffered from physical conditions such as, incisional pain, poor appetite, didn't pass flatus, and insomnia. This may be due to severe pain at the site of surgery, as well as wound infection. Also, the participants experienced a psychological condition as afraid of changing their intimacy with their husbands. This result is consistent with Mahardika, Setyowati, and Afiyanti[14], who showed that the physical demands for women following hysterectomy surgery are to deal with pain and sexual issues. Also, there is a similarity between the result of this study and the study of Janda et al [10], who clarified the common problems reported by the participant immediately after surgery were nausea and vomiting, regaining bladder or bowel functioning, problems with blood pressure, infection, problems with pain relief, and feeling weak due to blood loss during surgery. Also, this finding was in line with Alshawish, Qadous, and Yamani [7] who described the physical changes that happened to the participants after

hysterectomy as the following: pain, insomnia, eating disorder, and immobility.

The findings of this study showed that the need for affection and support from the husband was the main concern for the women after the hysterectomy. Some participants expressed their need of husband support as their spouses did not provide them with enough support. These results are congruent with Mahardika et al [14] who identified the holistic needs of childbearing age women with hysterectomy. Among these needs are the need to deal with sexual problems and pain and to be cared for by thefamily. Also, Goudarzi, et al [15] concluded that women who have undergone hysterectomy not only experience a significant desire for support from family members, especially their husbands but also from medical professionals and their coworkers.

The present study indicated that concerns about family and children were the main concerns for the participant after the hysterectomy. This finding may indicate that due to losing the opportunity of having another child, the participant showed more intimacy and relationship with the offspring. This finding was contradicted by the study of Goudarzi, et al [15] who found that fluctuation in emotional dependency on offspring mean some participant expressed more love for offspring while others reduced attachment to the offspring.

The current study revealed that the need for education regarding diet, daily activity, and sexual intercourse came from women's concerns post-hysterectomy. The current findings were in the same line with Bossick et al [12], who describe the experience of women after surgery and clarify that the women had insufficient information regarding complications post-surgery. Also, Gercek, et al [16] concluded that women's information needs were high after hysterectomy. Also, sexual concern in this study was the main concern after hysterectomy. This may be due to afraid from losing the desire after the surgery, this finding was in agreement with Maharlika, et al [14] who declared that from holistic needs of childbearing age women with hysterectomy is need to solve sexual problem.

The current findings revealed that hysterectomy had late effects after three months post-operation, such as fatigability and weight loss. This may be due to altered nutritional status and disturbed psychological status. This finding was contradicted by Janda et al[10], who stated that the level of energy recovered by 6 weeks after surgery, and contradicted with Alshawish, Qadous, and Yamani [7], who reported that some participants expressed an increased in their appetite and weight gain. The findings of the study revealed that hysterectomy affects the social relationships; this may be due to a feeling of incompleteness. This result agreed with that of Goudarzi, et al [15], who reported that participants experienced a change in their relationships with people who were important in their lives after hysterectomy.

The study findings revealed a change in the psychological status of the participants in the form of anxiety and aggression when dealing with each other; this may be due to the feeling of losing an important organ. This finding was in agreement with Wilson, Pandeya, Byles, & Mishra [17], who concluded that, in the long run, women who have had hysterectomies are at an increased risk of developing depressive symptoms for reasons unrelated to lifestyle or socioeconomic considerations. Also, this finding was in harmony with Alshawish, Qadous, and Yamani [7], who reported that depression, accompanied by anxiety, de-socialization, and aggression, was the most common complication after hysterectomy.

The present study indicated that there were varieties in the sexual activity after hysterectomy, some participants reported

alteration in sexual activities and excitement and this may be due to high level of anxiety or feeling with losing something and other reported no change in the sexual activity; this finding was consistent with Alshawish, Qadous, and Yamani [7] who reported many participants avoid discussing this topic. Some patients in the study reported sexual effects, and others did not. However, this finding was contradicted by Danesh et al., [8] who concluded from their study with on the effect of hysterectomy on women's sexual function that most sexual disorders improve after hysterectomy for uterine benign diseases, and most of the patients who were sexually active before the surgery experienced the same or better sexual functioning after the surgery.

Conclusion

According to the results of the current study it is concluded that hysterectomy is a sensitive operation whose participants need special need before and after surgery as it negatively impacted physically, psychologically and socially on women's life. The overall experience as perceived by the participants could be described as the following: 1) Immediate reaction towards hysterectomy was reflected by different feelings such as acceptance of the diagnosis, feeling of shock, feeling sad, and depression; 2) Early post-procedure suffering due to physical and psychological factors; 3) Expected later concerns and actual needs such as concern about family and children, sexual concern, need for affections and support from the husband, and needs for education; 4) Late post-procedure complaints due to fatigability, weight loss, social effects, loss of feminine role, anxiety, altered sexual behavior, and excitement.

Recommendations

Based on the findings from this research, recommendations can be made to nurses dealing with that condition to support the women and design appropriate nursing plans and interventions when caring for this group during hospitalization and after discharge. Future research is needed to explore the coping mechanisms of those participants.

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Conflict Of Interest

The author declares no conflict of interest, financial or otherwise.

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References

1. Solbrække KN, Bondevik H. Absent organs—Present selves: Exploring embodiment and gender identity in young Norwegian women's accounts of hysterectomy. International journal of qualitative studies on health and well-being. 2015 Jan 1;10(1):26720.
2. Allam IS, Gomaa IA, Fathi HM, Sukkar GF. Incidence of emergency peripartum hysterectomy in Ain-shams University Maternity Hospital, Egypt: a retrospective study. Archives of gynecology and obstetrics. 2014 Nov;290:891-6.
3. Shekhar C, Paswan B, Singh A. Prevalence, sociodemographic determinants and self-reported reasons for hysterectomy in India. Reproductive health. 2019 Dec;16:1-6.

4. Doğanay M, Kokanalı D, Kokanalı MK, Cavkaytar S, Aksakal OS. Comparison of female sexual function in women who underwent abdominal or vaginal hysterectomy with or without bilateral salpingo-oophorectomy. Journal of Gynecology Obstetrics and Human Reproduction. 2019 Jan 1;48(1):29-32.
5. Ali SA, Farahat MM, ElShafei MA. Surgical approach to hysterectomy for benign gynecological diseases. The Egyptian Journal of Hospital Medicine. 2019 Oct 1;77(3):5279-86.
6. Schmidt A, Sehnem GD, Cardoso LS, Quadros JS, Ribeiro AC, Neves ET. Sexuality experiences of hysterectomized women. Escola Anna Nery. 2019 Jul 29;23.
7. Alshawish E, Qadous S, Yamani MA. Experience of Palestinian women after hysterectomy using a descriptive phenomenological study. The Open Nursing Journal. 2020 Jun 1;14(1).
8. Danesh M, Hamzehgardeshi Z, Moosazadeh M, Shabani-Asrami F. The effect of hysterectomy on women's sexual function: a narrative review. Medical Archives. 2015 Dec;69(6):387.
9. Sloan A, Bowe B. Phenomenology and hermeneutic phenomenology: The philosophy, the methodologies, and using hermeneutic phenomenology to investigate lecturers' experiences of curriculum design. Quality & Quantity. 2014 May;48:1291-303.
10. Janda M, Armfield NR, Kerr G, Kurz S, Jackson G, Currie J, Page K, Weaver E, Yazdani A, Obermair A. Patient-reported experiences after hysterectomy: a cross-sectional study of the views of over 2300 women. Journal of Patient Experience. 2020 Jun;7(3):372-9.
11. Li N, Shen C, Wang R, Chu Z. The real experience with women's hysterectomy: A meta-synthesis of qualitative research evidence. Nursing Open. 2023 Feb;10(2):435-49.
12. Bossick AS, Sangha R, Olden H, Alexander GL, Wegienka G. Identifying what matters to hysterectomy patients: Postsurgery perceptions, beliefs, and experiences. Journal of patient-centered research and reviews. 2018;5(2):167.
13. Pilli P, Sekweyama P, Kayira A. Women's experiences following emergency Peripartum hysterectomy at St. Francis hospital Nsambya. A qualitative study. BMC pregnancy and childbirth. 2020 Dec;20:1-6.
14. Mahardika P, Setyowati S, Afiyanti Y. The holistic needs of women with hysterectomy: A grounded theory study. Enfermería Clínica. 2021 Apr 1;31:S24-8.
15. Goudarzi F, Khadivzadeh T, Ebadi A, Babazadeh R. Women's interdependence after hysterectomy: a qualitative study based on Roy adaptation model. BMC Women's Health. 2022 Feb 13;22(1):40.
16. Gercek E, Dal NA, Dag H, Senveli S. The information requirements and self-perceptions of Turkish women undergoing hysterectomy. Pakistan journal of medical sciences. 2016 Jan;32(1):165.
17. Wilson L, Pandeya N, Byles J, Mishra G. Hysterectomy and incidence of depressive symptoms in midlife women: the Australian Longitudinal Study on Women's Health. EpidemiolPsychiatr Sci. 2018;27(4):381-392.

Effect of Implementing Educational Program about Patients' Morbid Obesity Care on Nurses' performance at Intensive Care Unit

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Abstract

Background: Patients are generally considered morbid obese when their body mass index (BMI) is over 40 kg/m2. Critically ill morbidly obese patient places specific demands on intensive care services as a result of prolonged mechanical ventilation needs. **Aim:** Evaluate the effect of implementing educational Program about Patients' morbid obesity care on nurses' performance at Intensive Care Unit. **Design:** Quasi- experimental research design. **Subjects:** All nurses (70), 40 nurse from Intensive Care Unit of Emergency Hospital of Tanta University and (30) nurses from general ICU of El menshawy Hospital. **Tools:** Two tools were used for data collection .Tool (1) Nurseś structured Interview Scheduled and consisted of 2 parts; socio-demographic characteristics of nurses, structure nurses, knowledge interview questionnaire. Tool(2) Nurseś' observational check list about patient morbid obesity care. **Result**: The present study revealed that there was a significant improvement in the mean score of the total level of knowledge and practice immediately and post two-months of educational program implementation compared to preprogram with $p<0.05$.**Conculsion**. It can be concluded that, most of the studied nurses had high level of knowledge and majority of them had satisfactory practice immediately after program than pre implementation of educational program. **Recommendations:** In-service training programs should be conducted to maintain efficient nurses' performance.

Key words: Educational program, Morbid obesity, Nurses performance.

Introduction

Morbid obesity is a medical condition in which excess body fat has accumulated to an extent that it may have a negative effect on health. Patients are generally considered morbid obese when their body mass index (BMI) is over 40 kg/m2.(1-23)

Morbid obesity is a leading preventable cause of death worldwide, with increasing rates in adults.(4) In 2020,640 million adults were obese in 195 countries which is more common in women 375millon than men 266 millon. (5)Authorities view it as one of the most serious public health problems of the 21st century. The percentage of adults affected in the United States as of 2018_2019 is about 42.4% 700 millon overall (35millon of males and 35millon of females).(6) According to the World Health Organization (2020_2021) estimated that obesity in Egypt was 32% .These data indicate a much higher prevalence of obesity among adult women, while overweight is more marked among adult men. (7)

The etiology of obesity is multifactorial; obesity can be due to genetic, metabolic and environmental factors or a combination of these. A few cases are caused primarily by genes, endocrine disorders, medications, or mental disorder.(7) The view that obese people eat little yet gain weight due to a slow metabolism is not medically supported. On average, obese people have a greater energy expenditure than their normal

counterparts due to the energy required to maintain an increased body mass.[8-9]

Critically ill patients with morbid obesity are at risk for diabetes, musculoskeletal disorders, cancer, obstructive sleep apnea, cardiac dysfunction and obstructive sleep apnea.[10]

Additionally, morbid obese patients had excess abdominal fat and are directly related to high levels of total cholesterol, low-density lipoprotein cholesterol, triglycerides, and elevated blood pressure. Therefore obese patients are at high risk for circulatory disorders as deep venous thrombosis sternal wound infections, loss of skin integrity, difficult endotracheal intubation and prolonged length of stay in the ICU.[11-12]

Educational program for nurses who provide direct care to patients with morbid obesity offered several opportunities for increased nurses' knowledge and practice about care of morbid obesity, through formal courses initiated at the intensive care.[13,14]

Critically ill morbidly obese patient places specific demands on intensive care services as a result of prolonged mechanical ventilation needs, increased length of intensive care stay and increased respiratory and wound complications. This requires increased staffing support and specialist bariatric equipment. [13-15-16]

Critical care nurses should understand the physiological differences and practice guidelines for patients with a body mass index greater than 40. The approach encompasses key clinical concepts in the management of critically ill morbidly obese patients, including management of airways and breathing, minimizing nurses' back and other injuries, circulation problems, risks of decubitus ulcers and other skin breakdown, differences in drug calculations and metabolism, limitations in diagnostic equipment and imaging, diet and nutritional recommendations, and concerns with durable medical equipment.[17,18] Morbidly obese acutely ill patients require specialized nursing care, including; safe patient handling techniques to decrease injuries among nurses and patients. [19-20]

Aim of the study

Is to evaluate effect of implementing educational program about Patients' morbid obesity care on nurses' performance at Intensive Care Unit

Research hypotheses

H1: Nurses who receive educational program about morbid obesity care are expected to have increased mean score of knowledge.

H2: Nurses who receive educational program about morbid obesity care are expected to have increased mean score of practice.

Subjects and Method

Research design

A quasi- experimental research design was utilized.

Setting

The research study was conducted at two areas: Intensive Care Unit of Tanta University Emergency Hospital which consisted of two rooms, each room contained of 4 wards,21 beds, 21 ventilators, 21 monitors and El-Menshawy General Hospital in Tanta, contained of one room of 14 beds ,12ventilator,14 monitors, 2 emergency carts.

Subjects

All nurses (70) nurses who are working in the previously mentioned settings (40 nurses from Intensive Care Unit of Tanta Emergency Hospital and 30 nurses of El-Menshawy Hospital who provide direct care for morbidly obese patients.

Tools of data collection

Two tools were used in this study

Tool I: Nurses' Structured Interview Schedule [20-22], this tool was developed by the researcher after reviewing relevant literature to collect data pertinent to the current study. It consisted of two parts

Part (1): Socio-demographic data of nurses: It included age, sex, marital status, years of experience, level of education.

Part (2): Nurses' Knowledge about care of patient's morbid obesity : This part was used to assess nurses' knowledge related to morbid obesity, which included: definition of morbid obesity (1question), risk factor of morbid obesity (1question), symptoms of morbid obesity (1question), co-existing medical problems of morbid obesity(1question),complications associated with morbid obesity (1question) ,diagnosis tests (4questions), respiratory changes associated with morbid obesity(3 questions) ,circulatory changes associated with morbid obesity(2questions),nursing care of circulatory and respiratory problems associated with morbid obesity (10questions), minimize nurses backs injuries (4questions),risk decubitus Ulcers (2questions) , drugs calculation (3questions) ,diet and nutritional requirement(5questions)

Scoring system included the following: Two points were given for each complete and correct answer, complete response was given one point and incorrect answer was given zero. The total score more than 75% was considered high level of knowledge, score ≥ 60-75 % was considered moderate level of knowledge and less than 60% were considered low knowledge level.

Tools (II): **Nurses' Observational Checklist about care of morbid obesity** [18-22] **:** It was developed by researcher after reviewing of related literature to assess the actual nursing practice pre, immediate and 2 months later post implementation of educational nursing care program as following :

Measure weight, height and waist circumference(8steps),body mass index assessments (1steps),adequate circulation such as monitor vital signs (5steps),proper monitoring of central venous pressure (13steps),maintain adequate ventilation such as monitor depth of breath, breath sounds, encourage deep breathing exercises, change position periodically**,** maintain patients in a reverse trendelenburg position as tolerated and monitor pulse oximetry (11 steps),Provide adequate decubitus ulcers preventing measure**s** such as assessment of the patient's risk for ulcers**,** appropriate use of pressure-reducing devices, frequent skin care and positioning of patients(6 steps),closely monitor nutritional status such as assess weight, skin turgor and intake and output(5steps),safe patient handling techniques (6 steps),maintain deep vein thrombosis prophylaxis measures such as assessment of the patient's risk for deep vein thrombosis**,** encourage passive and active exercises, elastic stokes, monitoring clotting factors(6 steps).

Each item in checklist was scored as the following: correctly and fully complete step was received scored (2),correctly and partially completed step received scored (1) and incorrectly step was scored (0) .The nurses practice total scoring system was calculated and categorized as follows: More than 70% considered satisfactory and less than 70% considered unsatisfactory.

Method

The following steps were taken to complete the study

1. Administrative process

The director of Tanta Emergency had been informed of the study's official approval, which was received from the appropriate authorities at Tanta University's Faculty of Nursing.

2. Informed consent

Nurses' informal consent to participate in the study was obtained after the researcher explained to the nurses. The objective of the study and confidentiality was preserved.

3. Ethical and legal consideration

-Using code number rather of participant's name and allowing him to leave at any time of the study maintain the privacy and confidentiality. Nature of the study didn't cause any harm or pain.

-The researcher was assuring anonymity and confidentiality of subjects' data.

-The ethical committee consent was obtained from the Faculty of Nursing.

4. Tools development

Two tools were used in this study and developed by the researcher after reviewing related literature; Tool (l), included structured Interview Schedule and was divided into two parts: Part(1):Socio-demographic characteristics of the studied nurses, part (2): Nurses knowledge about morbid obesity caring. Tool (2): including Nurses' Observational Checklist about patient morbid obesity caring.

5. Content validity of the tools

The content validity of the developed tools was tested for clarity and applicability by seven experts in critical care nursing and Biostatistics to ensure their validity and modification was done.

6. Reliability of the tools

The reliability for the study was calculated by

The Cronbach Alpha was calculated for both knowledge (0.89), practice (0.921)**.**

7. Pilot study

It was carried out on 10% of the nurses (7nurses) to test the tool for its relevance, clarity and organization and to determine the length of time needed to collect the data from nurses. Modifications and some additional terms were done by the researcher before the main study, according to the experience gained from the pilot study.

8. Data collection

Data were collected over a period of 6 months starting from the beginning of June to the end December 2021. The researcher starts the interview by introducing herself after providing an explanation for the purpose and the nature of the study. Each nurse was individually interviewed to fulfill the sheet question. Each interview for the nurse lasted for about 20_30 minutes to complete the tool. The study was conducted at four phases.

9. Phases of the study

The study was conducted through four phases (Assessment, planning, implementation and evaluation)

1. Assessment phase

Data was collected by the previously mentioned tool through meeting nurses in ICU to assess knowledge and practice regarding patient morbid obesity caring. The researcher gave each nurse the knowledge questionnaire sheet to answer it. Also, the researcher observed each nurse individually during their work in morning and afternoon shift to assess their practice.

2. Planning phase.

-Setting the general and specific objectives of the educational program regarding morbid obesity caring in ICU. The content was prepared to meet the aim of the study. Booklet was prepared and written in simple Arabic language. The booklet will be revised by experts in critical care nursing field. Different teaching methods will be

used as booklet, video, group discussion and PowerPoint, demonstration and re-demonstration.

-The educational program Provided by the researcher over small sessions including theoretical and practical content based on the identified needs of critical care nurses and in the light of most recent pertinent literature.

-Expected outcome

Improvement of nurses' knowledge and practice about patient morbid obesity caring after implementation of the educational program.

3. Implementation phase

-The educational program conducted in 8 sessions to nurses who divided into 5 subgroups, 14 nurses in each group, four days per week until all subgroups finished program and time of each session was about 30 minutes.

-The researcher implemented the educational program for all study subjects as the following:

The first part: Theoretical part: Four sessions was used for four consecutive days 30 minutes for each session.

Session one: consisted of explaining the aim of the study, definition morbid obesity, risk factor and co-existing medical problems of morbid obesity.

Session two: consisted of diagnosis and representation of most common disorder, symptoms and complications associated with morbid obesity.

Session three: consisted of treatment and nursing guidelines for obesity management (management airways and breathing, circulation problems, risks of decubitus ulcers, differences in drug calculations and metabolism, limitations in diagnostic equipment and diet and nutritional recommendations and minimizing nurses' back and other injuries).

Session four: was carried- out for revision and open discussion between researchers and subjects. Each nurse was supplemented with knowledge booklet and received printed materials with guidelines after each session. During the classes, nurses were encouraged to ask questions and provide feedback. Communication was kept open between the researchers and the nurses. Teaching methods utilized were lectures.

For the practical part: four sessions were used for four consecutive days 30 minutes for each session. Subjects were divided into small groups (14 nurses) in each group.

Session one including, weight, height, BMI/waist circumference assessment.

Session two was covered nursing care regarding:

Maintain adequate circulation

Monitor vital signs (temperature, blood pressure, respiratory rate ,Use of a proper _sized blood pressure cuff in obese),Proper monitoring of central venous pressure and monitor heart rate \ rate and rhythm.

Maintain adequate ventilation

Monitor the speed / depth of breath. Auscultation of breath sounds, encourage deep breathing exercises, monitor pulse oximetry, give supplemental oxygen, maintain patients in a reverse trendelenburg position as tolerated to decrease intrathoracic pressure and reduce atelectasis, monitor ventilator settings, it should be set on the basis of the patient's predicted body weight (PBW) or ideal body weight (IBW) , change position periodically.

Session three: consisted of nursing management regarding:

Provide adequate decubitus ulcers preventing Measures

Assessment of the patient's risk for ulcers ,appropriate use of pressure-reducing devices, frequent skin care and positioning

of patients ,encourage passive and active exercises.

Maintain deep vein thrombosis prophylaxis measures

Assessment of the patient's risk for deep vein thrombosis, appropriate use of deep vein thrombosis prophylaxis measures as passive and active exercises, elastic stokes, monitoring clotting factors positioning of patients

Session four included nursing management regarding:

Closely monitor nutritional status, safe patient handling techniques, using the appropriate weight-based calculations for medications demonstrations and re-demonstration. Teaching media included group discussion with power point and real case study.

Evaluation phase

Evaluate the effect of implementing educational program about patients' morbid obesity care on nurses' performance at Intensive Care Unit by using tool I and II for nurses three times; pretest, immediate after program implementation and follow up two months.

Results

Results are presented in the following order: The first section is devoted to the description of distribution of the studied nurses according to their demographic data, their knowledge and practice about patient morbid obesity caring. (Table 1- 3). The second part covered correlations between total nurses' knowledge and their practice (Table 4). The third section covered relation between socio-demographic characteristics of the studied nurses and their total knowledge score and their practice about patients' morbid obesity (Table 5-6).

Table (1): Illustrates the distribution of the studied nurses according to their socio–demographic characteristics.

This table showed that there were more than three quarter of the studied nurses (77.1%) were in the age group of 20-<30 years. Also, it showed that the majority of the studied nurses (91.4%) were female and more than two third (74.3%) were married. Moreover, it was found that the majority of the studied nurses (91.4%) had baccalaureate degree and the mean years of experience in ICU were (3.94±2.283) years.Concerning nurse's previous training program, the present result concluded that all participant (100%) nurses didn't attend any previous training program about morbid obesity.

Table (2): shows mean score and standard deviation of the studied nurses' knowledge in relation to eight main domains about morbid obesity throughout phases of study. A significant decrease of total mean score of nurses knowledge (58.06±8.184) was found pre implementation phase related domain of (definition, risk factor, symptoms, complication, diagnostic tests, respiratory and circulatory changes, nursing care of circulatory problems, nursing care of respiratory problems, nurses backs injuries prevention, decubitus ulcers prevention and drugs calculation, diet requirements for morbid obese patient. However, significant improvement of total mean score (71.64±3.493) was observed at immediate phase of program and relatively reduced in mean score (65.11±17.603) post 2 month of program implementation with p= 0.000**.**

Table (3): Illustrates mean score and standard deviation of the studied nurses' practice related domains of morbid obesity care throughout phases of study.

A significant decrease of total mean score of nurses' practice (78.37±12.809) was noted pre implementation phase related to domain of (assessment and anthropometric measurement, monitoring vital signs, proper

monitoring of central venous pressure, maintain adequate ventilation, decubitus ulcers preventing measures, monitor nutritional status, apply safe patient handling techniques, DVT prophylaxis measures). On the other hand, this table revealed a significant improvement of mean score(121.90±9.038) of the same domain at immediate phase of program implementation, however there was a relative reduction in mean score (110.83±30.236) post 2 months of program implementation with P=0.000.

Table (4): Illustrates a highly statistical significant correlation between the studied nurses' overall knowledge score and their practice score throughout the intervention periods (pre, immediately and post 2 months) where P= 0.000 in addition 94.3% of nurses had high knowledge &satisfactory practice immediately following program implementation and this percentage decreased to 81.4% post 2 months of program implementations.

Table (5): Relation between socio-demographic characteristics of the studied nurses and their total knowledge score about patients' morbid obesity throughout Periods of implementation of educational program.

This table revealed that, there was no significant relation between total knowledge and their sociodemographic data. Also,This table shows that the highest mean ±SD of total knowledge was (71.69±3.581) immediately after program implementation compared to (58.48±7.655) pre-program and decreased to (66.06±16.968)post 2 months program among age of (20<30)years . It shows also an increase of mean score (71.70±3.571) immediately following program implementation and decreased gradually (65.25±17.533) post 2 months among female nurses.

The highest mean ±SD of total knowledge score (71.77±3.421) among baccalaureate nurses immediately following program but slightly decreased (65.25±17.527) post 2months following program implementation. Also, the highest mean ±SD of total knowledge score of the studied nurses with <5 years of experience in ICU was (71.77±3.422) immediately following program implementation but mean score decreased to (69.50±2.121) post two months of program implementations.

Table (6): Relation between socio-demographic characteristics of the studied nurses and their total practice score about patients' morbid obesity throughout Periods of implementation of educational program.

Concerning relation association between age, level of education and years of experience in ICU and their total practice score, no significance differences were observed among studied nurses in pre, immediately and post 2months periods with p >0.05. On the other hand, significance differences were observed among the studied nurses regarding to their gender and their total practice at immediately periods with p=0.000.

However, it was found that increased mean score (122.83±7.869) of nurses immediately following program among nurses in groups (20<30) years but decreased gradually (111.41±30.714) post 2months of program implementations. Also, this highest mean ±SD of total practice of the studied nurse's female was (123.13±7.489) immediately after program compared to (78.89±12.839) pre-program implementations and decreased gradually (111.70±30.131) post two-months of program implementing but the highest mean ±SD (122.30±8.487) was observed in baccalaureate degree nurses immediately following program. Also, it shows that the

highest mean ±SD of total practice of studied nurses >10years experience in ICU was (123.00±7.071) immediately after program and (123.00±7.071) post 2 months of program compared to (90.00±8.485) pre-program implementations.

Table (1): Distribution of the studied nurses regarding their Sociodemographic characteristics.

Characteristics	The studied nurses (n=70)	
	N	%
Age (in years)		
- (20-<30)	54	77.1
- (30-<40)	16	22.9
Gender		
- Male	6	8.6
- Female	64	91.4
Marital status		
- Single	18	25.7
- Married	52	74.3
Level of education		
- Baccalaureate	64	91.4
- Technical institute	6	8.6
Range	**(1-15)**	
Mean ± SD	**4.14±3.168**	
Years of experience in ICU		
- (<5)	52	74.3
- (5-<10)	16	22.9
- (≥10)	2	4.9
Range	**(1-10)**	
Mean ± SD	**3.94±2.283**	
Training courses related to morbid obesity		
Yes	0	00.0
NO	70	100.0

Table (2): Mean score and standard deviation of the studied nurses' knowledge in relation to eight main domains about morbid obesity throughout phases of study

Knowledge domains	The studied nurses (n=70) Range Mean ± SD			χ^2 P
	Pre	Immediate	Post 2 months	
Definition, risk factor, symptoms, complication of morbid obesity	**(1-10) 6.63±2.148**	**(6-12) 9.40±1.592**	**(3-12) 8.43±2.652**	**F=29.289 P=0.000***
Diagnostic tests	**(4-8) 6.77±1.332**	**(7-8) 7.90±0.302**	**(2-8) 7.07±2.101**	**F=11.427 P=0.000***

Respiratory and circulatory changes associated with morbid obesity	**(2-10) 5.69±2.857**	**(5-10) 8.19±1.526**	**(3-10) 7.60±2.392**	**F=22.148 P=0.000***
Nursing care of circulatory problems associated with morbid obesity	**(1-8) 5.40±2.046**	**(4-8) 7.00±1.077**	**(2-8) 6.29±1.994**	**F=14.476 P=0.000***
Nursing care of respiratory problems associated with morbid obesity	**(8-18) 13.06±2.807**	**(11-16) 14.36±1.240**	**(6-16) 13.16±3.147**	**F=5.688 P=0.004***
Nurses backs injuries prevention	**(2-8) 5.66±1.667**	**(4-8) 6.23±0.871**	**(2-8) 5.77±1.819**	F=2.804 P=0.063
Decubitus ulcers prevention and drugs calculation for morbid obese patient	**(4-10) 6.99±1.892**	**(8-10) 8.83±0.932**	**(2-10) 7.90±2.560**	**F=16.204 P=0.000***
Diet requirements for morbid obese patient	**(5-12) 7.87±1.955**	**(7-12) 9.74±1.548**	**(3-12) 8.90±2.793**	**F=13.156 P=0.000***
total knowledge	**(42-75) 58.06±8.184**	**(63-79) 71.64±3.493**	**(23-79) 65.11±17.603**	**F=24.93 P=0.000***

Table (3): Mean score and standard deviation of the studied nurses' practice of domains about morbid obesity throughout periods of intervention

Practice domains	**The studied nurses (n=70) Range Mean ± SD**			χ^2 **P**
	Pre	**Immediate**	**Post 2 months**	
Assessment and anthropometric measurement for morbid obese patient	**(6-14) 10.60±1.899**	**(12-16) 14.54±1.441**	**(4-16) 13.21±4.010**	**F=38.824 P=0.000***
Monitoring vital signs of morbid obese patient	**(0-10) 6.23±2.611**	**(6-10) 9.71±0.950**	**(4-10) 8.93±2.189**	**F=56.111 P=0.000***
Proper monitoring of central venous pressure for morbid obese patient	**(3-23) 15.67±4.717**	**(20-28) 26.89±1.915**	**(9-28) 24.43±6.566**	**F=105.694 P=0.000***
Maintain adequate ventilation for morbid obese patient	**(7-22) 13.36±3.711**	**(12-22) 18.47±3.900**	**(9-22) 17.24±4.859**	**F=28.463 P=0.000***
Decubitus ulcers preventing measures for morbid obese patient	**(2-12) 6.93±2.726**	**(8-12) 11.49±1.087**	**(3-12) 10.27±3.148**	**F=63.148 P=0.000***
Monitor nutritional status for morbid obese patient	**(5-16) 10.00±2.818**	**(10-16) 15.37±1.436**	**(4-16) 13.83±4.232**	**F=57.533 P=0.000***
Apply safe patient handling techniques for morbid obese patient	**(2-12) 7.03±2.626**	**(10-12) 11.64±0.591**	**(3-12) 10.49±3.120**	**F=71.290 P=0.000***
DVT prophylaxis measures for morbid obese patient	**(4-12) 8.56±2.198**	**(13-14) 13.79±0.413**	**(4-14) 12.43±3.483**	**90.226 P=0.000***

Total Practice	**(54-103) 78.37±12.809**	**(91-129) 121.90±9.038**	**(40-129) 110.83±30.236**	**F=92.654 P=0.000***

Table (4): Correlation between total knowledge score of the studied nurses and their total practice score throughout periods of implementation of educational program

Total knowledge level	**The studied nurses (n=70) Total practice level**				**χ^2 P**
	Unsatisfactory		**Satisfactory**		
	N	**%**	**N**	**%**	
Pre					
- Low	9	12.9	3	4.3	**8.046 0.018***
- Moderate	38	54.3	7	10.0	
- High	6	8.6	7	10.0	
r , P	0.009 , 0.940				
Immediate					
- Moderate	0	0.0	4	5.7	-
- High	0	0.0	66	94.3	
r , P	0.093 , 0.442				
- Post 2 months					
- Low	10	14.3	0	0.0	**70.00 0.000***
- Moderate	0	0.0	3	4.3	
- High	0	0.0	57	81.4	
r , P	**0.947 , 0.000****				

r: Pearson' correlation coefficient

* Significant at level P<0.05

** Highly significant at level P<0.01

Table (5): Relation between socio-demographic characteristics of the studied nurses and their total knowledge score about patients' morbid obesity throughout periods of implementation of educational program

Characteristics	**The studied nurses (n=70) Total knowledge score**		
	Pre	**Immediate**	**Post 2 months**
Age (in years)			
- (20-<30)	**58.48±7.655**	**71.69±3.581**	**66. 06±16.968**
- (30-<40)	56.63±9.912	71.50±3.286	64.83±17.933
t , P	0.632 , 0.429	0.034 , 0.854	0.059, 0.808
Gender			
- Male	**61.33±6.683**	71.00±2.683	63.67±20.007
- Female	57.75±8.288	**71.70±3.571**	**65.25±17.533**
t , P	1.052 , 0.309	0.220 , 0.641	0.044 , 0.835
Marital status			
- Single	**62.89±8.595**	70.56±3.434	63.33±18.759

- Married	56.38±7.410	**72.02±3.467**	**65.73±17.333**
t , P	**9.484 , 0.003***	2.395 , 0.126	0.245 , 0.622
Level of education			
- Baccalaureate	57.80±8.424	**71.77±3.421**	**65.25±17.527**
- Technical institute	**60.83±4.491**	70.33±4.320	63.67±20.067
t , P	0.752 , 0.389	0.921 , 0.341	0.044 , 0.835
Years of experience in ICU			
- (<5)	58.38±7.782	**71.77±3.422**	**69.50±2.121**
- (5-<10)	56.63±9.486	71.50±3.916	66.06±17.102
- (≥10)	61.00±11.314	69.50±2.121	64.65±18.218
F , P	0.409 , 0.666	0.416 , 0.661	0.100 , 0.905

* Significant at level P<0.05

Table (6): Relation between socio-demographic characteristics of the studied nurses and their total practice score about patients' morbid obesity throughout periods of implementation of educational program.

Characteristics	**The studied nurses (n=70) Total practice score**		
	Pre	**Immediate**	**Post 2 months**
Age (in years)			
- (20-<30)	77.69±13.506	**122.83±7.869**	**111.41±30.714**
- (30-<40**)**	**80.69±10.137**	118.75±11.969	108.88±29.443
t , P	0.675 , 0.414	2.577 , 0.113	0.085 , 0.771
Gender			
- Male	72.83±12.123	108.83±14.020	101.50±32.599
- Female	**78.89±12.839**	**123.13±7.489**	**111.70±30.131**
t , P	1.231 , 0.271	**16.872 , 0.000***	0.621 , 0.433
Marital status			
- Single	77.44±15.198	120.17±8.853	109.17±32.228
- Married	**78.69±12.024**	**122.50±9.108**	**111.40±29.823**
t , P	0.125 , 0.724	0.890 , 0.349	0.072 , 0.789
Level of education			
- Baccalaureate	**78.61±13.051**	**122.30±8.487**	**111.56±30.096**
- Technical institute	75.83±10.458	117.67±14.010	103.00±33.514
t , P	0.255 , 0.615	1.449 , 0.233	0.436 , 0.511
Years of experience in ICU			
- (<5)	78.75±13.380	**123.33±6.632**	111.46±31.091
- (5-<10)	75.69±10.725	117.13±13.832	107.25±29.677
- (≥10)	**90.00±8.485**	123.00±7.071	**123.00±7.071**
F , P	1.205 , 0.306	3.070 , 0.053	0.280 , 0.757

* Significant at level P<0.05

Discussion

Obesity is a serious health concern because it is associated with comorbid illnesses, such as diabetes, liver disease, hypertension, coronary artery disease and obstructive sleep apnea. [(1)] Nurses play a key role in caring for patients with morbid obesity in Intensive Care Unit. The high quality of health care provided for morbid obesity patients is increased with knowledge and practice. It is essential to provide more effective training, comprehensive knowledge and update information for nurses about caring morbid obesity in Intensive care unit. [(2-3)]

Demographic characteristics of the studied nurses

Regarding age, the findings of the present study revealed that more than three quarter of the total nurses were in the age group from (20-<30) years. This finding was matched with **fan et al (2020)** [(23)] who found that most of studied nurses were in age <30years old. Also, this finding was in similar with **kim et al (2021)** [(24)] who stated that the predominant age group of the studied nurses was between 20-30 years old. This finding is justified by new graduate nurses were appointed to work in ICU because this age considered had effective time to learn and modify their practice through training and education to improve the sense of identity and develop successful , in other hands .This finding was in disagreement with **Salah et al (2016)**[(25)] Who reported in his study at Ain-shams University Hospitals, about two thirds of study nurses were more than 35 years old.

Regarding gender. The finding of the present study showed the majority of the studied nurses were female; this result was in line with **Wynn et al (2018)**[(26)] who founds that the majority of the studied sample was female. Also this study was similarly with **Lopez et al (2020)**[(27)] entitled" Nurses' self-efficacy and practices relating to weight management of adult patients in London and revealed that 88.7% of the studied nurses were females. Also this finding was accepted **with Huang et al (2020)**[(28)] **and Tang et al(2018)**[(29)] Who found that near two thirds of nurses were females while the male was less than one third, in my opinion, This result is due to the entry of a large number of females into the nursing profession more than males previousl and a little number of men occupying this job in Egypt. Faculty of nursing newly inserted the male students in their study. On the other hand, this finding was contraindicated with **Abukhelai et al (2019)**[(30)]**.** Who mentioned that most of the professional nurses were male.

As regards marital status and educational level.The results of the current study showed that majority of the studied nurses were married and had baccalaureate degree this result was in line with **Al-hzoy et al (2020)**[(31)] who reported that about two thirds of nurses were married. From the researcher's point of view, this might because most of the studied sample ranged between 21_30years old. Also, This finding was matched with **Fasoi et al (2020)**[(32)] who found that the highest percentage of studied nurse's was graduated from college of Nursing. On the other hand this result disagreed with **Mansour et al (2019)**[(33)] Who concluded that the most of studied sample had technical institute.

As regard years of experience in ICU unit, the findings of the current study illustrated that the proportion of the studied nurses had experience less than 5 years. This finding was in line with **Turkmen et al (2021)**[(34)] **entitled** who revealed that most of the

studied sample was less than 5 years of experience. From the researcher's point of view, this might because most of the studied sample ranged between 20_30 years old. On other hand, this finding studied disagreed with **petrin et al (2017)**[35] Who reported that the majority of the studied nurses had more than 10 year of experience.

Concerning attendance of nurses' training courses **,**the findings of the present study clarified that all nurses in ICU didn't receive training courses on morbid obesity care, This finding was agreement with **Yang et al (2019)**[36] who showed that all nurses in ICU didn't attending any course about morbid obesity care. Also, the finding agreement with **Robstad et al (2018)**[37] who conducted cleared all the nurses didn't have the training. This result can be explained by the lack of administrative support, increasing workload in clinical area, and lack of motivation with the hospital have no staff development program related to the care of a critically ill .

Concerning the total knowledge domains of the studied nurses regarding morbid obesity in ICU throughout periods of study, the current study indicated that two-third of the studied nurses had moderate level of knowledge regarding morbid obese patient care. This finding was in congruence with a study done by **Naderi et al(2018)**[38] who revealed that there were highly statistically significant differences between studied nurses knowledge related to morbid obesity care pre and post educational program. It was observed that the mean score of knowledge increased Immediately after program compared to pre- program and decreased gradually after two months of the study .From the researchers' point of view the reasons for lack of nurses' knowledge regarding morbid obesity patient might be related to lack of continuing educational programs .Also, This finding was in line with **Dejong et al (2018)**[39] and **Martin et al (2018)**[40] they showed an increase in nurses score after training course.

Additionally, implementation of the educational program led to significant improvements in nurses' knowledge with a good level of knowledge immediately and two-months post-program implementation. This improvement might be related to the majority of nurses who are enthusiastic to learn and have a highly expressed need to learn more about morbid obese care. Also, the educational program had a good impact on improving nurses' knowledge, which could be due to the concise presentation of each session using simple Arabic language, clear educational methods, instructional media and frequent repetition to fix the knowledge. This finding agreement with **Taylor et al(2018)**[41] who showed statistically significant improvement of nurse's knowledge about patient morbid obese care. Also, this finding was in accordance with**. Phelan et al (2020)**[42] who showed that the lack of experience and knowledge of nurses about the physical and psychological needs of obese patients was a significant challenge who reported that continuously needing for educational sessions about morbid obese care to improve care delivery and patient outcomes**.**

Concerning total nurses practice score level. The current study revealed that the majority of nurses had unsatisfactory level preprogram implementation compared to all studied nurses had satisfactory practice immediately, with marked improvement of total mean practice score of nurses immediately and after two-months of program compared to pre-program. This result was supported by **Martin et al (2018)** [40]. Their study entitled (Knowledge, attitudes, representations and declared

practices of nurses and physicians about obesity in a university hospital and stated that nursing intervention had appositive effect for patients morbid obesity in ICU**.**

This result may be due to positive effects of the educational program on improving nurse's level practice due to uses of multiple media as videos and laptop clarification the skill. . This improvement might be related to several reasons, such as providing the nurse with booklet, using of audiovisual aids, frequent demonstration, providing better facilities and supplies that facilitate learning and better communication adequate number of nurses in ICU. Also, this result was supported by **Senanayake et al (2021) [(43)].** who revealed that continuing professional development programs, which aim to enhance health professionals practice and improve patients out comes .

Concerning correlation between total knowledge score of the studied nurses and their practice score throughout periods of intervention. The present study demonstrated a highly statistically significant relationship between the nurses overall knowledge scores and their practice score throughout period's intervention. This contributed that the integration between knowledge and practice providing an optimum learning process and facilitate application of clinical nursing skills to the critically ill patients. These results were similar to findings of a study done by **Wynn et al (2018[(26)].** which also revealed the attitudes of nurses regarding obesity care were improved and their knowledge levels were increased.

Also, these findings was agreed with **pearce et al (2019) [(44)]** who showed that there was a positive correlation between total nurse's knowledge and total practice scores pre and post implementation of the education program. On the other hand, this result disagreed with **Antony et al (2016) [(45)]**. whose result revealed that there was non-significant association between the knowledge and practice of staff nurses on morbid obese patient at Intensive care unit.

In relation between socio demographic characteristics of the studied nurses and their total knowledge score, The current study reported a non-significant association between nurse's age, gender, educational level and years of experience and their total knowledge throughout periods of program implementations. This finding supported by **Tiryag and Atiyah (2021) [(46)]** who reported that ICU nurses' knowledge and their level of education and their experience had non-significant association. Present study also concurred with **Gormley and Melby et al (2018)[(47)]** who reported there are non-significant association between nurse's demographic data in relation to level of educational and years of experience and their knowledge .

Concerning relation between socio demographic and total practice score of the studied nurse's pre, post immediately and two-months post program implementation. The present study demonstrated that there was non-significant relation between nurses' socio-demographic data, age, educational level and total practice level. On other hands, significance differences were observed among studied nurses regarding to gender, their experience in ICU and their total practice score. This was supported with the study done b**y Kausar et al (2021) [(48)].** Who found that a non-statistically correlation between nursing staff practice level and level of education

Conculsion

Based on the finding of the current study**,** it can be concluded that: Application of nursing educational program about patient morbid obesity care play a vital role in

improvement in the total mean scores of nurses' knowledge and practice immediately and two months post program implementation among studied nurses' compared to the pre-program implementation.

Recommendation

A.For critical care nurses.

-In-service training programs should be conducted to maintain efficient nurses' performance

B. For the hospital administrator.

-Implementing morbid obesity care protocol in the ICU at least all six months to achieve high quality of care with patients morbid obesity and minimize undesired complications.

-Morbid obesity training program should be mandatory for newly employed nurses'**.**

Recommendation for further studies.

-The study should be replicated on large sample, different hospitals setting and for long time

References

1. Kassotis c, Vandenberg N, Demeneix A , Porta, Slama, Trasande . "Endocrine-disrupting chemicals: economic, regulatory, and policy implications". The Lancet. Diabetes & Endocrinology. 8.2020;719–30.
2. Memon A , Gowda A , Rallabhandi B. "Have Our Attempts to Curb Obesity Done More Harm Than Good?". (September 2020 Cureus. 12 (9):e10275.
3. Schwartz M, Drewnowski A, Ravussin E, Redman LM, Leibel RL "Obesity Pathogenesis: An Endocrine Society Scientific Statement". Endocrine Reviews (Professional society guidelines). (August 2017) 38 (4):267–96.
4. Mehrzad R. The global impact of obesity. In: Mehrzad R, editor. Obesity. Amsterdam: Elsevier 2020; p. 55–72.
5. Glazer S, Vallis M. Weight gain, weight management and medical care for individuals living with overweight and obesity during the COVID-19 pandemic (EPOCH Study). Obesity Sic Pract. 2022.
6. Noor F, Islam M. Prevalence and associated risk factors of mortality among COVID-19 patients: a meta-analysis. J Commun Health. 2020;45(6):1270–82.
7. Smith G, Mittendorfer B, Klein S. Metabolically healthy obesity: Facts and fantasies. The Journal of Clinical Investigation. 2019;129(10):3978-89.
8. Lal, Mantilla-Herrera, Veerman L, Backholer K:Modelled Health Benefits of a Sugar-Sweetened Beverage Tax Across Different Socioeconomic Groups in Australia: PloS Med 2020; 17(7):e1003310.
9. Greenway A, Raben A, Astrup A, Apovian CM, Hill JO, Placebo-Controlled Study of Gelesis100: A Novel Nonsystemic Oral Hydrogel for Weight Loss. Obes (Silver Spring) (2019) ;27:205–16.
10. Russotto V, Myatra S, Laffey G. Intubation practices and adverse peri-intubation events in critically ill patients from 29 countries. JAMA. 2021;325(12):1164–72.
11. Bray G, Kim Wilding J. World Obesity: a chronic relapsing progressive disease process. A position statement of the World Obesity Federation. Obesity Review J. 2017;18(7):715-23.

12. Kinlen D, Cody D, O'Shea D. Complications of obesity. QJM. 2018;111(7):437–43.
13. Bazurro S, Ball L, Pelosi P Perioperative management of obese patient. Curr Opin Crit Care 2018; 24:560–67
14. Chien C, Tracking dynamic tongue motion in ultrasound images for obstructive sleep apnea. Ultrasound in medicine & biology, 2017;43(12): p. 2791-2805.
15. Waters H, Graf M. America's obesity crisis: the health and economic impact of excess weight. Miliken Institute. 2018;1–24.
16. Hales C, Carroll M, Fryar C, Ogden C. Prevalence of obesity and severe obesity among adults: United States, 2017-2018; NCHS Data Brief. 2020;360:1–6.
17. Boyle S, Janicke D, Robinson M, Wandner L. Using virtual human technology to examine weight Bias and the role of patient weight on student assessment of pediatric pain. J Clin Psychol Med Settings. 2019;26(1):106–15.
18. Hales C, Gray L, Russell L, MacDonald C. A qualitative study to explore the impact of simulating extreme obesity on health care Professionals' attitudes and perceptions. Ostomy Wound Manage. 2018;64(1):18–24.
19. Fernandez M, Gonzalez-Castro A, Magret M, Reconnection to mechanical ventilation for 1 h after a successful spontaneous breathing trial reduces reintubation in critically ill patients: a multicenter randomized controlled trial. Intensive Care Med. 2017;43:1660–67.
20. Robstad N, Westergren T, Siebler F .Intensive care nurses' implicit and explicit attitudes and their behavioural intentions towards obese intensive care patients. J Adv Nurs (John Wiley & Sons, Inc). 2019;75(12):3631–42.
21. Pervez H, Remolded S. Nurses' attitudes towards obese patients: a review of the literature. Nurs Times. 2017;113(2):42.
22. Saalbach A, Anderegg U. Thy-1: more than a marker for mesenchymal stromal cells. FASEB J. 2019 Jun;33(6):6689-96.
23. Fan M., Hong J., Cheung Tang, S., Yang, W. Knowledge and Attitudes Towards Obesity and Bariatric Surgery in Chinese Nurses. Obesity Surgery, 2020 ; 30(2), 618–29.
24. Kim E., Kim S. S. Effects of infection control education for nursing students using standardized patients vs. peer role-play. International Journal of Environmental Research and Public ;2021.
25. Salah M, Mahdy NE and Mohamed L, : Effect of educational program on performance of Intensive Care Nurses to Decrement the low Back pain. Life Science Journal, Available at ; Accessed on March 21,2016.
26. Wynn T., Islam N., Thompson C., Myint, K. S. The effect of knowledge on healthcare professionals' perceptions of obesity. Obesity Medicine, 2018;11, 20–24.
27. Lopez E. K. H., Helm M. Primary care providers' attitudes and knowledge of bariatric surgery. Surgical ;2020.
28. Huang Y, Lu Y, Huang YM.besity in patients with COVID-19: a systematic review and meta-analysis. Metabolism. 2020 Dec;113:154378.
29. Tang S, Yu S, Wang C. Factors influence the acceptance of surgical treatment in Chinese bariatric surgery candidates. Obes Surg. 2018;28:2767–73.

30. Abukhelaife E. Personal Protective Equipment Knowledge and Practices amo‹Nurses Working at Al-Baha King Fahad Hospital, Saudi Arabia;2019.
31. Al-hzoy H. Assessment of Nurses Knowledge toward Sleeve Gastrectomy at Surgical Unit in ALNajaf Al-Ashraf Governorate. Unpublished thesis, College of Nursing, University of Kufa;2020.
32. Fasoi G, Patsiou EC Stavropoulou A, Kaba E, Papageorgiou D, Toylia G, et al. Assessment of Nursing Workload as
33. Mansour et al Abellatif, D, Yassien, S. Nurses' Performance for Patient Undergoing Bariatric Surgery. Evidence-Based Nursing Research. 2019;21.
34. Turkmen A, Özbaş A. Examination of Attitudes of Nurses Working in Surgical Services Toward Obesity and Obese Patients. Bariatric Surgical Practice and Patient Care. 2021.
35. Petrin C., Kahan S., Turner M., Gallagher. Current Attitudes and Practices of Obesity Counselling by Health care Providers. Obesity Research and Clinical Practices, 2017 11(3), pp. 352-59.
36. Yang W. Biography: professor Cunchuan Wang, MD, PhD. Obes Surg. 2019;29(3):755–6.
37. Robstad, N., Söderhamn, U., & Fegran, L.,: Intensive care nurses' experiences of caring for obese intensive care patients: A hermeneutic study, Journal of clinical nursing, 2018 Vol. (27), No.(1), Pp 386-95.
38. Naderi N, Kleine CE, Park C, Hsiung JT, Moradi Obesity paradox in advanced kidney disease: from bedside to the bench. Prog Cardiovasc Dis .2018;61:168–181
39. De Jong A, Verzilli D, Sebbane M, Monnin M, Medical versus surgical ICU obese patient outcome: a propensity-matched analysis to resolve clinical trial controversies. Crit Care Med 2018;46:e294–e301
40. Martin F. , Lambert, N., Knowledge, attitudes, representations and declared practices of nurses and physicians about obesity in a university hospital: Clinical obesity, (2018); Vol. (8), No.(2), Pp122-130
41. Taylor SP, Karvetski CH, Taylor BT Initial fluid resuscitation following adjusted body weight dosing is associated with improved mortality in obese patients with suspected septic shock. J Crit Care 2018; 43:7–12
42. Phelan, S., Burgess, D., Yeazel, M., Hellerstedt, W., Griffin, J., & Ryn, M.Obesity stigma and patient care, Obes Rev, 2020 Vol. (16), Pp319-26.
43. Senanayake C, The Effect of Rewards on Work Commitment of Nurses at Surgical and Medical Section (SMS) of National Hospital. SciMedicine, 2020**;** 3(3), pp. 230-41.
44. Pearce C., Rychetinik L., Wutzke S. , Wilson A. Obesity prevention and the role of hospital and community-based health services: a scoping review. BMC Health Services Research, 2019;19(453).
45. Antony A., Moly C. Assessment of Knowledge and Self-Reported Clinical Practice on Prevention of Deep Vein Thrombosis (DVT) Among Staff Nurses. Journal of Nursing and Health Science, 2016**;**5 (1): 18-24.
46. Tiryag A and Atiyah H. Nurses' Knowledge toward Obesity in Al-Basra City.Ann. Romanian Soc. Cell Biol. 2021**;** 4667-73.

47. Gormley N and Melby V. Nursing students' attitudes towards obese people, knowledge of obesity risk, and self-disclosure of own health behaviors': An exploratory survey. Nurse. Educ. Today 2020; 84:104232

48. Kausar R., Mukhtar M. , Shaheen, T. Knowledge, attitude, and practices of obesity and weight management among nurses. Indo American Journal of Pharmaceutical Sciences, 2021; 8(3), pp. 350-53.

Academic Support, Locus of Control and Achievement among Postgraduate Nursing Students

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Abstract

Background: Postgraduate nursing students to complete their studies efficiently need effective academic support. Therefore, the Faculty of Nursing must provide a supportive environment to all nursing students and control their studies for better academic achievement. **Aim:** To assess the academic support, locus of control and achievement among postgraduate nursing students. **Research design:** A descriptive correlation design was used. **Setting:** The study was conducted in all departments of Faculty of Nursing at Tanta University. **Subjects**: All (N=161) postgraduate nursing students who are enrolled in a credit hours system. **Tools**: Three tools were used to collect the data, Perceived Academic Support Scale, Academic Locus of Control, and Student Achievement. **Results**: The majority of the postgraduate nursing students had high perception level of academic support and internal academic locus of control. Nearly one third of the postgraduate nursing students had very good (B). **Conclusion:** There was a highly statistically significant correlation between postgraduate nursing students' perception of academic support and their academic locus of control, while no statistically significant correlation between them and academic achievement. **Recommendations:** Conduct training sessions and workshops for faculty staff regularly to foster their role in supporting students academically. Make an orientation program for new faculty staff regarding effective characteristics and behaviors that students perceived as important.

Keywords: Academic Support, Achievement, Locus of Control, Postgraduate Nursing Students

Introduction

Education play a critical role in improving the quality of life of every individual. It aids in development of human skills, knowledge, and experience. Therefore, the number of students increasing to complete their studies and enroll in postgraduate studies. (1) Nursing education in the postgraduate program has a significant role in the nursing profession as it leads to enhanced nurses' self-esteem, further personal and professional growth, increased knowledge of nursing theories, and ensures the adequacy of nurses' competence. (2)

Postgraduate nursing students are students who have successfully completed an undergraduate degree-level course at a college or university and are undertaking further study at a more advanced level. **(3)** Postgraduate studies refer to academic or

professional degrees, certificates, diplomas, or other qualifications pursued by students who have earned an undergraduate (bachelor's) degree. Completing postgraduate studies helps nursing students further their career prospects and deepen their understanding of their area of study. Nursing students to complete their studies efficiently need effective academic support. [4]

Academic support entails a variety of instructional methods, educational services, and university resources that help students accelerate skill acquisition and learning progress, meet expected academic requirements and competencies, and succeed in their education. [5] Academic support strategies should be flexible, timely, and responsive to the intensity, length, and manner of support each student needs to succeed. For faculty staff, providing academic support to students is part of their daily professional responsibilities, and each university shall create the conditions that allow their staff provide necessary academic support. [6]

Academic support has six dimensions including personality characteristics, subject matter expertise, staff relation with students, teaching style, professional competence, and classroom management style. [7] Personality characteristics that reflect patterns of thoughts, feelings, and behaviors that contribute to effective teaching. [8] Subject matter expertise is when a lecturer has extensive knowledge and skills in a particular field or topic and can provide advice and support to students working on that topic. Faculty staff relation with students is defined as a supportive relationship between students and their faculty staff that can foster positive outcomes such as students' involvement and development. [9]

Teaching style comprises the principles and methods used by lecturers to enable student learning, to be effective should take into account the learner, the nature of the subject matter, and the type of learning it is supposed to bring about. Professional competence are skills, knowledge, and attributes required in order to work in a specialized area or profession. [10] Finally, classroom management style means well-defined ways of interacting with students, with predetermined lecturer control levels. Academic support is no longer related only to the support regarding the content of a course, as students also require support on aspects of their personality as an academic locus of control. [11]

Academic locus of control is defined as a fundamental students' difference variable that reflects students' beliefs about the degree of control they have over events in their academic lives. [12] Academic locus of control typically refers to how students perceive the causes of their academic success or failure. If they believe that they hold the keys to their fate, they are more likely to change their situation when needed. There are two types of academic locus of control, internal and external locus of control. [13]

Students with an internal locus of control generally believe that their success or failure is a result of the effort and hard work they invest when needed. A higher internal academic locus of control correlates to personality traits such as self-control and

self-efficacy. [14] Students with an external locus of control believe that they do not have autonomy over their outcomes while external forces drive their life events and change, and may blame an unfair faculty staff or test for their poor academic achievement. [15]

Academic achievement refers to the level of knowledge, skills, and abilities that the student acquires during the teaching-learning process, the evaluation of this is done through assessment of the learning of students enrolled in a course, and also refers to the percentage of students in their academic studies. [16] Measuring academic achievement provides key information about students' mastery of standards. A grade-point average serves as the most common measure of academic achievement, and it is a number representing the average value of the accumulated final grades earned in courses over time. [17]

Significance of study:

The Faculty of Nursing at Tanta University applied the credit hours system since two years on postgraduate nursing students, Most postgraduate nursing students are coming from different faculties and having emotional disturbance about new academic life. When postgraduate nursing students encounter academic support, they respond positively in their search for stability and success in their academic achievement. Therefore, this study aims to assess academic support, locus of control, and achievement among postgraduate nursing students. [18]

Aim of the study

Assess the academic support, locus of control and achievement among postgraduate nursing students.

Research Questions:

1. What are the postgraduate nursing students' perception related to academic support?
2. What is the most common type of academic locus of control among postgraduate nursing students?
3. What are the levels of postgraduate nursing students' academic achievement?
4. What is the relation between the academic support, locus of control and achievement among postgraduate nursing students?

Subjects and Method

Research design:

A descriptive correlation study design was used in present study.

Setting:

The present study was conducted in all departments of Faculty of Nursing at Tanta University (Nursing Administration, Community Health Nursing, Medical-Surgical Nursing, Critical Care and Emergency Nursing, Maternal and Newborn Health Nursing, Psychiatric and Mental Health Nursing, and Pediatric Nursing).

Subjects:

The study subjects were consisted of all (N=161) postgraduate nursing students who are enrolled in a credit hours system in the two academic years (2020-2021 / 2021-2022) and be available at time of data collection according to the records of postgraduates' department of Faculty of Nursing at Tanta University in all postgraduates' programs (diploma, master and doctorate).

Tools: Three following tools were utilized: -

Tool I: Perceived Academic Support Scale.

This tool was modified by the investigator, guided by **Calaguas and Glenn (2012)**. [19] It was used to assess postgraduate nursing students' perceptions regarding academic support. It consisted of two parts as follow:

Part 1: Personal data of the postgraduate nursing students: It included age, gender, department, semester, numbers of courses registered, total numbers of credit hours, GPA (grade point average), and CGPA (cumulative grade point average).

Part 2: Academic Support Scale: It consisted of 49 items categorized into six subscales:

1- **Personality characteristics:** included 11 items.
2- **Subject matter Expertise:** included 5 items.
3- **Educational staff relation with students:** included 9 items.
4- **Teaching style:** included 12 items.
5- **Professional competence:** included 5 items.
6- **Classroom management style:** included 7 items.

Scoring system:

Postgraduate nursing students' responses were measured on a three points Likert Scales, ranging from (1) disagree to (3) agree. The total scores calculated by cut of points and summing scores of all categories. The total scores represent varying levels as follows:

- High- level of academic support >75%.
- Moderate- level of academic support 60 - 75%.
- Low- level of academic support < 60%.

Tool II: Academic Locus of Control:

This tool was modified by the investigator, guided by **Curtis** and **Trice (2013).** [20] It was used to assess academic locus of control of postgraduate nursing students. It divided into internal and external academic locus of control. It included 28 items.

Scoring system:

Postgraduate nursing students' responses were measured on Yes/No Scale ranging from (0) no to (1) yes. The total scores calculated by cut of points and summing scores of all categories. The total scores represent varying levels. According to a jury, the negative items turned to positive items so the scores changed as follows:

- Internal academic locus of control ≥ 50%.
- External academic locus of control < 50%

Tool III: Student Achievement:

It was used to assess postgraduate nursing students' final scores. The form contains postgraduate nursing student name and grade. Postgraduate nursing students' scores ranging from exceptional to fail.

Scoring system

Exceptional (A+): 95% -100%
Excellent (A): 90% - < 95%
Superior (B+): 85% - < 90%
Very good (B): 80% - < 85%
Above Average (C+): 75% - < 80%
Good (C): 70% - < 75%
High Pass (D+): 65% - < 70%
Pass (D): 60% - < 65%
Fail (F): (2 out of 5) <60%

Methods

1. An official permission was obtained from the Dean of Faculty of Nursing and the authoritative personal that was submitted to the seven head of departments and permission from postgraduate control.

2. Ethical considerations:

a. An approval was obtained from the Ethical Committee before conducting the study, code no. (31/2/2022).
b. Nature of the study was not cause harm to the entire sample.
c. Informed consent was obtained from postgraduate nursing students after explanation of the study's aim.
d. Confidentiality and anonymity were maintained regarding data collection and the participants have right to withdrawal.

3. The study tools were translated into Arabic and presented to a jury of five experts in the area of specialty to check their content validity. The experts were; two assistant professor of Nursing Administration, one professor and one assistant professor of Psychiatric and Mental Health Nursing, one assistant professor of Critical Care and Emergency Nursing from Faculty of Nursing, Tanta University.
4. The experts' responses were represented in four points rating scale ranging from (4-1); 4= strongly relevant, 3= relevant, 2= little relevant, and 1= not relevant. Necessary modifications were done including; clarification, omission of certain items and adding others and paraphrasing of some words.

   -The face validity value of academic support scale was **99.29%,** academic locus of control was **99.46 %**
5. A pilot study was carried out on a sample (10%) of the subject (n=17). A pilot study was carried out after the experts' opinion and before starting the actual data collection. The pilot study was done to test clarity, sequence of items, applicability, relevance of the questions and to determine the needed time to complete the questionnaire. No modifications were done. The estimated time needed to complete the questionnaire items from postgraduate nursing students was 15-20 minutes.
6. Reliability of tools was tested using Cronbach's Alpha Coefficient test. Reliability of academic support scale =**0.969** and reliability of academic locus of control =**0.877**
7. Academic support scale and academic locus of control were used to collect data from identified subjects.
8. **Data collection phase:** the data were collected from postgraduate nursing students by online questionnaire. The researcher sends the online questionnaire to respondents' students and the subjects recorded the answer and send again to the investigator. The data was collected over period of six months started from 1/5/2022 until 1/11/2022. Tool of student achievement was collected by investigator from postgraduate control.

Results

Table (1): Illustrates frequency distribution of the postgraduate nursing students according to their personal data. It shows that, the age of postgraduate nursing students ranged from 25-47 years old with mean age 29.55 ± 3.71. The majority (92.5%) of postgraduate nursing students were females. More than three quarters (77.6%) of them in master degree. More than one quarter (30.4%) of them were in Nursing Administration Department. Nearly two third (65.2%) of them in academic year

2021/2022. More than half (52.8%) of them in second semester.

Table (2): Demonstrates frequency distribution of the postgraduate nursing students according to total levels of academic support. It shows that the majority (87.6%) of the postgraduate nursing students had high perception level of academic support. The majority (93.2%, 88.2%, 83.9%, 83.2%, 81.4%, 80.1%) of the postgraduate nursing students had a high perception level about subject matter expertise, professional competence, teaching style, personal characteristics, classroom management style, and educational staff relation with students, respectively.

Figure (1): Demonstrates distribution of the postgraduate nursing students according to overall academic locus of control. It reveals that the majority (98.1%) of the postgraduate nursing students had internal academic locus of control. While, the minority (1.9%) of them had external academic locus of control.

Table (3): Reveals frequency distribution of the postgraduate nursing students according to their academic achievement. It illustrates that nearly one third (30.7%) of the postgraduate nursing students had very good (B), and 1.3% of them had high pass (D+).

Table (4): Clarifies correlation between the postgraduate nursing students' perception of academic support, academic locus of control and academic achievement. As noticed from this table that academic support had a high positive statistically significant correlation with academic locus of control, where r = 0.417*, p-value = <0.001*. while, no statistically significant correlation with academic support and achievement, where r = -0.032, p-value = 0.695, and no statistically significant correlation with academic locus of control and achievement, where r = -0.028, p-value = 0.735.

Table (1): Frequency distribution of the postgraduate nursing students according to their personal data (n =161)

Personal data of the student	No.	%
Age		
25-<30	99	61.5
30-<35	43	26.7
35-<40	17	10.6
≥40	2	1.2
Min. – Max.	25.0 – 47.0	
Mean ± SD.	29.55 ± 3.71	
Median	28.0	
Gender		
Male	12	7.5
Female	149	92.5
Degree		
Diploma	6	3.7

Master	125	77.6
Decorate	30	18.6
Department		
Nursing Administration	49	30.4
Community Health Nursing	21	13.0
Medical-Surgical Nursing	19	11.8
Critical Care and Emergency Nursing	26	16.1
Maternal and Newborn Health Nursing	13	8.1
Psychiatric and Mental Health Nursing	7	4.3
Pediatric Nursing	26	16.1
Academic year		
2020/2021	56	34.8
2021/2022	105	65.2
Semester		
First	6	3.7
Second	85	52.8
Third	14	8.7
Thesis	56	34.8
No. of courses	**(n= 124)**	
Min. – Max.	0.0 – 11.0	
Mean ± SD.	6.66 ± 1.79	
Median	6.0	

Table (2):Frequency distribution of the postgraduate nursing students according to level of academic support. (n=161)

Academic support dimensions	Low		Moderate		High	
	No.	**%**	**No.**	**%**	**No.**	**%**
Personal characteristics	12	7.5	15	9.3	134	83.2
Subject matter expertise	7	4.3	4	2.5	150	93.2
Educational staff relation with students	17	10.6	15	9.3	129	80.1

Teaching style	10	6.2	16	9.9	135	83.9
Professional competence	9	5.6	10	6.2	142	88.2
Classroom management style	12	7.5	18	11.2	131	81.4
Overall academic support	**7**	**4.3**	**13**	**8.1**	**141**	**87.6**

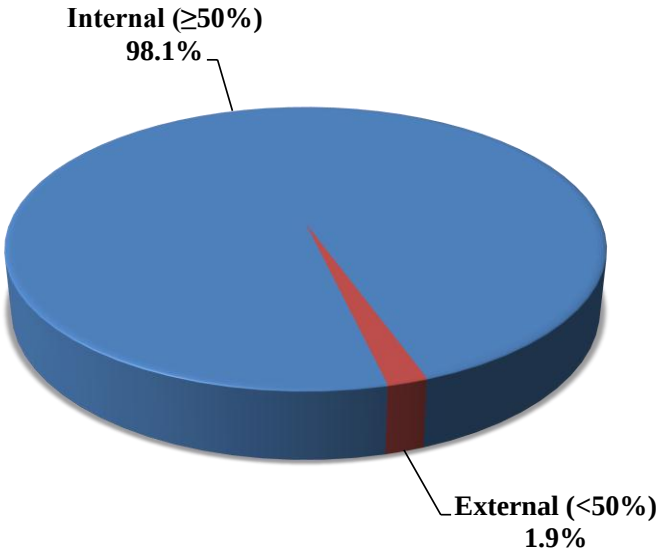

Figure (1): Distribution of the postgraduate nursing students according to overall academic locus of control

Table (3): Frequency distribution of the postgraduate nursing students according to their academic achievement (n = 150)

Student Achievement	No.	%
Exceptional (A+): 95% -100%	0	0.0
Excellent (A): 90% - < 95%	26	17.3
Superior (B+): 85% - < 90%	36	24.0
Very good (B): 80% - < 85%	46	30.7
Above Average (C+): 75% - < 80%	23	15.3
Good (C): 70% - < 75%	11	7.3
High Pass (D+): 65% - < 70%	2	1.3
Pass (D): 60% - < 65%	0	0.0
Fail (F): (2 out of 5) <60%	6	4.0

Table (4): Correlation between the academic support, locus of control and achievement among postgraduate nursing students

		Overall Academic support	Overall Academic locus of control	Tool III: Student Achievement
Overall Academic support	**r**		0.417*	-0.032
	p		<0.001*	0.695
Overall Academic locus of control	**r**			-0.028
	p			0.735
Tool III: Student Achievement	**r**			
	p			

Discussion

The present study results revealed that the majority of the postgraduate nursing students had high level of academic support. This is due to the majority of them had a high level of perception regarding subject matter expertise, professional competence, teaching style, personal characteristics, classroom management

style, and educational staff relation with students.

This result is supported by **Mpewe and Kalima (2023)** [21] who found that teacher support was very good. As well as, **El-Naby et al., (2019)** [7] and **El-Hosany and Sleem (2017)** [22] reported that the majority of students had high academic support.

On the other line, this result contradictory with **Jiang et al., (2023)** [23] and **Brooks (2021)** [24] who showed that most students had low perception of academic support.

The present study results revealed that the majority of the postgraduate nursing students had internal academic locus of control. This result is due to postgraduate nursing students attempt to master most of the material they learn at college, work toward improving their deficiencies, determine own career goals, know what want to do in their life, read more around the topics to be as knowledgeable as possible, have a plan for their future life, do the best in their field of study, consider themselves highly motivated to achieve success in life, plan well and stick to plans, and determine what want to learn according to their academic requirements.

This result is supported by **Fabella and Aler (2023)** [25] and **Fares (2020)** [26] who revealed that the most of the students had an internal locus of control. In addition, **Polzin (2018)** [27] found that more than two third of the participants had an internal locus of control.

On the other line, this result contradictory with **Mulike (2020)** [28] and **Bharathi and Joseph (2017)** [29] who found that respondents with an external locus of control had a higher percentage compared to the respondents with an internal locus of control.

The present study results revealed that the majority of the postgraduate nursing students had very good grade. This result may be due to the lack of time in the credit hours system, which causes pressure on postgraduate nursing students to complete their required courses and obtain high grades.

Along with this present finding, **El-Naby et al., (2019)** [7] who reported that more than half of nursing students had very good grade, while one third of them had excellent grade and minority of them had pass grade and fail grade.

The present study results revealed that there is a positive statistically significant correlation between academic support and academic locus of control. This result may be due to faculty staff thinking about the students' activities regarding their studies likewise their concentration in studies and their best performance in which subjects, and provide appropriate academic support strategies for them and take into account students' personality characteristics as an academic locus of control.

In the same scene, **Sari and Fakhruddiana (2019)** [30] and **Arslan et al. (2013)** [31] reported that there is a very significant correlation between internal locus of control and support of the students.

On contrary, **El-Hosany and Sleem (2017)** [22] study is inconsistent with the present study result and found that there was no significant correlation between locus of control whether internal or external and perceived academic support total score.

The present study results revealed that no statistically significant correlation between overall academic support and student achievement. This result may be due to the majority of postgraduate nursing students are females who may have children, more responsibility, sleep disturbance, the economic conditions they find themselves in, their health conditions, their relationships within the family, harsh control parenting, and job during studying.

Along with the present finding, **Koçak et al (2021)** [32] revealed that the number of variables affecting students' academic achievement are evaluated in the categories of psychological, socio-economic, socio-demographic and individual characteristics, and family was bigger than other categories.

On the other line, this result contradictory with **Kim (2021)** [33] and **El-Naby et al., (2019)** [7] who reported that there was a statistically significant positive correlation between faculty support and student achievement of all nursing students.

The present study results revealed that there is no statistically significant correlation between overall academic locus of control and student achievement. This result may be due to differences in their intelligence and personality, unhealth lifestyle, loss of interest for some subjects, socio-economic status for their parents, family problems and instability.

This result is supported by **El-Hosany and Sleem (2017)** [22] and **Ogunmakin and Akomolafe (2013)** [34] who revealed that there was no significant correlation between locus of control (internal or external) and learning performance.

On the other line, this result contradictory with **Akunne and Anyanmene (2021)** [35] and **Bahçekapili and Karaman (2020)** [36] who reported that the relationship between locus of control and academic achievement of students is statistically significant.

Conclusion

Based on the findings of the present study it was concluded that:

The majority of the postgraduate nursing students at Tanta University had high perception level of academic support and internal academic locus of control. Nearly one third of the postgraduate nursing students had very good (B). There was a highly statistically significant correlation between postgraduate nursing students' perception of academic support and their academic locus of control, while no statistically significant correlation between them and academic achievement.

Recommendations

In the light of the finding obtained from the present study, the following recommendations were suggested:

Faculty administration

- Conduct training sessions and workshops for faculty staff regularly to foster their role in supporting students academically.
- Make an orientation program for new faculty staff regarding effective characteristics and behaviors that students perceived as important.
- Review and modify the nursing curriculum to provide more opportunities for nursing students to intellectual development.

- Ensure and organize a comfortable learning environment that facilitates student support and needs.

Postgraduate nursing students

- Counseling practices, workshops or interviews can be planned in order to increase the awareness of the students in line with their own goals, expectations and desires and to provide them with skills to reach them.
- Enhancing students' habits in their academic studies by running courses in learning strategy.
- Orientation sessions that include the variables that affect the academic locus of control.

- **Further research**

- Replication of the study on various academic settings to investigate factors affected students' academic performance and their achievements to detect the facilities that enhance the quality of learning.
- Study factors that advance academic achievement as motivation, self-esteem and time management or hinder it as stress and anxiety.

References

1. **Shobande OA, Asongu SA.** The critical role of education and ICT in promoting environmental sustainability in eastern and southern Africa: A Panel VAR Approach. Technological Forecasting and Social Change. 2022; 176:121480.

2. **Alluhidan M, Tashkandi N, Alblowi F, Omer T, Alghaith T, Alghodaier H, Alazemi N, Tulenko K, Herbst CH, Hamza MM, Alghamdi MG.** Challenges and policy opportunities in nursing in Saudi Arabia. Human Resources for Health. 2020; 18(1):1-0.

3. **Juanamasta IG, Aungsuroch Y, Gunawan J, Fisher ML.** Postgraduate and undergraduate student nurses' well-being: A scoping review. Journal of Professional Nursing. 2022; 40:57-65.

4. **Xiao H, Mao J.** Effects of postgraduate education on technological innovation: a study based on the spatial Durbin model. Asia Pacific Education Review. 2021; 22(1):89-99.

5. **Sadoughi M, Hejazi SY.** Teacher support and academic engagement among EFL learners: The role of positive academic emotions. Studies in Educational Evaluation. 2021; 70:101060.

6. **Rotar O.** Online student support: a framework for embedding support interventions into the online learning cycle. Research and Practice in Technology Enhanced Learning. 2022; 17(1):1-23.

7. **El-Naby A, Zeinab A, Elsaye K, Abdullah N.** Contributing factors to advance academic achievement among nursing students at Benha Nursing Faculty. Menoufia Nursing Journal. 2019; 4(1): 61-9.

8. **Istiyono E, Kartowagiran B, Retnawati H, Cahyo Adi Kistoro H, Putranta H.** Effective teachers' personality in strengthening character education. International Journal of Evaluation and Research in Education. 2021; 10(2):512-21.

9. **Ramklass SS, Vithal R.** Student-faculty interactions within a physiotherapy curriculum in South Africa. Advances in Health Sciences Education. 2022; 27(1):49-61.

10. **Vikas S, Mathur A.** An empirical study of student perception towards pedagogy, teaching style and effectiveness of online classes. Education and Information Technologies. 2022; 27(1):589-610.

11. **Albayrak D, Ateskan A.** Classroom management in higher education: A systematic literature review. Journal of Further and Higher Education. 2022; 17:1-7.

12. **Landerio–Reyes G, Limpot MY.** Classroom management, academic locus of control, and communication competence: A structural equation model on language learning attitudes. EPRA International Journal of Multidisciplinary Research (IJMR). 2022; 8(2):1-1

13. **Samuel NN, Okonkwo IG.** Relationship between metacognition, locus of control, and academic achievement in secondary school chemistry students in Anambra State, Nigeria. Education Research International. 2021.

14. **Al Mulhim EN.** Flipped learning, self-regulated learning and learning retention of students with internal/external locus of control. International Journal of Instruction. 2021; 14(1):827-46.

15. **Yin W.** External locus of control and elementary teachers' subjective wellbeing: Self-efficacy as a mediator. social behavior and personality: an international journal. 2022; 50(6):40-8.

16. **Al-Abyadh MH, Abdel Azeem HA.** Academic achievement: Influences of University students' self-management and perceived self-efficacy. Journal of Intelligence. 2022; 10(3):55.

17. **Park K, Moon S, Oh J.** Predictors of academic achievement in distance learning for nursing students. Nurse Education Today. 2022; 108:105162.

18. **Ibrahim R.** Academic advising and its relation to nursing students' self-efficacy. Unpublished Master Thesis. Faculty of Nursing. Ain Shams. University. 2021; 1-200.

19. **Calaguas G.** Teacher effectiveness scale in higher education: Development and psychometric properties. International Journal of Research Studies in Education. 2012; 1(1):1-18.

20. **Curtis N, Trice A.** A revision of the academic locus of control scale for college students. Perceptual and motor skills.2013; 116(3): 817-29.

21. **Mpewe C, Kalima R.** Departure from generic to individualized student support: A case of ODEL teaching practicum experiences at Mzuzu University in Malawi. Science. 2023;11(1):15-24.

22. **El-Hosany W, Sleem W.** Nursing student's experience on locus of control and its relation with learning performance and academic support: A comparative study. American Journal of Nursing Science. 2017;6(4):315-23.

23. **Jiang J, Dong C, Liu J.** Toward a model of academic support in transnational education in China: Under the strategic goal of sustainability. Cogent Education. 2023;10(1):2184926.

24. **Brooks LR.** A study of retention through the effectiveness in academic support services at a Historically Black College: A case study (Doctoral dissertation, University of Phoenix).2021

25. **Fabella FE, Aler SV.** Investigating the relationship between profile factors and locus of control of selected college students in Camarines Norte, Philippines.2023
26. **Fares MN.** The relationship between academic advising and student motivation on the persistence of freshman exploratory studies students.2020
27. **Polzin E.** ***A*** correlational study of academic locus of control, study preparation, and the praxis ii (Doctoral dissertation, Lindenwood University).2018
28. **Mulike MP.** Predictors of academic locus of control among form three secondary school students in Kitui County, KENYA (Doctoral dissertation, Kenyatta University).2020
29. **Bharathi SV, Joseph S.** Understanding the locus of control of management students-an exploratory study. International Journal of Learning and Intellectual Capital. 2017;14(3):234-51.
30. **Sari WL, Fakhruddiana F.** Internal locus of control, social support and academic procrastination among students in completing the thesis. International Journal of Evaluation and Research in Education. 2019;8(2):363-8.
31. **Arslan S, Çardak M, Uysal R.** Student academic support as predictor of academic locus of control in Turkish university students. Procedia-Social and Behavioral Sciences. 2013; 106:2460-9.
32. **Koçak Ö, Göksu İ, Göktas Y.** The factors affecting academic achievement: a systematic review of meta analyses. International Online Journal of Education and Teaching. 2021;8(1):454-84.
33. **Kim SC, Jillapali R, Boyd S.** Impacts of peer tutoring on academic performance of first-year baccalaureate nursing students: A quasi-experimental study. Nurse Education Today. 2021; 96:104658.
34. **Ogunmakin AO, Akomolafe MJ.** Academic self-efficacy, locus of control and academic performance of secondary school students in Ondo State, Nigeria. Mediterranean Journal of Social Sciences. 2013;4(11):570.
35. **Akunne LI, Anyanmene AN.** Relationship among locus of control, academic interest and secondary school students academic achievement in Anambra state, Nigeria. Asian Journal of Education and Social Studies. 2021;16(1):9-15.
36. **Bahçekapılı E, Karaman S.** A path analysis of five-factor personality traits, self-efficacy, academic locus of control and academic achievement among online students." Knowledge Management & E-Learning: An International Journal. 2020; 12(2): 191-208.

Effect of Active Cycle Breathing Technique on Airway Clearance among Patients Underwent Cardiac Surgery

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Background: One of the most common problems encountered to patients undergoing cardiac surgery is bronchial secretions. In order to increase the effectiveness of airway clearance, active cycle breathing techniques have been used. **Aim:** To evaluate the effect of active cycle breathing technique on airway clearance among patients underwent cardiac surgery **Design**: A quasi experimental research design. **Setting:** This study was conducted at Cardiothoracic intensive care unit in Assuit Heart University Hospitals, Egypt. **Subjects:** A Purposive sample of 60 adult patients, divided into two equal groups 30 patients each as follows; control group and study group**. Two tools were used**; tool (I) cardiac surgery patient's assessment and tool (II) physiological and air way clearance indicators**. Results;** It was clarified that there were significant improvement regarding FVC, FEV1 , SpO2, and SaO2 among the patients in study group rather than control groups on the 3rd day post active cycle breathing technique ,where P value < 0.05. **Conclusions:** It was concluded that active cycle breathing technique give positive results on improving of spirometric, oxygenic parameters of the study group .**Recommendations**: It was recommended that active cycle breathing technique should be regarded as a standard component of care for cardiac surgery patients and replication of the study on large probability sampling.

Keywords: Active cycle breathing technique, Air way clearance, Cardiac surgery

Introduction:

The terrible increase in the incidence of heart disease is usually due to the epidemiologic transition implicating atherosclerosis, hypertension, and lifestyle risk factors [(1).] Replacement of the heart valve and coronary artery bypass grafting are the two most common cardiac procedures performed worldwide [(2, 3)].Even though cardiac surgery is performed to improve a patient's condition, there are many postoperative complications. The most typical complications are respiratory complications, which are still the most common reason for adverse outcomes post cardiac surgery and clearly contribute to an increase in morbidity and mortality rate [(3, 4).] Moreover, impairment of respiratory function is associated with a reduction in chest expansion, lung volume, and an impairment of the patient's ability to cough effectively [(5)].

Additionally, ineffective airway clearance and sputum retention are common respiratory problems post-cardiac surgery due to the sternal incision, which restricts chest movement and decreases the ability of the patient to cough effectively to remove the secretion that has become lodged in the respiratory tract, resulting in inadequate airway clearance [(3, 6)].

The term "airway clearance techniques refer to several methods used to remove excessive secretions from the respiratory tract and improve gas exchanges through re-expanding the collapsed areas of the lung [(7, 8).] Hence, they are different

strategies that are used to improve airway clearance and respiratory functions post cardiac surgery, as chest percussion, vibration, and breathing exercise with or without an incentive spirometer are recommended for cardiothoracic surgery patients to minimize the occurrence of respiratory complications [8, 9].

Consequently, an active cycle of breathing techniques has been performed to enhance the efficiency of airway clearance, which is based on a more consistent pattern of breathing control by the patient to improve airway clearance and encourage self-management by the patient [10, 11]. Moreover, this technique composed of three different breathing cycles performed in sequence as breath control, thoracic expansion exercises, and forced exhalation techniques [12, 13]. Therefore, the current study was done to clearly evaluate the effect of active cycle breathing technique on airway clearance among patients underwent cardiac surgery**.**

Significance of the study:

Patients who are undergoing cardiac surgery require specialized care. Recent studies suggest the prevalence of respiratory problems increases from 20% to 79% after cardiothoracic operations. However, the literature reports a 5.4% disability rate and a 3.7% mortality incidence [1, 6, 14]. The impaired ability of the patient to maintain efficient airway clearance post cardiac surgery remains a challenge for the patient and health care providers. Therefore, the nurse faces a great challenge in order to maintain efficient airway clearance. Furthermore, the implementation of active cycle breathing techniques aims to increase airway clearance effectiveness and promote patient autonomy [10,11]. Hence, there are limited studies have been done to evaluate the effects of ACBT on respiratory parameters and airway clearance in patients undergoing cardiac surgery. Therefore, the present study aimed to evaluate the effect of ACBT on airway clearance among patients underwent cardiac surgery**.**

Aim of the study:

Was to evaluate the effect of active cycle breathing technique on air way clearance among patients underwent cardiac surgery**.**

Research hypothesis:

-Patients undergoing cardiac surgery who are exposed to active breathing techniques exhibit an improvement in oxygenic and spirometric parameters compared to the control group**.**

-Patients undergoing elective cardiac surgery who are exposed to active breathing techniques exhibit an increase of daily amount of expectorated sputum compared to the control group**.**

Subjects and Method:

Research design:

A quasi experimental research design was utilized to conduct this study.

Study Setting:

This study was carried out at the Cardiothoracic Intensive Care Unit (CTCU) in Assuit Heart University Hospitals, Egypt. It was prepared and furnished with three rooms, each equipped with four beds.

Subjects:

A Purposive sample of 60 adult patients was assigned in the current study from the previously mentioned settings. The sample size was calculated using the Epi Info software statistical package.

According to an analysis of statistical data from Assuit Heart University Hospital, there were a total of 171 patients admitted in 2021–2022 [15]**.** Confidence level= 99.9%, an expected frequency of 50%, an accepted error of 5%, and a confidence coefficient of 95%. The accepted sample size was 60 patients.

The patients were allocated into two equal groups, each with 30 patients.

The control group was composed of 30 patients who were managed by routine

CTCU care such as routine respiratory physiotherapy such as chest compression, vibration, and an incentive spirometer.

The study group consisted of 30 patients who were exposed to an active cycle of breathing techniques alongside routine care.

Inclusion criteria include the following;

- Adult patients of both genders.
- After extubation for at least 6 hours post operation.
- Hemodynamic stable patients who did not receive any of the hemodynamic interventions as (any quantity of inotropic and vasopressor, medications, fluid therapy (colloid or crystalloid 400-2600/8h, packed red blood cells 500-800ml/24h)[16].
- Able to communicate.

Tools of the study: Two tools were used to gather data based on reviewing of the pertinent literatures [4-6, 10-14] .

Tool I: Cardiac Surgery Patient's Assessment

It was created by the researcher after reviewing the pertinent literature[11, 12,13]**.** It composed 2 parts as the following:

Part (A): Patient's Demographic Characteristics which composed; patient's code, age, gender**,** marital status, education and occupation.

Part (B): Patient's Medical data which included**;** medical diagnosis, duration of surgery, body mass index, past medical diseases and smoking history.

Tool II: Physiological and Airway Clearance Indicators

It was created by the researcher after reviewing the pertinent reviews [4,5,6,13,14]to assess physiological, oxygenic , spirometric parameters and daily amount of expectorated sputum. It included four parts as follows:

Part (A): Physiological Parameters; it was used to assess body temperature, pulse rate, respiratory rate and blood pressure).

Part (B): Oxygenic Parameters

This part was used to assess oxygenic parameters through SPO2 and arterial blood gas which include (SaO_2, PaO2, and $PaCO_2$).

Part (C) Spirometric Parameters: This part was used to assess vital capacity (VC), forced vital capacity (FVC), and forced expiratory volume (FEV).

Part (d) Daily Amount of Expectorated Sputum

-This part was used to measure the amount of expectorated sputum at the end of each session .At the end of the day, the total amount is calculated separately for each patient.

-The total amount of sputum collected and measured by using calibrated cups with milliliter.

Method

1-Written approval was taken from the director of the (CTCU) is affiliated to Assuit Heart University, by official letters from the faculty of nursing after clarification of the purpose of the study before gathering of related data.

2-Ethical consideration:

The ethical committee for the Faculty of Nursing approved the research proposal. During the execution of the study, emphasizing that there was no hazard to the study participants.

-The ethical code was **37-357-2022**.

-Before the patient's participation in this study and after clarification of the aim of this study, informed written consent was taken from the patients.

-The privacy of the patients was respected.

-Data confidentiality was assured to all studied patients.

-Tools development: All tools were created by the researchers based on a review of the pertinent literature.

- To ensure validity, five experts in the fields of critical care nursing, anesthesiologist, and medical biostatistics were examined the content validity of each study tool.

- Cronbach alpha technique was used to examine reliability of all tools of the study and reported to be 0.944 of too I and tool II.

- A pilot study was carried out on 10% of the sample after completion of the data gathering tools. It was used to test the tool for its clarity; feasibility and applicability of the tool. Studied patients in the pilot study were involved in the study.

Data collection:

-The researcher evaluated each patient who was a part of the study and met the inclusion criteria.

- Data collection was started from the end of February to the end of October 2022.

The present study was carried out through four phases' assessment, planning, implementation and evaluation.

A- **Assessment phase;**

Assessment of the baseline data related to demographic characteristic and medical data for cardiac surgical patients by using tool (I).

B- Planning phase;

Objectives of the study were prepared based on the assessment of the patients.

Expected outcomes were formulated;

-Improve of oxygenic parameters.

-Improve of spirometric parameters.

-Increase daily amount of expectorated sputum.

- Educational method composed of one to one instruction and demonstration.

C-Implementation Phases:

All patients in the control and study groups received the same analgesic protocol .

Control group; managed by routine chest physiotherapy post cardiac surgery, which includes breathing exercises with an incentive spirometer.

Study group; managed by the use of active cycle breathing techniques combined with routine physiotherapy.

-Each session of the active cycle breathing technique lasted for 10 to 20 minutes.

-The active cycle breathing technique was given as six sessions per day, two sessions per shift, for three days post extubation**.**

Implementation of active cycle breathing technique [10, 11,13]

-Explain the steps of ACBT to the patient.

- The patient was placed in a semi-sitting position with her or his back absolutely straight, and instructions were given to the patient to do the following steps:

1 .Breathing control phase

-Hold the spirometer straight.

-Exhale, then seal your lips around the mouthpiece and inhale slowly and deeply into your mouth.

-The piston in the incentive spirometer's transparent chamber will rise when you inhale deeply.

- Hold your breath for 3 to 5 seconds after taking a deep breath.

-Remove the mouthpiece and slowly exhale. For a few seconds, until the piston descends to the bottom of the chamber, relax and breathe normally.

-To regain control of their breathing, the patient was told to do lengthy, slow expirations between 5 and 7 times.

2 Thoracic expansion exercises

-Patient was instructed to relax your upper chest.

-The patient was instructed to breathe slowly and deeply through the nose without using the accessory muscle.

-The patient was instructed to hold their breath initially for 3 to 4 seconds and gradually increase it to the maximum time.

- Don't force the breath out; instead, softly exhale through pursed lips until your lungs are empty.

-Repeat the previous steps from 3to4 times.

3- Forced expiration technique (huffing**)**

- Patient was instructed to support the incision site by using a chest binder or keeping your hands over your incision.

- Cough twice as many times as they huffed two to three times**.**

- This steps was repeated a minimum of two times and a maximum of three times in one session.

D-Evaluation

-Evaluation of patient's physiological and airway clearance indicators of control and study groups were assessed pre and post intervention by using tool II. This was done pre and post at 1st and 3rd day. The mean of the measurements of both control and study groups were obtained separately**.**

- Daily amount of expectorated sputum post sessions was collected daily in calibrated cup by millimeter. Comparison between the control and study groups regarding total amount of expectorated sputum was done on 1st day and 3rd day.

Statistical analysis

The mean and standard deviation values were computed for each group in each test. Shapiro-Wilk and Kolmogorov-Smirnov tests were used to determine if the data had a non-parametric (not normal) distribution. Continuous variables were recorded by mean and standard deviation (Mean, SD).Whereas categorical variabl were described by number and percentage (n, %), the Chi square test and Fisher exact test were used to compare categorical variables, while continuous variables were compared between more than two groups in non-related samples .Mann Whitney was used to compare two groups in unrelated samples. The Wilcoxon t test was used to compare two groups in related samples. For correlation coefficients, use the Spearman correlation test. The significance level was set at $P \leq 0.05$. Statistical analysis was performed with IBM® SPSS® Statistics Version 26 for Windows [(17).]

Results:

Table (1) demonstrates that more than two thirds (70.0% and 76.7%) of studied patients were in the age group over 50 years with a mean ±SD 49.75±7.44&50.50±8.79 and more than half (60.0% and 53.3%) of them were male in both the control and study groups, respectively. Furthermore, more than two-thirds (70.0%) of studied patients in both control and study groups had a secondary education**.**

Table (2) illustrates that the majority (83.3% and 86.7%) of studied patients were diagnosed with ischemic heart disease, with the mean duration of surgery being (5.38±0.96 and 5.25±0.91) of control and study groups, respectively. As regards past medical history, it showed that (33.3%and30.0%) of patients in the control and study groups had hypertension. Additionally, more than half (56.7% and 53.3%) of them were smokers**.**

Table (3) presents the mean scores of physiological parameters for patients in the control and study groups. As regards body temperature, pulse rate, systolic and diastolic blood pressure, there were no significant changes were observed between the control and study groups pre

/post ACBT. On the other hand, there was a significant change in respiratory rate post ACBT between both control and study groups in the 1st and 3rd days, with p values (0.046, 0.001) respectively**.**

Table (4) indicates the total mean scores of oxygenic parameters between studied patients in the control and study groups. This result showed that there were statistically significant differences in SpO2, and SaO2 between the control and study groups on the 3rd day post ACBT, with p values of 0.006, 0.048, respectively. However, there was no statistically significant difference found between PaO2, PaCO2 among the studied patients in the control and study groups with P> 0.05.

Table (5) demonstrates the total mean scores of spirometric parameters pre / post active cycle breathing technique of the control and study groups. It was noticed that there were statistically significant differences in FVC, FEV1, and FEV1/FVC between control and study groups on the 3rd day post-ACBT, where p values were 0.001, 0.000, and 0.003, respectively.

Table (6) shows the mean scores of daily amount of expectorated sputum of the studied patients in both groups **.**It was observed that there was a significant increase of the total amount of expectorated sputum from22.2±5.12 to 69.64±3.56 among studied patients in control group while the total amount among patients in study group increased from 25.42±4.1 to78.45±2.06on the 3rd days with significant difference between the control and study groups where p value0.001**.

Table (7) shows that there was a statistically significant negative correlation between body mass index and FEV1/FVC among the studied patients in the study group (r = -460, p* = 0.041). Additionally, there was a statistically significant negative correlation between smoking and FEV1/FVC (r = -481, p* = 0.032

Table (1): Percentage distribution of the studied patients in both groups according to their demographic characteristics

Demographic characteristics	Studied patients				
	Control (n=30)		Study(n=30)		P. value
	N	%	n	%	
Age					
20 <30 years	0	0.0	2	6.6	0.159
30< 40 years	2	6.7	0	0.0	
40 <50 years	7	23.3	5	16.7	
50 ≥ years	21	70.0	23	76.7	
Mean ±SD	**49.75±7.44**		**50.50±8.79**		**0.524**
Gender					
Male	18	60.0	16	53.3	0.376
Female	12	40.0	14	46.7	
Marital Status					
Single	1	3.3	0	0.0	0.598
Married	28	93.4	29	96.7	
Separated	1	3.3	1	3.3	
Education					
Basic education	2	6.6	0	0.0	0.347
Secondary	22	73.3	23	76.7	
High education	6	20.0	7	23.3	
Occupation					
Employee	21	70.0	21	70.0	0.607
does not work	5	16.7	7	23.4	
Manual worker	4	13.3	2	6.6	

**** Statistical significant difference (P < 0.05)***

Table (2): Percentage distribution of the studied patients in both groups according to their medical data

Medical data	Studied patients				P. value
	Control (n=30)		Study(n=30)		
	N	%	N	%	
Diagnosis					
Ischemic heart disease	25	83.3	26	86.7	1.000
Angina	5	16.7	4	13.3	
Duration of surgery	**5.38±0.96**		**5.25±0.91**		0.808
Body mass index	**29±3.78**		**28.86±4.02**		0.957
Past medical					
Non	3	10.0	4	13.3	0.782
GIT	5	16.7	6	20.0	
Hypertensions	10	33.3	9	30.0	
Diabetes mellitus	6	20.0	6	20.0	
Rheumatic heart diseases	6	20.0	5	16.7	
Smoking history					0.377
yes	17	56.7	16	53.3	
No	13	43.3	14	46.7	

Significant level at P value < 0.05

Table (3): Mean scores of physiological parameters of the studied patients in both groups

Physiological parameters		Studied patients			
		Control (n=30)	Study(n=30)	Z	P.value
		Mean±SD	Mean±SD		
Temperature					
1st day	**Pre**	36.13±0.16	36.17±0.33	1.08	0.280
	Post	36.62±0.17	36.72±0.22	1.77	0.077
3rd day	**Pre**	36.84±0.56	36.59±0.36	1.472	0.141
	Post	37.14±0.28	37.12±0.2	0.368	0.713
Pulse rate					
1st day	**Pre**	105.35±20.42	107.7±13.35	0.353	0.724
	Post	106.45±20.35	108.65±13.45	0.095	0.924
3rd day	**Pre**	107.2±7.34	106.2±6.1	0.61	0.539
	Post	115.9±7.39	113.3±6.33	1.66	0.097
Respiratory rate					
1st day	**Pre**	25.75±8.13	25.45±7.49	0.313	0.754
	Post	33.9±2.17	32.2±2.59	2.00	**0.046***
3rd day	**Pre**	23.75±4.78	23.85±3.1	0.329	0.742
	Post	31±2.34	27.7±3.01	3.46	**0.001****
S B P					
1st day	**Pre**	117.1±22.63	122.1±20.4	0.421	0.674
	Post	120.65±13.27	114.2±10.2	1.626	0.104
3rd day	**Pre**	129.9±4.12	128.3±2.3	1.29	0.198
	Post	134.4±6.59	133.6±2.21	0.57	0.568
DBP					
1st day	**Pre**	65.3±14.83	72.2±15.29	1.354	0.176
	Post	71.85±10.75	69.6±8.7	0.774	0.439
3rd day	**Pre**	71.85±8.89	74.85±6.61	1.129	0.259
	Post	71.85±8.89	74.85±6.61	1.129	0.259

SBP. Systolic Blood Pressure ***DBP. Diastolic Blood Pressure***

Mann Whitney Test quantitative data between the two groups
****Significant level at P value < 0.05***

Table (4): Mean scores of oxygenic parameters among patients of both studied groups

Oxygenic parameters		Studied patients			
		Control (n=30)	Study(n=30)	Z	P. value
		Mean ±SD	Mean ±SD		
SpO2					
1st day	**pre**	95.05±3.8	95.55±0.51	1.394	0.163
	Post	96.32±8.0	96.85 ± 2.9	1.460	0.144
3rd day	**pre**	97.8±1.7	97.9±1.45	0.028	0.977
	Post	97.34±0.68	99.9±0.31	2.77	**0.006****
PaO2					
1st day	**pre**	91.7±3.71	91.6. ±3.33	1.826	0.068
	Post	92.51±3.72	93.80±3.13	0.541	0.588
3rd day	**pre**	94.66 ± 5.43	96.85±2.98	0.417	0.674
	Post	94.66 ± 5.43	96.85±2.98	0.417	0.674
PaCO2					
1st day	**pre**	40.3±10.73	38.8±7.64	0.203	0.839
	Post	39.68±6.63	37.74±5.10	0.394	0.694
3rd day	**pre**	37.25±6.3	39.85±6.25	1.099	0.272
	Post	38.31±6.16	38.71±6.44	0.16	0.871
SaO2					
1st day	**pre**	96.01±2.38	96.21±2.30	0.148	0.880
	Post	96.31±3.00	96.43±1.57	1.360	0.143
3rd day	**pre**	96.61±2.08	96.98±2.55	0. 879	0.352
	Post	96.91±3.00	98.69±1.40	1.974	**0 .048***

PaCO2: Partial pressure of carbon dioxide in arterial blood
PaO2: partial pressure of oxygen in arterial blood
SaO2: Arterial blood oxygen saturation
*Significant level at P value < 0.05

Table (5): Mean scores of spiro-metric values among patients of both studied groups

Spiro-metric values		Studied patients			
		Control (n=30)	Study(n=30)	Z	P. value
		Mean ±SD	Mean ±SD		
FVC					
1st day	**pre**	2.17±0.13	2.16±0.24	0.886	0.376
	Post	3.12±0.27	3.33±1.07	0.989	0.323
3rd day	**pre**	4.00±0.52	4.07±0.72	1.20	0.231
	Post	3.49±0.46	4.16±0.45	4.373	**0.001****
FEV1					
1st day	**pre**	3.10±0.24	3.23±1.06	0.977	0.311
	Post	3.20±0.36	3.43±1.34	0.998	0.335
3rd day	**pre**	4.07±0.72	4.68±0.6	1.20	0.231
	Post	4.73±0.84	5.41±0.42	3.66	**0.000****
FEV1/FVC					
1st day	**pre**	78.45±2.06	79.3±3.16	0.581	0.561
	Post	78.45±2.06	79.3±3.16	0.581	0.561
3rd day	**pre**	80.3± 6.34	81.2. ± 6.28	0.632	.528
	Post	81.23±2.73	83.81±2.89	3.624	**0.003***

FVC: Forced Vital Capacity
FEV1: Forced Expiratory Volume in one second
Mann Whitney Test quantitative data between the two groups
Wilcoxon Test for quantitative data
*Significant level at P value < 0.05,
**Significant level at P value < 0.01

Table (6): Mean scores of daily amount of expectorated sputum of the studied patients in both groups

Daily amount of expectorated sputum	Control(N=20)	Study(N=20)	Z	P. value
	Mean ±SD	Mean ±SD		
1st day	22.2±5.12	25.42±4.19	0.446	0.655
3rd day	69.64±3.56	78.45±2.06	5.199	0.001**
1st day versus 3rd day	2.096 0.036*	4.373 0.001**		

Mann-Whitney Test quantitative data between the two groups
Wilcoxon Test for quantitative data
*Significant level at P value < 0.05,
**Significant level at P value < 0.01

Table (7): Correlation between spirometric values with bio demographic data of studied patients in both groups

		Control			Study		
		FVC	FEV	FEV1/FVC	FVC	FEV	FEV1/FVC
Age	r	0.119	-0.234	0.118	0.062	-0.241	-0.339
	P	0.618	0.320	0.620	0.795	0.306	0.144
Gender	r	-0.204	0.226	0.029	-0.142	0.242	0.336
	P	0.388	0.337	0.903	0.551	0.304	0.147
Marital Status	r	0.000	-0.329	-0.261	-0.160	-0.323	-0.338
	P	1.000	0.157	0.266	0.500	0.165	0.144
Body mass index	r	-0.349	0.135	0.059	0.198	-0.172	**-.460-**
	P	0.132	0.570	0.805	0.404	0.470	**0.041***
Past medical	r	**-.491-***	**-.457-***	-0.032	0.264	0.380	0.334
	P	**0.028**	**0.043**	0.895	0.261	0.099	0.151
Smoking	r	-0.172	-0.376	0.281	0.212	-0.061	**-.481-**
	P	0.470	0.102	0.230	0.370	0.799	**0.032***

**** Statistically Significant correlation at P. value <0.05***

Discussion

Active cycle breathing technique and routine physiotherapy could be safely used post cardiac surgery. Moreover, the ACBT has been shown to be effective in improving airway clearance and spirometric parameters post cardiac surgery [18,19].

In regards to the age and gender of the studied patients, the current study shows that more than two thirds of the patients in the control and study groups

were over 50 years old, and more than half of them were male. This might be explained by the increased susceptibility of this age group to cardiac illnesses**.** This finding was congruent with **Helmy et al, (2019)** [(20)] and **Derakhtanjani et al, (2019**) [(11)] who revealed that the majority of the patients in both groups who had been studied were men, married, and had a mean age of 52 years . In addition to **Eid et al.,(2022)**[(21)] noticed that the age of patients was more than 60 years, and more than half of them were male.

In relation to the medical data, the current findings revealed that the majority of the patients in the study and control groups were diagnosed with ischemic heart disease, and had a history of hypertension and diabetes mellitus. This result supported by **Abd El Hafeez et., (2018)** [(22)] who recorded that the most common comorbid diseases among studied patients were hypertension, and diabetes mellitus. Additionally**, Afxonidis etal.,(2021)** [(10)]who documented that the studied groups had similar characteristics regarding gender and age.

As regards body temperature, pulse rate, systolic and diastolic blood pressure, no significant changes were observed between the control and study groups pre /post ACBT. On the other hand, there was a significant change of respiratory rate post ACBT between of both control and study groups on the 1st and 3rd days. It can be justified by the fact that tidal volume and inspiratory effort rise simultaneously when inspiratory work-load increases, which causes an increase in parasympathetic stimulation and thus respiratory rate increase [(12).] The result was in agreement with **Helmy et al, (2019)** [(20)] who showed a significant difference in respiratory rate between the study and control groups. In addition to **Derakhtanjani et al.,(2019)** [(11)]**,** reported a significantly increased of respiratory rate post-active cyclic breathing technique between studied patients on the 1st and 2nd days.

Concerning comparison between control and study groups in relation to oxygenic parameters, this finding showed that there were statistical significant differences regarding SpO2and SaO2 among control and study groups on the 3rd day post ACBT. On the other hands, no statistically significant difference between the study and control group's PaO2 and PaCO2 levels were noticed. and study groups. This may be attributed to the effect of ACBT on improving lung function by reducing bronchospasms, enhancing collateral ventilation, re-expansion of collapsed alveoli through thoracic expansion and inspiratory holds which promote redistribution of gas between the lung segments [(14, 15).]

These results are consistent with **Jain and Mistry (2017)** [(23)] who stated that the active cycle of breathing technique had a positive effect on the improvement of Spo2 and oxygenation for patients undergoing uncomplicated coronary artery bypass grafting surgery .Moreover, these results are congruent with **Hussain et al (2022)** [(19)] who stated that ACBT had a significant improvement in Sao_2, Pao2, and decreased paco2 in the study rather than the control group. Additionally,

Elsayed. et al. (2015) [24] and **Taha et.al, (2021)** [13] clarified that chest physiotherapy improved oxygen saturation and promoted normal results of arterial blood gases .

In relation to spirometric values, the findings of the present study showed that there were significant statistical differences regarding **FVC, FEV1, and FEV1/FVC** among control and study groups on the 3rd day post ACBT.

This result was consistent with **Hussain et al.,(2022)** [19] who noticed that ACBT had a positive effect on improving FEV1 and chest expansion in the interventional group. Moreover, **Monisha** and **Muthukumar,(2018)**[12] noticed that ACBT significantly improved lung volumes, and functional work capacity due to improved ventilation perfusion matching. On the other hand, these results were contradicted by **Alwekhyan et al., (2022)**[25] who recorded that there was no significant statistical difference between the study and the control group in postoperative on pulmonary function , Also, **Shen et al., (2020)** [26] recorded that there was no positive impact of ACBT on pulmonary function and arterial blood gas results.

As regards daily amount of expectorated sputum post ACBT. This result showed a significant increase daily amount of expectorated sputum post ACBT sessions on the 3rd day compared to the 1st day of both studied groups. It can be justified by the effect of ACBT, which enhances movement of the bronchial secretion through the forced expiration technique **(huffing),** which helps to expel the secretion more easily through coughing. [25]

This result was in the same direction as **Zisi et al, (2022)** [27] who concluded that ACBT is a method that has been found to be effective in increasing sputum removal from the airway**. Elsayed et al., (2015**) [24] mentioned that the application of ACBT helps to clean the airways from the excessive secretion**. Zhong et al., (2021**)[28] who demonstrated that ACBT is an effective approach for significantly increased sputum wet weight in study group.

The present study clarified that there was a negative statistical correlation between body mass index and FEV1/FVC. These findings were supported by **Bhatti etal., (2019)** [29], who found that there was a significant correlation between pulmonary function parameters and body mass index. Additionally, **Ruby (2022)** [30] reported a significant negative correlation between body mass index and FEV1/FVC in both males and females.

Conclusion:

It was concluded that ACBT gives positive results in conjunction with incentive spirometers in relation to improve airway clearance (oxygenic parameters, spirometer measurements and increase amount of expectorated sputum among the studied patients post elective cardiac surgery.

Recommendations:

The following recommendations have been offered in light of the findings of the study:

Active cycle breathing technique should be integrated with routine chest physiotherapy for patient undergoing

cardiac surgery. Moreover, replication of the study using large probability sampling should be performed.

References

1. Hardin S, Kaplow R. Cardiac Surgery Essentials for Critical Care Nursing ,3rd ed. Jones & Bartlett Learning; USA , 2020.pp 65,102,206.
2. **Mali S, Haghaninejad H.** Pulmonary complications following cardiac surgery. Arch Med Sci Atheroscler Dis. 2019 ;31(4):e280-e285.
3. **Pooria A, Pourya A, Gheini A**. Postoperative complications associated with coronary artery bypass graft surgery and their therapeutic interventions.Futurecardiology.2020;16(5):481-96.
4. **Silva M, Pascoal M, Nunes L, Sousa C, Araújo G, Gontijo C**. Ineffective airway clearance in surgical patients: Evaluation of Nursing interventions and outcomes. International journal of nursing knowledge. 2019; 30 (4):251-6.
5. **Dantas R, Almeida D, Matias C, Fernandes I, Tinôco D, Lopes V, Lira L.** Accuracy of the nursing diagnosis of ineffective airway clearance in intensive care unit patients. Rev Bras Enferm. 2023 30;76(1):e20220174.
6. **Razzaq A, Rasheed A, Ahmed S, ShahH.** Frequency of the clinical indicators of ‘ineffective airway clearance ‘among patients after coronary artery bypass grafting at tertiary care hospitals Karachi, Pakistan. The professional medical journal, 202;30 (01): 23-8.
7. **Leemans G, Belmans D, Van Holsbeke C, Becker B, Vissers D, Ides K, Verhulst S, Van Hoorenbeeck K**. The effectiveness of a mobile high-frequency chest wall oscillation (HFCWO) device for airway clearance. Pediatr Pulmonol. 2020; 55(8):1984-92.
8. **Belli S, Prince I, Savio G, Paracchini E, Cattaneo D, Bianchi M, Masocco F, Bellanti MT, Balbi B**. Airway clearance techniques: the right choice for the right patient. Front Med (Lausanne). 2021; 4(8):544826.
9. **Zanini M, Nery M, Lima B, Buhler P, Silveira D, Stein R.** Effects of different rehabilitation protocols in inpatient cardiac rehabilitation after coronary artery bypass graft surgery: a randomized clinical trial. Journal of cardiopulmonary rehabilitation and prevention.2019; 39(6), e19-e25.
10. **Afxonidis G, Moysidis V, Papazoglou S, Tsagkaris C, Loudovikou A, Tagarakis G, Karapanagiotidis T, Alexiou A, Foroulis C, Anastasiadis K.** Efficacy of early and enhanced respiratory physiotherapy and mobilization after on-pump cardiac surgery: A Prospective Randomized Controlled Trial. Healthcare (Basel). 2021, 15;9(12):1735.
11. **Derakhtanjani A, Ansari A, Haydari S, Negahban T**. Comparison the effect of active cyclic breathing technique and routine chest physiotherapy on pain and respiratory parameters after coronary artery graft surgery: a randomized clinical trial. Anesth Pain Med. 2019 16;9(5):e94654.
12. **Monisha R ,Muthukumar S.** Efficacy of active cycle of breathing technique on functional improvement in post CABG Patient.Research in Medical & Engineering Sciences. 2018;5(1):392-95.

13. **Taha, M. M., Draz, R. S., Gamal, M. M., Ibrahim, Z. M.** Adding active cycle breathing technique to chest physiotherapy after upper abdominal surgery: effect on blood gases and pulmonary complications prevention. randomized controlled trial. sao paulo medical journal.2021; 139, 556-63.
14. **Zisi D, Chryssanthopoulos C, Nanas S, Philippou A.** The effectiveness of the active cycle of breathing technique in patients with chronic respiratory diseases: A systematic review. Heart Lung. 2022;53:89-98.
15. Statistical data from Assuit Heart University Hospital 2021.
16. **Rahman A, Chang Y, Dong J, Conroy B, Natarajan A, Kinoshita T, Vicario F, Frassica J, Xu-Wilson M.** Early prediction of hemodynamic interventions in the intensive care unit using machine learning. Crit Care. 2021 Nov 14;25(1):388**.**
17. **Daniel, W. W., & Cross, C. L.** Biostatistics: a foundation for analysis in the health sciences. Wiley.2018
18. **Labib, M. A**. Effect of preoperative respiratory muscle training on respiratory complications after median sternotomy incision. The Egyptian Journal of Hospital Medicine,2023; 90(1), 1510-1514.
19. **Hussain N, Sheraz S, Razzaq A, Malik N**. Active cycle of breathing techniques improves post-operative pulmonary complications in coronary artery bypass graft surgery patients. PakHeartJ. 2022;55(02):186-90.
20. **Helmy Z, FarghalyA, Gado A, Elmosalamy H.** Effect of deep breathing on heart rate variability following coronary artery bypass graft. Med. J. Cairo Univ. 2019; 87 (8): 5179-86.
21. **Eid H, Hassan M, Elsayed E , El-Said H.** Evidence based exercise and early mobilization effectiveness on post cardiac surgeries physiological and psychological outcomes. Egyptian Journal of Health Care. 2022;13(1), 311-22.
22. **Abd-ElHafeez N, Hafez M, Sanhoury M.** Effect of changing position on patient outcomes after transfemoral diagnostic cardiac catheterization. Journal of Nursing and Health Science, 2018; 7(6): 32-42.
23. **Jain K, Mistry K.** Comparative study on effects of active cycle of breathing technique and manual chest physical therapy after uncomplicated coronary artery bypass grafting surgery. J Mahatma Gandhi Univ Med Sci Tech. 2017;2(2):65-8.
24. **Elsayed S, Kamal W, Fathy K**. Impact of active cycle of breathing technique on functional capacity in patient with bronchiectasis, international journal of therapies and rehabilitation research .2015;4(5):287-93.
25. **Alwekhyan A, Alshraideh A, Yousef M, Hayajneh F**. Nurse-guided incentive spirometry use and postoperative pulmonary complications among cardiac surgery patients: A randomized controlled trial. Int J Nurs Pract. 2022;28(2):e13023.
26. **Shen M, Li Y, Ding X, Xu L, Li F, Lin H.** Effect of active cycle of breathing techniques in patients with chronic obstructive pulmonary disease: a systematic review of intervention. Eur J Phys Rehabil Med. 2020;56(5):625-32.
27. **Zisi D, Chryssanthopoulos C, Nanas S, Philippou A.** The effectiveness of the active cycle of breathing technique

in patients with chronic respiratory diseases: A systematic review. Heart Lung. 2022;53(2) 89-98.

28. **Zhong J, Zhang S, Li C, Hu Y, Wei W, Liu L, Wang M, Hong Z, Long H, Rong T, Yang H, Su X**. Active cycle of breathing technique may reduce pulmonary complications after esophagectomy: A randomized clinical trial. Thorac Cancer. 2022;13(1):76-83
29. **Bhatti U, Laghari A, Syed M**. Effect of body mass index on respiratory parameters: a cross-sectional analytical study. Pak J Med Sci. 2019;35(6):1724-29.
30. **Ruby, D.** The impact of body mass index on spirometric parameters among a sample of population. Bulletin of National Institute of Health Sciences. 2022; 140(1)

Effect of Educational program on Nurses' Performance Regarding Acquired Skin injuries at Neonatal Intensive Care Units

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Abstract

Background: the skin of the neonate is less in thickness and more fragile than that of older infants requiring special nursing care to prevent acquired skin injuries in neonates. Maintaining skin integrity and prevention of skin injuries help to prevent complications to neonates and costs for the healthcare systems. **Aim**: the present study aimed to determine the effect of educational program on nurses' performance regarding acquired skin injuries at Neonatal Intensive Care Units. **Design**: quasi experiment research design **Settings:** the present study was conducted at Neonatal Intensive Care Units of Tanta University Hospital and Itay Elbaroud General Hospital. **Subjects**: a convenience sampling of 90 nurses working in the previously mentioned settings. **Tools:** two tools of data collection were used; a structured interview schedule for assessment of nurses' knowledge and observational checklists for assessment of nurses' practice regarding the skin care of neonates. **Results**: total scores of nurses' knowledge and practices improved after the educational program. There were statistically significant differences between nurses' knowledge and practice before, immediately after and three months after the educational program. **Conclusion**: Implementation of educational program regarding skin injuries improves nurses' performance at the Neonatal Intensive Care Units. **Recommendations**: Integrating the preventive care measures of acquired skin injuries in the routine care of the neonates. Continuous in service training about acquired skin injuries should be provided for neonatal nurses.

Keywords: Acquired skin injuries, Educational program, Nurses' performance, Neonatal Intensive Care Units.

Introduction:

Neonatal period is a critical and challenging time of the child life it is the first 28 days after birth. During this period, the neonate has to accommodate to the extra- uterine life successfully. Some of neonates fail to adjust and require admission to neonatal intensive care units with subsequent life support. Great advances and technology have been applied in the care of neonates in the Intensive Care Units (NICU) leading to marked decrease in morbidity and mortality in the neonates. On the other hand, many life support devices and multiple invasive procedures make it challenging to maintain the skin integrity of the neonate. (1-3)

Skin is the largest organ of the body. It is the first defense line for the body from external insults. It is also responsible for thermoregulation, maintenance of fluids and electrolytes through prevention of loss and control excretion, perception of touch stimulation and providing storage for fats. Many internal diseases can be diagnosed by remarkable skin manifestations. Skin of the neonate showed incomplete maturation in its thickness and functions. The skin barrier reaches its full development during the first weeks after birth therefore, it is crucial to maintain skin integrity within the neonatal period.(4)

Acquired skin injuries (ASIs) in neonates are the breakdown of the skin integrity after birth. There are various risk factors for acquired skin injuries which may be intrinsic including; prematurity, congenital skin malformations, nutritional deficits, or dehydration; or extrinsic factors including connecting to monitors and life-supporting devices, vascular accesses, improper use of adhesives, use of harsh detergents, unsafe products, impaired mobility, increased humidity, moisture and incompetent routine neonatal skin care. (5,6)

According to a systematic review published by August D, et al., in 2018, the incidence of neonatal acquired skin injuries and revealed that the prevalence was 9.25-43.1%. [7] Another cross-sectional study in 2017 reported that, the prevalence of neonatal acquired skin injuries were about 26% of the studied neonates due to the usage of skin adhesive tapes.(8)

The neonatal nurse should be aware about the intrinsic and extrinsic risk factors that put the neonate at a higher risk for acquiring skin injuries in the NICU in order to prevent their occurrence especially in the more vulnerable neonates.

Intrinsic risk factors include; prematurity, compromised circulation, generalized skin edema, birth skin problems, nutritional imbalances, and dehydration. Extrinsic risk factors include; life support devices ex., tubes, catheters, electrodes, probes, phototherapy, use of disinfectants topical skin agents, improper application of adhesives including fixation tapes, electrodes, restricted mobility and decreased activity, Use of harsh detergents and soaps, prolonged hospitalization of the neonate.(9,10)

Common acquired skin injuries at NICUs include; diaper dermatitis, needle puncture marks, extravasation skin injuries, iatrogenic calcinosis cutis, calcified nodules, burns, mechanical injuries, pressure injury, nasal injury, phototherapy related skin problems, cutaneous complications of umbilical catheterization, anetoderma of prematurity(11,12.)

Nursing care of the neonatal skin includes proper examination of the skin involving assessment of the risk factors for acquiring skin injuries and skin integrity. Risk

assessment guides nurses to effectively develop individualized skin care plan to avoid acquired skin injuries.[13]

General nursing care for the neonatal skin includes proper bathing, diaper care, and cord care, and gentle handling. The frequent change of diapers, keeping the skin dry, protecting the periumbilical skin during cord antisepsis, specific skin care during the use of invasive and noninvasive oxygen therapy, emollients, disinfectants and adhesive tapes.[14 15,16]

In the same context, there are other preventive measures including; use of double-walled incubators the use of plastic transparent bags for the neonates, and transparent adhesive dressings to reduce transepidermal water loss. Additionally, prevention of ultraviolet associated skin injuries includes protection from direct exposure to sunlight passing from windows and also dim lightening of the nursery or cover the incubators to protect neonates from light injury. [17, 18,19]

Significance of the study:

Acquired skin injuries at Intensive Care Units are common adverse problems that negatively affect the health of the neonate. Most acquired skin injuries can be completely avoided through efficient nursing care. There is no standard approach for the neonatal nurse to deal with skin injuries, or systematic strategy adopted for assessing and monitoring the factors relating to their occurrence and subsequently minimizing them. There are few clear studies assessing the current knowledge of nursing staff regarding acquired neonatal skin injuries. The current study aimed to provide an educational program about nursing performance regarding acquired skin injuries in NICUs.

Aim of the study:

The present study aimed to determine the effect of an educational program on nurses' performance regarding acquired skin injuries at Neonatal Intensive Care Units.

Research hypothesis:

Implementation of educational program is expected to improve nurses' performance regarding acquired skin injuries at Neonatal Intensive Care Units.

Subjects and Method

Research design

Quasi-experimental research design was used to conduct the current study.

Setting:

The study was conducted at two neonatal Intensive Care Units, Tanta University Hospital which affiliated to the Ministry of Higher Education & scientific Research, Algharbia governorate and NICU at Itay Elbaroud General Hospital which is affiliated to the Ministry of Health and Population, Elbohira governorate.

Subjects:

Convenience sampling of 90 nurses working at previously mentioned settings. Fifty from Neonatal Intensive Care Units at Tanta university Hospital and forty from Itay Elbaroud General Hospital.

Tools of data collection:

Two tools were used to collect the data:

Tool (I): A structured interview schedule

It was designed by the researcher based on the review of literatures. [9,19-21-]It consisted of two parts: **Part(1):** Socio-demographic characteristics of the nurses such as; age sex, marital status, educational level, years of experience at neonatal intensive care units, and whether they had attended any neonatal training courses.

Part (2): Nurses' knowledge about of the anatomy of skin, predisposing factors for

acquiring skin injuries, prevention of skin injuries, neonatal skin care and management of acquired skin injuries at neonatal intensive care units.

Nurses' knowledge was scored as following:

- Correct and complete answer was scored (2).
- Correct and incomplete answer was scored (1).
- Don't know or incorrect answer was scored (0)

The total score of nurses' knowledge was calculated as follow:

- Less than 65% was considered low level.
- From 65- <75% was considered moderate level.
- From 75%-100% was considered high level.

Tool (II):- Skin Care Observational Checklist:

It was developed by the researchers and used to assess nurses' practice regarding neonates ' skin care after reviewing recent related literatures.[22-28] It was used to assess nursing interventions pre, post and three months after the implementation of the educational program. It included nursing practice of the following:

a. Skin care including bathing, diaper care, cord care, prevention, and protection of skin during the use of invasive oxygen therapy, prevention of pressure injuries and decreasing trans-epidermal water loss.
b. Assessment of acquired skin injuries including assessment of the risk factors for acquiring skin injuries and characteristics of the skin, signs of skin breakdown and special assessment of acquiring skin injury.
c. Infection control practices for the nurses including antiseptic hand washing, use of appropriate personal protective equipment.

Nurses' interventions were evaluated as follows:

- Done correctly and complete were scored (1)
- Not done were score (0)

The total score for nurses' practice was considered as follow:

- Unsatisfactory practice: less than 70%.
- Satisfactory practice: more than 70%.

Method

1. Official permission was obtained from the Faculty of Nursing, Tanta University and the responsible authorities of the Intensive Care Units of Tanta University Hospital and Itay Elbaroud General Hospital.
2. Ethical and legal considerations:

- The nature of the study was discussed with the participants.
- Confidentiality and privacy were guaranteed all over the study.
- Nurses' approval to participate in the study including the right to withdraw at any time was maintained.

3. Ethical approval was obtained from the Faculty of Nursing Scientific Research Ethics Committee.
4. Study tools were developed by the researcher based on the review of the related literatures.
5. Tools of the study were tested for their content validity and reliability by a jury of five experts in pediatric nursing.
6. A pilot study was conducted on (10%) of the study sample to test the feasibility, applicability and clarity of the tools. Accordingly, the needed modification was done. The time

consumed for each session was also, be assessed. The pilot sample was excluded from the study sample.

7. Neonatal nurses were interviewed and their knowledge was assessed using Tool I part (2) pre-test, immediate post-test and three months later.
8. Nurses were observed for their practice using (Tool II) pre-test, immediately post-test and after three months from the program implementation.

Field of work:

Data collection has taken six months starting from the beginning of November 2020 to the end of April 2021. The study was performed in four main phases; assessment, planning, implementation and evaluation phases.

1. Assessment phase:

The researcher obtained nurses approval for the participation in the study. Nurses were interviewed individually, socio-demographic characteristics, and nurses' knowledge using Tool I. Assessment of nurses' practices was also assessed using the observational checklists using tool (II) to obtain baseline data.

2. Planning phase:

The collected data were reviewed by the researcher, organized and the researcher set priorities and formulated the educational objectives and outcomes**.** The researcher selected the appropriate teaching methods including lectures, demonstration, re-demonstration, discussions. The researcher also, prepared educational materials including booklet and power point presentations during this phase to reinforce the understanding of the nurses.

3. Implementation phase:

The researcher implemented the educational program for nurses at the NICUs through three sessions, three days / week. The studied nurses were divided into 9 subgroups each one consisting of 10 nurses.

Session one: It took about 20-30 minutes. The researcher focused on the anatomy of the skin, the characteristics of the neonatal skin, definition of the acquired skin injuries, risk factors for acquiring skin injuries and prevention of skin injuries, common acquired skin injuries in the NICUs, and the adverse consequences of skin injuries on the neonates.

Session two: It took about 30 minutes, the researcher revised the knowledge presented in the previous session and demonstrated measures of hand washing technique, wearing personal protective equipment, routine skin care practices including bathing, diaper care, cord care, assessment of risk factors, assessment of skin turgor, perfusion, color, and skin temperature and assessment of skin injuries of the neonate.

Session three: It took about 30 minutes the researcher reviewed the previous content and clarified measures to prevent the incidence of skin injuries involving safe and effective use of emollients, disinfectants and adhesives in the skin, special care of skin during oxygen therapy, prevention of trans-epidermal water loss(TEWL), and nursing management of skin injuries and care of skin wounds.

4. Evaluation phase:

Evaluation of nurses' performance was done immediately after implementation of the program and three months later. The effectiveness of the educational program was evaluated by comparing posttest results with pretest baseline data.

Statistical analysis:

The collected data were organized, tabulated and statistically analyzed using SPSS

software. For quantitative data, the range, mean and standard deviation were calculated. For qualitative data, Chi-square test (x^2), Z value of the Mann- Whitney test, F value of the ANOVA test were used Significance was adopted at P <0.05 for interpretation of results of tests of significance.

Results:

Figures (1): shows percentage distribution of the studied nurses according to their age. It was clear that more than half of the studied nurses (60%) were in the age group of 25<30 years, compared to 12.2% of them who were between 30-<35 years with mean age of 26.71 ± 3.1 years.

As regards nurses, educational level, **Figures (2)** clarifies that nearly two thirds of the nurses (63.3%) had a bachelor degree of nursing, while the rest of nurses (36.7%) were graduated from nursing institutes.

Total scores of knowledge before, immediate, and three months after the educational program was illustrated in **Table (1)**. It was evident that only one fifth of nurses (21%) had had level of knowledge prior to the program that was significantly improved to 82.2% immediately and 70% three months after with statistical significant differences pre and immediately posttest (P1= 0.001*), pre and post three months (P2= 0.001*). No statistical significant difference was found between immediately after and three months post educational program.

Table (2) presents total score of practices before, immediate, and three months after educational program. It was obvious that nearly equal percent (84.4% & 82.2%) of the studied nurses had satisfactory practices immediately and three months after the program respectively compared to 43.3% of them before the program with high statistical significant difference (P=0.001*).

Concerning relation between nurses' total knowledge and their total practices **Table (3)** illustrates that there were significant positive correlations between nurses' knowledge and practices concerning skin injuries pre, immediate and three months after the program implementation (P=0.001*).

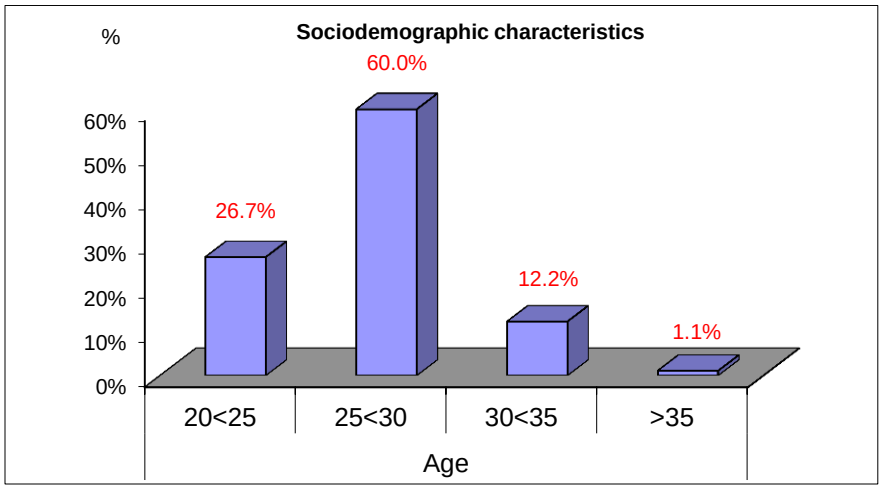

Figure (1): Studied nurses according to their age.

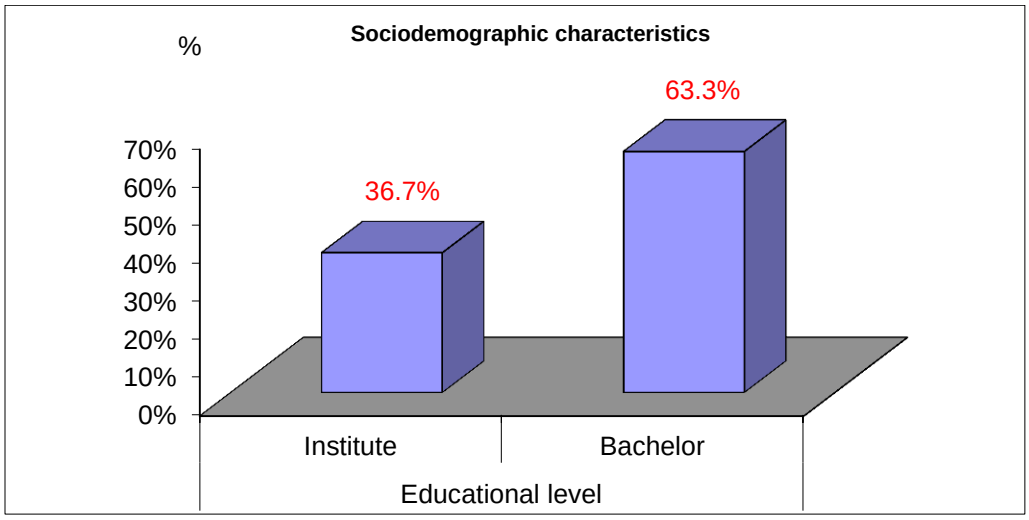

Figure (2): Educational level of the studied nurses

Table (1): Total scores of nurses' knowledge regarding acquired skin injuries before, immediate and 3 months after educational program.

Knowledge	Before	Immediate after	After three months	X^2
	No	No	No	
Low level	33	5	6	68.038
Moderate level	38	11	21	47.201
High level	19	74	63	4.102
P value	P1	P2	P3	
	**0.001	**0.001	0.129	

***Statistically significant difference at (P<0.05)**

****** **High statistical significance at (P value < 0.001)**

Table (2): Total scores of nurses practices regarding acquired skin injuries before &immediate and after three months of implementation the program.

Practice	Before	Immediate after	After three months	X^2	P
	No	No	No		
Unsatisfactory	51	14	16	32.968	**0.001
Satisfactory	39	76	74	29.119	**0.001

***Statistically significant difference at (P<0.05)**

**** High statistical significance at (P value < 0.001)**

Table (3): Relation between nurses' knowledge and practice.

Practice	Knowledge	
	r	P value
Pre	0.661	0.001**
Immediate	0.834	0.001**
After three months	0.719	0.001**

***Statistically significant difference at (P<0.05)**

**** High statistical significance at (P value < 0.001)**

Discussion:

Regarding the socio-demographic characteristics of the studied nurses, it was found that the majority of nurses were aged 25 < 30 that may be due to that younger nurses can tolerate the heavy workload of the NICU, that was not in the same line with **McKnigh et al (2020)**. who conducted a study in Kenya on neonatal nurses' strategies to cope with stress on and found that most of the nurses were on the average of 37 years old. [29]

Regarding the **educational level** of nurses, the present study revealed that nearly two-thirds of them had a bachelor's degree in nursing it may be due to that the most of faculty graduates are employed in the most critical parts of the hospital including the NICUs. These findings were consistent with **Abd El- Galil et al. (2019**) who assessed the effect of staff development program on the neonatal nurses' performance and found that nearly the same percent holding a bachelor degree in nursing. [30]

The present study showed improvement in the total scores of the studied nurses' knowledge immediately and three months after attending the educational program in comparison to their knowledge before the educational sessions this improvement in nurses' knowledge was similar to **Mohamed et al. (2019)** who conducted a study at Banha pediatric hospital to assess the effect of guidelines regarding pressure ulcer preventive measures and reported a remarkable improvement in nurses' knowledge after the implemented program in their study. [31]

Regarding the total scores of nurses' practices about acquired skin injuries in the

previously mentioned neonatal intensive care settings, nurses displayed significant progress concerning the overall neonatal skin care and prevention of acquired skin injuries. These results are concurrent with the intended outcome of the educational program which aimed to enhance nurses' performance regarding neonatal skin care. This improvement in the total practices of nurses was compatible with **Yan et al. (2021)** who conducted a meta-analysis to evaluate the effect of training programs on nurses' ability to care for subjects with pressure injuries.[32]

This current study showed that there was a significant statistical correlation between the studied nurses' level of knowledge and their observed practices regarding neonatal skin care. That means enhancing nurses' knowledge would subsequently be reflected in their performance. These results agreed with **Abdu H**(**2019**), who conducted a study to assess the knowledge and practice of immediate newborn care among nurses and found that the practices of the nurses were a strongly linked to level of knowledge.[33]

Conclusion

Based on the findings of the current study, it was concluded that:

The educational program was effective in improving nurses' knowledge and practices related to the care of neonatal skin and the prevention of acquired skin injuries. Moreover, there was a highly statistically significant positive correlation between total scores of knowledge and practice related to the prevention of acquired skin injuries and the skin care of the neonates in the NICUs.

Recommendations

–Emphasis on the early detecting of the risk factors for acquiring skin injuries in the NICUs in each neonate.

–Integrating the preventive measures for acquired skin injuries in the routine care of the neonate.

–Continuous educational programs for the nurses working in the Intensive Care Units to enhance nurses' knowledge and practice and prevents the occurrence of skin injuries.

–Discharge instructions regarding neonatal skin care must be provided to the mothers

References

1. Artese C, Paterlini G, Mascheroni E, Montirosso R. Barriers and Facilitators to Conducting Kangaroo Mother Care in Italian Neonatal Intensive Care Units. *J Pediatr Nurs*. Mar-Apr 2021;57:e68-e73. doi:10.1016/j.pedn.2020.10.028

2. **Lona Reyes JC, Pérez Ramírez RO, Llamas Ramos L, Gómez Ruiz LM, Benítez Vázquez EA, Rodríguez Patino V**. Neonatal mortality and associated factors in newborn infants admitted to a Neonatal Care Unit. *Arch Argent Pediatr*. Feb 1 2018;116(1):42-48. Mortalidad neonatal y factores asociados en recién nacidos internados en una Unidad de Cuidados Neonatales. doi:10.5546/aap.2018.eng.42

3. **Seid SS, Ibro SA, Ahmed AA, et al.** Causes and factors associated with neonatal mortality in Neonatal Intensive Care Unit (NICU) of Jimma University Medical Center, Jimma, South West Ethiopia. *Pediatric Health Med Ther*. 2019;10:39-48. doi:10.2147/phmt.S197280

4. **Taïeb A**. Skin barrier in the neonate. *Pediatr Dermatol*. Mar 2018;35 Suppl 1:s5-s9. doi:10.1111/pde.13482

5.**Faria T, Kamada I.** Skin injuries in newborns in neonatal intensive care. *Global Nursing*. 12/30 2017;17(1):211-236. doi:10.6018/eglobal.17.1.273671

6. **García-M, Balaguer L, Verdú J, Nolasco A, García P.** Cross-cultural adaptation, reliability and validity of the Spanish version of the Neonatal Skin Risk Assessment Scale. *J Nurs Manag*. Sep 2018;26(6):744-756. doi:10.1111/jonm.12612

7.**August D, New K, Ray R, Kandasamy Y**. Frequency, location and risk factors of neonatal skin injuries from mechanical forces of pressure, friction, shear and stripping: A systematic literature review. *Journal of Neonatal Nursing*. 2018/08/01/ 2018;24(4):173-180. doi:https://doi.org/10.1016/j.jnn.2017.08.003

8.**Habiballah L**. Prevalence of neonate adhesive skin injuries in a Jordanian intensive care unit. *Nursing children and young people*. Dec52017;29(10):42-46. doi:10.7748/ncyp.2017.e966

9.**Madhu R, Vijayabhaskar C, Anandan V, et al.** Indian Academy of Pediatrics Guidelines for Pediatric Skin Care. *Indian Pediatr*. Feb 15 2021;58(2):153-161.

10.**Broom M, Dunk A, AL .** Predicting Neonatal Skin Injury: The First Step to Reducing Skin Injuries in Neonates. *Health Serv Insights*. 2019;12:1178632919845630. doi:10.1177/1178632919845630

11.**Mariga T, Naidon A, Neves E.** Cuidados com a pele do recém-nascido internado em unidade de terapia intensiva neonatal: revisão integrativa Skin care to newborns admitted in neonatal intensive care unit: integrative review. *Revista de Pesquisa: Cuidado é Fundamental Online*. 10/04 2016;8:5156. doi:10.9789/2175-5361.2016.v8i4.5156-5162

12.**Sushmitha E.S, Manoj D , Ravindra K, Guruprasad G .**clinico-epidemiological study of iatrogenic cutenous manifestations in neonates in intensive care unit in a tertiary care hospital .*international journal ofresearch indermatology* . 2019 Feb;5(1):17-22. Doi:http//dx.doi.org/10.18203/issn.2455-4529.intjresdermatol20184710

13.**Kenner C, Lott J.** *Comprehensive neonatal nursing care*. Springer; 2015.

14.**Vanzi V, Pitaro R**. Skin Injuries and Chlorhexidine Gluconate-Based Antisepsis in Early Premature Infants: A Case Report and Review of the Literature. *J Perinat Neonatal Nurs*. Oct/Dec 2018;32(4):341-350. doi:10.1097/jpn.0000000000000334

15.**Boyar V**. Pressure Injuries of the Nose and Columella in Preterm Neonates Receiving Noninvasive Ventilation via a Specialized Nasal Cannula: A Retrospective Comparison Cohort Study. *J Wound Ostomy Continence Nurs*. Mar/Apr 2020;47(2):111-116. doi:10.1097/won.0000000000000616

16.**Bagheri I, Fallah B, Dadgari A, Farahani A, Salmani N.** A literature review of selection of appropriate antiseptics when inserting intravenous catheters in premature infants: The challenge in neonatal intensive care unit. *J Clin Neonatol*. 01/01 2020;9:162. doi:10.4103/jcn.JCN_135_19

17**. Goodarzi H.** et al *Neonatal Dermatology*: The normal ,The common , and The serious . National Liberary of Medicine .pub med journal . 2021

18. **Mishra U, Jani P, Maheshwari R, et al.** Skincare practices in extremely premature infants: A survey of tertiary neonatal intensive care units from Australia and New Zealand. *J Paediatr Child Health*. Oct 2021;57(10):1627-1633. doi:10.1111/jpc.15578

19.**Santos S, Ramos F, Costa R, Batalha L.** Evidence on prevention of skin lesions in newborns: integrative review. *ESTIMA, Brazilian Journal of Enterostomal Therapy*. 11/28 2019;doi:10.30886/estima.v17.787_IN

20. **Meszes A, Tálosi G, Máder K, Orvos H, Kemény L, Csoma Z**. Lesions requiring wound management in a central tertiary

neonatal intensive care unit. *World J Pediatr*. Apr2017;13(2):165-172. doi:10.1007/s12519-016-0070-6

21.**Steen E, Wang X, Boochoon KS, et al.** Wound Healing and Wound Care in Neonates: Current Therapies and Novel Options. *Adv Skin Wound Care*. Jun 2020;33(6):294-300. doi:10.1097/01.ASW.0000661804.09496.8c

22.**Santos S, Costa R.** Treatment of skin lesions in newborn children: meeting the needs of nursing staff. *Revista da Escola de Enfermagem da USP*. 2014;48:985-992.

23.**Ness MJ, Davis DM, Carey WA**. Neonatal skin care: a concise review. *International journal of dermatology*. Jan 2013;52(1):14-22.doi:10.1111/j.1365-4632.2012.05687.x

24. Johnson D. Extremely Preterm Infant Skin Care: A Transformation of Practice Aimed to Prevent Harm. *Advances in neonatal care : official journal of the National Association of Neonatal Nurses*. Oct 2016;16 Suppl 5S:S26-s32. doi:10.1097/anc.0000000000000335

25.Amin R, Kottner J,Peytavi U. Skin Care in Neonates and Infants: A scoping review. skin phamacol physical Jan-Feb 2023;36(2):51-66.HTTP:// doi.org/10.1159/000529550

26. Scheans P. Neonatal Pressure Ulcer Prevention. *Neonatal network : NN*. 2015;34(2):126-32. doi:10.1891/0730-0832.34.2.126

27. Delmore B, Deppisch M, Syvia C,andrson c,Nie A. Pressure Injuries In The Pediatric population: A National Prssure Ulcer Adivisory Panel White Paper: Wilter Kluwer Health.2019:1-15

28.Carole K.Fnap F,Leslie A,Marina B Comprehensive Neonatal Nursing Care. 6th ed. Springer Publishing ; 2019:DOI:10.189/9780826139146

29.**McKnight J, Nzinga J, Jepkosgei J,** English M. Collective strategies to cope with work related stress among nurses in resource constrained settings: An ethnography of neonatal nursing in Kenya. *Soc Sci Med*. Jan 2020;245:112698. doi:10.1016/j.socscimed.2019.112698

30.**Ibrahim A, Mohamed A, Elsayed A, Ahmed A .** Effect of Staff Development Program on Nurses' Performance Regarding Quality Standards of Neonatal Care. *Egyptian Journal of Health Care*. 2019;10(4):261-284. doi:10.21608/ejhc.2019.65535

31. **Mohamed R, Abd Elaziz S, Elaasar H.** Effect of Preventive Bundle Guidelines on Nurses' Knowledge and Compliance Regarding Pressure Ulcer Among Critically Ill Children at Pediatric Intensive Care Unit. *Am J Nurs*. 2019;8(5):249-260.

32.**Yan B, Dandan H, Xiangli M**. Effect of training programmes on nurses' ability to care for subjects with pressure injuries: A meta-analysis. https://doi.org/10.1111/iwj.13627. *International wound journal*. 2022/02/01 2022;19(2):262-271. doi:https://doi.org/10.1111/iwj.13627

33.**Abdu H, Gebrselassie M, Abdu M, Mare KU, Tadesse W, Liben M**. Knowledge and practice of immediate newborn care among midwives and nurses in public health facilities of Afar regional state, Northeast Ethiopia. *BMC Pregnancy and Childbirth*. 2019/11/19 2019;19(1):422. doi:10.1186/s12884-019-2581-3

Effect of Didactic Program about Health Care Providers' Role in Facing Climate Changes and Its Effects on Children Health

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Abstract

Background: One of the most important health issues and global injustices of our age is climate change. Health-care professionals represent the main stone in creating an international effort to deal with the factors that affect health and reduce the inequalities brought on by climate change. **So, this study aimed to**: Evaluate the effect of didactic program about health care providers' role in facing climate changes and its effects on children health. **Research Design:** Quasi-experimental design was utilized in this study. **Subjects:** Included a convenience sampling of 50 physician and 50 nurses who are working at Assuit university children's hospital. **Tools of data collection:** Four tools; **Tool (1):** Personal data and sources of knowledge about climate change, **Tool (II):** A structured interview sheet about physician and nurses' knowledge regarding climate changes. **Tool (III):** Health care provider's attitudes toward climate changes. **Tool (IV)**: Daily life practices questionnaire. **Results:** It noticed that the studied nurses had good knowledge, adequate reported practices, and positive attitudes toward climate change in pre &post intervention with statistically significant differences. Also, the studied physicians had good knowledge, adequate reported practices, and positive attitudes toward climate change in pre &post intervention with a statistically significant difference. **Conclusion:** Implementation of the program about role of health care providers in facing climate changes and its effect on children health improve their knowledge, attitudes, and reported practices. **Recommendations:** Continuing educational programs should be provided for health care professionals about environmentally sustainable health care services, practices, and behaviors to improve their knowledge and practices.

Keywords: Climate changes, Children, Health care providers, Role

Introduction

One of our generation's biggest health issues as well as a global injustice is climate change. Climate change is a "wicked" problem that places vulnerable people and
societies at risk of regressive exposure, the possibility of experiencing its direct and indirect health impacts is highest among people who have contributed the least to the planet's harm. Children of today's and tomorrow's generations are the group most at risk from the consequences of climate change. If climate mitigation methods are not put in place by 2030, there would be 131,000 more child fatalities annually because of the convergence of a rise in the incidence of infectious diseases, lack of access to food and instability in politics [(1)].

A significant intergenerational ethical conundrum will arise if we don't take immediate steps to reduce and adapt to climate change, which might harm current and future generations with worse mental and physical health than earlier generations. Currently, more than half a billion children live in places where extreme weather events are more likely to occur [(2)]. The most important risk to children's health today requires professionals who work with children's health to support actions to combat climate change that consider the intricate ethical, ecological, and health challenges that must be resolved. Children's health now and in the future is at danger if prompt action is not taken [(3)].

Egypt is one of the most vulnerable nations, facing numerous challenges to its energy, water, and food security as well as to its economic, social, and environmental assets. According to a report from the Egyptian Meteorological Service, temperatures in summer 2021 increased by an astonishing 3–4 degrees Celsius above average, five years earlier than usual [(4)]. The Egyptian government was compelled by this to implement more serious and successful activities, programs, and policies to adapt to impending climate change and to mitigate its detrimental effects on several economic sectors [(2)].

One of the key factors contributing to Egypt's high vulnerability to climate change is its excessive population. Additionally, the populated Nile delta is extremely vulnerable to sea level rise. The health of people will be impacted by the effects of global warming [(2)]. Over 95% of Egypt's population and agricultural production are concentrated in the delta, a narrow dip of the Nile that comprises 5% of the country. The following areas are the most vulnerable in terms of severity and the likelihood of results: agriculture, coastal zones, aquaculture and fisheries, water resources, human surroundings and settlements, and human health [(4)].

The long-term and cumulative character of the effects of climate change necessitate considering future exposure as well as evaluating numerous indirect rather than direct dangers that are unequally distributed within and between communities [(5)]. The effects of climate change on children are determined by global inequities between and within nations; obviously, underprivileged children will experience a disproportionately high and unjustified health burden [(5)].

In addition to the immediate physical consequences of heat stress, weather disasters, poor air quality, and food and water insecurity, the wide consequences of climate change on children's health also include the psychological toll of global instability, mass changes, and growing conflicts over limited resources [(6)].

The immediate, indirect, and long-term consequences of climate change on children's health are made worse by the socioeconomic context. The increase in infectious illnesses brought on by climate change, which will be made worse by the dynamic condition of starvation, will affect children the most [(6)].

Health-care professionals represent the main stone in creating a worldwide movement to address the factors that affect health and reduce the inequalities brought on by climate change [(7)]. Those involved in child health work must comprehend the challenges at hand and appreciate them in light of the Committee on the Rights of Children and the political system in which they are embedded and should use their position of power as "the voice" for today's children and future generations to engage policy makers and the general public [(7)].

Pediatric and community health nurse play a vital role in increasing understanding among children and actively encouraging them to adjust their behavior can assist prevent climate change and to safeguard their own health [(8)]. The significance of behavior changes by large populations to avert negative social and health effects, the significance of prevention as a response to climate change, and the unique position and function of nurses and doctors as educators [(9)].

Significance of the study:

By 2030, malaria, diarrheal illness, heat stress, and hunger alone will be responsible for almost 250.000 annual fatalities due to climate change [(2)]. In addition, both in developing and wealthy nations, climate change is a major contributor to Disability Adjusted Life Years (DALYs) [(10)]. People living in poor nations or cities, those who are already ill or disabled, children, and the elderly are most at risk due to climate change, which will lead to an increase in already existing health disparities [(11)]. The World Health Organization forecasts that if climate change mitigation policies are not implemented, there would be up to 131, 000 more child deaths per year by 2030. The world's children are the innocent victims of our - and previous generations' - damage to planetary health [(3&5)].

Aim of the study:

The study aimed to evaluate the effect of didactic program about health care providers' role in facing climate changes and its effects on children health.

Research hypothesis:

H1: There will be significant differences between pre-and post- program applications for physician and nurses' knowledge, attitude and reported practices scores regarding their role in facing climate changes and its effect on children's health.

H2: There will be a significant association between physicians' and nurses' knowledge, their reported practices and attitude.

Null Hypotheses: There will not be significant differences between nurses' &physician' knowledge and reported practices in pre- and post- program applications.

Subjects and Method:

Research design:

A quasi-experimental (Pre and posttest) research design was used in this study.

Setting:

The research was conducted at the Assiut University Children's Hospital.

Subjects:

A convenience sampling of 50 physicians and 50 nurses who are working in (emergency, medical, ICU, surgery, rehydration department) at Assiut University Children Hospital. The sample was calculated by using

power analysis at confidence interval 95% with precision levels 5% and $p \leq 0.05$.

-**The study subjects were selected according to the following criteria:**

- Inclusion criteria:

- Both sex
- Willing to participate in the study.

- Exclusion criteria

- Nurses & physicians who are working in premature department.

Tools of the study:

Four tools utilized for data collection in this study:

Tool (I): Structured interview sheet developed by the researchers based on extensive review of related literature and consultation of the experts and composed of two parts:

Part one: Personal data of physicians and nurses such as age, sex, educational level, years of experience, marital status, and residence. **Part two:** Sources of information about climate change.

Tool (II): A structured interview sheet about physician and nurses' knowledge regarding climate changes: It adapted after review of literature from previous research**.** It consisted of two parts: **Part one:** Included 17 multiple choice questions about basic facts about climate change and its occurrence such as main source of climate change information, risk group affected by climate change health problems.

Scoring system:

It consisted of questions (17 multiple choice that involved 77 items as many of them had a multiple answer). Each correct item was given one and incorrect item was given zero. The total score ranged from 0-77. Poor knowledge <50% (<39), average knowledge 50-70% (39-54), good knowledge >70% (>54). **Part two:** Contained of seven (7) questions about physician' role to manage the effect of climate changes on child health.

Scoring system:

It covered seven (7) questions. Each correct item was given one and incorrect item was given zero. The total score ranged from 0-7. Poor knowledge <50% (<4), average knowledge 50-70% (4-5), good knowledge >70% (>5).

Part three: Consisted of 17 questions Nurses' role to manage the effect of climate changes on child health.

Scoring system:

It involved 17 questions. Each correct item was given one and incorrect item was given zero. The total score ranged from 0-17. Poor knowledge <50% (<9), average knowledge 50-70% (9-12), good knowledge >70% (>12).

Tool (III): A modified Likert's scale adopted from **Netravathia, (2014)** [12] consisted from 11 items to assess health care provider's attitudes toward climate changes.

Scoring system:

It composed of 11 questions. Agree scored (2), uncertain (1) and disagree (0). The total score ranged from 0-22. The respondent's attitude considered positive if ≥70% (16) and negative if 70% (16) or less.

Tool (IV): Daily life reported practices questionnaire adopted from **Netravathia, (2014)** [12] covered 17 items to assess the health care providers' daily life practices which can lead to climate changes.

Scoring system:

It included 17 questions. "do" was scored (1) and "undo" was scored (0). The total score ranged from 0-17. ". Inadequate practices ≤70% (12), Adequate practices >70% (12).

Method of data collection:

- After explaining of the study aim, the Dean of the Faculty of Nursing granted official

approval to the manager of Assiut University Children Hospital to gather data.

- The ethical agreement was gotten from the Ethical Committee at the Faculty of Nursing Assiut University.
- The researchers prepared a systematic interview sheet.
- The validity index of the tools was judged by a jury of five university professors in the field of pediatric and community health nursing to examine the contents validity (covering, clarity, wording, length, format, and overall appearance) it was 94% for tool II, 96% for tool III and 93 for tool IV.
- The study instruments' reliability was examined by quantifying their internal consistency with Cronbach's alpha. This turned to be (α = 0.678) to study tool I& tool II. 0. 850 for tool III and 0. 0.825for tool IV.
- The goal and nature of the study clarified to the health care professionals, as well as their right to agree or disagree to participate in the study. Oral permission to engage in the study was obtained from each physician and nurse and they informed that the information obtained would be confidential and used only for the purpose of the study. The pilot study was done on 10% (10) of physician and nurse to test the clarity and applicability of the tools and to estimate the time needed for filling the sheet. The result of the pilot study confirmed that the study was feasible and there was no modification done in the tools. Physician and nurses who participated in the pilot study were included in the total sample size.

- **The educational program:** The researchers developed it based on the relevant literary source. It was used in four stages, as the following:

-Assessment phase: The researchers assessed the physician and nurses' personal data as; age, sex, level of education…etc. Test applicability of tools by taking a pilot study of the study sample to determine exactly all information needed to be included in the program.

-Planning phase: This phase covered planning for the program's implementation, such as the program's aim of improving health care professionals' understanding, attitudes, and practices concerning their roles in dealing with the effects of climate change on child health. The instructional environment, sessions, audiovisual aids, handouts, and pictures

- Teaching Time: The program's timing was determined by the rest intervals of physicians and nurses working in hospital departments.

- Teaching place: This work was done at the nurse's and physicians' room in the pediatric department of Assiut University Children's Hospital.

- Teaching methods and materials: As a teaching strategy, the researchers employed lectures, discussions, films, and booklet handouts that were provided to all medical professionals at the conclusion of the program.

Sessions: The purpose and anticipated results of the current study were clearly explained to them. The study received the verbal consent of healthcare professionals, who were also promised anonymity and informed that they might withdraw from the study at any moment.

Implementation phase: Two sessions were created from the program's contents: It was composed of:

Session (1): Included knowledge regarding facts of climate changes occurrence e.g., definition of climate changes, causes of climate changes and knowledge regarding their roles in facing climate changes and its effects on child health such as increase children' understanding of how climate change

affects their health. Physicians and nurses have a role in mitigation of climate changes through encouraging environmentally sustainable health care services. The researchers presented themselves and described the nature and goals of the program to establish a channel of contact. Each physician and nurse was then interviewed separately after the researchers had explained the purpose and methodology of the study. The interview lasted 20 to 30 minutes, and the researchers recorded the responses in the questionnaire. Six (6) physicians and 6 nurses were interviewed on two days weekly.

Session (2): Included attitudes towards climate change. In this session, the researchers asked each physician and nurse personally about their attitudes about climate change. The questionnaire was filled out during this session, which lasted 30 minutes.

Session (3): Included daily life reported practices to solve the problem and limiting causes that lead to occurrence of climate changes. It included two items such as indoor daily life practices e.g. switching-off lights when not in use& outdoor daily life reported practices as minimum use of papers. In this session the researchers interviewed each physician and nurse individually and asked them about daily life reported practices. This session took 15 minutes to fill the sheet. The educational program lasted three months, and it each physician and nurse took three sessions over the course of two days to finish it.

Fieldwork: From the beginning of February 2023 to the end of April 2023, a three-month period during which the data were collected from emergency, medical, ICU, surgery, rehydration department at Assiut University Children's Hospital. The researchers introduced themselves to the physicians and nurses, explained the purpose of the study, and discussed its nature with them. During two meetings, the pretest was completed. In the first, the pre-structured form was completed. The second section of the study included an explanation of the educational program's contents through handout booklet for the participants. About 3 nurses and 3 physicians were interviewed/day two times/week (total number of nurses was 6 and there were six physicians in total every week. Depending on their responses, each form's total completion time ranged from 15 to 30 minutes. The brochure, which featured pictures, posters, and information on the program, covered its contents. For each form, it took an average of 15 to 30 minutes to complete the post-test form. The post-test was administered a week following the pretest.

Evaluation stage: To measure the impact of the educational program, the knowledge, attitudes, and daily life practices were examined once after one week following the pretest.

Statistical analysis:

Data entry and data analysis were done using statistical package for the social science (SPSS) version 26. Data were presented as number, percentage means and standard deviation. Mc Nemar test was used to show difference between variables in pre and posttest, Pearson Chi-square was used to show relation between variables. P-value considered statistically significant when $p < 0.05$ and highly statistically significant when $p < 0.01$.

Results:

Table (1): Illustrates that (82%) of studied nurses were in the age group (≤ 35years) compared to (66%) of studied physicians. As regarding sex (100%) of studied nurses were female compared to (44%) of studied

physicians were male. Also, (56%) of studied nurses were from urban areas compared to (96%) of studied physicians. According to marital status more than two thirds of studied nurses were married while more than two fifths of studied physicians were single. Regarding educational level (40%) of studied nurses had nursing institute while the (80%) of studied physicians had master's degree. Also, the table shows (80%) of studied nurses had more than 5 years of experience in the opposite (48%) of studied physicians had ≤5 years.

Figure (1): Shows that (74%) of studied physicians the internet / social media was the main source of knowledge while (68%) of studied nurses the internet / social media was the main source of knowledge about climate change in pre intervention. Moreover, (30%) of studied nurses work was the source of their knowledge compared to (16%) of studied physicians.

Figure (2): Demonstrates that there was a statistically significant deference among studied nurses according to their level of knowledge in pre and post intervention p1-value (0.001). There was a statistically significant deference among studied physicians according to level of knowledge in pre and post intervention p2-value (0.001). There was a statistically significant deference among studied nurses& studied physicians according to level of knowledge in pre and post intervention p3-value (0.001).

Figure (3): Illustrates that (76%, 94%) of studied nurses had adequate level of practices in pre and post intervention respectively with statistical significant deference p- value (0.001). While (80%, 100%) of studied physician had adequate level of practices in pre and post intervention respectively with statistical significant deference p- value (0.001). There was highly a statistically significant deference between studied nurse and studied physicians in their practices in pre& post intervention p-value (0.001).

Figure (4): Reveals that (78%, 96%) of studied nurses had positive attitude toward climate change in pre &post intervention with a statistical significant differences p– value (0.001). As well as (88%, 98%) of studied physicians had had positive attitude toward climate change in pre &post intervention with a statistical significant differences p – value (0.003). There was a highly statistically significant difference between studied nurse and studied physicians in their attitude pre& post intervention p – value (0.002).

Table (2): Demonstrates that there was a significant correlation between studied nurses & physicians level of knowledge in pre-intervention and total practices.

Table (3): Reveals that there was a significant correlation between studied nurses & physicians level of knowledge in pre-intervention and total score of attitude.

Table (1): Distribution of the studied health team (pediatricians and nurses) according to their personal data (n=100)

Personal data	Nurses (50)		Pediatricians (50)	
	N	%	N	%
Age group/ years:				
• ≤ 35 years	41	82.0	33	66.0
• More than 35 years	9	18.0	17	34.0
Mean ± SD of age	**31.78±5.23**		**35.80±10.78**	
Sex:				
• Male	0	0.0	22	44.0
• Female	50	100.0	28	56.0
Residence:				
• Urban	28	56.0	48	96.0
• Rural	22	44.0	2	4.0
Marital status:				
• Single	13	26.0	24	48.0
• Married	35	70.0	25	50.0
• Widowed	2	4.0	1	2.0
Educational level:				
• Diploma	11	22.0	0	0.0
• Nursing institute	20	40.0	0	0.0
• Bachelor degree	16	32.0	10	20.0
• Master degree	3	6.0	40	80.0
Years of experience:				
• ≤5 years	10	20.0	24	48.0
• More than 5 years	40	80.0	26	52.0
Mean ± SD of years of experience	**10.36±6.16**		**10.28±9.97**	

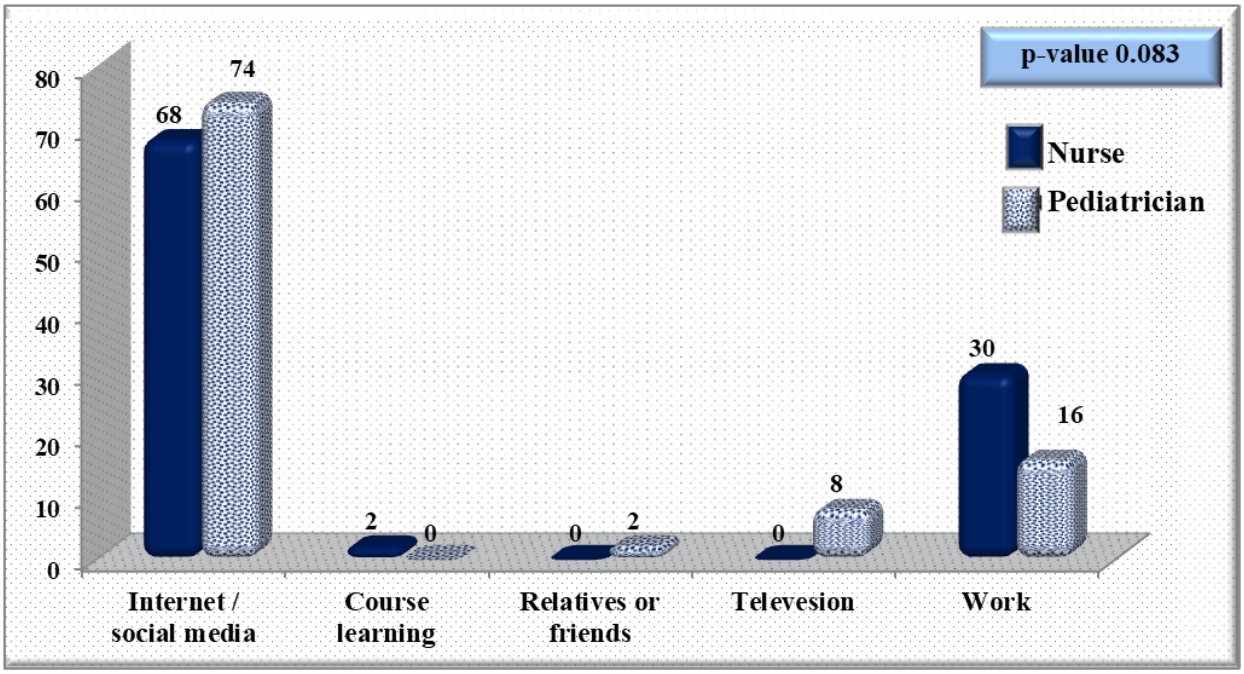
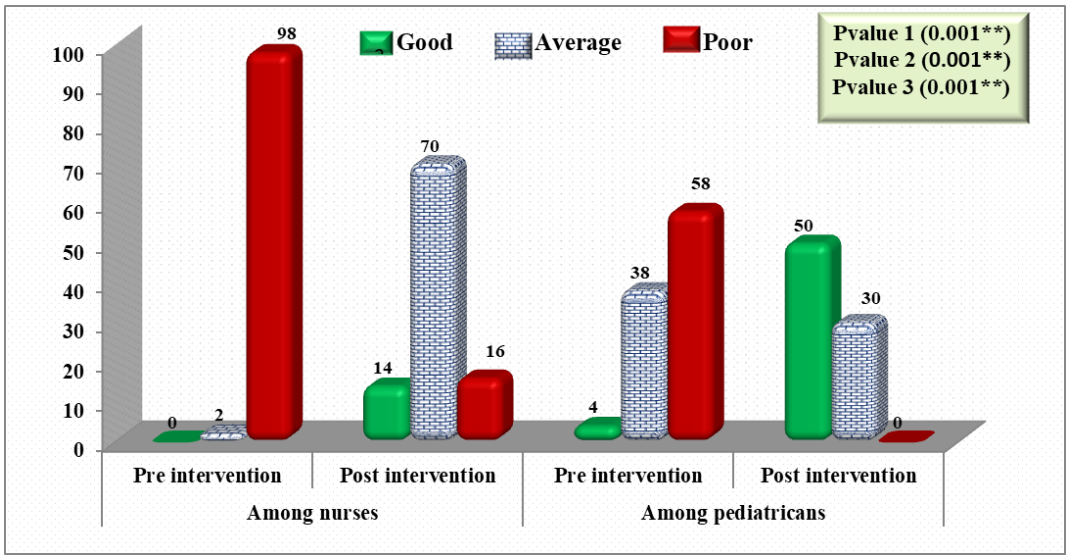
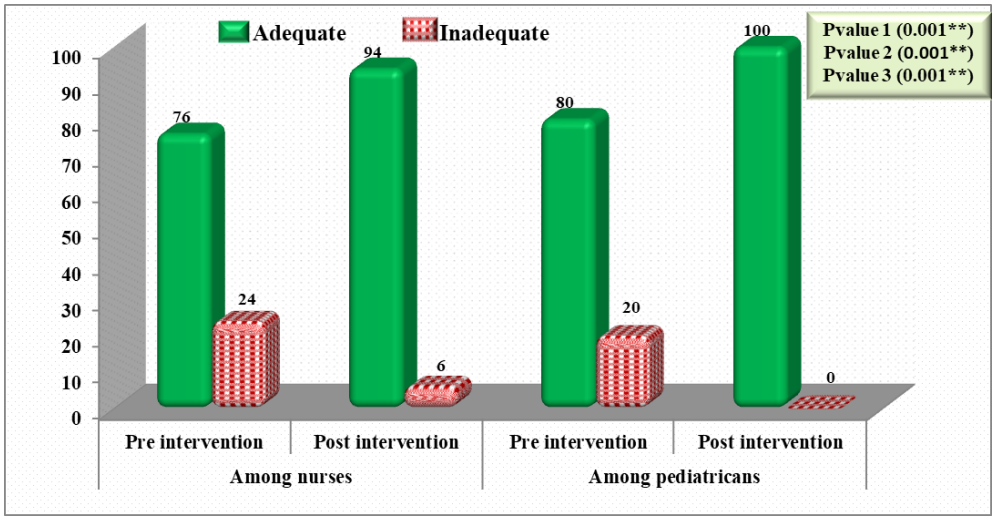


Figure (1): Distribution of the studied health team (pediatricians and nurses) according to their source of knowledge about climate changes in pre intervention (n=100)



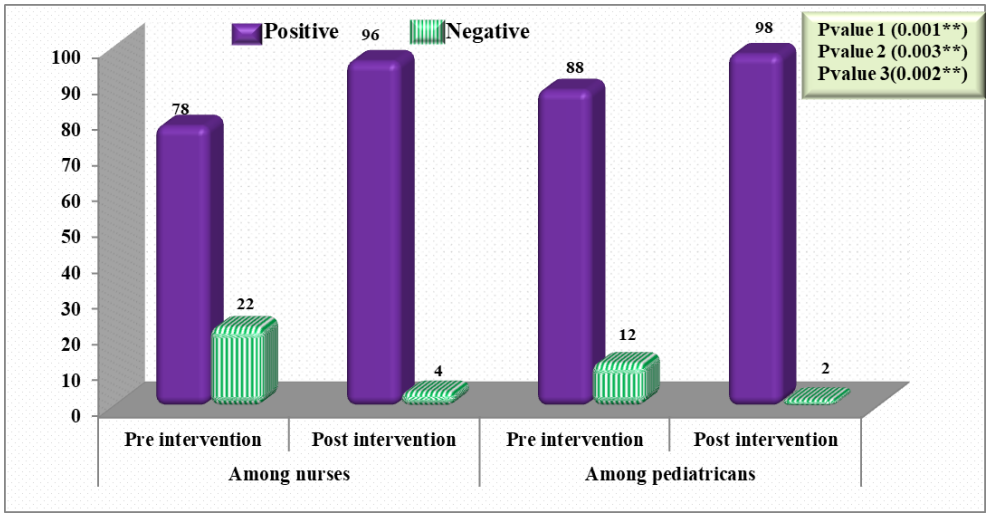
p-value1 between nurses in pre and post intervention
p-value2 between pediatricians in pre and post intervention
pvalue3 (between pre and post intervention among studied nurses and physician)
(*) Statistical significant difference (p<0.05) (**) Highly statistical significant difference (p<0.01)

Figure (2): Distribution of the studied health team (pediatricians and nurses) according to their level of knowledge about climate changes in pre and post intervention (n=100)



p-value1 between nurses in pre and post intervention
p-value2 between pediatricians in pre and post intervention
pvalue3 (between pre and post intervention among studied nurses and physician)
(*) Statistical significant difference (p<0.05) (**) Highly statistical significant difference (p<0.01)

Figure (3): Distribution of the studied health team (pediatrician and nurses) according to their level of practices about climate changes in pre and post intervention (n=100)



p-value1 between nurses in pre and post intervention
p-value2 between pediatricians in pre and post intervention
pvalue3 (between pre and post intervention among studied nurses and physician)
(*) Statistical significant difference (p<0.05) (**) Highly statistical significant difference (p<0.01)

Figure (4): Distribution of the studied health team (pediatricians and nurses) according to their attitude level toward climate changes in pre and post intervention (n=100)

Table (2): Correlation between the studied health team (pediatricians and nurses) knowledge level regarding climate changes in pre and post intervention and total practices (n=100)

Items		Knowledge level regarding climate changes			
		Nurses		Pediatricians	
		Pre intervention	Post intervention	Pre intervention	Post intervention
Total practices level	Pearson Correlation	**.595**	.076	**.483**	.2699
	Sig. (2-tailed)	**.000****	.600	**.001****	.059

(**) Correlation is significant at the 0.01 level (2-tailed).

(*) Correlation is significant at the 0.05 level (2-tailed).

Table (3): Correlation between the studied health team (pediatricians and nurses) knowledge level regarding climate changes in pre and post intervention and attitude toward climate changes (n=100)

Items		Knowledge level regarding climate changes			
		Nurses		Pediatrician	
		Pre intervention	Post intervention	Pre intervention	Post intervention
Total attitude	Pearson Correlation	**.410**	.121	**0.391**	.091
	Sig. (2-tailed)	**.003****	.403	**.007****	.530

(**) Correlation is significant at the 0.01 level (2-tailed).

(*) Correlation is significant at the 0.05 level (2-tailed).

Discussion:

One of the biggest risks to people's health is climate change. The World Health Organization estimates that environmental causes account for 23% of all deaths worldwide and that by 2030, climate change-related deaths would increase to 250,000 per year [(13)]. Few medical and nursing schools include climate education in their official curricula, despite pleas for action from numerous groups. Healthcare professionals need to be trained to recognize the problems caused by climate change because they are vital in informing patients about a range of health dangers [(14)].

The study aimed to evaluate the effect of didactic program about health care providers' role in facing climate changes and its effects on children health.

It was observed that most of studied nurses and more than half of physician were in the age group (≤ 35years) this was in contrast with **Ibrahim et al, (2018)** [(15)] who recorded that the average age of the participants was 33 years. As regarding sex all of the studied nurses were female. This observation was the same as **Polivka et al, (2022) and Sambath et al, (2012)** [(16 & 17)] who said that the majority of samples were female. This was illustrated by that it well known that nursing is female job in nature even that male being part of the profession recently.

In addition, about half of the physicians in the study were male. Also, more than half of studied nurses were from urban areas compared to the majority of physicians. As regards educational level, two-fifths of nurses had nursing institute. This was Contrary to **Polivka et al, (2022)** [(16)] who found that the majority of nurses had baccalaureate degree or higher.

While the majority of studied physicians had master's degree. It will know that Higher education plays an important part in promoting sustainability awareness and influencing young people's attitudes and behaviors.

The majority of nurses had more than 5 years of experience in the opposite nearly half of physicians had ≤5 years of experience this was opposite to **Ibrahim et al, (2018)** [(15)] who reported that nearly one-quadrate and more than half of physicians and nurses had < 5 years of experience. Additionally, according to **Polivka et al, (2022)** [(16)] reported that more than one-third of nurses had >10 years of experience.

It was noticed that nearly three-fifths of studied physicians the internet / social media was the main source of knowledge while more than two-thirds of studied nurses the internet/social media was the main source of knowledge about climate change in pre intervention. We cannot, however, ignore social media's importance in this subject. It has evolved into a very valuable forum for discussion of scientific matters, with climate change now ranking among the most popular topics. This result was similar with those of **Reddy et al, (2022)** and **Polivka et al, (2012)** [(18 & 17)]. On the other hand this was incongruent with **Ibrahim et al, (2018)** [(15)] who reported that newspapers (28.2%), television (25.8%) and social media (18.1%) served as the main source of information on climate change and health for the respondents. On the same line **Salem et al, (2022)** [(19)] recorded that main sources of information were TV and school/university.

There was a statistically significant deference among studied nurses according to their level of knowledge in pre and post intervention. This was the same as the results of [(2)] Also, **Sambath et al, (2022) and La Torre et al, (2020)** [(16 & 20)] who revealed that knowledge concerning the health-related impacts of climate change by respondents was minimal.

Moreover, **Mekawy (2023)** [21] disclosed that most of the studied sample had poor level of knowledge and practice related to climate change**. Mohammed et al, (2022)** [22] confirmed on the positive effect of the awareness program on the knowledge level.

There was a statistically significant deference among studied physicians according to level of knowledge in pre and post intervention. This observation further highlighted an important educational gap in our traditional medical and nursing school curriculum during an era of rapid and significant climate change. These findings agreed with **Netravathia (2014) and Casson et al, (2023)** [12 & 14] who stated that there were low pre-intervention survey responses suggested a baseline lack of knowledge.

Also, **Ghazy and Fathy, (2023)** [23] reveled that there was low level of knowledge about the climate change among the respondents. **Yang et al, (2018)** [24] disclosed that the majority of the medical practitioners have concluded that they are knowing the health impacts of climate change in their practice.

In the same regard **Sarfaty et al, (2014)** [25] recorded that the studied physicians aware about climate change and its effects. Additionally, this result wasn't consistent with **Ibrahim et al, (2018), Salem et al, (2022) and Boland and Temte, (2019)** [15, 19 & 26] who reported that there was higher awareness about climate change elements and its effects. **Reddy et al, (2022)** [18] observed that more than two-thirds of the participants were knowledgeable regarding climate change and **Kircher et al, (2022)** [27] who conducted a study in Philippines and assessed knowledge and attitudes of future physicians towards climate change and revealed that the majority had fair knowledge of climate change. Likewise, **Domantay et al, (2021)**[28] found that awareness, knowledge, and concern about climate health impacts were high.

There was a significant improvement in nurses' practices following the intervention about practices regarding climatic changes in pre and post intervention. This agreed with **Abdallah and Farag, (2022)** [2] However, this result was contrast with **Mekawy, (2023) and La Torre et al, (2020)** [21 & 20] who observed that approximately half of the staff nurses had a low reported practices dimension.

The majority of studied physicians had proper practices in pre and post intervention respectively with statistically significant deference. There was a highly statistically significant deference between studied nurses and studied physicians in their practices in pre& post intervention. This was in congruent with **Ibrahim et al, (2018)** [15] who recorded that there was high level of reported practices. Similarly, **Mohammed et al, (2022)** [22] indicated that the awareness program has a significant positive effect on the respondents' daily life reported practices regarding climate change. While **Polivka et al, (2012)** [17] recorded that lesser proportion of the study participants had proper practice.

Most of nurses who were evaluated had favorable attitudes about climate change in before and post intervention, and there were statistically significant variations between these views **Abdallah and Farag, (2022)** [2] reported the same observation.

According to the current study, differences between the pre- and post-intervention were statistically significant, that showed that most doctors had a favorable attitude towards climate change. These findings are positive because they demonstrate that the health sector has a role to play in addressing climate change and its implications on public health. This was consistent with the findings of **Netravathia, (2014)** [12] who observed that

after completion of the educational intervention, median agreement level on survey responses significantly increased. This was agreed with **Casson et al, (2023)** [14] who stated that the majority of studied sample had a positive attitude toward global warming as an example of climate change. As well as, **Ibrahim et al, (2018) and Boland and Temte, (2019)** [15& 26] reported that most of the health workers had positive contributes toward climate change. In the same regard **Casson et al, (2023)** [29] recorded that nearly the majority of health professionals agreed that they have responsibility to climate changes measures in their workplace. On the opposite side, **Reddy et al, (2022)** [18] stated participants must receive the information in a new way if they are to have a constructive attitude towards the mitigation of climate change issue.

There was a significant correlation between studied nurse's educational level and their knowledge regarding climate change. These findings highlighted the crucial role that education plays in the problem of climate change, the value of include it in the curriculum, and the urgent steps that need be taken to lessen its negative effects. In the same regard this finding was supported by **Reddy et al, (2022)** [18]. On the other hand this observation wasn't agreed with **La Torre et al, (2020)** [20] who claimed that there wasn't significant association between knowledge level and education.

The degree of knowledge of the nurses and doctors under study in both the pre-intervention and overall practices was significantly correlated. It was discovered that individuals with sufficient understanding of climate change exhibited more environmentally friendly behaviors than those with insufficient information. This observation was agreed with **Polivka et al, (2012)** [17].

Conclusion:

The program's implementation about the role of healthcare professionals in addressing climate change and its impact on children's health enhanced their knowledge and practice. In addition, statistically significant differences were identified between the studied nurses and the studied physicians in terms of their knowledge, practices, and attitudes before and after the program's implementation. These results were aligned with the study hypothesis.

Recommendations:

1. Mass media, including TV, pamphlets, and educational campaigns, has a major role to play in raising awareness of health issues about effects of climate changes on children heath and the importance of inclusion of heath care professionals to cooperate with policy decision makers to face the problem and reduce its effects.
2. Continuing educational programs should be provided for health care professionals about environmentally sustainable health care services, practices and behaviors.
3. Encourage health care professionals to participate in public health initiatives such disease surveillance, vaccinations, vector control, nutritional supplements, food safety, and public education.
4. Further researches on larger sample size for generalization of the findings.

References:

1. Williams, P., Marais, B., Isaacs, D., & Preisz, A. Ethical considerations regarding the effects of climate change and planetary health on children. 2021; 57 (11): 1775–1780.https://doi.org/10.1111/jpc.15704.

2. Abdallah Z., Farag A. Impact of Awareness Program Regarding Health Consequences of Climate Change on Knowledge, Perception and Daily Life practices among Nursing Students, Egyptian

Journal of Nursing & Health Sciences EJNHS. 2022; 3 (1): 367-390.

3. World Health Organization (WHO). Quantitative Risk Assessment of the Effects of Climate Change on Selected Causes of Death, 2030s and 2050s. Geneva: The World Health Organization; 2014.

4. Centers for sickness management and interference (CDC). Gillespie E, Schramm P, Hsu J. "U.S. public health response to climate change for allergist simmunologists external icon." ANNALS OF ALLERGY, ASTHMA & IMMUNOLOGY, 2020.

5. Ahdoot S., Pacheco S. Global climate change and children's health. Pediatrics 2015; 136: 992–997.

6. Xu Z., Etzel R., Su H., Huang C., Guo Y., Tong S. Impact of ambient temperature on children's health: A systematic review. Environ. Res. 2012; 117: 120–31.

7. Waterston T. Advocacy and the paediatrician. Paediatr. Child Health 2016; 26: 179–84.

8. Ryan E., Dubrow R., Sherman J. Medical, nursing, and physician assistant student knowledge and attitudes toward climate change, pollution, and resource conservation in health care. 2020.

9. Ryan, A. & Croweley, B. Climate Change and Health: APosition Paper of the American College of Physicians. Annals of Internal Medicine. 2016 doi:10.7326/M15-2766.

10. Costello, A., Abbas, M., Allen, A., Ball, S., Bell, S., Bellamy, R., Lee, M. Managing the health effects of climatechange. The Lancet. 2009; (9676)373, 1693-1733.

11. Michael, E., Jeremy J. Hess. Climate Change. Impacts onand Implications for Global Health. Elsevier on behalf of American Journalof Preventive Medicine. 2008; 35(5), 527–538.

12. Netravathia G. A Scale to Measure Attitude of Research Scholars towards Climate Change Studying in Agricultural Universities, Indian Res. J. Ext. Edu. 2014; 14 (1).

13. Gomez J., Goshuaa A., Pokraja N., Ernye B. , Auerbach P., Nadeau K., Gisondi M. Teaching medical students about the impacts of climate change on human health, The Journal of Climate Change and Health. 3 (2021) 100020, P.p. 1-5.

14. Casson N., Cameron L., Mauro I, Friesen-Hughes K., Rocque R. Perceptions of the health impacts of climate change among Canadians, BMC Public Health. (2023) 23:212; P.p. 1-13. https://doi.org/10.1186/s12889-023-15105-z.

15. Ibrahim A., Fahmy H., Mahmoud S. Knowledge and Attitude regarding Global Warming Phenomenon among Assiut University Students, Assiut Scientific Nursing Journal. 2018; 6 (14): 1-13.

16. Sambath V., Narayan Sh., Kumar P., Kumar P., Pradyumna A. Knowledge, Attitudes and Practices Related to Climate Change and its Health Aspects among the Healthcare Workforce in India –A Cross-Sectional Study. The Journal of Climate Change and Health. 2022; P.p. 1-40.

17. Polivka B., Chaudry R., Crawford J. Public Health Nurses' Knowledge and Attitudes Regarding Climate Change, Environmental Health Perspectives. 2012; 120 (3): 321-325.

18. Reddy G., Rajamouli J., Arora D., Jothula K., Amaravadi S., Boda A. Knowledge, perceptions and practices of medical students towards climate change and global warming: A cross sectional study, Journal of Family Medicine and Primary Care| Published by Wolters Kluwer – Medknow. 2022; 11 (6): 2557-2564.

19. Salem M., Hegazy N., Mohammed A., Hassan E., Abdou M., Zein M. Climate change-related knowledge and attitudes among a sample of the general population in Egypt, Front. Public Health, Sec. Environmental health and Exposome. 2022; Vol. 10, P.p. 1-10. https://doi.org/10.3389/fpubh.2022.1047301.

20. La Torre, G., De Paula Baer, A., Sestili, C., Cocchiara, R., Barbato, D., Mannocci, A., Del Cimmuto, A. Knowledge and perception about climate change among healthcare professionals and students: A cross-sectional study. South East Eur J Public Heal 2020; 13:1–19. https://doi.org/10.4119/SEEJPH-3347.

21. Mekawy Sh. Climate Change and its Relation to Environmental Sustainability Practice as Perceived by Staff Nurses, Journal of Nursing Science-Benha University. 2023; 4 (1): 1226-1243.

22. Mohammed E., Abd El-Mouty S., Ameen N. Nursing Students knowledge, Attitude, And Practice Regarding Health Effect of Climate Change, Mansoura Nursing Journal (MNJ). 2022; 9 (2): 589-601.

23. Ghazy H. & Fathy D. Effect of Awareness Program Regarding Climate Change on Knowledge, Attitudes and Practices of University Students, International Egyptian Journal of Nursing Sciences and Research (IEJNSR). 2023; 3 (2): 186-203.

24. Yang, L., Liao, W., Liu, C., Zhang, N., Zhong, S., Huang, C. Associations between Knowledge of the Causes and Perceived Impacts of Climate Change: A Cross-Sectional Survey of Medical, Public Health and Nursing Students in Universities in China. Int J Environ Res Public Health. 2018; Vol. 15, P.p.2650 15:2650. https://doi.org/10.3390/IJERPH15122650.

25. Sarfaty, M., Mitchell, M., Bloodhart, B., Maibach, E. A survey of African American physicians on the health effects of climate change. Int. J. Environ. Res. Public Health 2014, 11, P.p. 12473–12485. [CrossRef] [PubMed].

26. Boland, T., Temte, J. Family Medicine Patient and Physician Attitudes toward Climate Change and Health in Wisconsin. Wilderness Environ. Med. 2019, 30, 386–393. [CrossRef] [PubMed].

27. Kircher M., Doheny B., Raab K., Onello E., Gingerich S., Potter T. Understanding the Knowledge, Attitudes, and Practices of Healthcare Professionals toward Climate Change and Health in Minnesota, Challenges. 2022; 13 (57): 1-17.

28. Domantay, J., Leochico, C., Salvador, P., Ciriaco, V., Abad, P., Cruz, G., Torres, C. Knowledge and attitudes of future physicians in the Cordillera region of the Philippines towards climate change: A prepandemic cross-sectional study. The Journal of Climate Change and Health. 2021; 4, 100063.

29. Casson N., Cameron L., Mauro I, Friesen-Hughes K., Rocque R. Perceptions of the health impacts of climate change among Canadians, BMC Public Health. 2023; 23:212, P.p. 1-13. https://doi.org/10.1186/s12889-023-15105-z.

30. Ryan E., Dubrow R., Sherman J., Medical, nursing, and physician assistant student knowledge and attitudes toward climate change, pollution, and resource conservation in health care. BMC Med Educ. 2020. https://doi.org/https://doi.org/10.1186/s12909-020-02099-0.

31. Ryan, A. & Croweley, B. Climate Change and Health: A Position Paper of the American College of Physicians. Annals of Internal Medicine. 2016. doi:10.7326/M15-2766.

Effect of implementing Family Empowerment Model on the Quality of Life and Self-Efficacy of Mothers of Children with Systematic Lupus Erythematous

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Abstract

Systemic lupus erythematosus in children is a multisystem disease with extensive organ involvement. Mothers may struggle to manage their child's health, their own emotions and had positive effect on mothers quality of life and self-efficacy. **The aim of the study:** Was to evaluate effect of implementing family empowerment model on quality of life and self- efficacy of mothers of children with systematic lupus. **Research design:** A quasi-experiental design. **Setting:** This study was conducted at Rheumatology and Immunology Department and Outpatient Clinics at Benha University Hospital **Tools of data collection: Tool (I): Mothers knowledge questionnaire;** A structured interviewing questionnaire Sheet **(pre/post):** It was divided into four main parts**: part (1):** Personal characteristic of the studied mothers, **Part (2):** Characteristics of the studied children, **Part (3):** Medical data of studied children and **Part (4):** Mothers knowledge Assessment questionnaire **Tool (II): Mothers Quality of Life questionnaire. Tool (III): mothers Self-efficacy Scales** .**Tool (IV): Mothers Reported Practices Assessment Sheet, Results** there was a highly statistically significant differences between total scores of knowledge and reported practices levels after family empowerment implementation. Also, that there was a highly statistically significant differences between mother's self-efficacy and quality of life. **Conclusion:** implementation of family empowerment model were improving quality of life and self- efficacy of mothers of children with systematic lupus **Recommendation:** Family empowerment program should be conducted for caregiver periodically and regularly to enhance care of their children with Systematic lupus erythematous .

Key Words: Family Centered Empowerment, , Quality of Life , Self-Efficacy, Mothers, Children, Systemic lupus Erythematous .

Introduction

Systemic lupus Erythematous (SLE) is an autoimmune disease that affects the connective tissue in different organs. It is a long-term illness that causes organ dysfunction. [(1)] Systemic lupus Erythematous can cause a wide range of symptoms, including joint pain, rash, photosensitivity, and fatigue, as well as irreversible organ damage and death. It has been linked to significant morbidity and mortality, as well as significant negative effects on children perceptions of health and daily activities. [(2)] Other lupus symptoms are damage to a particular organ system, joint pain and stiffness, skin changes, changes in kidney function, the digestive system can be affected by medications used to treat lupus. Also, lupus can affect lung, heart, nervous system and eye. [(3)]

Systemic lupus Erythematosus (SLE) is a Significant global public health problem. The estimated incidences of the systematic lupus in worldwide is 0.28–0.9 per 100,000 children and a prevalence of 3.3–8.8 per 100,000 children, in USA the range of 0.4–2.2 per 100,000 children yearly [(4)]**.** The estimated incidences of the systematic lupus

in Egypt, is 1/100,000 population (0.24/100000 males and 1.8/100000 females). 7.4% developed pre-pubertal SLE (≤ 7 years); 73.3%, peri-pubertal; and 19.3% during early adolescence [5].

The nature of systematic lupus disturbs the unit of the family and leaves serious complications since children receive a major part of their treatment at home and study in usual schools. Children depend on family care, and the role of the active member in child care in the family is very effective in the process of treatment and recovery of the child. [6] It is clear that children need concentration, self-control, and autonomy. In addition, the lack of physical activity may prevent the involvement of children with chronic disease in school and extracurricular activities creating a sense of humility and inadequacy. [7]

The mothers are the primary caregivers for their children with a long-lasting disease and take responsibility for monitoring, management, and protection despite the level of skills and complexity involved in the child care at home. Also, most children with chronic disease have cared at home without nursing or other health care services and the mother must assume the role as a care coordinator for their children with SLE. Therefore, to perform home care effectively each mother requires receiving extensive training skills, instructions about the child's care, and guidance about proper diet, sun protection, exercise, appropriate immunizations, and management of comorbid conditions, which leading to better self-efficacy and quality of life for mothers and improve child's health outcomes.

Quality of life (QOL) is an individual's perception of their position in life in the context of the culture and value systems in which they live, and in relation to their aims, expectations standards and interests, conditioned by the environment. [8,9]

Self-efficacy was refers to the ability of performing a particular function that a person expects from his/her ability to do in different situations. Self-efficacy is the most important precondition to change behavior. Self-efficacy is one of the concepts of family-centered empowerment model. In fact, empowering the children and his family and increasing the involvement of children in self-care reflects the emphasis on health, prevention and health education, not just focusing only on illness and its treatment. [10] Awareness of mother about the disease is a vital part of the child care and is essential for caring and making appropriate decisions to support the diseased children. On the other hand, nursing interventions for children must also address the participation of their families. Family involvement in child's care is one of the key principles of the family-centered empowerment model. As a result, giving an opportunity to the children and family members by nurses might help them to become aware of their abilities required to meet the needs of children. [11]

Family–Centered Care (FCC) is a way of caring for children and their families within health services which ensures that care is planned around the whole family, not just the child and in which all the family members are recognized as care recipients.[12,13] The empowerment approach

should be tailored to the caring conditions of a child with a chronic disease or disability. Family-centered empowerment model is designed with an emphasis on the effectiveness of the family role in the dimensions of motivation, knowledge, attitude, and perceived threat, self-efficacy and quality of life can simultaneously promote knowledge, skills, values, and beliefs of the children and the family and the main purpose of this model is to empower the family system to promote health. [14]

Through this model, children and their families can identify their weaknesses and have enough power to alter their current situation, which is achieved through increased information, support, and skill development. In general, family-centered empowerment can be considered an important way to improve children self-care and to involve family members. One of the most important responsibilities of a nurse is to promote the level of health and empowerment of the family. Having children with chronic diseases can have adverse effects on family members, especially mothers, and can reduce self-esteem and increase anxiety and stress that may affect their quality of life. [15]

Meanwhile, nurses are one of the most appropriate members of the health team for training of mothers due to their vocational and professional responsibility and ability to undertake different roles in health service systems [3]. Also, nurse can play an important role in the process of treatment of systemic lupus Erythematosus especially during periods of exacerbation of the disease. Because the nurse helps children to cope with the disease in their everyday lives, teaches how to deal with lupus symptoms, prevents periods of SLE exacerbations, and provide systematic health education concerning lifestyle changes. The nurse supports the children and family by giving the necessary help, provides emotional support to the pediatric patient and family, undertaking educational actions connected with lifestyle and rehabilitation to improve their quality of life.[16,17]

Significance of the Study

Systemic lupus Erythematosus has a negative effect on mother's quality of life and self-efficacy [18]. The children with lupus represent a traumatic stressful for their mothers due to lack of mothers' awareness to handling their children and expenses finance to manage their children with SLE [19]. Systemic lupus Erythematosus (SLE) is a significant global public health problem. The estimated incidences of the systematic lupus in Egypt, is 1/100,000 population.

Aim of the Study

The aim of this study was to evaluate the effect of implementing family empowerment model on quality of life and self- efficacy of mothers of children with systematic lupus Erythromatosus.

The research hypotheses:

Mother's quality of life and self-efficacy are expected to be improved after implementing family empowerment model. **Study Design**

A quasi-experimental research design was utilized for conducting the study.

Setting

The study was conducted at Rheumatology and Immunology Department and Outpatient Clinics at Benha University Hospital. Rheumatology and Immunology Department located in the Seventh floor, and of four rooms, the first room contains 4 beds, the second room contains 8 beds, the third room contains 4 beds and the fourth room contains 8 beds. Rheumatology and Immunology Outpatient Clinics are located in the First floor in Benha University Hospital.

Subjects of the Study

A purposive sample of (60) mothers accompanying their children suffering from systemic lupus erythematosus attending the above-mentioned setting after fulfilling the following.

Inclusion criteria

- Mothers' had children with SLE and their age ranged from 8-14years old.
- Mothers' willing to participate in the study.

Tools of Data Collection

Four tools were used for data collection; it was all written in an Arabic language to suit mothers' level of understanding.

Tool (I): Mothers knowledge questionnaire a structured interviewing questionnaire Sheet

This tool was developed by the researchers based on the previous related literatures [12] and used for collection of data related children with systematic lupus. It was divided into three main parts:

Part (1): Mothers ' Personal characteristics: including; age, educational level, occupation, number of family members, consanguinity and residence.

Part (2): Children' bio-soico-demographic characteristics :- It consisted of data related to children socio-demographic data including; data related to children, through individual interviewing of children and their accompanying mothers such as age, gender, education, residence and ranking. And Mothers knowledge regarding children's medical history including ; age of the child at diagnosis, onset of disease, family history of systemic lupus, duration of disease, systematic lupus symptoms, method of diagnosing lupus, number of pervious hospitalization, and causes of pervious hospitalization and duration of follow up. The researchers collected medical data of studied children

Part (3): Mothers Knowledge Assessment Format

It was designed by the researchers based on Hockenberry and Wilson, (2021) [20], to assess Mothers' knowledge about systemic lupus Erythematosus questionnaire sheet. It was this part consisted of (14) multiple-choice questions as the following:

A) Mothers knowledge regarding systematic lupus

The first section concerned with assessment of mothers' knowledge related to systematic lupus. It included 8 questions: Definition of lupus, causes, predisposing factor, types, clinical manifestation, complication, investigation and management.

B) Mothers Knowledge regarding medications ; It included 6 questions: Type of treatment of systematic lupus, role of corticosteroid in treatment of lupus, side effect of corticosteroid,

method to prevent of side effect from corticosteroid, complication may occur from stop corticosteroid treatment and role of inflammatory drug in treatment of lupus.

Mothers' knowledge was scored as following

Studied mothers answered were compared with model key answers; where scored as complete correct answer had score (2), incomplete correct answer had score (1) and incorrect or unknown had scored (0). Total knowledge scores ranged from (0- 28) points. In this respect the level of mothers' knowledge was categorized as the following: poor level of knowledge (< 40%) was ranged from (0 >9) points, average level of knowledge (<40-60%) was ranged from (9 >18) and Good level of knowledge (≥ 60%) was ranged from (19 to 28) points.

Tool (2): Mothers Quality of Life questionnaire

It was a adapted from **Skevington, etal., (2004) [21],** to assess mothers' quality of life toward children with systematic lupus. It consisted of 24 items in which their responses were evaluated using a 5-point Likert scale on four domains: physical health (6 items) psychological health (6 items) social relationships (3 items) and environment (7 items).

Scoring system Mothers Quality of Life

- Mothers' responses were classified into five point likert scale, strongly disagree (1), disagree (2), neutral (3), agree (4), strongly agree (5). Total scores were ranged from (0- 120) points, so the level of mothers quality of life was categorized as the following, good level was ranged from (80–120) points,
- Poor level of knowledge < 60% = <71
- Moderate level of knowledge 60 – 80= 72- 95
- High level of knowledge = 80% = 96 - 120

Tool (3): Mothers Self-Efficacy Scales

Was adapted from a standardized likert type rating scale by **Kankaras (2017) [22],** to assess mothers self-efficacy It consisted of 17 items in which their responses were evaluated using a 5-point Likert scale as following (I can always manage to solve difficult problems if I try hard enough, I can solve most problems if I invest the necessary effort and I can remain calm when facing difficulties because I can rely on my coping abilities).

Scoring system Mothers Self-Efficacy Scales

Mothers' response was classified into five point likert scale, strongly disagree (1), disagree (2), neutral (3), agree (4), strongly agree (5). Total scores were ranged from (0-85) points, so the level of mothers self-efficacy was categorized as the following, High self-efficacy was ranged from (51 -85) points and low self-efficacy (less than 45) point.

-High self-efficacy≥ 60%

-Low self-efficacy<60%

Tool (4): Mothers Reported Practices Assessment sheet ; It was adapted from **Martin, (2022) [23],** to assess the mothers' reported practices regarding care provided for their children with systemic lupus. It was used twice pre and after family

empowerment implementation. It Consisted of 52 items grouped under seven domain that included nutrition (9 items), personnel hygiene (8 items), drug administration (8 items), prevention from infection (6 items), management of pain and fatigue (8 items), skin care (7 items) and hair care(6 items).

Mothers' reported practice was scored as following

The scoring system consisted of two points: done and not done as reported by mothers was scored (1), not done was scored (0). The total scores were ranged from (0 to 52) points. Accordingly, the level of mothers' reported practices was categorized as the following, poor level of practices(< 17 point), average level of practices (< 34%) and good level of practice (34 to 52) points.

The total score for all practice was classified as the following:

- Good reported practice ≥ 60%
- Poor reported practice <40%

Operational design

The operational design included: preparatory phase, content validity, reliability of tool, pilot study and field work.

The preparatory phase

This phase included reviewing the related literatures and different studies related to Systemic Lupus Erythematosus and theoretical knowledge of various aspects of the study, using textbooks, evidence based articles, internet, periodicals and journals to develop tools and to get acquainted with the various study aspects of the research problems.

Content validity

Tools validity was checked through a jury of three experts (professors) of Pediatric Nursing from the Faculty of Nursing Benha University, and El-Mansoura University, to test the content validity of the instruments and to judge its clarity, comprehensives, relevance, simplicity, and accuracy.

Reliability

Reliability for tools was applied by the researchers for testing the internal consistency of the tools. Internal consistency reliability of all items of the tools was assessed using Cronbach's alpha coefficient. This turned to be (0.72.) for Mothers knowledge assessment sheet. Reliability of Mothers' quality of life; the value was (0.79). Reliability of Mothers 'Efficacy Scales, the value was (0.88).

Ethical Considerations

Ethics approval granted from the Scientific Research Ethical Committee of Faculty of Nursing, Benha University, an official approval was obtained from directors of the Benha University Hospital. Informed consent was obtained from the studied mothers prior to data collection. The children and their mothers were informed about the purpose and the expected outcomes of the study. Also, the mothers were assured that the study their participation was voluntary and they have the right to withdraw from the study at any time without giving any reason.

Pilot study

A pilot study was carried out involving 10% of the total subjects (6) mothers who have children with systematic lupus and excluded from the present study

Field work

Data collection for this study was carried out over a period of Five months starting from

November 2022 until the end of March 2023. The researchers were available two days /week. Data was collected during the morning times from the previously mentioned setting. The researchers started to collect data through assessment, planning, implementation and evaluation phases as the following:

Assessment phase

Assessment phase involved interviews with mothers who accompanied their children to the study settings to collect baseline data. The researchers were visited Benha University Hospital two days/ weeks by rotation from 9 AM and extended to 1.00 PM. At the beginning of interview; the researchers welcomed mothers, explained the purpose, duration, activity of the study and take their oral approval to participate in the study prior to data collection. The data of the children with SLE was collected from medical record and from the mothers' and it took nearly 15 minutes . The researchers to assessed the mothers knowledge, it took nearly 30- 45 minutes, This period of pretest took 4 weeks starting from beginning to the end of November 2022).

Planning phase

Based on baseline data obtained from assessment phase and relevant review of literature, the family centered care empowerment model implementation was designed by the researchers for mothers of children with systematic lupus. According to the mother's needs. It was constructed, revised and modified to improve quality of life, self-efficacy of mothers toward children with systemic lupus. The contents were prepared according to mothers' level of understanding in simple Arabic language. Selecting the teaching place at the study setting (teaching classroom). Different teaching methods were used such as; lecture, modified small group discussion, demonstration, and re-demonstration and role-play. Suitable media was used such as booklet, photos, power point presentation, educational videos, lab top, and CD to help proper understanding of the content by children and their mothers.

Program Design

General objective

The main goal of family empowerment implementation is to improve quality of life and self-efficacy of mothers of children with systematic lupus erythematous.

Specific objectives: At the end of the family empowerment implementation, the mothers will be able to:

1. Define systematic lupus erythematous., list predisposing factors , types , clinical manifestation , complication, investigation and management , type of treatment , role of corticosteroid in treatment , side effect of corticosteroid and method to prevent it as well as possible complication may occur from stop corticosteroid treatment and role of inflammatory drug in treatment of lupus

Implementation phase

This phase took two months from the beginning December 2022 to the end of January2023.

The implementation phase was achieved through sessions, each session started by a summary of the previous session and objective of the new one. Motivation and reinforcement during sessions were used to reinforce sharing in the study.

Empowerment nursing intervention was designed and implemented by the researchers for mothers. The overall aim of the family empowerment intervention was to enhance mothers self-efficacy and hence their quality of life confidence, advising about the disease, empowering against worried situations and getting with appropriate method of problem solving to increase mothers' quality of life and self-efficacy toward children with systemic lupus and decreases mothers strain level. Family empowerment nursing intervention contains four steps as follow:

First step: (knowledge enhancement)

To enhance Mothers' knowledge about lupus. The studied children were divided into 10 groups. The educational content was explained by the researchers to mothers in small group around (6 mothers) per each group. The total numbers of sessions were 10 sessions distributed as the following; (6) sessions for theoretical part each session kept going for 30-45 minute and (4) sessions for practical part each session kept going for 45 minute. These sessions were repeated to each group. **Theoretical part as the following**; **the first session** of the program included introduction of the family empowerment model, definition, causes, risk factors and types of Systemic Lupus Erythematosus. **The second session** included clinical manifestation, investigations, complication, contraindications that prevent child from taking medications regularly and treatment of systemic lupus. **The third session** included role of steroids in treatment of systemic lupus, side effect of steroids, measures followed to prevent side effects from steroids, methods of withdrawing steroid dose from the child's body and complications happen if steroid stop suddenly. **The fourth session** included role of NSAD in treatment of systemic lupus, side effects of NSAD, measures followed to prevent side effect of NSAD, role of immunosuppressant drug in treatment of systemic lupus, side effects of immunosuppressant drug, role of antimalarial drug in treatment of systemic lupus and side effects of antimalarial drug. **Fifth session** included knowledge about nutrition and personnel hygiene. **Sixth session** include prevention from infection and drug administration.

Second step: (improvement of self-efficacy)

To enhance self-efficacy and competence, two learning sessions per week for three weeks was held by demonstration and re-demonstration teaching methods and practical presentation method. The duration of each session about 30-45 minutes. Firstly, the researchers explained to the mothers about the related skill and its importance and the complications that arise due to lack of its control. The researchers presented the ultimate procedure of the skill in front of the mothers. Then, the mothers were asked obtain self-efficacy in other components of the skill through practice and repetition and to be able to do it without researcher's attendance. Finally, the mothers got completely self-efficient in the skill, learning and the feeling of learning when capability resulted in their encouragement and increased self-esteem. Mothers

requested to perform all learned skills in every group discussion sessions. The following practical presentation including: **The first session** addressed the practice of mothers that involved demonstration about nutrition and personnel hygiene. **The second session** involved demonstration to prevention of infection and drug administration. **The Third session** involved demonstration to management of pain and fatigue. **The Fourth session** involved demonstration to skin care and hair care.

Third step: (process evaluation)

It included evaluation method. In order to assess feedback at the start of every session, two verbal questions were requested to mothers from the prior session. Moreover, evaluation of self-efficacy was performed by asking the mothers to indicate the related skills properly.

Evaluation phase

After the implementation of the family empowerment contents, the post test was carried out to assess mothers' knowledge by using the same formats of pretest. This help to evaluate the effect of family empowerment implementation, this was done immediately after application of empowerment sessions. This phase took two month from the beginning of Febrauary to the end of March 2023.

Administrative Design:

An official approval was taken from the Dean of the Faculty of Nursing Benha University to Rheumatology and Immunology Outpatient Clinics at Benha University Hospital in Benha city. A clear explanation was given about the nature, importance and expected outcomes of the study to carry out the study with minimal resistance.

Statistical Design

The collected data organized, tabulated and statistically analyzed using Statistical Package for Social Science (SPSS) version 21 for windows, running on IBM compatible computer. Descriptive statistics were applied (e.g. frequency, percentages, mean and standard deviation). Test of significance, Chi-square test ($\chi 2$) this test used to measure significant of qualitative variables and correlation coefficient (r) used for quantitative variables that were normally distributed or when one of the variables is qualitative. These tests were applied to test the study hypothesis. Reliability of the study tools was done using Cronbach's Alpha. A highly significant level value was considered when $p < 0.001$, a significant level value was considered when $p < 0.05$ and. No statistical significance difference was considered when $p > 0.5$.

Result

According to mothers characteristic, Half (50.0%) of studied mothers were in the age group 30<40, with mean ±SD= 31.2667±6.years. Also, less than three quarters (70.0%) of studied mothers were living in rural areas. Meanwhile, more than one third (40.0%) of studied mother had secondary education.

Table(1): Illustrats that, more than half (55.0%)of the studied children were in the age group 12< 14 years, with Mean ±SD = 12.033±.years. In relation to educational level, more than half (55.0%) of the children were in preparatory school. According to

gender, nearly two thirds (63.3%) of studied children were females.

This table also shows that, less than half (46.6%) of studied children had onset of disease at age between 10< 14 years. Also, less than three quarter(71.6%)of studied children had family history of systemic lupus. Meanwhile, nearly two thirds (61.6%)of studied children diagnosed through clinical manifestations.

Table (2): Represents that, less than three quarters (70.0%, 60.0%, 66.7% and 53.3%) of the studied mothers had incorrect or unknown answer regarding definition of systemic lupus, clinical manifestations ,investigations , complications , treatment and role of steroids in treatment of it., in the pre family empowerment implementation phase. While, more than three quarters of them (88.3%, 85.0%) had correct answer regarding all items in the post and after three month of family empowerment implementation phase respectively. The difference was highly statistically significant with P-value <0.001.

Table (3): Clarifies that nearly three quarters (76.7% & 70.0% and 60.0%) of the studied mothers had incorrect or unknown answer regarding side effects of steroids, prevention of side effects from steroids, method of withdrawing steroid ,complications from stopped steroid suddenly, role of immunosuppress drug , side effects of immunosuppressant drug , side effects of antimalarial drug and role of antimalarial drug in treatment of systemic lupus in the pre family empowerment implementation phase. While, 88.3% and 85.0% of them had correct answer regarding all items in the post and after three month of family empowerment implementation phase respectively. The difference was a highly statistical significant with P-value <0.001.

Table (4): illustrates that, less than three quarters (70.0% & 76.7% & 63.3%) of the studied mothers had poor quality of life at pre family empowerment implementation. While, (73.3% & 78.3% & 71.7%) of studied mothers had good quality of life at post and after three months of family empowerment implementation respectively. Moreover, there was a highly statistically significant difference at pre, post and after three months of family empowerment implementation regarding in all domains of quality of life ($P \leq 0.001$).

Table (5): Presents that, there was a highly statistically significant difference in mothers reported practice regarding care of children with systemic lupus Erythematosus at posttest and after three months of of family empowerment implementation as compared to pre family empowerment implementation (P=<0.001).

Table (6): Revealed that, there is a positive correlation between studied mothers total knowledge, quality of life, reported practice and self-efficacy (p value < .001) after family empowerment implementation.

Fig (1): Demonstrates that, more than two third (60.0% & 78.3%) of studied mothers had good level of knowledge at post and after three months of family empowerment implementation as compared to pre family empowerment implementation.

Fig (2): displays that, less than one third 10.0% of studied mothers had good level of all domain quality of life at pre family

empowerment implementation. While, majority (80.0% &78.3%)of studied mothers had good level of all domain quality of life at post and after three months of family empowerment implementation respectively.

Fig. (3): Illustrates that, less than one third 25.0% of studied mothers had low self-efficacy level at pre family empowerment implementation, while, majority (90.0%) and 46.7% of studied mothers had high self-efficacy at post and after three months of family empowerment implementation.

Fig (4): Illustrates that, majority (81.7% & 83.3%) of the studied mothers had good reported practice level at post and after three months of family empowerment implementation as compared to pre family empowerment implementation respectively

of knee that affect level of daily activity (66.7% and 60.0% respectively) at 2nd day of operation, which developed after 1st week of operation in the control and study groups to (53.3% and 23.3% respectively), then become much better in the control and study groups at the 2nd week of the operation(60% and 16.7% respectively).

Figure 3: -_Illustrate distribution of the studied patients according to their total of functional limitation of activity of daily living by Knee Outcome Survey-Activities of Daily living scale(ADL). The result show that more than half of studied patients in control and study groups were suffering from high functional limitation of activity of daily living (66.7% and 63.3% respectively) at 2nd day of operation, which developed after 1st week of operation in the control and study groups to (56.7% and 23.3% respectively), then become much better in the control and study groups at the 2nd week of the operation (50% and 10% respectively).

Table (1): Distribution of the studied children regarding their characteristics (n=60).

Children characteristics	Studied Children (n =60)	
	No.	%
Child age		
8<10 years	9	**15.0**
10< 12 years	14	23.4
12< 14 years	33	**55.0**
≥ 14 years	4	6.6
Mean ±SD = 13.033±.839		
Child education		
Primary School	**27**	**45.0**
Preparatory School	**33**	**55.0**
Ranking		
First child	**20**	**33.4**
Second child	**21**	**35.0**
Third child	**9**	**15.0**
Fourth child	**10**	**16.6**
Onset of disease		
-3< 6 years	**5**	**8.4**
- 6< 10 years	**27**	**45.0**
- 10< 14 years	**28**	**46.6**
Mean ±SD= 10.850±1.070		
Family history of systemic lupus		
- Yes	43	71.6
- No	17	28.4

Table (2): Distribution of the studied mothers knowledge regarding Systemic Lupus Erythematosus before immediately after and three months after implementation of family empowerment program. (n =60).

Items of Knowledge related to systemic lupus erythematosus	Phases of family empowerment implementation(n=60)																		X^2 (1)	P value	X^2 (2)	P value
	Pre- family empowerment implementation						Post family empowerment implementation						Three months After implementation OF family empowerment									
	Complete correct answer		Incomplete correct answer		Incorrect or unknown answer		Complete correct answer		Incomplete correct answer		Incorrect or unknown answer		Complete correct answer		Incomplete correct answer		Incorrect or unknown answer					
	N.	%	N.	%	N.	%	N.	%	N.	%	N.	%	N.	%	N.	%	N.	%				
Definition	2	3.3	22	36.7	36	60.0	51	85.0	9	15.0	0	0.0	54	90.0	6	10.0	0	0.0	19.687	<0.00	21.439	<0.00
Clinical manifestations	2	3.3	16	26.7	42	70.0	53	88.3	7	11.7	0	0.0	52	86.7	8	13.3	0	0.0	10.220	<0.05	8.585	<0.05
Investigations	2	3.3	38	63.3	20	33.3	48	80.0	12	20.0	0	0.0	36	60.0	24	40.0	0	0.0	29.114	<0.00	8.585	<0.05
Complications	4	6.7	24	40.0	32	53.3	39	65.0	21	35.0	0	0.0	38	63.3	22	36.7	0	0.0	8.998	<0.05	8.548	<0.05
Treatment	8	13.3	24	40.0	28	46.7	49	81.7	11	18.3	0	0.0	48	80.0	12	20.0	0	0.0	29.417	<0.00	24.122	<0.00
Role of steroids in treatment of systemic lupus erythematosus	4	6.7	16	26.7	40	66.7	44	73.3	16	26.7	0	0.0	48	80.0	12	20.0	0	0.0	9.455	<0.05	11.204	<0.05

Table (3): Distribution of the studied mothers knowledge about medications of systemic lupus erythematosus thorough empowerment implementation phases (n= 60).

Items of knowledge related to medications of systemic lupus erythematosus	Phases of empowerment implementation																		X^2 (1)	P value	X^2 (2)	P value
	Pre- empowerment implementation						Post empowerment implementation						After empowerment implementation									
	Complete correct answer		Incomplete correct answer		Incorrect or unknown answer		Complete correct answer		Incomplete correct answer		Incorrect or unknown answer		Complete correct answer		Incomplete correct answer		Incorrect or unknown answer					
	N.	%	N.	%	N.	%	N.	%	N.	%	N.	%	N.	%	N.	%	N.	%				
Side effects of steroids	5	8.3	25	41.7	30	50.0	47	78.3	13	21.7	0	0.0	45	75.0	15	25.0	0	0.0	12.543	<0.00	10.662	<0.00
Prevent side effects from steroids	4	6.7	24	40.0	32	53.3	53	88.3	7	11.7	0	0.0	42	70.0	18	30.0	0	0.0	22.315	<0.00	18.968	<0.00
Method of withdrawing steroid dose from the child's body	2	3.3	22	36.7	36	60.0	50	83.3	10	16.7	0	0.0	48	80.0	12	20.0	0	0.0	12.204	<0.05	10.251	<0.05
Complications that occur from stopped steroid suddenly	2	3.3	16	26.7	42	70.0	53	88.0	7	12.0	0	0.0	53	88.0	7	12.0	0	0.0	8.186	<0.05	8.186	<0.05
Role of immunosuppress drug in treatment of systemic lupus	2	3.3	12	20.0	46	76.7	49	81.7	11	18.3	0	0.0	48	80.9	12	20.0	0	0.0	4.155	>0.05	3.532	>0.05
Side effects of immunosuppressant drug lupus erythematosus	2	3.3	22	36.7	36	60.0	51	85.0	9	15.0	0	0.0	48	80.0	12	20.0	0	0.0	13.265	<0.05	12.602	<0.05

Side effects of antimalarial drug	4	6.7	24	40.0	32	53.3	48	80.0	12	20.0	0	0.0	46	76.7	14	23.3	0	0.0	24.210	<0.00	28.689	<0.00
Role of antimalarial drug in treatment of systemic	2	3.3	22	26.7	42	70.0	38	63.3	22	36.7	0	0.0	34	56.7	26	43.3	0	0.0	40.247	<0.00	33.003	<0.00

P value: <0.00

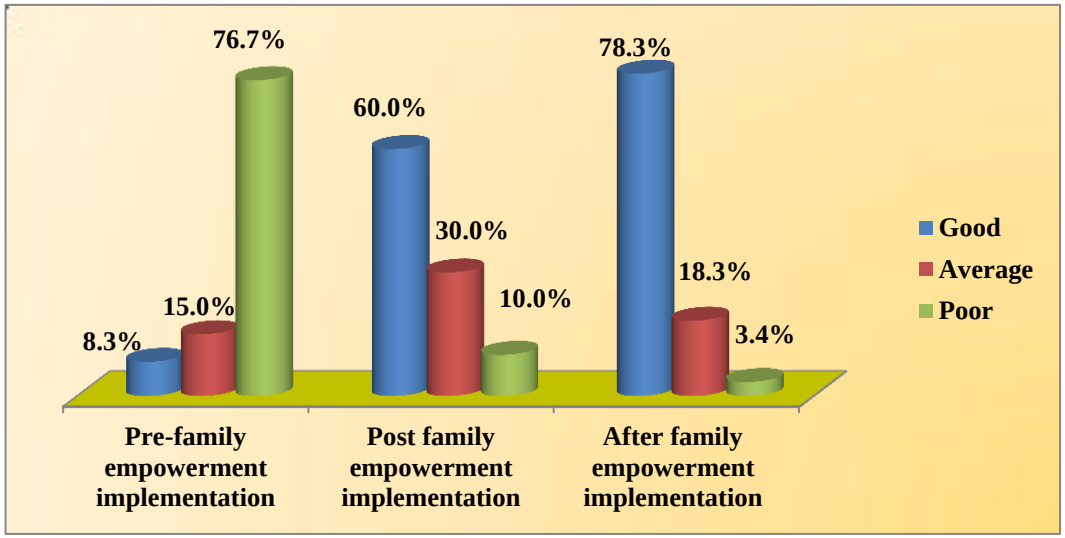

Fig.(1) Distribution of the studied mothers total knowledge score regarding to systemic lupus Erythematosus thorough family empowerment implementation phases (n= 60).

Table (4): Distribution of the total level of domains for studied mothers regarding their quality of life score thorough family empowerment implementation phases (n =60).

Domain	Phases of family empowerment implementation(n=60)																		X^2 (1)	P value	X^2 (2)	P value
	Pre family empowerment implementation						Post family empowerment implementation						After three months family empowerment implementation									
	Good		Average		Poor		Good		Average		Poor		Good		Average		Poor					
	N.	%	N.	%	N.	%	N.	%	N.	%	N.	%	N.	%	N.	%	N.	%				
Physical health	8	13.3	10	16.7	42	70.0	48	80.0	10	16.7	2	3.3	44	73.3	13	21.7	3	5.0	96.40	0.000	81.70	0.000
Psychological health	6	10.0	16	26.7	38	63.3	47	78.3	12	20.0	1	1.7	43	71.7	16	26.7	1	1.7	83.80	0.000	71.30	0.000
Social relationships	2	3.3	12	20.0	**46**	**76.7**	**40**	**66.7**	17	28.3	3	5.0	**44**	**73.3**	16	26.7	0	0.0	87.90	0.000	66.20	0.000
Environment	10	16.7	20	33.3	30	50.0	48	80.0	10	16.7	2	3.3	47	78.3	13	21.7	0	0.0	60.40	0.000	39.26	0.000

P value =0.000

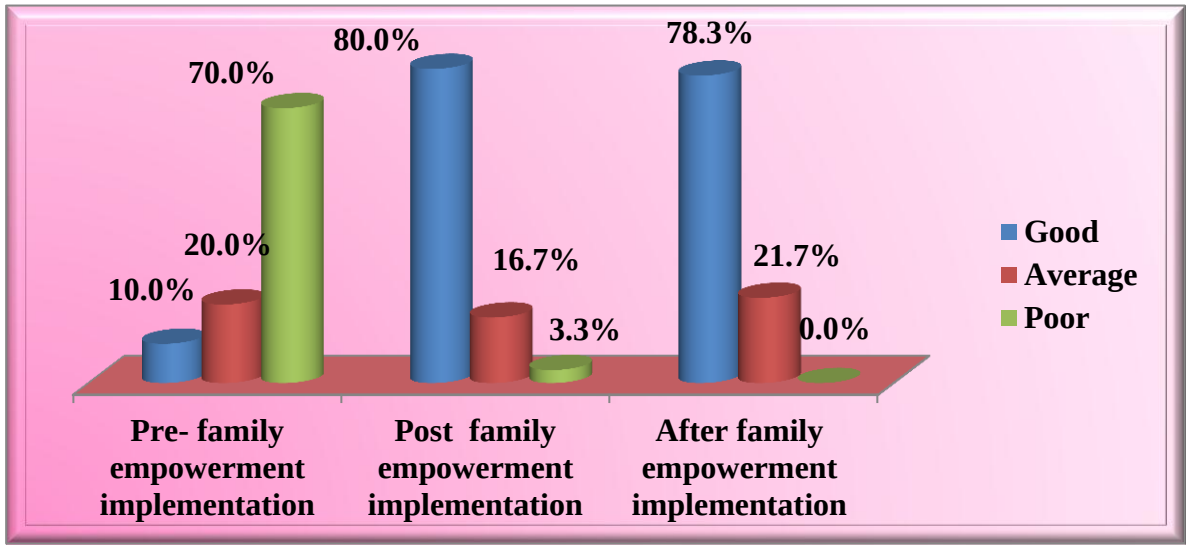

Fig. (2)Distribution of the studied mothers regarding their total quality of life thorough family empowerment implementation phases (n =60)

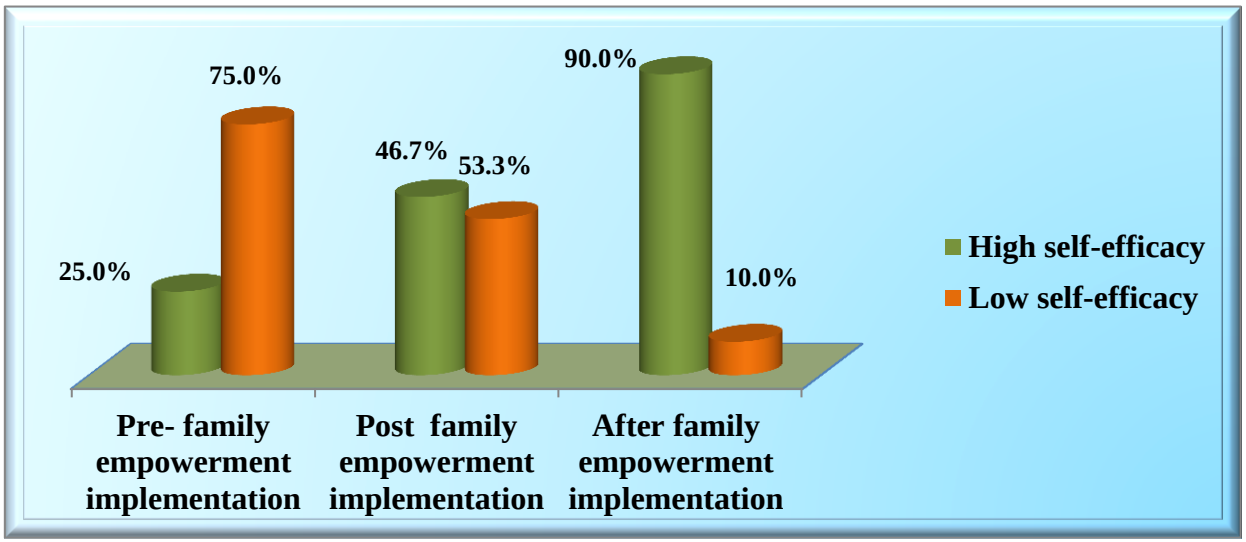

Fig.(3)Distribution of the studied mothers self-efficacy scores regarding children with systemic lupus thorough family empowerment implementation phases (n =60)

Table (5): Mean scores of the studied mothers reported practice regarding care of children with systemic lupus Erythematosus thorough family empowerment implementation phases (n=60).

Items	Phases of family empowerment implementation(n=60)			Pair t (1)	P Value	Pair t (2)	P value
	Pre- family empowerment implementation	Post family empowerment implementation	After family empowerment implementation				
	Mean ± SD	Mean ± SD	Mean ± SD				
Nutrition	7.500±5.043	15.450±6.431	14.716±6.375	14.437	**0.00**	13.889	**0.00**
Personnel hygiene	4.383±3.617	8.533±3.698	7.700±3.665	13.677	**0.00**	12.012	**0.00**
Drug administration	5.633±4.290	8.950±4.224	9.716±4.017	14.432	**0.00**	14.564	**0.00**
Prevention from infection	5.300±5.624	13.491±5.440	11.400±5.459	13.024	**0.00**	11.809	**0.00**
Management of pain and fatigue	5.283±4.166	8.583±3.562	9.100±3.563	14.774	**0.00**	14.337	**0.00**
Skin care	5.750±5.385	10.350±5.341	11.166±5.459	12.725	**0.00**	12.487	**0.00**
Hair care	4.650±4.095	9.216±4.438	9.966±4.352	12.899	**0.00**	12.848	**0.00**

(P=<0.001)

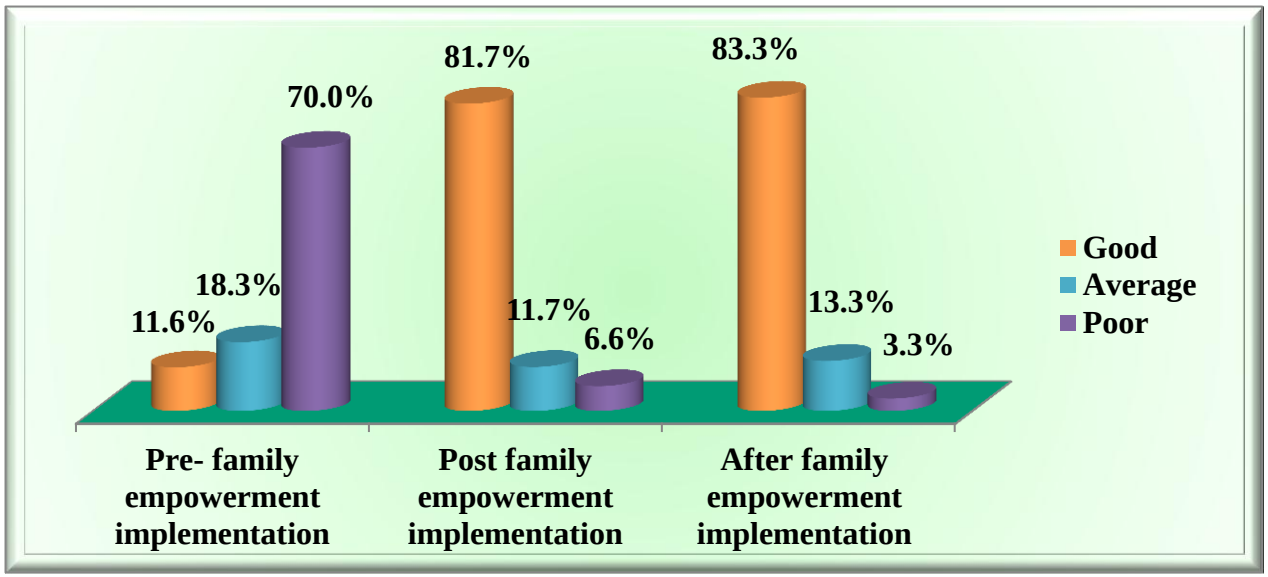

Fig (4) Distribution of the studied mothers total reported practice scores regarding care for children with systemic Lupus Erythematosus thorough family empowerment implementation phases (n= 60).

Table (6): Correlation between studied mothers total knowledge, quality of life, reported practices and self efficacy toward children with systematic lupus through family empowerment implementation (No= 60).

Items	Pearson correlation coefficient							
	Knowledge score		Reported practice score		Quality of life score		Self efficacy score	
	Pearson	Sig	Pearson	Sig	Pearson	Sig	Pearson	Sig
Knowledge score	1	-	.879**	< .001	.940	< .001**	1	-
Reported practice score	.879**	< .001**	1	-	.938	< .001**	0.929	0.000**
Quality of life score	.940	< .001**	.938	< .001**	1	-	0.480	0.000**
Self efficacy score	0.929	0.000**	0.480	0.000**	1	-	1	-

**** Correlation is significant at the 0.01 level (2- tailed).**

Discussion

Systemic lupus Erythematosus (SLE) is one of the most common autoimmune diseases in children caused by highly abnormal immune systems and accompanied by extreme morbidity and mortality rate and poor quality of life. It is a multisystem autoimmune disease with extensive organs involvement characterized by chronic and actuating course. Also, it constitutes a vital pediatric problem because of their influence on children's health and their strong correlation with behavioral, psychological, and social problems and associated with high significant of morbidity and mortality rate, decreased substantial direct and indirect economic costs and effect on quality of children life **(24).**

Regarding characteristics of studied mothers', the present study showed that, half of studied mothers were in the age group 30<40, with mean ±SD= 31.2667±6.516. Also, less than three quarters of studied mother were living in rural areas. Meanwhile, more than one third of studied mother had secondary education. This result was paralleled with **Phuti, et al. (2019) (25),** who studied "Living with systemic lupus Erythematosus in South Africa, " and observed that, slightly more than half of the studied mothers their age was 31 years

old and above, with mean age ± SD (30.3±11.6). The educational level of about two thirds of mothers were secondary education. Also, this study accordance with **Abdel Aziz, et al. (2022) [26],** who studied " Assessment of mothers' knowledge and practices towards systemic lupus erythematosus" and found that, 62% of the studied mothers were in the age group 30< 40 years with a mean age 36.68± 6.88 years old. Concerning educational level, 42% of the studied mothers had secondary education. Meanwhile, this finding incomparable with **Tęcza, & Pych . (2018) [27]:** who studied" nursing care of a patient with systemic lupus erythematosus" and found that, more than half (55.9%) of the studied mothers were in the age group ≥ 40 years with ± SD was 39.62 ± 5.86 years and more than one third(38.3%) of them were intermediate education, while the majority 88.3% of them were housewives.

As regard, age of studied children, the current study revealed that, more than half of the studied children were aged 12< 14 years, with Mean ±SD = 13.033±.839**.** This result was paralleled with, **Pradeep, et al. (2022) [28],** who studied, "Primary Healthcare Practitioners' Knowledge, Attitude, and Practice Toward Systemic Lupus Erythematosus" and found that reported in the majority of studies is between 11 to 12 years. Also, This result matched with **El-Sayed, & Mesbah . (2018), [3]** who studied" effect of health education based intervention on self-care among systemic lupus erythematosus clients" and found that, the majority (85% and 83.3%) of the studied children was in the age group from 12-18 years and females respectively. This may be due to lupus mainly a girlish disorder and hormones play a major role in the etiology of disease girls are most exposure to estrogen hormone, while androgen hormone in boy plays as defending function in SLE

As regard, educational level of the studied children, the present study illustrated that, more than half of the children were in preparatory school. This study matched with **Mohamady, et al. (2022) [29],** who studied" effect of self- care management on health outcomes and symptoms for females with systemic lupus erythematosus" and mentioned that, 54% of the children were in preparatory school. While 36% of studied children were ranked as second children in their families. This finding was supported by **Pilevar, et al. (2019) [19],** who studied "Effect of Implementing Family-centered Empowerment Model on the Quality of Life in School-age Children Diagnosed with Rheumatoid Arthritis" reported that, found that, 37.5% of the children are in preparatory school. Also, nearly two thirds of studied children (Intervention and control groups) were females, From the researcher point of view, this result confirmed the scientific review about increase incidence of SLE between female than male due the important role of female hormones in increasing vulnerability to SLE.

As regard clinical manifestation of systematic lupus, the current study illustrated that, more than one third of children with systemic lupus had arthritis, less than one third of them had fatigue and skin rash. This study accordance with **Lewandowski, et al. (2017) [30],** who studied " missed opportunities for timely diagnosis of pediatric lupus in South Africa: a qualitative study" and found that, the majority of SLE patients in this study 63% had severe symptoms such as arthritis , skin rash fatigue, GIT disturbance and pericarditis requiring intervention at the

time of diagnosis. That's go in the same direction with **Mohamady, et al. (2022) [29],** the most common symptoms of studied females were fatigue 87.9%, pain 74.2%, skin rash 71.2% as well, 69.7% had hair loss & 60.6% complaining of arthritis

As regards, previous hospitalization, less than one third of studied children had one pervious hospitalization. This result was supported **Shoeib, et al. (2018) [31]**, who studied "Hospitalization of systemic lupus patients " and mentioned that more than two fifth of studied patient admitted to hospital one time, while more than three quarters of studied patient the cause of admission was nephritis. This result agreed with the result by **Petrongolo, et al. (2020) [32]**, who studied" examining uncertainty in illness in parents and children with chronic kidney disease and systemic lupus erythematosus" and found that, the most frequently reported diagnoses were genitourinary 28.1%, followed by neurology-endocrinology 25.0%, hematology.

As regards, cause of previous hospitalization, the present study revealed, more than one third of studied children were previously hospitalized due to complications of urinary system. This result agreed with the result by **Samar et al. (2020) [33],,** who studied" An audit study on the management of children with lupus nephritis admitted to Assiut University Children Hospital" and found that more than half of studied children admitted to hospital due to renal complications and nephritis. This may be due to the inflammation caused by lupus being able to affect many organs of body and can be deposition in circulating immune complexes in the glomerular basement membrane that can lead to lupus nephritis and renal failure.

On assessing mothers' total knowledge about systematic lupus erythematous, the present study showed that, less than two third of studied mothers had good level of knowledge at post and after three months of family empowerment implementation as compared to pre family empowerment implementation. That's go in the same direction with **Hovde, et al. (2019) [34],,** who studied" Multi-pronged approach to enhance education of children and adolescents with lupus, caregivers, and healthcare providers in New Jersey " and found that, most of (86%) of mothers had unsatisfactory knowledge about systematic lupus before the program implementation. While, total knowledge satisfactory level of mothers increased at immediate post and one month after the program respectively with highly statistically significant difference P <. 0.001. Also, this result similar to **Khawaja, et al. (2018) [35],,** who studied" parental knowledge and participation in the management of children with Systemic Lupus Erythematosus" and showed that, a highly statistically significant improvement was detected in the total mean scores of mothers' knowledge about systematic lupus immediate post and one month after attending the empowerment program with P.=0.001. Meanwhile, this study accordance with **Asiri, et al. (2020) [36],,** who studied" awareness of systemic lupus Erythematosus among general population in Abha, KSA" and found that, most of (90%) of studied mothers had unsatisfactory level of knowledge toward systemic lupus at preprogram while majority (82%) of studied mothers had satisfactory level of knowledge toward systemic lupus post program implementation. This may be due to mothers 'had lack of knowledge about nature of the disease and knowledge is

important to help mothers' in the management of chronic disease to prevent complications.

In relation to total quality of life of studied mothers, this study clarified that, less than one third of studied mothers had good quality of life at pre family empowerment implementation. While, majority of studied mothers had good quality of life at post and after three months of family empowerment implementation respectively. This finding was supported by **Ramos et al. (2015) [37],** who studied," Burden and quality of life of mothers of children and adolescents with chronic illnesses ". reported that, majority of mothers have low quality of life of mothers preprogram while three quarters (75%) of mothers had high level of quality of life post and after three month of program implementation. This may be due to family caregivers of chronic children are under a lot of pressure as those at risk of disease are often referred to as a hidden disease. Family empowerment model provide mothers sufficient knowledge and practice help mothers to deal with children with systematic lupus erythematous. Furthermore, these practices reduce the psychological stress of family members and promote their QOL and self-efficacy.

Concerning, studied mothers reported practice, majority of the studied mothers had good reported practice level at post and after three months of family empowerment implementation as compared to pre family empowerment implementation. This result was congruent with the study done by **Abdel Aziz, et al. (2022) [26],** illustrated that, before the program all mothers had unsatisfactory level of reported practice. While as immediate and one month after 70%, and 50% had satisfactory level of practice respectively. **Shoeib, et al. (2018) [31],,** found that, there was highly statistically significance improvements in mothers` reported practices at immediately post and following up phases of guidelines implementation as regards all items of their reported practices about systemic lupus Erythematosus in their children. Also, This study agreement with **Tamrou, et al. (2019) [38]**, who studied " Systemic lupus Erythematosus: state of the art on clinical practice guidelines" and found that, the majority (82.5%) of the studied mothers had incomplete practices level preprogram, while the majority (90%) of them had complete practices level post program with a highly statistically significant difference pre/post program, where ($p<0.001$).This result was in the same line with **Faheim, et al. (2023) [39]**, who studied " Effect of Nursing Educational Guidelines on Knowledge and Practices of Mothers having Children with Systemic Lupus Erythematosus" and found that, there were positive correlations between knowledge scores and educational level that were statistically significant at both the pre-and following-up phases of the guidelines implementation ($P<0.001$). However, this table showed that there were statistically significant correlations between knowledge and practices and mothers' age and occupational level at pre and follow-up guidelines implementation phases. This could be due to lack of continuous training and education performed for mothers' regarding care of their children with SLE.

Concerning, studied mothers' self-efficacy, the current study illustrated that, less than one third of studied mothers had low self-efficacy level at pre family empowerment implementation, while, majority of studied mothers had high self-efficacy at post and after three months of family empowerment implementation. This study accordance

with **Barani**, **et al. (2021)** [40], who studied " effect of educational intervention based on self-efficacy theory on the caring behavior of mothers having children with cancer " and found that, a significant difference in the mean score of mothers' self-efficacy after intervention (P < 0.001). Besides, the two-way self-efficacy score of the first and second follow-ups was p = 0.096. Furthermore, the mean score of caring behavior before and after the intervention indicated a significant difference (P < 0.001). Also, that's go in the same direction with **Hameed, et al. (2021)** [41], who studied " knowledge, attitude, practice, and self-efficacy of caregivers of children with epilepsy" and found that, significant improvements in the knowledge, attitude, and reported practice as well as the self-efficacy scores of caregivers of children with epilepsy following the implementation of the educational intervention. Meanwhile, this result similar to **Hegazy, and Dawood. (2021)** [42] **,** who studied " effect of upgrading mothers' awareness regarding cardiovascular diseases on their self-efficacy to promote their children life style" and found that, the mothers had elevated self-efficacy mean scores immediately after the educational intervention 235.167±29.656 compared to before program. There were statistically significant differences regarding the total means scores of the mothers' self-efficacy before, immediately after and one month after application of the educational intervention (p<0.001)

Regarding, studied mothers' total knowledge, quality of life, reported practice and self-efficacy, this study showed that, there is positive correlation between studied mothers total knowledge, quality of life, reported practice and self-efficacy (p value < .001) after family empowerment implementation. This study in accordance **with Nada, et al. (2018)** [43] **,** who studied" Effect of Health Education Intervention on Mothers' Performance of Their ChildrenSuffering from Systemic Lupus Erythematosus" and mentioned that, there statistical significant differences in knowledge 21.33 ± 2.23, attitude 53.94 ± 9.45, and self-efficacy 137.62 ± 11.32 in mothers before and after the intervention, with the difference being significant (P < 0.01). This could be due to mothers who attended good knowledge has good practice and knowledge is the baseline for the practices. From the researcher point of view ,present study show the important of family empowerment on knowledge and reported practice of mothers that enhance to increase self-efficacy and quality of life for mother caring children with Sysrematic Lupus erythematous

Conclusion

Based on the results of the current study, it can be concluded that implementation of family empowerment model were improving quality of life and self- efficacy of mothers of children with systematic lupus

Recommendations

In the light of the findings of the current study the following recommendations were suggested:

1. Design an educational program for children and their mothers about SLE
2. Public awareness to educate people about SLE, its clinical manifestations, diagnosis, treatment, and complications, it may be fatal if neglected.
3. Dissemination of research updated pamphlets, posters and Arabic booklets at the Rheumatology department to the mothers having children with SLE and continuous health education about the disease and care.

4. Further researches regarding SLE, is needed.
5. Family empowerment program should be conducted for caregiver periodically and regularly regarding systematic lupus erythematous to minimize complication among children.

References

1. Rose J. Autoimmune connective tissue diseases: systemic lupus erythematous and rheumatoid arthritis. Emergency Medicine Clinics 2022; 40(1), 179-191
2. Baligar B., Bande U. S., Kalinga B. E., Chethan Y. Systemic Lupus Erythematosus Presenting as Knee Joint Effusion. Journal of Clinical & Diagnostic Research. 2018:12(10):166-78
3. El-Sayed D.M. , Mesbah S.K. Effect of Health Education based Intervention on Self-Care among Systemic Lupus Erythematosus Clients. American Journal of Nursing Research. 2018; 6 (3): 105-12. doi:10.12691/ajnr-6-3-4.
4. Maria O., Almada V., Hocaoglu M. Jesse Y., Shirley D., Onomah A. O., Basiaga M. L. Epidemiology of Childhood-Onset Systemic Lupus Erythematosus: A Population-Based Study. Arthritis Care & Research. 2021:74(5):728-32 Available at: https://doi.org/10.1002/acr.24827
5. Tang S. P., Lim S. C. , Arkachaisri T. Childhood-Onset Systemic Lupus erythematosus: Southeast Asian Perspectives. Journal of Clinincal Medicine. 2021: 10(4): 559.Available at:http:// doi: 10.3390/jcm10040559
6. Afzali, L., Ghasemzadeh S. , Hashemi Bakhshi M. The effectiveness of family-centered interventions on clinical symptoms of children with oppositional defiant disorder]. Empower Except Child. 2017:7(4);87-94
7. Olesinska M. , Saletra A. Quality Of Life in Systemic Lupus Erythematosusand its Measurement. Reumatological journal. 2018; 56(1): 38-47.
8. Hamzallari O., Rosinski L., Petrenko A. , Bridgett D. J. Mothers' emotion regulation and Negative Affect in Infants: The Role of Self-Efficacy and Knowledge of Parenting Practices. Children. 2023;10(1). Available at: https://doi.org/10.3390/children10010085
9. Battran R., Ismail S., Abd El Monem H. The effect of instructional guidelines on caregivers to improve quality of life for their children with systemic lupus erythematosus. International Journal of Pediatrics. (2022):1(2)111-28 Available at: DOI:10.35841/0971-9032.26.8.1559-1571.
10. Albanese A. M. The role of parental self-efficacy in parent and child well-being: A systematic review of associated outcomes. Child: Care, Health and Development. 2019: 45(3). p. 333-63.Available at: https://doi. org/10.1111/ cch.12661
11. Gomez-Velasco D.V., Almeda-Valdes P., Martagon A.J., Galan-Ramirez G.A. , Aguilar-Salinas C.A. Empowerment of patients with type 2 diabetes: current perspectives. Diabetes Metab Syndr Obes. . 2019 : 12(13).456-478.
12. Hill C., Knafl K. A., Docherty S. , Santacroce S. J. Parent perceptions of the impact of the Pediatric Intensive Care environment on delivery of family-centered care. Intensive and Critical Care Nursing. 2018. 50(7).88-94.
13. Segers, E., Ockhuijsen, H., Baarendse, P., van Eerden, I., and van den Hoogen, A. The impact of family

centered care interventions in a neonatal or pediatric intensive care unit on parents' satisfaction and length of stay. Intensive and Critical Care Nursing Journal. 2018 : 20(7).

14. Varvani Farahani P., Hekmat Pou D., Alhani F., Ashori M. , Azadnia M. Investigating the Effect of Family-Centered Empowerment Model on the Lifestyle of Children Suffering From Leukemia. J Holist Nurs Midwifery. 2018: 28(3):198–204. Available at: doi: 10.29252/hnmj.28.3.198.
15. Arief Y.S., Nursalam N., Ugrasena I.D., Devy S.R., Saudah N. Family Factors that Affect Family Empowerment in Caring Children with Leukemia. Health Notions. .2018: 2(4):457–469.
16. Ogórek-Tęcza, B ., Pych A. Nursing care of a patient with systemic lupus erythematosus. ProblemyPielęgniarstwa . 2018 : 26 (4): 312–316. DOI: https:// doi. org/ 10. 5114,1123-1142.
17. Pilevar N., Ramezani M., Malek A. , Vashan, H. B Effect of Implementing Family-centered Empowerment Model on the Quality of Life in School-age Children Diagnosed with Rheumatoid Arthritis. Rehematology and Immunity Journal. . 2019 : 9(2)65-73 Available at: 10.22038/ebcj.2019.39702.2046.
18. Fava A., Petri M. Systemic lupus erythematosus: Diagnosis and management. Journal of autoimmunity, 2019: 11(10):1-13.
19. Eesa N. N. , Nabi H. A. Systemic lupus erythematosus children in Egypt: Homeland spectrum amid the global situation. SAGE Journals. 2021: 30(13).Available at: https://doi.org/ 10.1177/09612033211043010
20. Hockenberry M.J. , Wilson D. Wong's Nursing Care of Infants and Children.11th .ed. St. Louis: Elsevier Health Sciences. . 2021 : 196- 299.
21. Skevington SM, Lofty M, O'Connell KA. The World Health Organization WHOQOL-BREF quality of life assessment: psychometric properties and results of the international field trial. A report from the WHOQOL group. Qual Life Res. 2004: 13.299–310
22. Kankaras M. Measures of Self-Efficacy. OECD Education. 2017: (157) ..Available at: www.oecd.org/edu/workingpapers
23. Martin G. Systemic Lupus Erythematosus Nursing Care Plans.nurselabs com.pp1-7 Avaliable at :http://nurselabs.com/pivacy-policy/. 2022
24. Barber M., Drenkard C. , Falasinnu, T. Global epidemiology of systemic lupus erythematosus. Nat Rev Rheumatol. 2021: 17(1): 515–32.
25. Phuti A., Schneider M., Makan K., Tikly M. ,Hodkinson, B. Living with systemic lupus erythematosus in South Africa: a bitter pill to swallow. Health and Quality of Life Outcomes J. 2019: 17 (65).1-10.
26. Abdel Aziz F.S., Ismail S.S., Sabaq A.G. , Abdel-Salam A.A. Assessment of Mothers' Knowledge and practices towards Systemic Lupus Erythematosus, Journal of Nursing Science – Benha University JNSBU, ISSN 2682 – 3934. 2022: . 3(1).p 17-20.
27. Tęcza Q. B. , Pych A. NursingCare of a Patient with Systemic LupusErythematosus. Problemy Pielęgniarstwa, 2018 : 26 (4): 312–316.
28. Pradeep H., Arun P., Patra P. , Kumar. "Childhood-onset systemic lupus erythematosus in the first year of

life with joint involvement: A case report and mini-review. Journal of Family Medicine and Primary Care. F. 2022: 11(10):p 6571-6575.Available at: DOI: 10.4103/jfmpc.jfmpc_569_22

29. Mohamady S.H., Srour O.A. , Saad N.S. Effect of Self- Care management on Health Outcomes and Symptoms for Females with Systemic Lupus Erythematosus. Tanta Scientific Nursing Journal. 2022: 25(2).
30. Lewandowski L. B., Watt M. H. , Schanberg L. E., Thielman N. M. , Scott, C. Missed opportunities for timely diagnosis of pediatric lupus in South Africa: a qualitative study. Pediatric Rheumatology Journal. 2017: 15(14).Available at: https:// doi.org/10.1 186/s12969-017-0144-6
31. Shoeib S., Elhamid A., Elshebiny E., Shehata Y., Elshormilisy A., Mazen M. Hospitalization of systemic lupus patients causes and outcomes. Menoufia Medical Journal. 2018 : 30.pp 12-18.
32. Petrongolo J. L., Zelikovsky N., . Keegan R. M. , Furth S. L. Examining Uncertainty in Illness in Parents and Children With Chronic Kidney Disease and Systemic Lupus Erythematosus: A Mediational Model of Internalizing Symptoms and Health-Related Quality of Life. Journal of Clinical Psychology in Medical Settings. 2020:27(3).Available on:DOI:10.1007/s10880-019-09617-3.
33. Hamdi SM., A., Hashem EA., Ali AB., An audit study on the management of children with lupus nephritis admitted to Assiut University Children Hospital. Journal of current medical research and practice. 2020 : 3(2).pp19-25.
34. Hovde A. M. McFarland R. , Moorthy N. Multi-pronged approach to enhance education of children and adolescents with lupus, caregivers, and healthcare providers in New Jersey. 2019 : 30(1). Available at: https://doi.org/10.1177 /0961203320969975.
35. Khawaja E., Zletni M., Abushhawia Elmagrabi Z. ,sabei L. Parental knowledge and participation in the management of children with Systemic lupus erythematosus. MOJ Orthopedics & Rheumatology. 2018 : 10(3): 338-342.
36. Asiri A., Assiri F., Medawi A., Asiri M., Alkhalidi, Y. Awareness of Systemic Lupus Erythematosus among General Population in Abha, KSA. Rheumatology (Sunnyvale). 2020 : 10(2). pp26. 33.
37. Ramos M., Santos M., Rangel L., Macedo E. Burden and quality of life of mothers of children and adolescents with chronic illnesses: an integrative review, Rev Lat Am Enfermagem. 2015 : 23(4): 769–777.
38. Tamrou F., Arnoud L., Talarico R., Scire C., Alexander T., Amoura Z., Avcin, T. Systemic lupus erythematosus: state of the art on clinical practice guidelines. European reference network, RMD open. 2019 : pp 4- 12.
39. Faheim S. S., Hegaz A.A. Ismail A. A. , Mohammed A Ali . Effect of Nursing Educational Guidelines on Knowledge and Practices of Mothers having Children with Systemic Lupus Erythematosus.EgypEgyptian Journal of Health Care. 2023 :14 No. 1
40. Barani,M., Hassani L., Ghanbarnejad A. , Ali, M. Effect of Educational Intervention Based on Self-Efficacy Theory on The Caring Behavior of Mothers Having Children with Cancer. Creative Commons Attribution International. 2021:

Available at: DOI:10.21203/rs.3.rs-450017/v1

41. Hameed M. A., Almana M., Hussien R. M. Knowledge, attitude, practice, and self-efficacy of caregivers of children with epilepsy: Impact of a structured educational intervention program. Epilepsy & Seizure 2021:13(1):1-16. Available at:DOI:10.3805/eands.13.1
42. Hegazy S. M. , Dawood, B. M. Effect of Upgrading Mothers' Awareness Regarding Cardiovascular Diseases on their self- efficacy to promote their children life style. Egyptian Journal of Health Care. 2021: 12 (1)
43. Nada, M.A., Bahgat R.S., Sharshour SM. Effect of Health Education Intervention on Mothers' Performance of Their Children Suffering from Systemic LupusErythematosus. International Journal of Novel Research in Healthcare and Nursing. 2018:5(1): 214-226. Available at:www. noveltyjournals.com.

Effect of Applying Virtual Reality Glasses on Reducing Pain and Anxiety of Children Undergoing Chemotherapy

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Abstract

Background: Virtual reality technology is a remarkably effective method to distract attention from painful stimuli. It is a promising and attractive intervention to help reduce anxiety and pain of children undergoing painful procedures. **Aim**: to evaluate the effect of applying virtual reality glasses on reducing pain and anxiety of children undergoing chemotherapy. Method: A quasi-experimental research design was used to conduct the study at the Oncology Department of the Specialized Children's Hospital in Benha, affiliated with the Ministry of Health and Population, Egypt. A purposive sample of 50 children undergoing chemotherapy was included. Four tools were used for data collection: A structured interviewing questionnaire, pain rating scale, Beck anxiety inventory scale, and Physiological assessment of children. **Results:** The results of the study revealed that more than half (52.0%) of the children experienced severe pain before the intervention, while less than two-thirds (60.0%) of the children reported no pain after the intervention. Furthermore, less than two-thirds (60.0%) of the studied children had a high anxiety level before the virtual reality glasses intervention. However, during the intervention, less than half (46.0%) of the studied children had a low anxiety level **Conclusion:** Children who received the virtual reality glasses exhibited less pain and anxiety score compared to children who did not receive them Recommendations: Virtual reality should be used as a technology to reduce pain and anxiety during painful procedures of children admitted in pediatric oncology departments.

Keywords: Anxiety, Chemotherapy, Children, Pain, Virtual reality glasses.

Introduction

Virtual reality (VR) is a relatively new technique that provides distraction and is more effective than traditional methods. It involves a computer-generated environment that allows for orientation and three-dimensional interaction. This environment is projected directly in front of the user's eyes through advanced head-mounted displays (HMDs), which include wide fields of view and motion tracking systems. (1)

Virtual reality provides complete immersion and permits users to feel as if they are in a virtual environment. This immersion is very important as it is directly concerned with pain relief, with less attention given to pain perception. VR is an especially exciting method for children who are interested in imaginative play. Additionally, VR makes children feel comfortable, helps familiarize them with medical procedures, and environments, and reduces pain as well as anxiety. (2)

Virtual reality technology creates an immersive experience in a virtual environment that closely resembles the

real world. VR-based interventions distract children's attention from active cognitive processing, which may result in higher pain thresholds and tolerance. [2] Additionally; these interventions allow children to interact with simulated computing environments. The human brain has a limited ability to process details, so more complex VR programs tend to be more effective in reducing pain. [3]

Pain is an unpleasant sensory and emotional experience associated with tissue damage. Children undergoing medical procedures often experience higher levels of anxiety, and distress, and display various signs of discomfort compared to adults. Their experience and memory of pain serve as strong predictors of future pain responses. Repetitive procedures can lead to conditioned distress and fear, posing concerns for medical professionals and parents, [4] Children may develop anticipatory anxiety responses, including physical symptoms and behavioral changes. Virtual reality has emerged as a promising tool in pediatric healthcare, offering immersive and interactive environments that effectively distract children during medical interventions. It helps reduce anxiety and pain, providing a smoother and less traumatic experience for children, especially those with chronic illnesses requiring frequent procedures. [5]

With the increasing number of childhood cancer survivors, it is crucial to examine the psychosocial consequences of surviving cancer diagnosed during childhood. [6] Understanding the psychosocial needs of these survivors is particularly important. Pain, anxiety, and depression are highly prevalent among children with cancer, posing significant challenges for healthcare professionals. [7]

Medical procedures often elicit pain, distress, and anxiety in children, which not only greatly impact their comfort during the procedures but are also associated with adverse consequences such as attempts to escape, improper recovery, disturbances in the pattern of sleep & feeding, and posttraumatic stress symptoms. Addressing pain and anxiety in children is essential as these experiences can lead to avoidance of necessary healthcare interventions. [8]

Pain associated with the oncological process in childhood is often accompanied by anxiety related to medical procedures, hospitalization, treatment side effects, separation anxiety, and psychological stress. [9] Cancer treatment is a significant anxiety source among children because it is often invasive, painful, and results in major side effects. These treatments disrupt children's lives, altering routines and relationships with family and peers. [10]

Significance of the study

Approximately 400,000 children are diagnosed with cancer each year. Children with cancer undergo numerous painful medical procedures, usually inducing pain and anxiety. Pain experienced by children is often linked to anxiety because young children may lack the cognitive development to understand that subsequent procedures can be less painful with appropriate analgesic medication. [4] The application of VR can significantly impact nursing practice by offering a non-pharmacological strategy to reduce pain and anxiety commonly associated with painful medical procedures, [11] Therefore, this study was conducted to evaluate the effect of applying virtual reality glasses on reducing pain and anxiety of children undergoing chemotherapy.

Aim of the study

The aim of this study was to evaluate the effect of applying virtual reality glasses on reducing the pain and anxiety of children undergoing chemotherapy. This is accomplished through the following:

- Assessing the pain intensity of children undergoing chemotherapy.
- Assessing the physiological parameters of children undergoing chemotherapy.
- Assessing the level of anxiety of children undergoing chemotherapy.
- Evaluating the effect of applying virtual reality glasses on reducing pain and anxiety of children undergoing chemotherapy

Research Hypothesis

Children who receive virtual reality glasses may exhibit less pain and anxiety compared to children who do not receive them .

Research design

A quasi-experimental research design was utilized to conduct this study .

Setting

The study was carried out at the Oncology Department located on the fourth floor of the Specialized Children's Hospital in Benha City, which is affiliated with the Ministry of Health and Population, Egypt. The department comprises five rooms, with each room accommodating four beds .

Subject:

The study included a purposive sample of 50 children undergoing chemotherapy within 6 months in the previously mentioned setting. The inclusion criteria for selecting the study participants were as follows: Children in the age group of 6-12 years who were undergoing chemotherapy, both gender, and children agreed to participate in the study.

On the other hand, the following exclusion criteria were applied: Children who were clinically unstable and unfit to participate. Children with cognitive impairments that may hinder their ability to comprehend and engage in the study procedures. Children with visual or hearing impairments could potentially affect their experience with virtual reality glasses. Children with craniofacial abnormalities might impede the proper use and fit of virtual reality glasses.

Tools of data collection

There were four tools utilized to collect the required data. Those tools as the following :

Tool I: A structured interviewing questionnaire was developed by the researchers after reviewing related literature. It was written in the Arabic language to suit the study sample. The questionnaire is composed of two parts:

Part 1: Characteristics of the child, such as age, gender, child ranking, and educational level.

Part 2: Medical history of the children. This tool was designed by the researchers after reviewing literature and children's hospital sheets to collect data about each child, including medical diagnosis and clinical manifestations.

Tool II: Pain rating Scale: It included two parts:

Part 1: Use Wong-Baker Faces pain rating scale

This scale was adopted from **Wong, Lau & Campbell (2016)** [(12)] to assess the intensity of pain in children. It consisted of 6 line-drawn faces ranging from "no hurt" to "hurts worst." A scoring system was used to categorize pain into four levels: no pain (score of zero), mild pain (scores 1-2), moderate pain (scores 4-6), and severe pain (scores 8-10.(

Part 2: Behavioral rating scale

This scale was adopted from **Hjermstad etal,(2011)** [(13)] The behavioral rating scale

included four pain behaviors: crying, movement, agitation, and verbalization. Each behavior category was scored from 0 to 2. The total pain score ranged from 0 to 10. Mean scores were calculated for different levels of pain: no pain (score of 0), mild pain (scores 1-3)

Tool III: Beck Anxiety Inventory (BAI) scale: Adapted from **Beck etal, (1988)** [14] **.** It was used to assess Children's anxiety levels during chemotherapy with moderate pain (scores 4-6), and severe pain (scores 7-10). The Beck Anxiety Inventory (BAI) scale was utilized to measure children's anxiety levels with a total score of 60. The mean scores for different levels of anxiety were calculated as follows: not at all (score of 0), mild (score of 1), moderate (score of 2), and severe (score of 3). The total anxiety score was then classified into the following categories:

Scoring system: No anxiety: Scores ranging from 0 to 20, low anxiety: Scores ranging from 20 to 40, moderate anxiety: Scores ranging from 40 to 60, and high anxiety: Scores above 60.

Tool IV Physiological assessment: Adapted from **Walco etal, (2005)** [15] this component involved monitoring vital signs (pulse, and respiration) before, during, and immediately after the intervention of virtual reality glasses during chemotherapy.

Validity and reliability

The validity of the tools was assessed by a jury of three experts: professors of pediatric nursing from the Faculty of Nursing at Benha University and El-Menofia University, and a professor of oncology medicine from the Faculty of Medicine at Benha University. They evaluated the content validity of the tools and judged their clarity, comprehensiveness, relevance, simplicity, and accuracy. All of their remarks were taken into consideration, and some items were rephrased to finalize the tools. The experts deemed the tools to be valid. The reliability for the pain rating scale showed a coefficient alpha of 0.89, and the anxiety scale yielded a coefficient alpha of 0.82 .

Ethical Considerations

The study received approval from the Ethics Committee at the Faculty of Nursing, Mansoura University. The researchers explained the purpose of the study and the anticipated results to all participating children during the initial interview. Oral approval was obtained from parents of children to participate in the study. The children were assured that all information would be kept confidential. Furthermore, they were informed that they could withdraw from the study at any time without needing to provide a reason.

Pilot Study

A pilot study was conducted on 10% of the total study sample, consisting of 5 children. The purpose of the pilot study was to assess the feasibility of the research process and the reliability, clarity, and applicability of the tools. No significant modifications were made to the study tools, which allowed for the inclusion of the study subjects in the final sample. Additionally, the pilot study helped estimate the time required for data collection, which was determined to be approximately 20-30 minutes.

Field of work

To achieve the aim of the current study, the following stages were followed: the pre-intervention stage, during the intervention stage, and the immediately after intervention stage. These stages were accomplished within six months, starting from July 2022 and concluding in December 2022

Stage one: Pre-intervention stage :

At the beginning of the study, the researchers conducted individual interviews with each child, introducing themselves and explaining the purpose and duration of the study. Oral approval was obtained from the parent and child before data collection. The researchers visited the study settings on a rotational basis, twice a week (Sunday and Wednesday) during the morning shift, to collect data using the established data collection tools.

During data collection, the researchers gathered information from the child's medical assessment sheet, including age, gender, diagnosis, disease onset, cancer therapy details, chemotherapy administration route, duration, and chemotherapy side effects. Additionally, the researchers measured the child's physiological parameters (temperature, pulse, and respiration) using a thermometer and a watch (tool I). The average interview duration for each child ranged between 20-25 minutes.

After the initial assessments, the researchers observed each child while they received chemotherapy, using subjective and objective pain rating scales as well as physiological pain measurements (tool II). The average time required for completing these assessments ranged between 15-20 minutes. Furthermore, the researchers evaluated each child's anxiety level using tool III, with an average completion time of 15-20 minutes. This phase of data collection spanned the month of July 2022, starting at the beginning of the month and concluding at the end.

Stage two: Intervention Stage (Implementation): - it included :

-1Prepare the needed equipment: (Virtual reality (VR) 3D glasses).

The researchers prepare the videos and games according to the studied children's needs using the following steps: Preparation and organization of the content videos and games according to children's age and ability. Selecting the videos and games. Using virtual reality glasses methods

Preparation and organization of the content of videos and games: The content of videos and games were prepared and organized under various headings according to aim, objectives, and principles.

Selecting the videos and games: The videos selected by the researchers to the following criteria: Videos and games should meet children's needs and interests. Videos and games should include section breaks. Videos and games should have acceptable technical quality. The length and pace of each video and game are appropriate to children's age and gender. Videos and games manipulating and rearranging create a flow add effects, graphics, and music, alter the style, pace, or mood of the video and games to adjust angle then watch it and take notes. Music, sound, color correction, and effects were added. The prepared videos and games were edited by a video expert.

-3Using virtual reality glasses methods

Methods involving virtual reality glasses are used to minimize pain & anxiety in children during and after chemotherapy. Each child should receive psychological preparation, which involves explaining the effects and importance of virtual reality glasses on their body muscles. Physical preparation includes helping the child assume relaxing positions, such as sitting with their entire back resting against the back of a chair, placing their feet flat on the floor with legs separated, or lying supine with a pillow under their head. Virtual reality glasses (VRE) are connected to a mobile device, and children

use them during chemotherapy administration. The virtual reality glasses intervention, which involves adjusting the lenses to match the interpupillary distance, is fitted with a mobile device and headphones, providing children with an opportunity to listen to and watch VR videos. They are allowed to choose from different videos that were previously reviewed based on their age and preferences. Virtual reality headsets are devices that help reduce pain and anxiety. This phase lasted for three months, from August to October 2022

Virtual reality headset

The researchers considered the use of the Arabic language when explaining the intervention to children in order to enhance their engagement in the study. The total number of children who participated in the study was 45, with 5 of them not being excluded from the pilot study. Therefore, the final study sample consisted of 50 children who agreed to participate. The study group was divided into 9 groups, with each group consisting of 5 to 6 children.

Initially, the researchers explained the objectives of the intervention and the expected outcomes to the children. The researchers visited the Oncology Department at the Specialized Children's Hospital three days a week on a rotational basis (Saturday, Monday, and Thursday) from 9 am to 1 pm. During these visits, when the nurses performed needle punctures for children receiving chemotherapy through IV injections, the researchers assessed the children's pain sensations and anxiety. They used tools II and III to determine objective pain scores.

After using the virtual reality glasses, each child was asked to indicate their level of pain and anxiety during chemotherapy administration by ticking on a numeric pain rating and anxiety scale. Additionally, the researchers monitored and recorded physiological measures such as temperature, pulse, and respiration for each child during chemotherapy administration.

Stage three: Post-intervention stage

During this stage, the researchers conducted a reassessment of pain and anxiety after half an hour of using virtual reality glasses for each child. They used pain and anxiety tools II and III for the assessment, which took approximately 15-20 minutes per child. The post-test tools were similar to the pretest. This phase of the study lasted for two months, from November to December 2022.

Statistical analysis

The collected data were organized, tabulated, and analyzed using the statistical software SPSS version 20. Descriptive statistics were calculated, including the mean and standard deviation for quantitative data, and frequency and distribution for quantitative data. In analytical statistics, inter-group comparisons of categorical data were performed using the chi-square test (X2 value). Additionally, the Pearson correlation coefficient test was used. A p-value of less than 0.05 was considered statistically significant (*), while a p-value greater than 0.05 was considered statistically insignificant. A p-value of less than 0.001 was considered highly significant (**), indicating strong statistical evidence in all analyses.

Results

Table (1): Illustrates that less than two-thirds (60.0%) of the studied children aged 6 to <8 years old, with a mean age of (6.760±.846). Regarding the level of education, less than two-thirds (98.0%) of the studied children had primary

education. Additionally, more than half (54.0%) of them live in rural areas.

Fig (1): Shows that less than two-thirds (64.0%) of the studied children were diagnosed with leukemia, while less than one-fifth (18.0%) were diagnosed with lymphoma.

Fig (2): Explains that more than half (58.0%) of the studied children suffered from weight loss, while less than one-quarter experienced insomnia. Additionally, a change in the skin was found in 4.0% of them.

Table (2): displays the mean scores of physiological measurements for children before, during, and after the application of virtual reality glasses. The results indicate that the mean pulse before, during, and after the application of virtual reality glasses was 112.080 ± 6.043 beats/minute, 81.920 ± 1.998 beats/minute, and 74.440 ± 3.928 beats/minute, respectively. Furthermore, the mean respiration rate for children before, during, and after the virtual reality glasses intervention was 31.880 ± 1.493, 20.640 ± .851, and 20.720 ± .858, respectively.

Table (3): Shows that more than half (56.0%) of the children experienced pain as a side effect of cancer medication. In terms of the behavior of the child during pain, less than half (48.0%) experienced anorexia. Furthermore, less than one-third (38.0%) of the children watched cartoons to reduce the sensation of pain during chemotherapy.

Table (4): Illustrates that there were highly statistically significant differences between the pre and during-virtual reality glasses intervention. The results indicate that in the pre-intervention phase, (68.0%, 80.0%, 74.0%, and 52.0%) of children responded to pain by crying, not responding to tender loving care, being fully bent with finger flexion, and being able to be comforted to reduce agitation, or localizing verbally or by pointing, respectively. However, after the virtual reality glasses intervention, (52.0%, 54.0%, 40.0%, and 60.0%) of children showed no crying, no movement, calmness, and stated no pain, respectively.

Fig (3): Clarifies that more than half (52.0%) of the children experienced severe pain before the intervention. However, after the intervention, less than two-thirds (60.0%) of the children reported no pain .

Table (5): indicates highly statistically significant differences in the anxiety levels of the studied children during the virtual reality glasses intervention compared to the pre-intervention phase (P=<0.001). However, there were no significant differences in the mean scores of the studied children during and immediately after the intervention (P= >0.05 .(

Table (5): Shows that there was a highly statistically significant difference between the studied children regarding anxiety levels during virtual reality glasses compared to pre-virtual reality glasses intervention (P=<0.001). While there were no significant differences in the mean score of the studied children during and immediately after intervention (P>0.05.(

Fig (4): Illustrates that less than two-thirds (60.0%) of the studied children had a high anxiety level before the virtual reality glasses intervention. However, during the virtual reality glasses intervention, less than half (46.0%) had a low anxiety level during the intervention, and more than half (58.0%) of them had a low anxiety level after the intervention.

Table (1): Percentage distribution of children according to their demographic characteristics (n=50).

Demographic characteristics	N.	%
Age in years		
6 <8 years	30	**60.0**
8 <10 years	18	36.0
10-12 years	2	4.0
Mean ±SD 6.760±.846		
Child education		
- Primary school	**49**	98.0
- Secondary school	1	2.0
Child's rank		
- First	11	22.0
- Middle	28	**56.0**
- Last	7	14.0
- Alone child	4	8.0
Residence of children		
- Urban	23	46.0
- Rural	27	**54.0**

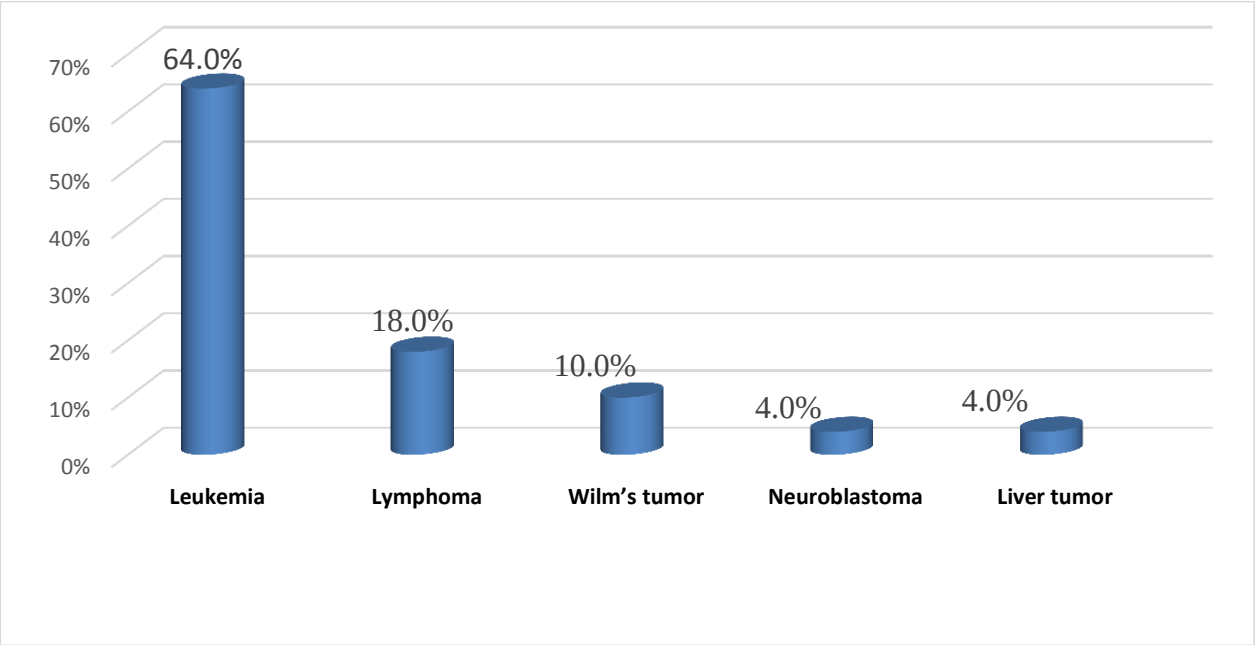

Figure (1): Distribution of children undergoing chemotherapy according to medical diagnosis (n=50).

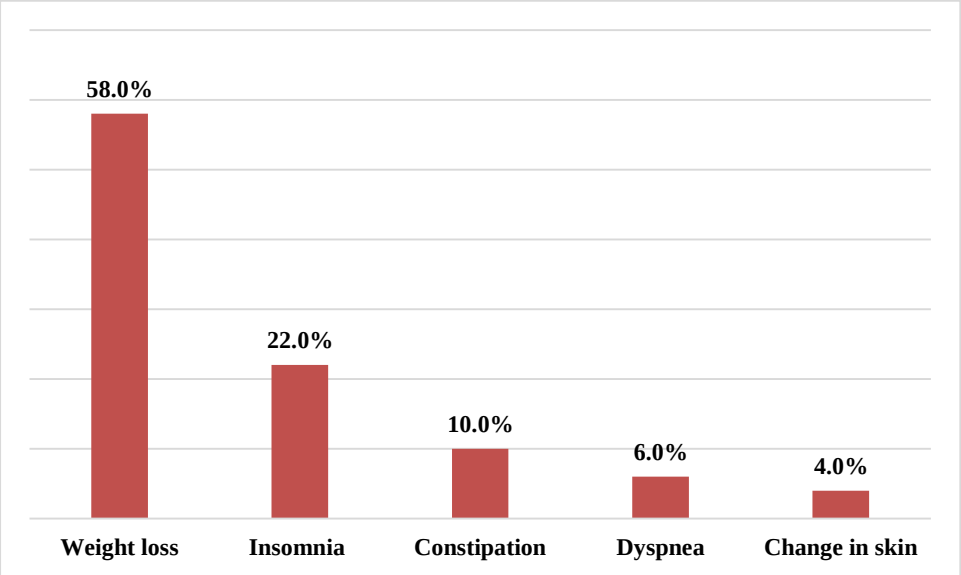

Figure (2): Distribution of children undergoing chemotherapy according to clinical manifestation (n=50).

Table (2): Total means score of children's pulse and respiration pre, during, and after intervention (n=50).

Items	Children's vital signs through three phases of intervention (n=50)			t	p. value
	Pre-intervention	During intervention	Immediately after intervention		
	Mean ± SD	Mean ± SD	Mean ± SD		
Pulse	112.080 ± 6.043	81.920 ± 1.998	74.440 ± 3.928	6.224	<0.01
Respiration	31.880 ±. 1.493	20.640 ± .851	20.720 ± .858	5.999	<0.01

Table (3): Distribution of the children's according to their pain (n=50)

Items	Children (n=50)	
	N.	%
Feeling pain due to		
- Cancer disease	22	44.0
- Adverse reaction from cancer medication	28	**56.0**
The behavior of children during pain		
- Anorexia	24	**48.0**
- Sleep disturbance	12	24.0
- Attachment to a parent	4	8.0
- Unable to make any activity	10	20.0
Action is taken to reduce children's pain sensation during chemotherapy		
Cartoon	17	38.0
Drugs	19	34.0
Mobile	14	28.0

Table (4): Distribution of the children according to their pain assessment using a behavioral rating scale through three stages of intervention (n=50).

Children's Response to Pain	Studied children during three phases of implementation (n=50)									
	Pre-intervention		During intervention		X^2	P value	Immediately after intervention		X^2	P value
	N.	%	N.	%			N.	%		
Crying										
Not crying	7	14.0%	26	52.0	16.83	0.00	27	54.0	1.183	P>0.05
Crying but the response to tender loving care (TLC).	9	18.0%	13	26.0			11	22.0		
Crying and does not respond to TLC	34	68.0%	11	22.0			12	24.0		
Moving of limbs during chemotherapy										
No movement	0	0.0%	25	50.0	19.04	0.00	32	64.0	1.837	P>0.05
Partially bent	10	20.0%	11	22.0			15	30.0		
Fully bent with finger flexion	40	80.0%	14	28.0			3	6.0		
Agitation										
Child calm	0	0.0%	23	46.0	28.35	0.00	30	60.0	2.455	P>0.05
Can be comforted to lessen the agitation (mild).	13	26.0%	14	28.0			13	26.0		
Cannot be comforted.	37	74.0%	13	26.0			7	14.0		
Verbal evaluation or body language										
No pain	0	0.0%	20	40.0	12.90	0.00	30	60.0	2.826	P>0.05
Mild pain (cannot localize)	6	12.0%	15	30.0			9	18.0		
Moderate pain (can localize	18	36.0%	10	20.0			6	12.0		
Severe pain	26	52.0%	5	10.0			5	10.0		

Highly significant (P<0.001) no significant difference (P= >0.05) X^2= chi-square**

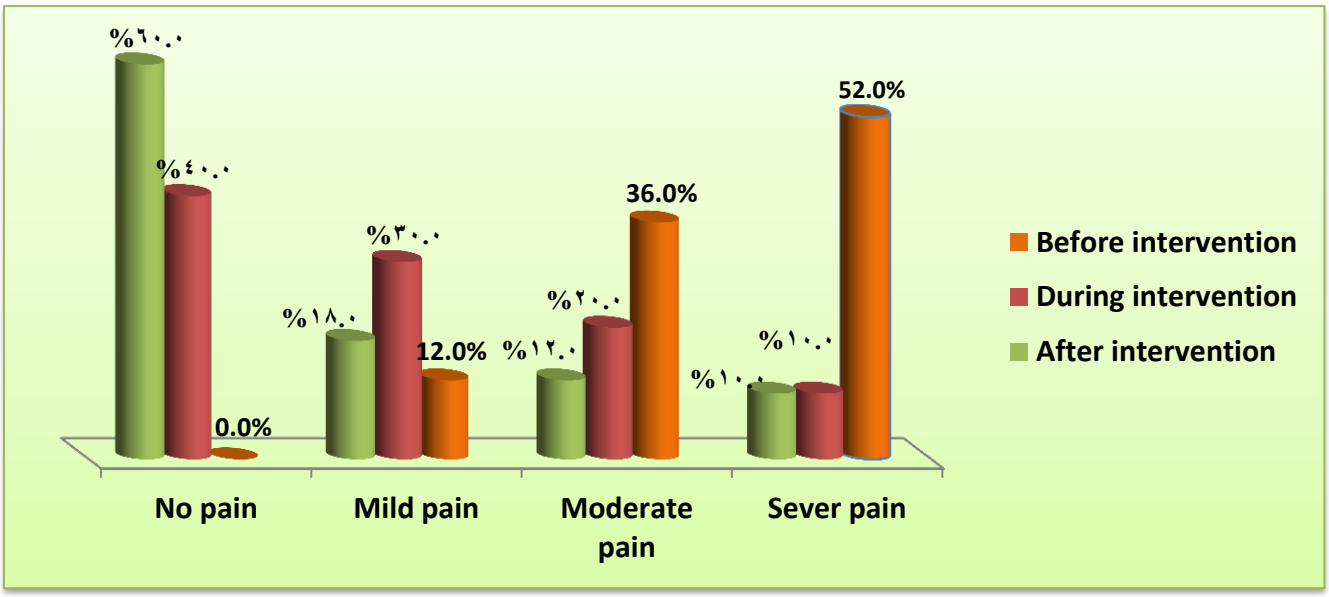

Figure (3): Distribution of the children according to their pain assessment using the Wong-Baker Faces pain rating scale through three stages of intervention (n=50).

Table (5): Mean and standard deviation of the studied children's anxiety undergoing chemotherapy through three stages of virtual reality glasses intervention (n=50).

	Studied children's anxiety during three phases of intervention						
	Pre-intervention	During intervention	t test	P	Immediately after intervention	t test	P
	Mean ± SD	Mean ± SD			Mean ± SD		
Numbness or tingling	2.440±.704	720±.809.1	5.054	0.00**	1.500±.614	1.585	P>0.05
Feeling hot	2.40±.638	1.720±.757	5.116	0.00**	1.620±.725	1.018	P>0.05
Wobbliness in legs	2.40±.699	1.860±.808	5.837	0.00**	1.700±.735	1.471	P>0.05
Unable to relax	2.40±.677	1.720±.833	5.157	0.00**	1.540±.761	1.231	P>0.05
Fear of the worst happening	2.50±.707	1.780±.815	5.563	0.00**	1.620±.725	1.125	P>0.05
Dizzy or lightheaded	2.50±.674	1.860±.808	6.279	0.00**	1.500±.735	0.495	P>0.05

Heart pounding / racing	2.320±.620	700±.788.1	4.732	0.00**	1.400±.670	2.966	P>0.05
Unsteady	2.280±.729	760±.796.1	4.826	0.00**	1.380±.666	2.010	P>0.05
Terrified or afraid	2.300±.614	1.720±.833	4.732	0.00**	1.500±.735	1.485	P>0.05
Nervous	2.400±.638	640±.270.1	4.521	0.00**	1.480±.762	1.798	P>0.05

Highly significant difference (P<0.001) no significant difference (P >0.05) T= Independent t test**

Continue (5): Mean and standard deviation of the studied children's anxiety undergoing chemotherapy at pre, during, and after virtual reality intervention (n=50).

Items	**Studied children anxiety during three stages of intervention**						
	Pre-Intervention	**During intervention**	**Paired t-test**	**P**	**Immediately after intervention**	**T-test**	**P**
	Mean ± SD	**Mean ± SD**			**Mean ± SD**		
Feeling of choking	**2.340±.688**	**1.520±.677**	**4.601**	**0.00****	**1.420±.641**	**1.774**	**P>0.05**
Hands trembling	**2.480±.677**	**1.720±.809**	**4.222**	**0.00****	**1.440±.674**	**2.196**	**P>0.05**
Shaky /unsteady	**2.500±.707**	**1.580±.758**	**3.933**	**0.00****	**1.360±.631**	**1.464**	**P>0.05**
Fear of losin control	**2.320±.620**	**1.580±.784**	**5.634**	**0.00****	**1.440±.760**	**1.009**	**P>0.05**
Difficulty in breathing	**2.280±.729**	**1.560±.704**	**4.482**	**0.00****	**1.380±.635**	**0.747**	**P>0.05**
Fear of dyin	**2.340±.626**	**1.720±.833**	**6.918**	**0.00****	**1.360±.631**	**1.836**	**P>0.05**
Scared	**2.440±.704**	**1.640±.827**	**5.671**	**0.00****	**1.440±.760**	**2.560**	**P>0.05**
Indigestion	**2.480±.677**	**1.520±.677**	**4.586**	**0.00****	**1.380±.635**	**2.190**	**P>0.05**
Face flushed	**2.510±.710**	**1.7200±.833**	**4.683**	**0.00****	**1.440±.760**	**2.088**	**P>0.05**
Hot/cold sweats	**2.400±.638**	**1.780±.815**	**6.038**	**0.00****	**1.380±.635**	**2.400**	**P>0.05**

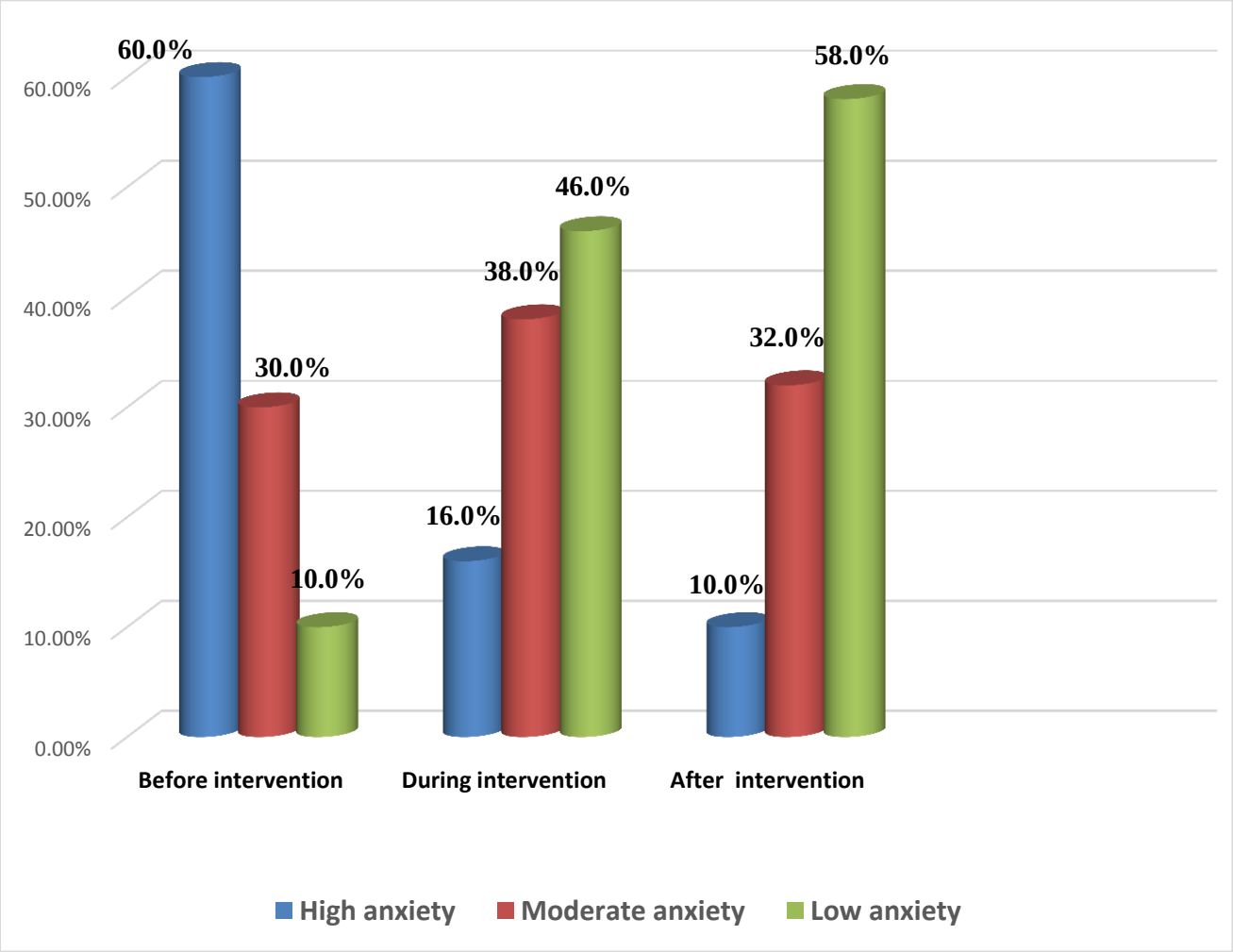

Figure (4): Percentage distribution of total anxiety score among children undergoing chemotherapy through three stages of intervention. (n=50).

Discussion

Cancer and its treatment can have significant emotional and psychological effects on children. Managing chronic cancer pain is a complex process that involves various pharmacological and non-pharmacological approaches. Pain and anxiety can negatively impact the treatment of children with cancer **(Longkuan et al., 2021)** [16]. Thus, this study aimed to evaluate the effect of applying virtual reality glasses on reducing pain and anxiety of children undergoing chemotherapy. Regarding the characteristics of the studied children, the current study revealed that less than two-thirds of the children were between the ages of 6 to <8 years, and slightly less than two-thirds were males. These findings are consistent with the study by **Semerci et al. (2021)** [17]**,** which also found that more than two-thirds of children with cancer were between the ages of 6-10 years, and more than half were males. Additionally, this study aligns with the findings of **Aydin & Ozyazicioglu (2019)** [18], who reported that 80% of children in their study were between the ages of 6 to 10 years. However, this study disagrees with the findings of **Tennant et al.**

(2020) [19]**,** who observed that nearly half of the studied children in both groups were between the ages of 6 to ≤10 years old, and more than half of them were boys.

Regarding the medical diagnosis of the studied children, the findings of the present study highlight that less than two-thirds of them were diagnosed with leukemia. This finding is consistent with **Wong et al. (2020)** [20]**,** who stated that leukemia is considered the most common type of cancer in childhood, Similarly, the study findings align with **Yang & Cho (2019)** [21]**,** who reported that nearly two-thirds of pediatric cancer patients suffer from hematologic malignancies. Additionally, the findings agree with **Fooladi et al. (2019)** [22], who found that more than two-thirds of pediatric patients were affected by acute lymphoblastic leukemia (ALL).

Regarding the clinical manifestations experienced by the studied children receiving chemotherapy, the current study highlights that more than half of them suffered from weight loss, and less than one-quarter experienced insomnia. This finding is in agreement with **Ibrahim et al. (2021)** [25], who reported that weakness/tiredness, fever, and paleness are classic symptoms observed in cases of pediatric cancer. It is also consistent with **Wong et al. (2022)** [26], who found that pain and weight loss were frequently reported manifestations in children undergoing chemotherapy. However, this finding contradicts the findings of **Tanriverdi et al. (2020)** [27], who documented changes in weight in more than two-thirds of cases. On the other hand, it aligns with **Diakatou & Vassilakou (2020)** [28], who found a significant positive correlation between children's self-reported total fatigue score and play activity. Additionally, it corresponds with **Pelangi & Allenidekania (2020)** [29], who found a significant relationship between types of cancer and fatigue. Furthermore, **Sheikh et al. (2021)** [30] stated that children with cancer often experience higher levels of fatigue and sleep disturbances, with insomnia being the most prevalent symptom.

Regarding the mean score of children's pulse and respiration pre, during, and after virtual reality glasses intervention, the current study showed a decline in mean pulse and respiration rates during and immediately after the intervention. This finding is in accordance with **Helmy et al. (2022)** [23], who found that there were declines in mean pulse and respiration rates in the virtual reality group compared to the control group, with statistically significant differences observed before and after the virtual reality intervention. These findings are also supported by **Fralish (2017)** [24], who observed a decrease in mean heart rate after virtual reality glasses intervention. Furthermore, the mean pain intensity after the intervention was significantly lower in the intervention group compared to the control group. These changes in vital signs and pain intensity may be attributed to the fear and anxiety experienced by children during chemotherapy administration.

Regarding the level of pain, the findings of the current study indicate that more than half of the studied children experienced severe pain before the virtual reality intervention, while less than two-thirds of them reported no pain after the intervention. This can be attributed to the effectiveness of the virtual reality distraction experienced during the procedure. These findings are supported by **Hoffman et al. (2020)** [31], who reported that the pain score in the intervention group was lower than the comparison group after the intervention. Additionally, **Gerçeker et al. (2021)** [1], found that the use of virtual reality in the intervention group significantly reduced pain compared to the control group receiving pharmacological intervention alone. **Nordgard & Lag (2021)** [32], also reported significantly lower pain levels during virtual

reality compared to non-virtual reality conditions. Overall, these findings highlight the effectiveness of virtual reality glasses in reducing pain levels.

Regarding anxiety levels, the current study revealed that less than two-thirds of the studied children had severe anxiety levels pre-VR intervention. While less than half of them had low anxiety levels during and after the intervention. These results are in line with **Wong et al. (2022)** [(26)], who found that the use of virtual reality reduced needle-related anxiety compared to the control intervention. Similarly, **Smith et al. (2022)** [(33)], reported reduced levels of pain and anxiety in the active virtual reality group compared to the standard care group, with significant differences observed in pain intensity and distress behaviors. The findings of **Hashimoto et al. (2020)[(34)],** also support these results, as they found significantly lower pain and anxiety scores during procedures in the virtual reality group compared to the control group. These findings suggest that virtual reality glasses have a strong and positive effect on reducing anxiety levels in children.

In conclusion, the use of virtual reality glasses has demonstrated effectiveness in reducing both pain and anxiety levels in children undergoing Chemotherapy. These findings are consistent with previous studies and highlight the potential of virtual reality as a non-pharmacological intervention for managing pain and anxiety in pediatric patients.

Conclusion

Children who received virtual reality glasses exhibited less pain and anxiety compared to children who did not receive them

Recommendation

-Hospitals and healthcare facilities should consider integrating VR technology into their pediatric oncology departments to provide an additional pain and anxiety management tool

-Healthcare professionals, particularly nurses, should receive comprehensive training on the proper utilization of VR technology for pain and anxiety management in pediatric patients.

Evidence-based guidelines and protocols should be developed to ensure the safe and effective use of VR interventions.

-Further research and development should focus on customizing VR experiences to cater to the individual preferences and needs of children undergoing chemotherapy.

-Future studies should investigate the long-term effects of VR interventions on pain and anxiety levels, as well as explore potential psychological and physiological benefits

References

1. Gerçeker G. O., Bektas M., Aydınok Y., Oren, H., Ellidokuz H. & Olgun N. The effect of virtual reality on pain, fear and anxiety during access of a port with huber needle in pediatric hematology-oncology patients: Randomized controlled trial. Eur. Journal Oncology Nurse, 2021; 50, (1). Available on: http://doi 101886.
2. Ahmadpour N., Keep M., Janssen A., Rouf A.S. & Marthick M. Design strategies for virtual reality interventions for managing pain and anxiety in children and adolescents: scoping review. JMIR Serious Games, 2020 ; 8 (5).pp 66-95.
3. Lopez-Rodriguez M. M., Fernández-Millan A. & Fernández-Medina I. M.: New technologies to improve pain, anxiety and depression in children and adolescents with cancer: A systematic review, International Journal of Environmental Research and Public Health, May, 2020; 17(10).pp 3563-3577.

4. Czech O., Wrzeciono A., Rutkowska A., Guzik A., Kiper P., Rutkowski S. & Czech O. Virtual reality interventions for needle-related procedural pain, fear and anxiety-A systematic review and meta-analysis. J Clin Med. 2021; 10(15).Available on :http://doi:3248.
5. Chen Y. J., Cheng S. F., Lee P. C., Lai C. H., Hou I. C. & Chen C. W. Distraction using virtual reality for children during intravenous injections in an emergency department: A randomized trial. J. Clin. Nurs. 2020; 29 (4).p 50-53
6. Loeffen E.A., Knops R.G., Boerhof J., Feijen E.A., Merks J., Reedijk A., Lieverst J.A., Pieter R., Boezene H.M., Kremer L. &Tissing W. Treatment-related mortality in children with cancer: Prevalence and risk factors, European Journal of Cancer, 2019; 121, pp 113-122. Available at, https://doi.org/10.1016/j.ejca.2019.08.008.
7. Ozalp G. G., Ayar D., Özdemir E.Z. & Bektas M. Effects of virtual reality on pain, fear and anxiety during blood draw in children aged 5-12 years old: A randomized controlled study. J Clin Nurs. 2020; 29 (7).pp51-61.
8. Tychsen L. and Foeller P. Effects of immersive virtual reality headset viewing on young children: vasomotor function, postural stability, and motion sickness. American Journal Oncology.2020; 8(2). Available on: http://doi: 151 1002.1026.
9. Goldman R. D. & Behboudi A. Virtual Reality for Intravenous Placement in the Emergency Department-A Randomized Controlled Trial. Eur. J. Pediatr,2020; 18(7).pp15-17
10. Friedrichsdorf S. J. & Goubert L. Pediatric pain treatment and prevention for hospitalized children. J Pediatr Oncol Nurs. 2020; 10(3).pp16-19
11. **World Health Organization,** Childhood cancer, available at, **https://www.who.int/news-room/fact-2021;sheets/detail/cancer-in-children.**
12. Wong C., Lau E. & Campbell F. Pain management in children, Part 1 , Pain assessment tools and a brief review of non pharmacological and pharmacological treatment options, springer, 2016;Pp1159-1160
13. Hjermstad M.J., Fayers P.M., Haugen D.F. , Caraceni A, Geoffrey W.H , Loge J.H., Fainsinger R, Aass N.& Stein Kaasa S. Studies comparing numerical rating scales,verbal rating scales, and visual analogue scales for assessment of pain intensity in adults. Journal of Pain and Symptom Management. 2011; 41(6). pp 73-75
14. Beck A.T., Epstein N., Brown G. & Steer R.A. An inventory for measuring clinical anxiety:Psychometric properties. Journal of Consulting and Clinical Psychology. 1988; 56(8).
15. Walco G.A., P Conte A. M., Labay L. E ., Engel R. and Zeltzer L. KProcedural distress in children with cancer: self-report, behavioral observations, and physiological parameters. 2005; *Clinical*

Journal Pain, 21(6),48-50. http:// doi: 10.1097/01.ajp.0000146166.15529.8b.

16. Longkuan R., Nan Z., Lin F., Pinping Z., Chao Z. & Cong Y. Application of virtual reality on non-drug behavioral management of short-term dental procedure in children. J. Clin. Nurs. 2021; 8(2). pp52-54
17. Semerci R., Akgün Kostak, M., Eren T., Avci G. & Semerci E. Effects of Virtual reality on pain during venous port access in pediatric oncology patients: A randomized controlled study. J Pediatr Oncol Nurs. 2021; 38(2).pp14-17
18. Aydin A. I. & Ozyazicioglu N. Using a virtual reality headset to decrease pain felt during a venipuncture procedure in children, J. Perianesthesia Nurs. 2019; 34 (6).pp1215–1221.
19. Tennant M., Youssef G., McGillivray J., Clark T., McMillan L. & McCarthy M. Exploring the use of Immersive Virtual Reality to enhance psychological wellbeing in pediatric oncology: A pilot randomized controlled trial .European Journal of Oncology Nursing. 2020; 15 (9).Available on: http://doi 13:101804.
20. Wong C. L., Li C. K., Chan C. H., Choi K. C., Chen J. & Yeung M. T. Virtual reality intervention targeting pain and anxiety among pediatric cancer patients undergoing peripheral intravenous cannulation. J Pediatr Oncol Nurs. 2020; 7(4). Available on: http://doi 10.5: 1080.1097
21. Yang H. & Choi H. A prospective study on changes in body composition and fat percentage during the first year of cancer treatment in children. Nutrition Research Practice. 2019; 13(3).Available on: http: doi: 10.4162 /nrp. 2019,1 3.3.214.
22. Fooladi S., Ghaljaei F., Keikhaei A. & Aliabad G. Effect of distraction therapy on physiological indices and pain intensity caused by intra-spinal injection of chemotherapy drugs in cancerous children: A clinical trial. Medical - Surgical Nursing Journal. 2019; 8(1).Available at: http: doi: 10.5812/msnj.90409.
23. Helmy A. A., Mansour H. E., Ahmed M.M. & Abd- El aziz E. Effect of virtual reality technology on sleeping pattern and its effect on physiological parameters among critical ill children. Egyptian Journal of Health Care. 2022; 13 (2).
24. Fralish B. Improved physiology and psychosocial well-being for children with physical disabilities through virtual reality immersion. Master Thesis. University of Central Florida. 2017; Available on: doi: 10. 90/children4040022
25. Ibrahim F. E. Elsayed N. A. M. & Zayed H. H. A survey on the effectiveness of virtual reality-based therapy and pain management,international Journal of Advanced Computer Science and Applications (IJACSA). 2021; 12(7).Available on: http: www.ijacsa.thesai.org.

26. Wong Y., Guo L., Xiong X. & Wang Y. Effects of virtual reality-based distraction of pain, fear and anxiety during needle-related procedures in children and adolescents. J Front Psychol.2022; 19(8).pp13-15
27. Tanrıverdia M., Vuralb M. & Çakır F. The effects of treatment on nutrition in children with cancer. Experience Clinical Medical Journal. 2020; 37(3).Available on: http: doi:10.5835/jecm.omu.
28. Diakatou V. & Vassilakou T. Nutritional status of pediatric cancer patients at diagnosis and correlations with treatment, clinical outcome and the long-term growth and health of survivors. Children. 2020; *7*(11).Available at: https://doi.org/10.3390/children7110218.
29. Pelangi J. & Allenidekania A. Relationship between depression and fatigue in children with cancer undergoing chemotherapy. Enfermería Clínica. 2020; 31(2).Available on: https://doi.org/10.1016/j.enfcli.2020.12.027
30. Sheikh I. M., Roth M. & Stavinoha P. L Prevalence of sleep disturbances in pediatric cancer patients and their diagnosis and management. Children (Basel), 2021; 8(12).Available on: http: doi: 10.3390/children8121100.
31. Hoffman H. G., Vagnoli L., Patterson D. R. Alhalabi, W. & Messeri, A. venipuncture in pediatric patients with oncology-hematological diseases. Front. Psychol. 2020; Vol 20(6). Available on: https: //doi.org/10.33 89/ fpsyg.2020.02508
32. Nordgard R & Lag T. The effects of virtual reality on procedural pain and anxiety in pediatrics: A systematic review and meta-analysis. Systematic Review Article. 2021; 7(3). Available at: https:// doi.org /10.3 389/ frvir. 2021.699383.
33. Smith K. L., Wang Y. & Colloca L. Impact of virtual reality technology on pain and anxiety in pediatric burn patients: A systematic review and meta-analysis. Front Virtual Reality. 2022; 6(2). Available on: https:// doi.org/ 10.3389 / frvir. 2022.751735
34. Hashimoto Y., Chaki T., Hirata N., Tokinaga Y., Yoshikawa Y. & Yamakage M. Video glasses reduce preoperative anxiety compared with portable multimedia player in children: A randomized controlled trial. J. Perianesthesia Nurs. 2020; 35 (3) pp 321–325.

Effect of Educational Program on Knowledge and Attitude of Female Students' Regarding Oocyte Cryopreservation

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Abstract :Background: Cryopreservation of human ovarian tissue has been widely used all over the world to protect fertility, not only for women undergoing chemotherapy, but also for women who wish to delay pregnancy for a certain period in order to preserve fertility. **Aim of the study** was to find out the effect of an educational program on knowledge and attitude of female students' regarding oocyte cryopreservation. **Research Design:** quasi-experimental research design was used in this study. **Setting:** This study was conducted at faculties of art and education, Zagazig University, Egypt. **Sample:** purposive sample composed of 115 of postgraduate female students. **Results**: After implantation of an educational program 97.2% of study subject shows highly satisfactory score of total knowledge compared to 12.3% in pre-intervention phase. As well as 92.3% of study subject reported positive attitude in posttest compared to 25.3% in pretest. **Conclusion:** The educational progam was effective on increase knowledge and change attitude of post graduated female students regarding oocyte cryopreservation. **Recommendation:** More efforts needed by the health care system, to increase the youth knowledge about ways to preserve their fertility especially unmarried girls

Keywords: post graduate female, Knowledge, Attitude, oocyte cryopreservation

Introduction

Over the past thirty years, a progressive social trend has been observed towards delaying childbearing among women. This is due to many reasons, including those related to lifestyle and societal changes, such as improving educational and professional opportunities for women, family care obligations, economic difficulties, and the need for more financial security. As a results of these delaying women's may find themselves affected by age-related infertility when they decide to become pregnant, and fertility preservation techniques can be suggested to them as a solution [(1)] .Furthermore, the fact that female fertility gradually decreases with age has been recognized by several demographic and epidemiological studies that have shown a decline in fertility since the mid-third decade[(2)] .

Fertility preservation is an important issue for young people at risk of becoming infertile due to clinical conditions, illnesses, or medications. Egg freezing as a personal choice, also called social egg freezing, is defined as oocyte cryopreservation (OC) for potential future use by women who are choosing to delay childbearing for personal causes, such as career pursuits, progress in education, lack of a partner or financial stability[(3)] .

The OC is one of the methods used to preserve fertility for an extended period of time after the normal time of pregnancy, where the eggs are collected using assisted reproductive technology ART then

Cryopreserved by verification and put into storage until a later time when it can be used to create embryos through in vitro fertilization (IVF) [4].

As for the safety of OC a preliminary data assuring with good evidence that fertilization and pregnancy rates are similar to those achieved with fresh oocytes or with frozen eggs and no increase in chromosomal abnormalities' , birth defect or development deficits have been noticed in the children born from frozen eggs [5].

Cryopreservation is used to preserve the fertility of females if they are going to undergo ovarian chemotherapy or some surgeries. Also, to reduce the risk of ovarian hyper stimulation syndrome and some women resort to preserve their fertility if they have a genetic predisposition to early menopause (which referred to medical indications) [6] . However, more recently non-medical indications of OC have become an option for women who had social reasons that require postponing pregnancy for a certain period. The Oocyte freezing allows women to consider pregnancies later as it halts the aging of egg [7].

The Ethics Committee of the American Society for Reproductive Medicine (2018) concluded that elective OC is an ethically permissible medical therapy, with the sole purpose to preserve reproductive potential of healthy women. On other hand , Islamic authorities in Egypt permit the procedure where the Egyptian's Dar Al-Ifta issued fatwa declaring the OC among single women is permissible if carried out under four conditions including: prevention of any damage to the eggs which might pose a risk to future offspring, safe control over the frozen eggs to prevent intentional and unintentional mixing with other frozen eggs, no donation of frozen eggs to other women and fertilization of the frozen eggs with a husband's sperm during the course of married with no use of frozen eggs or fertilized embryos following divorce or death of the husband [8].

Oocyte cryopreservation process takes almost 4 to 6 weeks for a single retrieval. The procedure of egg retrieval includes "2-4 weeks of self-administered hormone injections and birth control pills to temporarily turn off natural hormones" and "10-14 days of hormone injections to motivate the ovaries and ripen numerous eggs." [9] . For preserving virginity and intact hymen until marriage oocyte retrievals would be done trans-anally or by the use of laparoscope rather than through-vagina[10] . The success of oocyte freezing technology depending on several factors as costs, culture, attitudes, beliefs and increasing age of the woman when the eggs were frozen where the highest success rates are for women aged below 35 years old [11].

In spite of the availability of successful collection and oocyte freezing, it remains vague to what extent females are aware of the availability of this technique, their attitudes towards its use, or the conditions under which this technique may be considered [12] .

Postgraduate students are at a stage in their lives where they consider their future and career goals. Given the currently increased visibility and feasibility of oocyte cryopreservation technology, these students are increasingly faced with OC as an option that may influence their life and career decisions [13] . On other hand , the deficiency of knowledge or uncertain expectations regarding oocyte

cryopreservation among post graduate students have a negative effect on poor uptake in oocyte preservation among them. So they should be provided with the required knowledge regarding fertility preservation, and explore their attitude regarding it [14].

With the existence of such a phenomenon, the nurse midwife is the key member and have in important role in education and increasing awareness regarding the latest technology that have a role in preserving fertility, as well as increasing the chances of pregnancy after the age of thirty. Lately, findings from previous studies revealed that from the physicians' viewpoint, it is the nursing responsibility to discuss about fertility preservation options [15].

Significant of the study:

Throughout the world, the age at which women become first-time mothers has increased over the past several decades because of the increased role of women in social and economic participation. An increasing number of women in developed countries are postponing childbirth, despite well-documented evidence of a decrease in fertility with increasing age. In report of **The Central Agency for Public Mobilization and Statistics, 2020** [16], in Egypt revealed that the average age of marriage among males reached 30.4 years, compared to 24.7 years among females nationwide during 2020. Although there are many factors that affect the level of fertility among women, including delay age of marriage, there is little attention to level of female's awareness of the effects of ovarian aging on fertility and reproductive planning, as well as the medical options available and knowledge of the various aspects of social egg freezing [17]. To provide competent counseling, it is important to identify females' knowledge level, as well as attitude that influence their decision-making regarding fertility preservation, especially in unmarried and childless women. Therefore, it is important to inform about fertility preservation at early age.so the current study conducted to find out effect of educational intervention program on postgraduate nonmedical female students' knowledge and attitude regarding oocyte cryopreservation

Aim of the study:

This study aimed to find out the effect of an educational program on knowledge and attitude of female students' regarding oocyte cryopreservation.

Research hypothesis:

After implementation of an educational program regarding oocyte cryopreservation the female students' knowledge and attitude will expect to be improved.

Subjects and method:

Research Design: quasi-experimental research design with pre\posttest for one group was used in this study. Quasi-experimental research designs examine the cause-and-effect relationship between two variables (the independent and dependent variable). The independent variable (educational program) is the variable of influence and the dependent variable (knowledge and attitude of non-medical female students)' is the variable that is being influenced. The independent variable is expected to bring about some variation or change in the dependent variable **(18).**

Setting: This study was conducted at two non-medical faculties (faculty of education and faculty of Art) at Zagazig University. Zagazig University is one of the largest governmental universities in Egypt, its

establishment in 1974 and enrolled in 24 academic colleges and institutions. A list of nonmedical faculties at Zagazig University was prepared by the researchers and two faculties were chosen randomly (simple random sample) from the list of 15 faculties, these were namely (faculty of education and faculty of art).

Sampling technique: A purposive sampling technique was used to recruit students' according to the inclusion until the sample size was fulfilled.

Inclusion criteria:

- Age ≥ 25 - 40 years
- Postgraduate non-medical students
- Unmarried students

Sample Size: The total number of postgraduate female students at faculty of education and faculty of Art Zagazig University who engaged in diploma, master and PHD program for the academic year 2022/2023was estimated.

Based on the following formula:

$x = Z(c /100) 2 r(100-r)$ $n = N x/((N-1)E 2 + x)$

$E = Sqrt [(N - n)x /n(N-1)]$

Where N is the population size, r is the fraction of responses that you are interested in, and Z(c/100) is the critical value for the confidence level c. The sample was carefully chosen based on their agreement to participate in the study.

Sample: According to the previous formula 142 female postgraduates' students were calculated to be involved in the study only 115 accepted to participate and complete posttest of the study

Tool of the study: Self-administered questionnaire was designed by the researchers written in Arabic language to avoid unobvious wards regarding oocyte cryopreservation, it involved two tools.

Tool I: This tool was composed of two parts:

Part one: included demographic characteristics' of post graduated female students' as (age, residence, employment condition and economic level).

Part two: This part was concerning with students' previous knowledge regarding oocyte cryopreservation and their source of this knowledge. It involved 6 close ended questions. As well as students' knowledge assessment regarding oocyte cryopreservation was used in pre and posttest. The construction of this part was designed by the researchers after checking, reviewing the related and previous literature [1, 18 & 19]. It included 16 multiple choice questions which were divided into four categories. The first-category was coverage the general concept of cryopreservation which includes 6 items as (definition, indications, total duration, success rate and factors effect on success rate for oocyte-cryopreservation and the availability of special bank for oocyte cryopreservation in Egypt). The second section was discussed the preparation and steps of cryopreservation. Signs and the risk of oocyte cryopreservation were presented in the third category. The fourth section was containing 2 items for religion opinion in Egypt about this procedure.

Knowledge scoring system:

The response of each question was scored as 1 for a correct answer and zero for incorrect answer or does not know. The range of total scores was 0-16 points; the higher scores reflect a higher level of knowledge. The total knowledge score was graded as the following: knowledge was considered satisfactory if the percent score

was<60% and considered unsatisfactory if the percent score was ≥60%.

Tool II: **Likert scale** (Students' attitudes regarding oocyte cryopreservation):

It was an Arabic self-administered questionnaire developed by the researchers after reviewing related literature and guided by **[1&20].** This tool used in pre and posttest and included14 sentences to assess post graduated female students' attitudes by using a 2 point Likert scale(disagree or agree),

Attitude scoring system:- Each statement was scored 1 for disagree answer and 2 for agree answer. The total attitudes scores ranged from 1 to 28, attitude was considered to be positive if the percent score was 70 % or more and if less than 70% is consider negative attitude.

Tools Validity and reliability: Once prepared in its initial form the tools and educational intervention were presented and reviewed by a panel of three experts' professors in the field of obstetrics and gynecological nursing who revised the tools for clarity, relevance, and comprehensiveness. Minor modifications were applied accordingly. To assess reliability of tool used in the study Alpha Cronbach was conducted to evaluate the steadiness of the instruments' internal consistency; it was 0.790 for knowledge questionnaire and 0.89 for the attitudes. The coefficient suggesting the items have average internal consistency and appears to be acceptable.

Ethical consideration:- The Zagazig University nursing faculty's Scientific Research Ethical Committee officially approved the study before it got started. All ethical considerations were taken into account at every stage of the investigation, and the subjects' confidentiality and anonymity were upheld. The researchers introduced themselves and briefly described the study's purpose and nature before each student provided their consent to participate. After student agreement they informed that the data collected was only used for the purpose of research and they have right to discontinue at any time.

Pilot study: On 10 %(12) of the study sample the Pilot study was conducted to assess the applicability and clarity of the instruments, evaluate the feasibility of fieldwork, and identify any potential difficulties that the investigator could encounter and impede the collection of data. Important improvements have been made based on the findings of the pilot study, such as (removing certain questions and adding others) to endorse their content or for clearer and more specific purposes. The participants in pilot study were excluded from the studied sample.

Administrative design: An official permission was obtained using proper channels of communication. This was done through letters addressed from the Dean of the Faculty of Nursing, Zagazig University explaining aim and procedures of the study and asking for cooperation to the study setting's responsible authorities for obtaining their data collection permit.

Field work: Once the approval was granted to progress in the study, the researchers started to organize a schedule for collecting the data. The data was carried out from the first of October to the end of December 2022 over a period of three months. To accomplish the aim of the study the researchers had followed the following three phases:

1. Assessment phase (pre-test)

The researchers conducting the first meeting with each student in the postgraduate programs (diploma, master and PHD) according heir schedule of attendance and free time and explained the nature and aim of the study, its duration, and how to fill out the questionnaire. As well as, they informed that their participation is optional and they had the right to withdraw from the study at any time. An informed consent to participate in the study was obtained from the students and after that each student received pre-test self-administered questionnaire to fill the data concerning to demographic characteristics and evaluate data regarding knowledge and attitude towards oocyte-cryopreservation. The filling of the questionnaire was took an average of thirty minutes.

2. Implementation phase

After evaluating the students' knowledge and attitude toward oocyte cryopreservation by pretest questions tools. The educational sessions were conducted to implement the educational program which focused on information regarding cryopreservation as definition, indication ,total duration , success rate ,factors affect success rate, preparation , steps of preparation and religious believes . Three planned sessions were provided in Arabic language to each postgraduate program. The researchers visited the pre-mentioned setting three times /week for 8 weeks for conducting the sessions. The students in each postgraduate program were divided into sub groups and the total number of all small groups was (nine groups), each group contains 10-15students. This distribution was done in accordance with the students' availability and readiness to make it easier for them to attend the sessions. Each session consumed 30-45 minute divided for PowerPoint presentation and for open discussion .At the beginning of each session a feedback was attained to ensure students understanding. The educational training methods were lectures, group discussions and brain storming. The sessions were aided by using videos and pictures to facilitate and illustrate teaching.

3. Evaluation phase (post-test):

In order to the influence of the educational sessions on improving knowledge and attitudes of students towards oocyte cryopreservation, the post-test was administrated after two weeks of implementation of the educational intervention. The same tools used in the pre-test were re-used

Statistical design: The statistical analysis of data was done by using the computer software of Microsoft Excel Program and Statistical Package for Social Science (SPSS) version 22. Data were presented using descriptive statistics in the form of frequencies and percentage for categorical data, the arithmetic mean (X) and standard deviation (SD) for quantitative data. Qualitative variables were compared using chi square test (X) 2, P-value to test association between two variables and R-test to the correlation between the study variables.

Degrees of significance of results were considered as follows:

- P-value > 0.05 Not significant (NS)
- P-value ≤ 0.05 Significant (S)
- P-value ≤ 0.01 Highly Significant (HS).

Results

Table 1: reveals the demographic data of postgraduates females and reports that 60 %

have an age ranged between 25 -<30 years with a mean ± SD of 25.53±4.95.As for the residence and occupation, it was obvious that 61.7 %& 56.6% respectively of the participants were lives in Urban areas and not working. Also, 51.4% of study subjects were had a moderate level of socio-economic level.

Figure (1): demonstrates the sources of information about oocyte cryopreservation for the study subjects, it was found that the main sources were TV and internet (31.3% & 30.8% respectively).

Table(2) shows the correct knowledge of postgraduate unmarried females regarding oocyte-cryopreservation through-out the intervention phases of the study, and clarifies that there is a highly statistically significant difference between pre and post intervention phases regarding the all items of oocyte-cryopreservation. Figure 2 illustrate that only 2.8% of studied student's had satisfactory level of knowledge about the oocyte-cryopreservation at pre intervention and this percentage was changed to 97.2% at post intervention with statistically highly significant (p<0.001).

Table (3) reflects attitude of studied subjects regarding OC, and illustrates that there was marked increase in study subjects' agreements in all items of attitude after implementation of educational intervention than pre intervention.

Figure (2) illustrate that only 2.8% of studied student's had satisfactory level of knowledge about the oocyte-cryopreservation at pre intervention and this percentage was changed to 97.2% at post intervention with statistically highly significant (p<0.001).

Figure (3): displays that total attitude score about oocyte-cryopreservation improved from 25.6% positive in pretest compared to 90.3% in posttest.

Table (4): represents that, there is marked increase mean scores of study subject's knowledge towards oocyte-cryopreservation and their demographic characteristics. As age group 25-<30 and rural residence subjects shows significant improve in their score 14.01±1.17&14.1±1.17 in posttest respectively. As regards occupation working subjects shows 12.1±1.17. And moderate socio-economic level shows 14.1±1.15 in posttest.

Table(5) indicates there was a statistically significant correlation between total knowledge and total attitude score among the study subjects throughout intervention phase. As with increase in total knowledge of the study subjects 14.27±1.75 there was improve in their attitude score 8.97±1.77 in posttest scor

Table (1):-Demographic characteristics of the study subjects (n=115)

Items	No	%
Age		
25- <30	69	60.0
30-<35	35	30.5
>35	11	9.5
Mean ± SD of 25.53±4.95		
Residence		
Urban	71	61.7
Rural	44	38.3
Occupation		
Working	50	43.4
Not working	65	56.6
Socio-economic level		
Low	36	31.3
Moderate	59	51.4
High	20	17.3

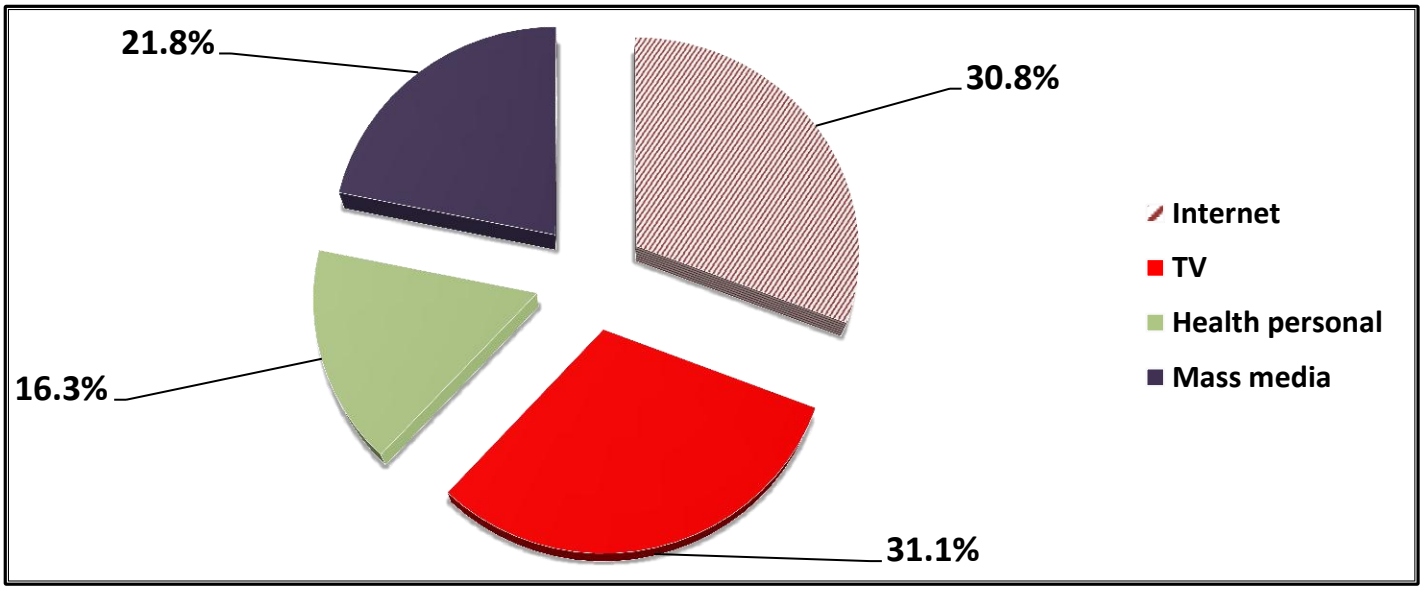

Figure (1): Distribution of study subjects according to source of knowledge about oocyte-cryopreservation (n=20)

Table (2): Distribution of study subjects regarding their correct knowledge about oocyte-cryopreservation throughout the intervention phases (n=115)

Items of knowledge	Intervention phases				X^2 test	p-value
	Pre		Post			
	No.	%	No.	%		
General concept regarding oocyte cryopreservation :						
• Definition	**17**	**14.7**	**100**	**86.9**	159.74	0.000**
• Indication	15	13.0	105	91.3		
• Total duration	20	17.3	110	95.6		
• Success rate	30	26.0	109	94.7		
• Factors affect success	25	21.7	98	85.2		
Preparation of cases	8	9.6	103	89.5	162.5	0.000**
Steps of preparation	3	2.6	99	86.0	163.8	0.000**
Signs and risk of oocyte cryopreservation	4	3.4	95	82.6	157.43	0.000**
Religious opinion toward cryopreservation	6	5.2	110	95.6	160.67	0.000**

** = statistical highly significant

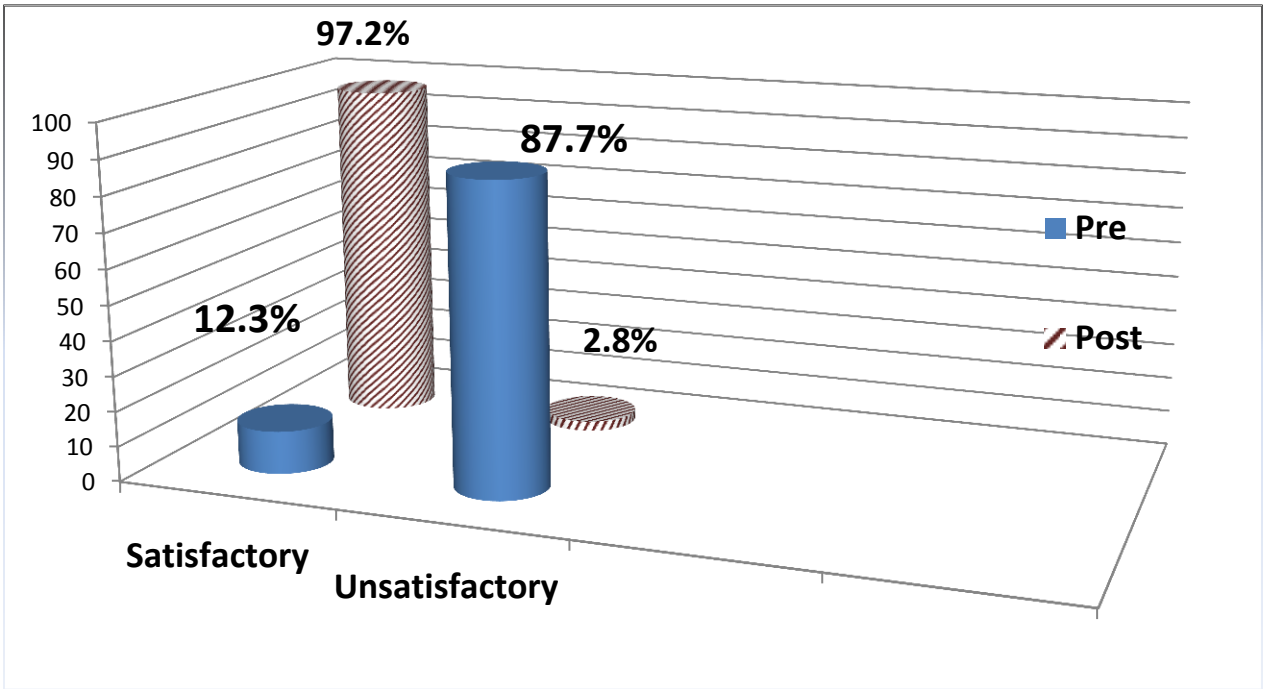

Figure (2): Total Score of study subjects knowledge regarding oocyte-cryopreservation throughout Study Phases (n= 50).

Table (3): Distribution of study subjects regarding their attitude toward oocyte-cryopreservation throughout the intervention (N=115)

Items		Pre		Post	
		N	%	N	%
Oocyte-cryopreservation may be a possible option for unmarried girls	Agree	98	85.2	115	100
	Disagree	17	14.8	0	0.0
Oocyte-cryopreservation is dangerous because of its complicates	Agree	28	24.3	100	86.9
	Disagree	87	75.7	15	13.1
Oocyte-cryopreservation should be encouraged	Agree	62	53.9	105	91.3
	Disagree	53	46.1	10	8.7
Worried about missed used of oocyte-cryopreservation	Agree	30	26.0	90	78.2
	Disagree	85	73.9	25	21.8
Worried about bad storage of oocyte	Agree	28	24.3	100	86.9
	Disagree	87	75.7	15	13.1
Worried of long-time storage of oocyte	Agree	98	85.2	115	100
	Disagree	17	14.8	0	0.0
Would consider oocyte-cryopreservation for medical reasons only	Agree	105	91.3	10	8.7
	Disagree	10	8.7	105	91.3
Infection control precautions must be used during oocyte-cryopreservation	Agree	62	53.9	115	100
	Disagree	53	46.1	10	0.0
Would consider oocyte-cryopreservation for social and career reasons	Agree	35	30.4	85	73.9
	Disagree	80	69.6	30	26.1

Oocyte-cryopreservation should be followed up	**Agree**	**51**	**44.3**	**82**	**71.3**
	Disagree	**64**	**55.7**	**33**	**29.7**
Oocyte-cryopreservation applicable in Egypt	**Agree**	**105**	**91.3**	**82**	**71.3**
	Disagree	**10**	**8.7**	**33**	**29.7**
Oocyte banks should be accredited and standards	**Agree**	**43**	**37.3**	**95**	**82.6**
	Disagree	**72**	**63.7**	**20**	**17.4**
It is very expensive and therefore cannot be feasible to anyone	**Agree**	**35**	**30.4**	**82**	**71.3**
	Disagree	**80**	**69.6**	**33**	**29.7**
Would consider oocyte-cryopreservation if it's cost is suitable for me	**Agree**	**50**	**43.4**	**78**	**67.8**
	Disagree	**65**	**56.6**	**37**	**32.2**

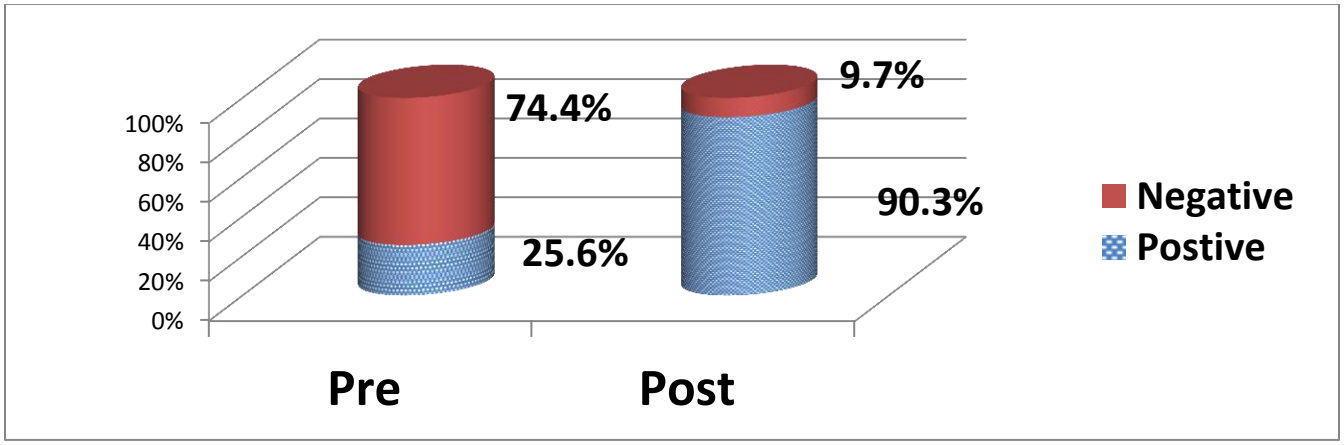

Figure (3): Distribution of study subjects according to total attitude score about oocyte-cryopreservation throughout intervention phases

Table (4): relation between the mean scores of study subject's knowledge towards oocyte-cryopreservation and their demographic characteristics.

Items	Pre-test	Post test
Age		
25- <30	2.23±1.12	14.01±1.17
30-<35	2.32±1.12	12.01±1.16
>35	2.13±1.12	13.01±1.17
Residence		
Urban	2.22±1.12	13.1±1.17
Rural	2.03±1.12	14.1±1.17
Occupation		
Working	3.22±1.12	12.1±1.17
Not working	3.03±1.12	13.1±1.15
Socio-economic level		

Low	2.23±1.12	12.1±1.17
Moderate	2.32±1.12	14.1±1.15
High	2.13±1.12	13.1±1.17

Table 5: Correlation matrix between total knowledge and total attitude score among the study subjects throughout intervention phase.

	Pre	**Post**	**T**	**P**
Total knowledge score	**3.99±1.66**	**14.27±1.75**	**0.566**	**0.034**
Total attitude score	**3.17±0.62**	**8.97±1.77**	**11.114**	**0.00****
P	**0.00****	**0.01***		

Discussion

Fertility maintenance is an important issue for all workers using reproductive technologies, and it is the responsibility of maternity nurses to maintain older girls' knowledge and attitudes in this regard. As the field continues to evolve, dilemmas related to fertility treatments and ethical considerations should be explored [(21)] . Awareness of elective egg freezing varies widely, even among medical and non-medical professionals, and caregivers play an important role in educating and advising others about fertility. Therefore, it is necessary to raise the awareness of "self-first, then others" among non-medical students.

Judging from the demographic characteristics of female graduate students, more than half of female graduate students are between 25 and 30 years old, live in urban areas, have no jobs, and are in the middle socioeconomic level. These are representative of the characteristics of graduate students in Egypt, as reported in a similar study by **Fahmy S., Mohamed M. (2021)**[(22)] where individual data for undergraduate nursing students in this bridging program reported a mean age of 25.23 ± 4 years, 25 years old, lives in the countryside. Less than half of them work in university hospitals. Specialization in the same age group, but differences in residence and work status lead to geographical differences and differences in the mandatory employment of all nursing students after graduation.

Regarding the subjects' sources of information regarding oocyte preservation, this study found that one-third of the participants obtained information from television and the Internet. It is not surprising to find such a result, as the target group of the current study justifies the age of young people they are interested in through social media and the internet, which are always readily accessible and provide them with a wealth of information. Information provided in different fields. This result is similar to the study by **Fotopoulou et al., (2015)**[(23)] who found the internet, magazines and/or television to be the main sources of information. On the other hand, earlier results contradict those of **Will et al.,**

(2017) [24] who mentioned formal education as the most common source, followed by social media and friends and **Tozzo et al., (2019)** [1] found that more than a third of participants had heard of oocyte cryopreservation through their family, friends, media and school or university

According to the results of the current study, the knowledge score of postgraduate females regarding ovum cryopreservation was significantly higher post-intervention compared to pre-intervention, when the majority of them had given accurate answers regarding the general concept, preparation, risks, and religious beliefs. These results were in line with those of **Hong et al., (2019)** [25] who examined the level of awareness and knowledge on elective oocyte cryopreservation among reproductive unmarried women in Korea. They found that the majority of the women who participated in the study had the correct response for EF.

Concerning total knowledge score of study subjects regarding oocyte-cryopreservation, the majority of the study subjects show satisfactory score of total knowledge after implantation of study intervention compared to pre-intervention. This may return to clarity and simple way used in explanation of the educational material used in the study. The implementation of educational intervention has proven to meet their needs in enhancing their knowledge and improving their attitudes which led to acceptance of the research hypothesis.

Similar results were discovered by **Rafiei N., Zanjani SE., and Khodamoradi (2020)** [15] in their quasi-experimental study the impact of educational package on nursing Students' knowledge towards fertility preservation. After receiving the teaching materials, all of the participants showed increased change awareness towards fertility preservation when they answered questions correctly. These alterations show that the instructional programme had a greater influence on these inquiries. In the same line**, Abdelwahab and Samy (2017)** [26] in Egypt conducted a study to determine the challenges that oocyte cryopreservation in the Middle East faces and showed that the majority of the investigated sample cited lack of knowledge about the intervention's efficacy, and excess or expense..

Alternatively, in a study by **Fahmy S. and Mohamed M. (2021)** [22] to assess knowledge, attitude, and barriers of unmarried female bridging program nurses regarding egg frozen at South Valley University, they found that 60% of the students' knowledge of EF was insufficient. This may indicate that the study subjects in the two studies were different because nursing students may have more knowledge from their study than non-nursing or non-medical students.

As regards attitude of the study subjects regarding oocyte cryopreservation the present study results shows that there was marked increase in study subjects total score of attitude in posttest after implantation of educational intervention. Total attitude score about oocyte-cryopreservation improved from one quarter positive in pretest to majority of them in posttest. Similar research was done in Egypt by **Hasab Allah MF, Abdelnaem SA, and Abuzaid ON. (2021** [10] about the influence of educational guidelines on nursing students' knowledge, beliefs, and attitudes towards oocyte cryopreservation. According to the study's findings, only 25.6% of nursing students had a positive attitude towards egg freezing in the pretest, but this number rose to 56.8% in the posttest, with a statistically significant difference.

The current study findings showed that there is marked increase mean scores (mean ± standard deviation) of study subject's knowledge towards oocyte-cryopreservation and their demographic characteristics. As age group 25-<30 and rural residence subjects shows significant improve in their score in posttest respectively. As regards occupation working subjects and moderate socio-economic level shows increased in posttest.

In line with the previous finding, **Hasab Allah MF., Abdelnaem SA., & Abuzaid ON., (2021)** [(10)] found a highly statistically significant relationship between students' overall knowledge of oocyte cryopreservation and their demographic information, including their age, academic standing, marital status, and mothers' level of education, in both the pretest and posttest. However, **Rafiei et al. (2020)** [(15)] who revealed that knowledge score is not substantially different between different sex, residence, and marital status post-education program, disagreed with the previous findings.

Regarding the relationship between the study respondents' overall knowledge and attitude scores during the intervention phase. The study subjects' posttest attitude score improved along with their overall knowledge, which increased. According to **Hasab Allah MF., Abdelnaem SA., & Abuzaid ON., (2021),**[(10)] there was moderately positive correlation between the studied students' knowledge and attitudes about oocyte cryopreservation and weakly positive correlation between their beliefs and attitudes about the practice in the pretest, where the r_ values were.406 and.270, respectively, with statistically significant differences where the p_ values were 0.022 and 0.050, respectively

Conclusion:- Based on the results of the present study results and verified of the research hypothesis, it can be concluded that the impact of an educational intervention regarding oocyte cryopreservation on knowledge and attitude of post graduated female students was effective in increase their knowledge and change their attitude. And there was positive relation between satisfactory knowledge and positive attitude regarding oocyte cryopreservation among study subjects after implementation of educational intervention. So, the previously mentioned findings justified the current research hypothesis

Recommendation

- As a result of delay age of marriage in Egypt , more efforts needed by the health care system, to increase the youth knowledge about ways to preserve their fertility especially unmarried girls
- Further study involved a provision of educational courses for different non-medical faculties to improve their knowledge and change their attitudes regarding oocyte cryopreservation

References

1) **Tozzo P., Fassina A., Nespeca P., Spigarolo G., & Caenazzo L.** Understanding social oocyte freezing in Italy: a scoping survey on university female students' awareness and attitudes. Life sciences, society and policy, **2019,** 15(1), 1-14.
2) **The Central Agency for Public Mobilization and Statistics. 2022.** Available at https://www.capmas.gov.eg/11/1/2023.
3) **Rodriguez-Wallberg K, Hao X, Marklund A, Johansen G, Borgstrom B & Lundberg F .** Hot topics on fertility preservation for womenand girls, current research, knowledge gap and future possibilities. Journal of clinical medicine, 2021 10(8):1650
4) **Baldwin K, Culley L, Hudson N,Mitchell H.** Running out oftime: exploring women's motivationsfor social egg freezing. J PsychosomObstet Gynaecol. 2019. Jun;40(2):166173.doi:10.1080/0167482X.2018.1460352
5) **Inhorn, M. C., Birenbaum-Carmeli,D, Y u R., & Patrizio, P.** Egg freezing at the end of romance: A technology of hope, despair and repair. Science, technology& human values, 2022. 47(1): 53-84
6) **Sunderam S, Kissin DM, Crawford SB, Folger SG, Boulet SL, Warner L, et al.** Assisted reproductive Technology surveillance - United States, 2015. MMWR Surveill Summ. United States. 2018, 67:pp. 1–28
7) **Ethics Committee of the American Society for Reproductive Medicine.** Planned oocyte cryopreservation for women seeking to preserve future reproductive potential: an Ethics Committee opinion. Fertil Steril, 2018, 110:1022-8.
8) **Alawi, S: 2019:** Egg freezing permissible in Islam, according to Egypt's Dar Al-Ifta. Bill of Health, 23 September 2019. https://blog.petrieflom.law.harvard.edu/2019/09/23/egg-freezing-permissible-in-islam-according-to-egypts-dar-al-ifta/. Accessed 1 December 2022.
9) **Nicolette A.** Empty benefits: employer-sponsored oocyte cryopreservation and potential for employment discrimination. Hastings Women's LJ. 2016, 27, 341.
10) **Hasab Allah MF., Abdelnaem SA., & Abuzaid ON.** Impact of Educational Guideline on Nursing Students' Knowledge, Beliefs and Attitudes toward Oocyte Cryopreservation Assiut Scientific Nursing Journal. 2021 ASNJ.91433.1223
11) **Nagy, Z. P., Chang, C. C., Shapiro,D. B., Bernal, D. P., Elsner, C. W.,Mitchell-Leef, D., Toledo, A. A., &Kort, H. I.** Clinical evaluation of the efficiency of an oocyte donation program using egg cries banking. Fertility and Sterility, 2019, 92(2), 520–526.https://doi.org/10.1016/j.fertnstert.2008.06.005
12) **Lallemant, C., Vassard, D., Andersen, A.N., Schmidt., L & Macklon, N.** Medical and social egg freezing: internet based survey of knowledge and attitudes among women in Denmark and the UK.

Acta Obstetrica Gynelogica Scandinavia, 2016 95, 1402-1410.https://doi.org/10.1111/aogs.13024

13) **Mahesan A., Sadek S., Ramadan H., Bocca S., Paul A., & Stadtmauer L.** Knowledge and attitudes regarding elective oocyte cryopreservation in undergraduate and medical students. Fertility research and practice,2019. 5(1), 1-7

14) **Daniluk JC, Koert E.** Childless women's beliefs and knowledge about oocyte freezing for social and medical reasons. Human Reproduction, October 2016; 31(10): 2313–2320

15) **Rafiei N., Khosravizadeh Z., Zanjani S., & Khodamoradi K.** The Impact of Educational Package on Nursing Students' Knowledge Towards Fertility Preservation, A Quasi-experimental Study. The Journal of Sexual Medicine, 2020. 17(1), S77

16) **Pritchard N, Kirkman M, Hammarberg K, McBain J, Agresta F, Bayly C, Hickey M, Peate M, Fisher J.** Characteristics and circumstances of women in Australia who cryopreserved their oocytes for non-medical indications. J Reprod Infant Psychol 2017.;35(2):108-118.d 10.1080/02646838.2016.1275533. Epub 2017 Jan 11. PMID: 2951735

17) **Loewen, S., & Plonsky, L.** An A-Z of applied linguistics research methods. London: Palgrave Macmillan. 2016 Available from: https://www.researchgate.net/publication/334250281_Experimental_and_quasi-experimental_designs [accessed 9 March. 2023].

18) **Hong, Y. H., Park, J. W., Kim, H.,Kim, S. K., Choo, C. W., Jee, B. C., Suh, C. S., & Kim, S. H.** A survey on the awareness and knowledge about elective oocyte cryopreservation among unmarried women of reproductive age visiting a private fertility center. Obstetrics and Gynecology Science, 2019. 62(6), 438–444.https://doi.org/10.5468/ogs.2019.62.6. 438

19) **Platts S, Trigg B, Bracewell-Milnes T, et al**. Exploring women's attitudes, knowledge, and intentions to use oocyte freezing for non-medical reasons: A systematic review. Acta Obstet Gynecol Scand. 2021;100:383–393. https://doi.org/10.1111/aogs.14030

20) **Ikhena-Abel, D.E., Confino, R., Shah, N.J., Lawson, A.K., Klock, S.C., Robins, J.C., &Pavone, M.E.** Is employer coverage of elective egg freezing coercive?: a survey of medical students' knowledge, intentions, and attitudes toward elective egg freezing and employer coverage. Journal of Assisted Reproduction and Genetics, 2017. 34,1035-1041. https://doi.org/10.1007/s10815-017-0956-9.

21) **Harzif, A. K., Maidarti, M., Silvia, M., Mariana, A., Mutia, H. D., & Wiweko, B.** Knowledge, attitude, intention, and religion aspect toward fertility preservation among obstetrics and gynecology residents in indonesia: A cross-sectional study. International Journal of Reproductive Bio Medicine, 2020. 18(1), 47–56. https://doi.org/10.18502/ijrm.v18i1.6199

22) **Fahmy S .& Mohamed M.** Knowledge, Attitude and Barriers of unmarried female bridging program Nurse regarding Egg Frozen at South Valley University. Egyptian Journal of Health Care, 2021. EJH Vol 12. no.3

23) **Fotopoulou V., Chasiakou A., Gryparis A., & Baka S.** Greek medical student‘s knowledge and attitudes towards infertility and assisted reproductive technologies (Greek medical students and ART). Women's Health Care, 2015. 4, 4-7

24) **Will E., Maslow B., Kaye L., & Nulsen J.** Increasing awareness of age-related fertility and elective fertility preservation among medical students and house staff: a pre-and post-intervention analysis. Fertility and sterility, 2017. 107(5), 1200-1205.

25) **Hong, Y. H., Park, J. W., Kim, H.,Kim, S. K., Choo, C. W., Jee, B. C., Suh, C. S., & Kim, S. H.** A survey on the awareness andknowledge about elective oocyte cryopreservation among unmarried women of reproductive age visiting a private fertility center. Obstetrics and Gynecology Science, 2019. 62(6), 438–444.https://doi.org/10.5468/ogs.2019.62.6. 438

26) **Abdelwahab S., & Samy M.** Obstacles facing oocyte cryopreservation in the Middle East. Obstetrics & Gynecology International Journal, 2017. 7(2), 00238.