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.