Nurses' Performance for Patient Undergoing Bariatric Surgery

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ABSTRACT

Context: Bariatric surgery is currently considered the most effective treatment option for morbid obesity; it results in more significant improvement in weight loss outcomes and obesity-related co-morbidities when compared with non-surgical interventions. The performance of bariatric nurses is very relevant for the quality and outcome of surgery.
Aim: The study aimed to assess nurses' performance for a patient undergoing bariatric surgery.
Methods: A descriptive exploratory design was followed to achieve the aim of this study. The study was conducted at surgical units at Ain Shams University hospital Cairo-Egypt. A purposive sample of 30 nurses recruited in this study worked in bariatric surgery units at Ain Shams University hospital. Tools of data collection were structured self-administered knowledge assessment questionnaire and evaluation practice checklist used to collect data of this study.
Results: This study showed that 73.3% of studied nurses had inadequate knowledge, and 70.0% had poor practice regarding managing the patient undergoing bariatric surgery. Furthermore, there was a statistically significant correlation between total knowledge and total practice of the studied nurses.
Conclusion: The current study concluded that more than two-thirds of the studied nurses had a reduced level of knowledge and practice. The study emphasized implementing an educational training program to improve nurses' performance regarding caring for bariatric surgery patients.

Keywords: Bariatric surgery, nurses' performance

1. Introduction

Obesity has rapidly become an increasing problem in many countries in which economic changes have led to a more sedentary life and increased consumption of a high caloric diet. It can affect all ages, genders, and ethnicities; it also worsens individuals' health; the adolescent who is obese has a 70% increased risk of being obese in adulthood. Obesity can be defined as a pathological condition when there is too much adipose tissue for body size *(Khatab, 2016).*

Previous studies revealed that obesity negatively affects health outcomes and increases the risk for high blood pressure, diabetes, cancer, arthritis, heart disease, eating disorders, depression, poor self-esteem, sleep apnea, asthma, and premature death. Individuals who develop obesity are highly susceptible to develop one or more of the medical illnesses associated with obesity which is called comorbid medical problems *(Perathoner et al., 2013).*

The treatment of obesity includes primary prevention, dietary measures, behavior modification, pharmacotherapy, and bariatric surgery (BS). Bariatric treatment describes the medical treatment of severe overweight, that is, obesity. Bariatric surgery is only employed when other weight loss methods have been tried and failed (Mandal, 2014).
Bariatric surgery is an effective treatment providing permanent weight loss for obesity. Bariatric surgery techniques are applied in various types. There are four main types of bariatric surgery: The Roux-en-Y, adjustable gastric band, sleeve gastrectomy, and biliopancreatic diversion with duodenal switch. These procedures are options for patients who have tried unsuccessfully to lose weight by other means or have chronic health problems related to obesity *(Dambaugh & Ecklund, 2016).*

Each procedure involves manipulating the stomach or small bowel to achieve restriction, mal-absorption, or both; restricted food intake and absorption promote weight loss. Bariatric surgery is also extremely useful in ameliorating the co-morbidities associated with severe obesity, such as diabetes, sleep apnea, and hypertension. In addition to long-term adherence to diet and exercise programs is the key to success *(Neil & Roberson, 2015).*

In bariatric surgery, patient care is becoming increasingly important before and after surgery due to concomitant diseases in obese patients. During this period, particular nursing practices include reducing the risks in the care of patients who are candidates for bariatric surgery, preventing complications, and supplying the recovery from illness as soon as possible *(Elian, Rabl, Khoraki & Campos, 2016).*

A bariatric nurse provides holistic care to those patients who have a diagnosis of morbid obesity. It also includes care of patients undergoing bariatric surgeries. A bariatric nurse practitioner provides either inpatient or outpatient care to patients who are morbidly obese. Aside from providing direct care, a bariatric nurse practitioner provides patient teaching, evaluates patient progress after bariatric surgery and alters plan if needed,

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and prepares the patient for discharge in collaboration with the bariatric surgery team *(Earlywine, 2012).*

2. Significance of the study

Bariatric surgery is designed to alter or interrupt the digestion process. A reduction in the amount of each nutrient and calories absorbed enables patients to lose weight and decrease their risk for obesity-related health risks or disorders. According to the *World Health Organization (2015)* estimated that obesity in Egypt was 74% to 86% in women and 69% to 77% in men. These data indicate a much higher prevalence of obesity among adult women, while overweight is more marked among adult men. *Angrisani et al. (2015)* estimated that 5875 of the population in Egypt did bariatric surgery. According to *Ain Shams University Hospital Statistical Department (2015),* 500 patients are undergone bariatric surgery this year. However, quality nursing care and effective patient teaching are essential to achieving positive patient outcomes.

3. Aim of the study

The study aims to assess nurses' performance for caring patient undergoing bariatric surgery through:

- Assess nurses' knowledge regarding the management of a patient undergoing bariatric surgery.
- Assess nurses' practice regarding the management of a patient undergoing bariatric surgery.

4. Subjects & Methods

4.1. Research design

A descriptive exploratory design was conducted to achieve the aim of this study.

4.2. Research setting

This study was conducted in obesity surgery units at Ain Shams University Hospital affiliated to Ain Sham University. Cairo-Egypt. Three units are dedicated to obesity surgery. Each unit contains approximately 18 beds. There is also an intermediate care unit in one of them, which contains three beds.

4.3. Subjects

A purposive sample of 30 nurses working in obesity surgery units at Ain Shams University Hospital. They were recruited to assess the nurses' performance in caring for a patient undergoing bariatric surgery.

Inclusion criteria

- Nurses were already dealing with patients undergoing bariatric surgery.
- Nurses had not less than one year for working in surgery units.
- Nurses who are willing to participate in the study.

4.4. Tools of data collection

4.4.1 A Structured Self- Administered Knowledge Assessment Questionnaire

The self-administered questionnaire was used to assess nurses' level of knowledge regarding managing patients undergoing bariatric surgery. The researcher developed it after reviewing the related literature *Dewit (2009); Ponstein (2012); Thailer and Cohen (2013); Rothrock (2014); Provost (2015); Centers for Disease Control and Prevention (2015); American Society for Metabolic and Bariatric Surgery (2016); Linton (2016); DeMaria and Ansar (2016); Wicker and Dalby (2017).* The researcher translated it into the simple Arabic language. The study subjects filled it. The questionnaire consisted of 155 questions in the form of multiple-choice questions (MCQ), true/false questions, and open-end questions. This tool including seven parts as follows:

The 1st part is concerned with nurses' socio-demographic characteristics, including gender, age, educational level, years of experience, training course, and training outcome, in addition to serial number and ward.

The 2nd part included (6 MCQ questions) to assess nurses' knowledge about obesity.

The 3rd part included (63 true and false questions) aimed to assess nurses' knowledge of bariatric surgery, which encompasses indications for bariatric surgery (6 questions), benefits of bariatric surgery (6 questions), nurses' knowledge of gastric bypass surgery (13 questions), nurses' knowledge of gastric sleeve surgery (12 questions), nurses' knowledge of gastric band surgery (13 questions) and nurses' knowledge of biliopancreatic diversion surgery (13 questions).

The 4th part included (21 MCQ & true and false questions) to assess nurses' knowledge regarding complications of bariatric surgery, which encompasses anatomical complications (10 questions) and nutritional complications (11 questions). The 5th part concerned with the assessment of nurses' knowledge regarding preoperative nursing management of a patient undergoing bariatric surgery: It included (20 MCQ, true & false, and open-end questions) designed to assess nurses' knowledge for patient preoperative preparation (8 MCQ questions), preparatory education (6 true &false questions), dietary education (5 true &false questions) and nurses' knowledge for universal precaution of infection control (one five points open-end question).

The 6th part: It concerned with the assessment of nurses' knowledge regarding postoperative nursing management of the patient after bariatric surgery: it included (25 questions MCQ and true &false questions) covering nurses' knowledge for immediate postoperative nursing management (6 true & false questions), late postoperative nursing management (6 MCQ questions), postoperative nutritional guidelines (5 true &false questions) and wound care (8 true &false questions).

The 7th part concerned with assessing nurses' knowledge regarding the discharge plan of a patient after bariatric surgery (16 true & false questions).

Scoring system

The total score of knowledge was 155 marks. Each correct answer gave one mark, and the incorrect answer gave zero. (≥75% =Satisfactory level of knowledge = ≥ 117 marks correct answers, and <75% = unsatisfactory level of knowledge = <117 marks correct answers).

4.4.2. Evaluation Practice Checklist

The researcher developed it to assess nurses' level of practice regarding managing patients undergoing bariatric surgery. This tool used in English language form based on the following literature *Dewit (2009); Ponstein (2012); Thailer and Cohen (2013); Burns (2014); Rothrock*

(2014); Provost (2015); Centers for Disease Control and Prevention (2015); Cooper and Gosnel (2015); American Society for Metabolic and Bariatric Surgery (2016); DeMaria and Ansar (2016); Wicker and Dalby (2017). This tool divided into two parts covering bariatric surgery caring procedures as follows:

The 1st part: preoperative assessment checklist of patient clinical data, patient preparation night before surgery and patient preparation the day of surgery as the following: Demographic data (name, age, hospital number, marital state, occupation, and educational level), patient history (medical, surgical, allergic and family history), Check patients' body mass index, assessment of STOP-BANG score (8questions), assessment nurses' practice for patient preparation night before surgery (13 questions) which included for example list allergy, check pre-anesthetic done, discontinuity of aspirin, sign the informed consent and assessment nurses' practice for patient preparation the day of surgery (11questions) included: assess ABC, assess the conscious level, assess vital signs, remove jewelry, dental prosthesis.

The 2nd part is concerned with the postoperative assessment checklist of nurses' practice in the Bariatric surgery unit, which includes: Immediate postoperative care that encompasses (e.g., maintenance of airway patency, evaluation of breathing, assessing conscious level), late postoperative care that includes (e.g., assisting patient for recovery position, obtaining vital signs, assessing patient for respiratory status), and discharge planning which includes (e.g., naming performed procedure, identifying permanent changes in anatomic structure or function, description sign and symptoms of complications).

Scoring system

The total score of practice was159 marks. Each correct step was given one mark and zero for the step which was not done or incorrectly done. The total score was distributed as the following: ≥75% = Satisfactory level of the practice = ≥ 120 correct actions, and <75% =unsatisfactory level of the practice = <120 correct actions.

4.5. Procedures

The operational design included the preparatory phase, ethical considerations, validity and reliability, pilot study, fieldwork, and study limitation. The preparatory phase included reviewing relevant literature to develop data collection tools. The ethical research considerations in this study included the following: The research approval of protocol obtained from Scientific Research Ethical Committee in Faculty of Nursing at Ain Shams University before starting the study, the researcher clarified the objective and aim of the study to the nurses included in the study, anonymity, and confidentiality of the subjects' data is maintained, nurses were informed that they allowed choosing to participate or not in the study and they had the right to withdraw from the study at any time without giving any reasons, and ethics, values, culture, and beliefs were respected.

The testing validity of the proposed tools used face and content validity. It did by a jury of seven experts in medical-surgical nursing at the faculty of nursing, Ain Shams University. The experts reviewed the tools for clarity, relevance, comprehensiveness, simplicity, and applicability; minor modification was done. Testing reliability of proposed tools was done statistically by alpha Cronbach test for the following: As a general = 0.8681, Questionnaire sheet = 0.806, Observational checklist = 0.791

A pilot study was conducted to test the feasibility and applicability of the study tools used in this study. It was carried out on 20% of total study subjects (6 nurses). There was no modification done on the study tool after the pilot study so that the nurses who were included in the pilot study were included in the main study group.

Field Work started **with** approval from the hospital directors and nursing directors of obesity units at Ain Shams University Hospital. Data were collected in three months, through the morning, afternoon, and night shifts during actual nurses' work and documented care steps for patients undergoing bariatric surgery. The observational checklist was used before administering the questionnaire to ensure the maximal realistic observations and minimize the possibility of bias. The researcher assessed the nurses' practice while they are caring for patients undergoing bariatric surgery. It took about 20-30 minutes for each period. The self-administered questionnaire sheet was filled by the nurses providing the care for the patient undergoing bariatric surgery; it took 30-45 minutes. The nurses recorded the answer by themselves.

4.6 Data analysis

The collected data were organized, tabulated, and analyzed using appropriate statistical significance tests. The data were collected and coded. Then, the data analyzed with the program (the statistical package for social science) (SPSS) under windows version 11.0.1. Number and percentage for qualitative variables done. For the relation between variables, Fisher's exact test and paired t-test were used. Also, the alpha Cronbach test was used to test the reliability of tools. Test of significance used, and regarding the significance of the result, the observed differences and associations are considered as follows: Non-significant (NS) $p > 0.05$, Significant (S) $p < 0.05$, Highly significant (HS) $p < 0.001$.

5. Results

Table 1 shows the distribution of the studied nurses according to their characteristics. Regarding gender, the results revealed that 66.7% of studied nurses were females. As regards age, 66.7% of studied nurses were 30 to less than 40 years old. About educational level, 56.7% of studied nurses were secondary school diploma nurse. While regarding the years of experience, 66.6% of studied nurses had experience ≥15 years. Regarding training courses and performance enhancement, 23.3% of studied nurses attended training courses, and six of studied nurses represented 85.7% had performance enhancement regarding the management of a patient undergoing bariatric surgery.

Table 2 shows that 86.7% of the studied nurses had inadequate knowledge regarding obesity. Regarding knowledge of bariatric surgery, 83.3%, 73.3% of them had poor knowledge level regarding indications and benefits of bariatric surgery consecutively. 86.7%, 80% of studied nurses had inadequate knowledge regarding biliopancreatic diversion and adjustable gastric band, respec-

tively. Besides, 86.7% and 80% of the nurses had poor knowledge regarding anatomical and nutritional complications.

Table 3 reveals that 76.7%, 73.3% of the studied nurses had poor knowledge regarding preparatory and dietary education. Moreover, 63.3%, 53.3%, 53.3% of the studied nurses had inadequate knowledge regarding wound dressing, immediate and late postoperative care, respectively. In contrast, 56.7% of studied nurses had adequate knowledge regarding postoperative nutritional instructions. Also, 53.3% of studied nurses had unsatisfactory knowledge of total knowledge regarding discharge plans.

Figure 1 shows that 73.3% of the studied nurses had unsatisfactory total knowledge regarding managing the patient undergoing bariatric surgery.

Table 4 shows that all the studied nurses had poor practice assessing patient history and the assessment of obstructive sleep apnea. Regarding patient preparation for the night before surgery, it showed that 86.7%, 83.3%, 80%, 80%, and 70% of the studied nurses had satisfactory practice regarding revising discontinuity of aspirin and anticoagulant as doctor order, signing informed consent, listing allergy as well as checking pre-anesthetic and applying identification band respectively. In contrast, 76.7% of studied nurses had poor practice regarding checking for diagnostic measures. While 70% of studied nurses had poor practice regarding instructing for deep breathing and coughing exercise, 63.3% of studied nurses had poor total practice regarding patient preoperative preparation night before bariatric surgery.

Table 5 shows that 86.7%, 80%, 80%, 76.7%, and 63.3% of the studied nurses had satisfactory practice regarding Connect patient to IV therapy, assessing vital signs as well as administering preoperative medications, removing jewelry, dental prosthesis, eyeglasses, and contact lenses and assessing conscious level respectively. While 76.7%, 70%, and 63.3% of studied nurses had unsatisfactory practice regarding preparing the site for surgery, elevating side rails up and bed to the lowest level, and instructing for bed adjustment moving, respectively. Moreover, 63.3% of studied nurses had poor total practice regarding patient preoperative preparation on the day of surgery for bariatric surgery.

Table 6 showed that 76.7%, 70.0%, and 56.7% of the studied nurses had poor practice regarding the assessment of circulation, reviewing of body systems, and assessing conscious level. While 50.0% and 50% of studied nurses had a satisfactory level of practice regarding maintaining airway patency and evaluating breathing, 70.0% of studied nurses had poor total practice regarding patient immediate postoperative care for bariatric surgery. Regarding late postoperative nurses' practice, the table reveals that all studied nurses had poor practice promoting optimal comfort and relief for the pain. In addition to 76.7%, 76.7%, and 63.3% of studied nurses had poor practice assessing the respiratory state, promoting optimal renal and urinary function, and applying wound care. While 63.3% of studied nurses had poor practice regarding obtaining vital signs, 76.7% of studied nurses had poor total practice regarding late postoperative patient care after bariatric surgery.

Table 7 reveals that all of the studied nurses had poor total practice regarding patient discharge plan for bariatric surgery, promoted psychological support need, and starting time and date of the follow-up appointment. In addition to 83.3% of studied nurses had poor practice regarding the interpretation of sampling and reporting lab investigation.

Figure 2 shows that 70.0% of the studied nurses had poor total practice regarding managing the patient undergoing bariatric surgery.

Table 8 reveals a significant correlation between the total studied nurses' knowledge and practice ($r=0.398$ at $p < 0.05$).

Table (1): Number and percentage distribution of demographic characteristics of the studied nurses (n =30).

Character	N	%
Gender		
Males	10	33.3
Females	20	66.7
Age		
< 20- 29	6	20.0
30 - < 40	20	66.7
≥ 40	4	13.3
Level of Education		
Secondary school diploma	17	56.7
Technical institute diploma	6	20.0
Bachelor's degree in nursing	7	23.3
Post graduated	0	0.0
Experience years		
<5	5	16.7
5-<15	5	16.7
≥15	20	66.6
Training course related to bariatric surgery care		
Yes	7	23.3
No	23	76.7
Performance enhancement (n=7)		
Yes	6	85.7
No	1	14.3

Table (2): Number and percentage distribution of studied nurses' knowledge of obesity and bariatric surgery (n=30).

Knowledge elements	Satisfactory		Unsatisfactory	
	N	%	N	%
Knowledge of obesity	4	13.3	26	86.7
Knowledge of bariatric surgery				
Indication for bariatric surgery	5	16.7	25	83.3
Benefits from bariatric surgery	8	26.7	22	73.3
Types of bariatric surgery				
Gastric bypass surgery	13	43.3	17	56.7
Sleeve gastrectomy	10	33.3	20	66.7
Adjustable gastric band	6	20.0	24	80.0
Biliopancreatic diversion	4	13.3	26	86.7
Complications of bariatric surgery				
Anatomical complications	4	13.3	26	86.7
Nutritional complications	6	20	24	80

Table (3): Number and percentage distribution of studied nurses' knowledge regarding pre-and postoperative nursing management and discharge teaching for the patient undergoing bariatric surgery (n=30).

Knowledge elements	Satisfactory		Unsatisfactory	
	N	%	N	%
Preoperative nursing management				
Patient preparation	12	40.0	18	60.0
Preparatory education	7	23.3	23	76.7
Dietary education	8	26.7	22	73.3
Universal precaution of infection control	12	40.0	18	60.0
Postoperative nursing management				
Immediate postoperative care	14	46.7	16	53.3
Late postoperative care	14	46.7	16	53.3
Postoperative nutritional instructions	14	56.7	16	43.3
Wound dressing	11	36.7	19	63.3
Discharge teaching	14	46.7	16	53.3

Table (4): Number and percentage distribution of studied nurses' practice regarding the preoperative assessment of patients undergoing bariatric surgery (n=30).

Practice steps	Satisfactory		Unsatisfactory	
	N	%	N	%
Assessment of patient clinical data				
Demographic data	11	36.7	19	63.3
Patient history	0	0.0	30	100.0
Body mass index	11	36.7	19	63.3
Assessment of obstructive sleep apnea.	0	0.0	30	100.0
Patient preparation (the night before surgery)				
Listing allergy	24	80.0	6	20.0
Checking pre-anesthetic done	24	80.0	6	20.0
Revising discontinuity of aspirin and anticoagulant as doctor order	26	86.7	4	13.3
Signing informed consent	25	83.3	5	16.7
Type and crossmatch for units of blood	13	43.3	17	56.7
Applying the identification band (ID)	21	70.0	9	30.0
Checking for diagnostic measures	7	23.3	23	76.7
Instructing for deep breathing and coughing exercise	9	30.0	21	70.0
Instructing for performing leg exercise	11	36.7	19	63.3
Instructing for caring with shower and bath given with antiseptic solution	15	50.0	15	50.0
Explaining nursing procedures to the patient and his/ her family	13	43.3	17	56.7
Reassuring the patient	13	43.3	17	56.7
Assessing bowel preparation	15	50.0	15	50.0
Total	11	36.7	19	63.3

Table (5): Number and percentage distribution of studied nurses' practice regarding patient preoperative preparation the day of surgery of bariatric surgery (n=30).

Practice steps	Satisfactory		Unsatisfactory	
	N	%	N	%
Patient preparation (the day of surgery)				
Assessing ABC	15	50.0	15	50.0
Assessing conscious level	19	63.3	11	36.7
Assessing vital signs	24	80.0	6	20.0
Removing jewelry, dental prosthesis, eyeglasses, and contact lenses	23	76.7	7	23.3
Helping the patient to wear a gown	15	50.0	15	50.0
Allowing the patient to void	15	50.0	15	50.0
Connecting patient to IV therapy	26	86.7	4	13.3
Administering pre-op medications	24	80.0	6	20.0
Preparing Site for surgery	7	23.3	23	76.7
Elevating side rails up and bed to the lowest level	9	30.0	21	70.0
Instructing for bed adjustment moving	11	36.7	19	63.3
Total	11	36.7	19	63.3

Table (6): Number and percentage distribution of studied nurses' practice regarding patient immediate and late postoperative care after bariatric surgery (n=30).

Practice steps	Satisfactory		Unsatisfactory	
	N	%	N	%
Immediate postoperative care				
Maintaining airway patency	15	50.0	15	50.0
Evaluating breathing	15	50.0	15	50.0
Assessing conscious level	13	43.3	17	56.7
Assessing circulation	7	23.3	23	76.7
Reviewing body systems	9	30.0	21	70.0
Total	9	30.0	21	70.0
Late postoperative care				
Assisting the patient for recovery position	15	50.0	15	50.0
Obtaining vital signs	19	63.3	11	36.7
Assessing patient respiratory states	7	23.3	23	76.7
Promoting optimal cardiovascular function	12	40.0	18	60.0
Promoting optimal neurological functions	14	46.7	16	53.3
Promoting optimal renal and urinary function	7	23.3	23	76.7
Promoting optimal gastrointestinal and meet nutrition need	11	36.7	19	63.3
Promoting optimal comfort and relief for pain	0	0.0	30	100.0
Applying wound care	7	23.3	23	76.7
Total	7	23.3	23	76.7

Table 7: Number and percentage distribution of studied nurses' practice regarding patient discharge plan for bariatric surgery (n=30).

Practice steps	Satisfactory		Unsatisfactory	
	N	%	N	%
Discharge planning				
Naming performed procedures	11	36.7	19	63.3
Identifying any permanent change in anatomic structure or function	11	36.7	19	63.3
Describing signs and symptoms of complications	11	36.7	19	63.3
Describing ongoing postoperative regimen	11	36.7	19	63.3
Stating the time and date of the follow-up appointment	0	0.0	30	100.0
Interpretation of sampling and reporting lab investigation	5	16.7	25	83.3
Promoting psychosocial support need	0	0.0	30	100.0
Total	0	0.0	30	100.0

Table 8: Correlations between total studied nurses' knowledge and practice regarding managing the patient undergoing bariatric surgery (n=30).

Variables	Total practice	
	r	P-value
Total knowledge	0.398	0.030

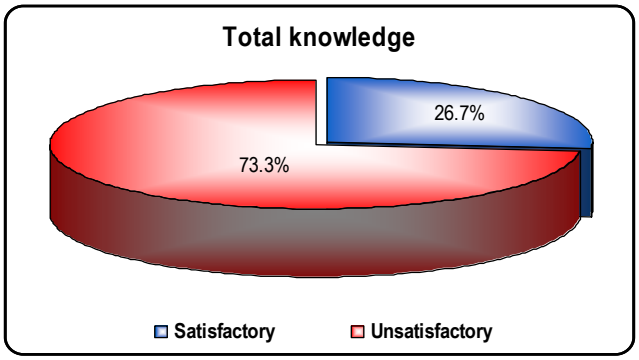

Figure (1): Percentage distribution of total studied nurses' knowledge regarding managing the patient undergoing bariatric surgery.

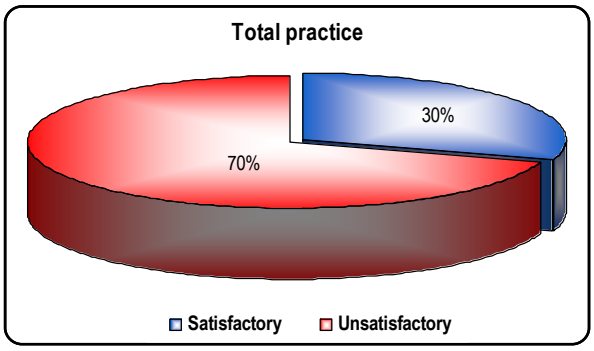

Figure (2): Percentage distribution of total studied nurses' practice regarding managing patients undergoing bariatric surgery.

6. Discussion

Bariatric surgery is a medical procedure that produces weight loss by limiting how much the stomach can hold and limiting the absorption of calories *(Dent, Chrisopoulos, Mulhall & Ridler, 2010)*. The nurse must ensure care and health education, with a view of preventing complications, determining well-being, and helping the patient to adapt to the new way of living *(Ferreira, Felix & Galvao, 2014)*. The study was carried out to assess nurses' performance for caring patient undergoing bariatric surgery.

The present studied nurses' socio-demographic characteristics reveal that two-thirds of the study nurses were females. This finding may be due to the greater fraction of the nurses in Egypt being females and may also be related to nursing studying in Egyptian universities exclusive for females only until a few years ago. This finding is consistent with a study done by *Zhu, Norman, and While (2013),* entitled "Nurses' self-efficacy and practices relating to weight management of adult patients in London," which revealed that 88.7% of the studied nurses were females, confirming most females in the profession. *Tanaka and Peniche (2009)*, in their study entitled: "Perioperative care for the morbid-obese patient undergoing bariatric surgery: challenges for nurses in Brazil," stated that; there was a predominance of female nurses (97.1%).

Concerning the educational level, the current study illustrates that more than half of the studied nurses were secondary school diplomas and about only one-quarter of them had a bachelor's degree in nursing. This finding might elaborate on the current condition of nursing qualification in Egypt. This result on the same line with *Farag (2008),* who assured in the study which was entitled: "Economic analysis of the nurse shortage in Egypt" that nursing education and the distribution of nurses approximately 87- 93% had diploma nursing. Regarding years of experience, the current study showed that two-thirds of the study nurses had experienced more than 15 years because they had a certification and license to practice their field as a nurse since graduated.

This finding agrees with a study done by *Phillips, Wood, and Kinnersley (2014),* entitled "Tackling obesity: the challenge of obesity management for practice nurses in primary care in Oxford," which revealed that 61% of nurses had 10–20 years of experience.

Regarding training course and performance enhancement, the present study finding shows that more than three-quarters of the studied nurses did not attend any training courses related to bariatric surgery. This finding may be due to the lack of programs or conferences about the role of nursing regarding bariatric surgery within the hospital. This finding is consistent with *Tanaka and Peniche (2009)*. They added that more than half of the studied nurses did not receive training courses, and the specific content regarding bariatric surgery is not uniformly inserted into the undergraduate courses, limiting the experience and practice in this specialized service.

While, this result is contradicted with *Nolan, Deehan, Wylie, and Jones (2012)*, who emphasized in the study which was entitled: "Practice nurses and obesity: professional and practice-based factors affecting role adequacy and role legitimacy in London" that nurses who felt positively about their role were those who had received training on obesity surgery and had the time to use this knowledge and skills with patients within consultations or in a group.

The current study results indicate that the majority of the studied nurses had inadequate knowledge regarding obesity. This inadequacy of nurses' knowledge in this area might result from a lack of educational training programs and resources that provide them with knowledge about obesity care. This finding is in congruence with a study done by *Blackburn, Stathi, Keogh, and Eccleston (2015)*, entitled "Raising the topic of weight in general practice: perspectives of GPs and primary care nurses in England," which confirmed that nurses had inadequate knowledge regarding obesity due to lack of content that makes them not recognizing obesity as a complex medical problem and uncertainty about obesity. Also, the bariatric nurse must understand the procedures to guide nursing actions to get the best patient outcomes.

While, this result contradicted a study done by *Miller, Alpert, and Cross (2008)* entitled "Overweight and obesity in nurses, advanced practice nurses, and nurse educators in the United States," which revealed that most nurses had adequate knowledge related to obesity. In addition to providing weight-related health information to the public, which suggests that they may benefit from continuing education on obesity and its risks.

The present study findings show that most of the studied nurses had poor knowledge regarding the indication of bariatric surgery. In addition to about three-

quarters of the studied nurses had inadequate knowledge regarding the benefits of bariatric surgery. This finding may be due to a lack of materials and resources about bariatric surgery, and this topic is not incorporated in the curriculum of nursing. This result contradicted *Phillips, Wood, and Kinnersley (2014)*, who showed that more than three-quarters of studied nurses had a satisfactory level of knowledge regarding the indication and benefits of bariatric surgery.

The present study findings show that most of the studied nurses had poor knowledge regarding biliopancreatic diversion. This finding may be because this type is less commonly performed than the other type of bariatric surgery in the study setting, so nurses had a lack of awareness about those surgical techniques, which affected their knowledge. This result in the same line with a study done by *Neff, Olbers, and le Roux (2013)*, entitled: "Bariatric surgery: the challenges with candidate selection, individualizing treatment and clinical outcomes in Sweden," which intensified that nurses had inadequate knowledge about biliopancreatic diversion surgery which less commonly performed.

While this result is contradicted with *Dunham (2012),* who assured in the context entitled: "The Increasing Incidence of the Biliopancreatic Diversion with Duodenal Switch as a Surgical Weight Loss Option: Implications for Nursing Care in Pennsylvania" that biliopancreatic diversion becomes more prevalent so, the nurses need to be knowledgeable about the anatomy of this surgical option. Understanding the anatomical changes created by the surgeon will help the nurse anticipate any potential immediate complications, provide education about self-care on discharge, and highlight the importance of long-term follow-up with the patient's bariatric team.

The present study findings show that most of the studied nurses had inadequate knowledge regarding anatomical and nutritional complications of bariatric surgery. This finding might be due to a lack of caring protocol for the patient undergoing bariatric surgery, and most of the patients discharged after a day or a few days from surgery and follow-up carrying out at the outpatient clinic. These results are contradicted with a study done by *Gagnon and Shef (2012),* entitled "Outcomes and complications after bariatric surgery in the United States," who assured that; nurses are providing intervention for bariatric surgery patient according to guidelines to prevent the possibility of complication so, they have a significant role in optimizing care for patients with bariatric surgery by improving self-management skills, prevention/treatment of nutritional deficiencies, and optimizing nutritional status.

The present study findings show that around three-quarters of the studied nurses had poor knowledge regarding bariatric surgery's preparatory and dietary education, and less than two-thirds of them had inadequate knowledge regarding patient preparation. This finding might be due to a lack of continuous educational programs and nurses' preparation courses for caring for patients undergoing bariatric surgery and lack of awareness about the importance of these aspects. This finding goes in the same line with *Still, Sarwer, and Blankenship (2014)*. They mentioned in the context entitled "Motivations for and expectations about bariatric surgery in New York" that the nurses had a reduced level of knowledge regarding preoperative nursing management of the patient with obesity.

Concerning the results of the current study, it is found that more than half of the studied nurses had inadequate knowledge regarding immediate postoperative care as well as late postoperative care. This finding may be because the nurses did not have enough information, training courses about it, and the absence of standard nursing care related to immediate and late postoperative care for such patients. Also, in the current study, nurses reported difficulties encountered by many patients and a lack of resources for the nursing staff.

This finding goes in the same line with *Marquis and Huston (2009),* who reported that each medical organization and profession must set standards and objectives to guide team and practitioners in performing safe and effective care. Also, *de Oliveira Serra et al. (2015)* emphasized in a study which was entitled: "Nursing care in the immediate postoperative period: a cross-sectional study in Fortaleza, Ceará, Brazil " that nursing care is not fully offered, lack of resources, and nurses have difficulties in using nursing care systematization post-operatively.

The present study shows that all the studied nurses had poor practice assessing patient history and assessing obstructive sleep apnea. This finding may be due to staff shortage and work overload as well as they did not have enough time to complete patient assessment, also their lack of knowledge about a standard of STOP-BANG scoring system that represented negatively in nurses' practice.

This result agrees with a study done by *Keogh (2014)* entitled "Nurses say patients still neglected because of inadequate staff levels in the UK," which emphasized that 65% of nurses said they do not have enough time because of understaffing, 54% of nursing care was being left undone, 45% of survey respondents said they were caring for eight or more patients on ward settings and rising to 51% for night staff. All of these reasons impact negatively on preoperative patient assessment and quality of care. This result also, in the same way with *Seet and Chung (2010),* who affirmed in a study entitled "Obstructive sleep apnea: preoperative assessment in Singapore and Canada" that obstructive sleep apnea (OSA) is the most prevalent breathing disturbance during sleep, especially in obese patients and nurse may greatly be assisted if screening tools are on hospital wards to enhance awareness of OSA and identify other less obvious risk factors.

While this is contradicted with *Van Klei et al. (2004),* who mentioned that most nurses had the experience to complete patient health assessment which may improve the quality of perioperative care, in the other hand, *Malley, Kenner, Kim, and Blakeney (2015)* assured in the study which was entitled: "The accuracy of trained nurses in preoperative health assessment in University Medical Centre Utrecht, Netherlands" that most nurses had the skills to provide appropriate nursing care and provide education as well as obtained information related to preoperative period.

Based on the current study results, most of the studied nurses had satisfactory practice regarding revise discontinuity of aspirin and anticoagulant, signing informed consent, listing allergy, checking pre-anesthetic, and applying identification band. This finding may be due to those procedures are routine care done for all surgical

patients and considered everyday routine for any surgical nurse in any surgical ward.

These findings were in the same line with *Perry, Potter, and Ostendorf (2016),* who stated that medications revise, and diagnostic measures are essential steps of patient preparation before surgery in patient checklists for nurses. In addition to *Punder (2005)*, who reported in the context entitled for "perioperative assessment: Nursing the surgical patient in the USA" that nurses revise patient before the day of operation through a preoperative checklist which includes listing allergy, informed consent, fitness for anesthesia as well as the identification band.

Contradicting to satisfactory performance in doing routine care, nurses show unsatisfactory performance in checking diagnostic measures and instructing patients for deep breathing and coughing techniques. This finding could be explained that nurses consider checking diagnostic measures as the role of the physician and underestimate the benefits of deep breathing and coughing techniques among their daily workload. This result was not in agreement with *Cassidy, Rosenkranz, McCabe, Rosen, and McAneny (2013)*, who revealed that most nurses could re-demonstrate coughing and breathing exercise with their patients after receiving training program.

Concerning the nurses' practice regarding patient preparation on the day of surgery, the current study results clarify that the majority of the studied nurses had satisfactory practice regarding connecting patients to IV therapy, assessing vital signs, and administering preoperative medication. Also, more than three-quarters of them had satisfactory practice regarding removing jewelry, dental prosthesis, eyeglasses, and contact lenses, and about two-thirds of them had a satisfactory practice regarding assessing conscious level for patient preparation on the day of surgery. This finding may be due to their believes that is considered the daily routine of nurses' duties.

This result agrees with *Christoforo and Carvalho (2009),* who reported in the study which was entitled: "Nursing care applied to surgical patient in the pre-surgical period in Brazil" that almost all nurses had performed all care procedures as 96.1% regarding assessing vital signs, 72.9% regarding removing jewelry, dental prosthesis, eyeglasses, and contact lenses, near half of them, had satisfactory practice regarding pre-anesthetic medication and assessing conscious level at the day of surgery.

The current study reveals that more than three-quarters of the studied nurses had poor practice regarding prepare site for surgery. Also, more than two-thirds of the studied nurses had unsatisfactory levels regarding the patient safety of elevating side rails up and bed to the lowest level. In addition to more than half of them had poor levels regarding instructing for bed adjustment moving. This finding may be due to a lack of nurses' awareness and knowledge about the importance of some aspects of patient preparation for surgery and their dependence on nurses' aid and relatives until they reach the operating room.

This result is the same with *Penalver-Mompean, Saturno-Hernandez, Fonseca-Miranda, and Gama (2012),* who pointed out that most nurses lack updates through evidence-based information, as they even delegate practices that increase infection and safety risks. This finding reveals a clear need to improve the planning of the care process assigned to staff, especially nurses, for better patient safety. Prioritizing these efforts can be useful to reduce the unwanted effects of surgical site preparation surgical site infection (SSI) and reduce the risk of falls and other safety hazards.

Postoperative nursing assessment reveals another significant shortcoming as half of the studied nurses had poor practice regarding maintaining airway patency and evaluating breathing, and more than half got unsatisfactory performance in assessing conscious level for patients' immediate postoperative care. This finding may be due to a lack of nurses' training and awareness about the primary approach for assessing immediate postoperative patients.

This result was similar to *Van Huyssteen and Botha (2009)*, who reported that most nurses in the study 85.4% indicated that they never had the opportunity to be trained to assess patients after surgery and did not have the necessary knowledge and competencies needed to render quality nursing care to postoperative patients. Also, *Singh and Chong (2016)* mentioned in the study entitled: "Assessing Nurses Knowledge of Glasgow Coma Scale in the Emergency and Outpatient Departments of a Tertiary Medical Centre" 55.56% had poor knowledge of the Glasgow coma scale. This finding raises concerns about the importance of knowledge and skill in assessing GCS. Continuing education and practice on the use of the GCS are essential.

Concerning the nurses' practice regarding the assessment of circulation after bariatric surgery, the current study reveals that more than three-quarters of the studied nurses had poor practice. Also, more than two-thirds of the studied nurses had inadequate practice regarding reviewing systems. This result reflects the nurses' neglecting of the most important part of nursing care through which the nurses provided life-saving measures and believed that is a physician's role. This result was not in agreement with Williams, Bailey, *Bulstrode, Love, and O'Connell (2008),* who stated that assess patient circulation should be included on initial assessment so; nurses put it into their consideration during immediate postoperative care.

Regarding total immediate postoperative care after bariatric surgery, more than two-thirds of the study nurses have unsatisfactory total. This result may be due to lack of training courses, lack of job description, motivation, interest, and the shortage of nursing staff and resources leading to work overload. The above finding contradicted *Zeitz (2008),* who stated that most nurses had satisfactory practice regarding immediate postoperative care for bariatric surgery patients.

While more than half of the studied nurses have poor practice regarding promoting optimal cardiovascular function, renal and urinary function, this finding may be due to a lack of nurses' knowledge that impacts their skills and makes them incompetent in their career. This result had not an agreement with *Oakey and Slade (2006),* who mentioned that general care nurses would most likely have a great impact on the postoperative outcomes of these patients. The challenges to the nurses are to be knowledgeable of bariatric operations and complications

and plan carefully for the care of bariatric patients to achieve optimal outcomes.

The current study reveals that all the study nurses had inadequate practice regarding promoting optimal comfort and relief for the pain. This result may be due to nurses' pain assessment being mostly constrained by; lack of guidelines and protocols, assessment tools, documentation charts, education on assessment tools, inadequate documentation of pain assessment and management, and poor communication of pain assessment priorities.

These findings are in the same line with *Milutinovic, Milovanovic, Pjevic, Martinov-Cvejin, and Cigic (2009)*, who showed a lack of regular assessment of pain intensity and follow-up of effects of analgesic therapy in professional nursing care.

The present study shows that more than three-quarters of the studied nurses had poor practice regarding wound care. It was found that nurses did not give any care to the wound, and they only assist the surgeon in the dressing procedure. Wound care is mainly the surgeon's duties in the unit, which may be referred to the hospital regulation. *Aiken, Clarke, and Sloane (2009)* found that nurses were performing non-nursing tasks such as delivering and retrieving food trays, carrying out housekeeping work, ordering ancillary services, and transporting patients; while nursing activities such as comforting patients, developing and updating care plans providing oral hygiene and skincare, and teaching patients and their families had been left undone.

Concerning nurse practice regarding patient discharge planning for bariatric surgery patients, all of the studied nurses have poor practice regarding stating the time and date of follow-up appointments and promoting psychological support need. In addition to the majority of the studied nurses had poor practice regarding the interpretation of sampling and reporting lab investigation. This finding may be due to a lack of educational programs about discharge and follow-up for bariatric surgery patients.

This result on the same line in a study done by *Barth and Jenson (2006),* entitled "Postoperative nursing care of gastric bypass patients at the American Association of Critical-Care Nurses National Teaching Institute, New Orleans," who stated that most of the healthcare team members especially nurse will require a multidisciplinary educational approach related to the disease, type of operation performed, and accompanying postoperative care.

Concerning the correlation between nurses' total knowledge and total practice, these study findings clarify that there is weak positive statistically significant relation between studied nurses' total knowledge and their entire practice; where the nurses who have adequate total knowledge are competent in their whole practice, which means that the level of nurses' practice affected by the nurses' knowledge.

This study result is consistent with *Istomina, Suonminen, Razbadauskas, Martinkenas, Kuokkanen, & Lein-Kilpi (2012),* who mentioned that there was a positive correlation between knowledge and practice of the study nurses. Surgical nurses feel empowered when they have higher education and have completed the continuing education courses. While *Saleh (2008)* revealed a positive, statistically significant relationship between nurses' knowledge with their entire practice, this correlation was not statistically significant.

In summary, the results of this study revealed that there is a need to focus on the development of nursing staff knowledge, skills, and attitude, so effort should be directed towards enhancing creativity among nurses. Nurses must have access to updated information, learning resources, and endless educational opportunities. The nurses must continuously seek better ways to improve their care to patients undergoing bariatric surgery by acquiring knowledge and implementing the established standards of care, which must be updated periodically.

7. Conclusion

Based on this study findings, it can be concluded that about three-quarters of the studied nurses had unsatisfactory knowledge. Also, more than two-thirds of the studied nurses had poor practice regarding managing the patient undergoing bariatric surgery. Additionally, there was a statistically significant correlation between studied nurses' knowledge, practice.

8. Recommendation

- Bariatric surgery units should be supplied by a protocol regarding nurses' performance for the patient undergoing bariatric surgery.
- Further study is recommended to evaluate the reflection of educational training programs regarding managing patients undergoing bariatric surgery on nurses' performance and consequently on the patient's outcomes.
- The study should be replicated on a large sample and in different hospital settings to generalize the results.
- Implementing an educational training program for nurses to improve their performance regarding managing a patient undergoing bariatric surgery.
- Developing a clear and comprehensive booklet, including guidelines on nursing management for the patient undergoing bariatric surgery (pre and post).
- Close supervision and teaching on the spot are needed to ensure that nurses' quality of care is provided while managing patients undergoing bariatric surgery.

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