

## Effect of Nursing Guidelines on Minimizing Postoperative Complications for Patients with Abdominal Bariatric Surgeries

Heba Gomaa El-dawoody, Osama Yaseen Taha, Ghona Abed EL-naser Ali & Sahra Zaki Azer.

Demonstrator in Adult Nursing Department, Faculty of Nursing , Sohag University, Egypt.

Professor in Plastic Surgery Department, Faculty of Medicine, Assiut University, Egypt.

Assistant Professor in Adult Nursing Department, Faculty of Nursing ,Sohag University, Egypt.

Lecturer in Adult Nursing Department, Faculty of Nursing, Assiut University, Egypt.

### Abstract

**Background**, Bariatric surgery includes a variety of procedures performed on people who have obesity. The study **aimed** to investigate the impact of nursing guidelines among bariatric surgery patients on minimizing the postoperative complications for patients with bariatric surgery. **Research design**, Quasi-experimental research design was utilized in this study. **Sample**, the study was conducted on a convenient sample of 50 adult patients with bariatric surgery who selected randomly (25 - study group and 25 - control group). **Setting**, data were collected from plastic surgery department at Assiut University Hospital. **Tools**, data were collected through two tools; patient informational assessment sheet and postoperative complications follow up sheet. **Results**, this study concluded that more than half of the sample in the study group were females. While the majority of the sample in control group 92% were females and 52.0 %were married. There was statistically significant difference as regarded pre and postoperative score for level of knowledge of study group about bariatric surgery except important of the efficiency of vital signs, knowledge about postoperative complications, an exercise carried out and good diet after the operation. **Conclusion**, there were significant differences improvements throughout the implementation of nursing guidelines among the study group. **Recommendation**, the study recommended that pamphlets and simple illustration booklet should be available for patients illiterate to with simple explain how to safely live after bariatric surgery.

**Keywords:** *Guidelines, Postoperative complications, Nursing & Bariatric surgery*

### Introduction

Obesity is defined as abnormal or excessive fat accumulation that presents a risk to health. A crude population measure of obesity is the body mass index (BMI), a person's weight (in kilograms) divided by the square of his or her height (in meters). A person with a BMI of 30 or more is generally considered obese. A person with a BMI equal to or more than 25 is considered overweight (Ogden et al., 2012).

Bariatric surgery (weight loss surgery) is a procedure that makes changes to the digestive system to help lose weight by limiting how much you can eat or by reducing the absorption of nutrients, or both. Bariatric surgeries are done when diet and exercise haven't worked or when patients have serious health problems because of obesity (Arterburn et al., 2015). Indications of bariatric surgery include; BMI greater than 40; BMI between 35 and 40 associated with significant comorbidity: hypertension, diabetes, degenerative joint disease or arthritis, sleep apnea (Noria, 2013). Contraindications of bariatric surgery; an uncontrolled psychiatric disorder such as major depression, current drug, alcohol abuse, cancer that is not in remission and inability to comply with nutritional requirements, including lifelong vitamin replacement (when indicated) (Pepino et al., 2014).

Classification of bariatric surgical procedures; weight loss operations fall into three categories; restrictive, malabsorptive and mixed procedures. Restrictive procedures are solely restrictive act to reduce oral intake by limiting gastric volume, produce early satiety, and leave the alimentary canal in continuity and minimizing the risks of metabolic complications. Restrictive procedures include vertical banded gastroplasty, adjustable gastric band, sleeve gastrectomy, the intragastric balloon (gastric balloon) and gastric placcation. Malabsorptive procedures, although they also reduce stomach size, the effectiveness of these procedures is derived mainly from creating a physiological condition of malabsorption. Malabsorptive procedures include biliopancreatic diversion and jejunoileal bypass. Combination (mixed) procedures employ both restriction and malabsorption which include: gastric bypass surgery, sleeve gastrectomy with duodenal switch and implantable gastric stimulation (Horwitz et al., 2015).

anastomotic leak or intestinal obstruction may not be easy to diagnose because of the patient's large abdomen .Thus, there should be a low threshold for

ordering a barium radiograph or computed tomogram. Endoscopy is rarely indicated at this time. Late complications; in describing the nursing care of the bariatric-surgery patient defines late complications as those which occur once the patient has been discharged from the hospital and has recovered from the surgery. These complications can be further classified according to the surgical procedure performed. The euphoria induced by weight loss in bariatric patients may be replaced by disappointment and regret with the development of new gastrointestinal tract symptoms and complications. Some nutritional, hepatobiliary, luminal, and functional complications are more likely after specific bariatric procedures (O'Brien et al., 2013).

**General guidelines of post bariatric surgery diet** eat balanced meals with small portions, follow a diet low in calories, fats and sweets, keep a daily record of food portions and of calories and protein intake, eat slowly and chew small bites of food thoroughly, avoid rice, bread, raw vegetables and fresh fruits, as well as meats that are not easily chewed, such as pork and steak. Ground meats are usually better tolerated, do not use straws, drink carbonated beverages or chew ice. They can introduce air into pouch and cause discomfort, avoid sugar, sugar-containing foods and beverages, concentrated sweets and fruit juices, for the first two months following surgery, calorie intake should be between 300 and 600 calories a day, with a focus on thin and thicker liquids, daily caloric intake should not exceed 1,000 calories (Contreras et al., 2013).

**Exercise plane after bariatric surgery,** Develop and maintain a consistent exercise program to strengthen heart and bones, burn calories, develop muscles, increase metabolic rate, improve mood and relieve stress. Exercising can also improve blood sugar control. Walking is an excellent exercise that patient can begin immediately after surgery. Start by walking 10 minutes a day. Increase walk by one minute every few days. Remember, exercise needs to increase heart rate, so gardening does not count. It is also recommended to add strength training to build and maintain muscle mass, but please do not start strength training until at least six weeks after surgery. It is important to allow incisions to heal first. The patient must be keep in mind that you may not lose weight if not exercising (Marquez et al., 2015).

### Significance of the study

This study is the first study in this field. The study can also open in the development of the study of minimizing postoperative complications for a patient with bariatric surgery. According to the international

study, bariatric surgery complications affect about 15% of patients annually. Complications range from minor to severe and could be a single event or chronic in nature. This research will help health care team to minimize the risks of complications associated with each type of weight loss surgery (Mechanick et al., 2010).

### Aim of the Study

#### This study aims to

- Assess knowledge of patient about bariatric surgery and nursing guideline.
- Develop nursing guidelines for patients with bariatric surgery.
- Evaluate the effect of nursing guidelines on knowledge and postoperative complications of patients with bariatric surgery.

#### Hypothesis

To fulfill the aim of the study the following research hypothesis were formulated

- The knowledge of the study group bariatric patients after application of the nursing guidelines is more than knowledge of control group.
- The postoperative complications of patients with bariatric surgery are minimized in the study group than control group.

#### Research design

Quazi experimental research design was utilized to conduct data of this study.

#### Setting

The study was conducted in the plastic surgical department at Assiut University Hospitals.

#### Subjects

A purposive sample of available patients (50). The samples were divided into two equal groups, 25 study group who received nursing guidelines and 25 control group who received routine hospital care (male and female).

#### Sampling

The sample size was calculated using the sample size equation. Sample size was estimated with statistical program (Mini tab 17) and determined according to this equation

as follow:

$$n = \frac{Z^2 P(1-p)}{d^2}$$

- n = required sample size
- Z = confidence level (1.96)
- d = margin of error 0.5
- p = 0.5

n : according to equation, it was equal to = 348

note: selecting 50 patient depended on the decreasing number of patients undergoing bariatric surgery per

month in Assiut university hospitals (about 7 cases monthly).

The tools were tested for content validity by 5 experts of (2 academic Plastic Surgery staff and 3 nursing staff from faculty of Nursing) at Assiut University who reviewed the tools for clarity, relevance, comprehensiveness, and understanding. Minor modifications were required and correction was carried out accordingly. Then the final form of the tool was designed and tested for reliability by using internal consistency for the tools measured using Cronbach test, the tools proved to be reliable (0.73).

#### Inclusion criteria

- Age between (18-65) years old.
- Patients with BMI >40.
- Patients with BMI=35 with serious coexisting medical conditions related to obesity as sleep apnea and chronic obstructive pulmonary disease.

#### Study tools

Two tools were used for investigate the impact of nursing guidelines on minimizing postoperative complications after bariatric surgery.

**Tool 1: Patient informational assessment sheet:** this tool was developed by the researcher and used to assess the informational needs of patients in study and control groups, it included two parts:

**Part 1:** it included the demographic and clinical data of patients under study; name, age, gender, level of education, marital status, occupation, type of surgery and type of wound, height, weight, body mass index and chronic diseases such as coronary artery disease, diabetes mellitus types 1 & 2, chronic renal failure and cardiac failure.

**Part 2:** it includes 11 questions about definition of bariatric surgery, indications, contraindications, preoperative instructions, radiological and laboratory investigations, postoperative complications, preoperative preparation, postoperative diet and exercise, pre&postoperative care and instructions on discharge after bariatric surgery.

#### Total scoring system of tool (1):

Patient assessment knowledge about bariatric surgery which includes 11 questions, each question was observed, categorized, and scored into either know = 1 or don't know = 0 on all questions.

**Tool 2: Postoperative complications follow up sheet;** it was developed by the researcher to assess complications and patient outcome. Is the follow after 1<sup>st</sup>, 2<sup>nd</sup>, and 6<sup>th</sup> months.

anastomotic leak or intestinal obstruction may not be easy to diagnose because of the patient's large abdomen. Thus, there should be a low threshold for ordering a barium radiograph or computed tomogram. Endoscopy is rarely indicated at this time. Late complications; in describing the nursing care of the bariatric-surgery patient defines late

complications as those which occur once the patient has been discharged from the hospital and has recovered from the surgery. These complications can be further classified according to the surgical procedure performed. The euphoria induced by weight loss in bariatric patients may be replaced by disappointment and regret with the development of new gastrointestinal tract symptoms and complications. Some nutritional, hepatobiliary, luminal, and functional complications are more likely after specific bariatric procedures (O'Brien et al., 2013).

#### Nursing guidelines for bariatric surgery

It was developed by the researcher based on the review of the relevant literature and available resource. It includes three parts:

##### Part 1: Information to the patient about

Definition, indications, contraindications, preoperative instructions, radiological and laboratory investigations, postoperative complications, preoperative preparation, postoperative diet and exercise, pre & postoperative care and instructions on discharge after bariatric surgery.

**Part 2: Patient diet;** Information about diet which included:

Eat balanced meals with small portions, follow a diet low in calories, fats and sweets, keep a daily record of food portions and of calories and protein intake, eat slowly and chew small bites of food thoroughly, avoid rice, bread, raw vegetables and fresh fruits, as well as meats that are not easily chewed, such as pork and steak. Ground meats are usually better tolerated, do not use straws, drink carbonated beverages or chew ice. They can introduce air into pouch and cause discomfort, avoid sugar, sugar-containing foods and beverages, concentrated sweets and fruit juices, for the first two months following surgery, calorie intake should be between 300 and 600 calories a day, with a focus on thin and thicker liquids, daily caloric intake should not exceed 1,000 calories (Contreras et al., 2013).

Estimate the balanced meal equation by the following:

Calculate your CALORIC BASELINE:			
<input type="text"/>	x 11 =	<input type="text"/>	
Your current weight in pounds		Your CALORIC BASELINE	
Then take your CALORIC BASELINE and ADD 400 calories for MAINTENANCE CALORIES			
<input type="text"/>	+ 400 =	<input type="text"/>	
Your CALORIC BASELINE	(calorie burn)	Your MAINTENANCE CALORIES	
Then SUBTRACT 600 calories from your MAINTENANCE CALORIES to find your CALORIE TARGET for weight loss.			
<input type="text"/>	- 600 =	<input type="text"/>	
Your MAINTENANCE CALORIES		Your CALORIE TARGET	

lications occur af

**Fig (1): adopted from (Contreras, et al., 2013).**

**Part 3: Patient exercise:**

Exercise is recommended for success in achieving and maintaining weight loss. Develop and maintain a consistent exercise guidelines to strengthen heart and bones, burn calories, develop muscles, increase metabolic rate, improve mood and relieve stress. Exercising can also improve blood sugar control as walking, aerobic exercise, and strength training.

**Description of the nursing guidelines**

**Postoperative bariatric surgery guidelines**

The guidelines consist of three phases; preparatory phase (assessment and planning phase), implementation phase; this phase comprised the preoperative, postoperative and during this phase exercise training guidelines and diet were implemented and follow-up phase (evaluation phase). The nursing guidelines were designed to minimize the postoperative complications of bariatric surgery through individualized sessions. It developed by the researcher based on the review of relevant literature, available resources, and the patient needs assessment. A number of sessions; a total (3) sessions was conducted for each patient in addition to the pre-assessment session. Preparing of guidelines training place, teaching aid and media (pictures and Arabic handout); the content of guidelines modified in Arabic language and give it to the patient to help and facilitate the implementation of the guidelines for the patient. The first session included; information about bariatric surgery; definition, indications, contraindications of bariatric surgery. The second session included preoperative instructions, radiological and laboratory investigations and postoperative complications. The third session included; preoperative preparation, postoperative diet, and exercise, pre & postoperative care and instructions on discharge.

**Procedure**

The study was carried out in three phases: 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> phases:

**Preparatory phase**(assessment and planning phase) involved the following: Review of relevant literature; nursing textbooks, journals, internet resources about bariatric surgery. Then content and construct validity for tools were carried out. Patient's agreement for voluntary participation was obtained, the purpose and nature of the study were explained to the patient. A review of current and past, local and international related literature in the various aspects of the problems using books, articles, periodicals, and magazines was done. This phase ended by a pilot study.

**Content Validity**

It was established by panel of 5 experts who reviewed the tools for clarity, relevance, comprehensiveness, understanding, easiness for administrative minor

modifications were required. The content validity of this tool was checked by expert professors in fields of plastic surgical department and medical surgical nursing and correction were carried out accordingly.

**Ethical Consideration**

- Research proposal was approved by ethical committee in the faculty of nursing.
- Informal consent was obtained from patient or guidance that is willing to participate in the study after explaining the nature and purpose of the study.
- Confidentiality of the data was assured.
- Study subject has the right to refuse to participate or withdraw from the study without any rational at any time.
- Study subject privacy was considered during data collection.

**Administrative design**

An official permission to conduct the study was obtained by the researcher from the head of plastic surgical department to collect the necessary data after explain the aim of the study to them to obtain their cooperation. Also, the meetings with the patient to explain the objectives and contents of these tools after obtaining the patient consent for this study.

**The second phase (implementation phase):** This phase comprised the preoperative, postoperative and during this phase, the exercise and diet guidelines were implemented.

**Field work phase**

Data were collected at plastic surgical department at Assiut University Hospital during the period from 15/8 /2015 to 15/2/2016. The tools were all filled through interviewing. The purpose of the study was explained to the patients prior to answering the questions. The study was carried out during morning and afternoon shifts for all available patients.

**Preoperatively**

Patients were equally enrolled in the study as control and study groups sequentially. The 1<sup>st</sup> patient's interview was used to explain purpose and nature of the study as well as patient agreement for voluntary participation was obtained.

**Postoperatively**

- The interview with study group was at 2<sup>nd</sup> day postoperatively, and then once time daily during hospitalization for base line data was obtained from study and control groups patients.
- Before discharge, the investigator emphasized the importance of following up visit for all subjects (control and study) and arranged with study group the time and place for follow up which were 1<sup>st</sup>, 2<sup>nd</sup> and 6<sup>th</sup> week postoperatively in outpatient bariatric surgery clinic at Assiut University Hospitals.

- Control group patients were exposed to the routine hospital nursing intervention, while study group patients were received preoperative teaching nursing guidelines about diet and exercise after bariatric surgery.

**The last phase** of proposed guidelines is the evaluation phase. After implementation, the patient knowledge has been evaluated by the researcher by using nursing guideline. A line of contact was established between the investigator and subjects of both groups for feedback, monitoring, and provision of needed consultation and help.

#### A pilot study

Carried out in mid August 2015 to evaluate the clarity and applicability of the study tools on groups of 5 patients (10%) of the sample. The purpose of the pilot study was to detect any particular problem in the statements clarity, feasibility, and applicability of the

tool. The data obtained from the pilot study wear analyzed no change was done in the assessment sheet, so the 5 patients selected for the pilot study were included in the main study.

#### Statistical design

Data collected and analyzed by computer program SPSS" ver. 21" Chicago. USA. Data expressed as mean, Standard deviation and number, percentage. Mann-Whitney was used to determine significant for numeric variable. Chi. Square was used to determine significance for categorical variable. Pearson's correlation was used for correlations between groups.

n.s P > 0.05 no significant

\* P < 0.05 significant

\*\* P<0.001 moderate significance

\*\*\* p<0.000 Highly significance

## Results

**Table (1): Distribution of bio-socio-demographic patient's characteristics in study and control group subjects (n=50)**

Variables	Study n=(25)		Control n=(25)		P. value
	No.	%	No.	%	
<b>Age</b>	35.6+9.5		32.6+6.9		0.221 <sup>ns</sup>
<b>BMI</b>	51.5+6.5		49.4+7.5		0.295 <sup>ns</sup>
<b>Sex</b>					0.637 <sup>ns</sup>
Male	3	12.0	2	8.0	
Female	22	88.0	23	92.0	
<b>Marital status</b>					0.346 <sup>ns</sup>
Single	6	24.0	10	40.0	
Married	16	64.0	13	52.0	
Divorced	3	12.0	1	4.0	
Widow	0	0.0	1	4.0	
<b>Educational level</b>					0.149 <sup>ns</sup>
Illiterate	0	0.0	2	8.0	
Read & write	25	100.0	23	92.0	
<b>Occupation</b>					0.254 <sup>ns</sup>
Work	12	48.0	16	64.0	
Not work	13	52.0	9	36.0	

*T-test used for comparison between means (age, BMI)*

*Chi-square test used for comparison between percentages (e.g. sex)*

<sup>ns</sup> No statistically significant difference (p>0.05)

Table (2): Pre and postoperative score level of knowledge for patients about bariatric surgery for study group (n=50).

Variable	Pre (n=25)						Post (n=25)						P. value
	Cc		Incc		Inc		Cc		Incc		Inc		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
1. Meaning of bariatric surgery.	-	0.0	9	36	16	64	-	0.0	25	100	-	0.0	<0.001**
2. Indications of bariatric surgery.	-	0.0	1	4	24	96	7	28	14	56	4	16	<0.001**
3. Contraindications of bariatric surgery.	-	0.0	4	16	21	84	15	60	9	36	1	4	<0.001**
4. Patient tips should know before bariatric surgery.	4	16	8	32	13	52	13	52	11	44	1	4	<0.001**
5. Laboratory and radiological tests before bariatric surgery.	7	28	15	60	3	12	20	80	4	16	1	4	<0.001**
6. Measuring vital signs.	25	100	-	0.0	-	0.0	25	100	-	0.0	-	0.0	-
7. Complications after bariatric surgery.	-	0.0	-	0.0	25	100	13	52	3	12	9	36	<0.001**
8. Preparations before bariatric surgery.	5	20	9	36	11	44	9	36	14	56	2	8	0.015*
9. Exercise carried out after bariatric surgery.	2	8	23	92	-	0.0	16	64	9	36	-	0.0	<0.001**
10. Good diet after bariatric surgery.	-	-	-	-	-	-	-	-	-	-	-	-	
1 <sup>st</sup> stage : Day 0-3: Clear liquid diet	-	0.0	7	28	18	72	5	20	14	56	6	24	<0.001**
2 <sup>nd</sup> stage: Day 4 - 14: Full liquid diet	-	0.0	7	28	18	72	5	20	14	56	6	24	0.006**
3 <sup>rd</sup> stage: Day 15- 35: Puree diet	-	0.0	7	28	18	72	5	20	14	56	6	24	<0.001**
4 <sup>th</sup> stage: Week 6 & Beyond: regular food	-	0.0	7	28	18	72	5	20	14	56	6	24	<0.001**
11. Instructions followed after discharge from the hospital.	-	0.0	3	12	22	88	16	64	8	32	1	4	<0.001**

Chi-square test used for comparison between percentages

Cc: Complete correct.

(\*\*) Statistically moderate significant  $P < 0.01$ .

Incc: Incomplete correct.

(\*) Statistically significant  $P < 0.05$ .

Inc: Incorrect.

**Table (3): Comparison between study and control group as regarded late complications after implementation of nursing guidelines (n= 50):**

Late complication	Study (n=25)						Control (n=25)						P1	P2	P3	
	1 <sup>st</sup>		2 <sup>nd</sup>		After 6 months		1 <sup>st</sup>		2 <sup>nd</sup>		After 6 months					
	No	%	No	%	No	%	No	%	No	%	No	%				
<b>Internal hernia</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Bowel obstruction</b>	2	8	2	8	1	4	9	36	9	36	8	36	0.038*	0.038*	0.022*	
-Abdominal pain	2	8	2	8	1	4	9	36	9	36	8	36	0.038*	0.038*	0.022*	
- Distension	2	8	2	8	1	4	9	36	9	36	8	36	0.038*	0.038**	0.022*	
-Vomiting,	2	8	2	8	1	4	9	36	9	36	8	36	0.038*	0.038*	0.022*	
-diarrhea or Constipation	2	8	2	8	1	4	9	36	9	36	8	36	0.038*	0.038*	0.022*	
<b>3-Impaired skin integrity</b>	2	8	2	8	1	4	9	36	9	36	8	36	0.038*	0.038*	0.022*	
Dryness of lips and tongue	2	8	2	8	1	4	9	36	9	36	8	36	0.038*	0.038*	0.022*	
- Skin wrinkling	3	12	2	8	1	4	11	36	9	36	7	36	0.024*	0.038*	0.042*	
<b>Wound infection</b>	4	16	2	4	1	4	12	48	9	36	7	28	0.031*	0.038*	0.042*	
-Redness and swollen	4	16	2	4	1	4	12	48	9	36	7	28	0.031*	0.038*	0.042*	
-Wound pus	4	16	2	4	1	4	12	48	9	36	7	28	0.031*	0.038*	0.042*	
-Hyperthermia	4	16	2	4	1	4	12	48	9	36	7	28	0.031*	0.038*	0.042*	
-Yellowish and radish secretions	4	16	2	4	1	4	12	48	9	36	7	28	0.031*	0.038*	0.042*	
<b>Vitamins and minerals deficiency</b>	1	4	1	4	0	4	7	48	7	28	6	24	0.042*	0.042*	0.027*	
-Muscle cramps	1	4	1	4	0	4	7	48	7	28	6	24	0.042*	0.042*	0.027*	
-Decrease intellectual function	1	4	1	4	0	4	7	48	7	28	6	24	0.042*	0.042*	0.027*	
-Fatigue-	1	4	1	4	0	0.0	6	24	6	24	4	16	0.047*	0.047*	0.117*	
-Increase the sense of coldness-	1	4	1	4	0	0.0	6	24	6	24	4	16	0.047*	0.047*	0.117*	
-Constipation-	1	4	1	4	0	0.0	6	24	6	24	4	16	0.047*	0.047*	0.117*	
-Lack of appetite	1	4	1	4	0	4	7	28	7	28	6	24	0.042*	0.042*	0.027*	
-Chills of eyelids and mouth	1	4	1	4	0	4	7	28	7	28	6	24	0.042*	0.042*	0.027*	
<b>Gall stones formation</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<b>7-Recurrence of obesity</b>	4	16	2	4	1	4	12	48	9	36	7	28	0.031*	0.038*	0.042*	
-By BMI-	4	16	2	4	1	4	12	48	9	36	7	28	0.031*	0.038*	0.042*	

Chi-square test used for comparison between percentages

P1: Comparison between study and control group in 1<sup>st</sup>

P2: Comparison between study and control group in 2<sup>nd</sup>

P3: Comparison between study and control group after 6 month

Table (4): Relation between knowledge and socio-demographic data in study group.

	Study group												P. value	
	Knowledge level before						P. value	Knowledge level after						
	Poor		Fair		Good			Poor		Fair		Good		
	No.	%	No.	%	No.	%		No.	%	No.	%	No.		%
<b>Age groups</b>														
20- <30 years	5	25.0	2	40.0	0	0.0	0.784	2	33.3	1	11.1	4	40.0	0.505
30-<40 years	9	45.0	2	40.0	0	0.0		2	33.3	6	66.7	3	30.0	
40+ years	6	30.0	1	20.0	0	0.0		2	33.3	2	22.2	3	30.0	
<b>Sex</b>														
Male	2	10.0	1	20.0	0	0.0	0.538	0	0.0	1	11.1	2	20.0	0.489
Female	18	90.0	4	80.0	0	0.0		6	100.0	8	88.9	8	80.0	
<b>Marital status</b>														
Single	5	25.0	1	20.0	0	0.0	0.594	1	16.7	1	11.1	4	40.0	0.256
Married	12	60.0	4	80.0	0	0.0		4	66.7	8	88.9	4	40.0	
Divorced	3	15.0	0	0.0	0	0.0		1	16.7	0	0.0	2	20.0	
Widow	3	15.0	0	0.0	0	0.0		1	16.7	0	0.0	2	20.0	
<b>Occupation</b>														
Work	11	55.0	5	100.0	0	0.0	0.061	4	66.7	6	66.7	6	60.0	0.944
Not work	9	45.0	0	0.0	0	0.0		2	33.3	3	33.3	4	40.0	

Chi-square test used for comparison between percentages

Table (5): Relation between knowledge and socio-demographic data in control group

	Control group										P. value	
	Knowledge level before					P. value	Knowledge level after					
	Poor		Fair				Poor		Fair			
	No.	%	No.	%	No.		%	No.	%	No.		%
<b>Age groups</b>												
20- <30 years	6	28.6	2	50.0	0.499	6	31.6	2	33.3	0.994		
30-<40 years	12	57.1	1	25.0		10	52.6	3	50.0			
40+ years	3	14.3	1	25.0		3	15.8	1	16.7			
<b>Sex</b>												
Male	2	9.5	0	0.0	0.520	2	10.5	0	0.0	0.407		
Female	19	90.5	4	100.0		17	89.5	6	100.0			
<b>Marital status</b>												
Single	8	38.1	2	50.0	0.101	7	36.8	3	50.0	0.240		
Married	12	57.1	1	25.0		11	57.9	2	33.3			
Divorced	1	4.8	0	0.0		1	5.3	0	0.0			
Widow	0	0.0	1	25.0		0	0.0	1	16.7			
<b>Occupation</b>												
Work	10	47.6	2	50.0	0.930	8	42.1	4	66.7	0.294		
Not work	11	52.4	2	50.0		11	57.9	2	33.3			

Chi-square test used for comparison between percentages

Table (6): Comparison between early complications and knowledge in study and control group:

Early complications	Study			P. value	Control			P. value
	Poor (n=6)	Fair (n=9)	Good (n=10)		Poor (n=19)	Fair (n=6)	Good (n=0)	
Internal bleeding	0	0	0	-	0	0	0	-
External bleeding	2	0	0	0.032*	7	2	0	0.876
Respiratory failure	0	0	0	-	0	0	0	-
Pulmonary embolism	0	0	0	-	0	0	0	-
postoperative leakage	5	1	0	0.001**	19	3	0	0.001**
Deep venous thrombosis	0	0	0	-	0	0	0	-
Splenic injury	0	0	0	-	0	0	0	-

Table (7): comparison between late complications and knowledge in study and control group:

Late complications	Study (n=25)									P. value	Control (n=25)									P. value
	1 <sup>st</sup>			2 <sup>nd</sup>			After 6 months				1 <sup>st</sup>			2 <sup>nd</sup>			After 6 months			
	Poor (n=6)	Fair (n=9)	Good (n=10)	Poor (n=6)	Fair (n=9)	Good (n=10)	Poor (n=6)	Fair (n=9)	Good (n=10)		Poor (n=19)	Fair (n=6)	Good (n=0)	Poor (n=19)	Fair (n=6)	Good (n=0)	Poor (n=19)	Fair (n=6)	Good (n=0)	
Internal hernia	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	-	
Bowel obstruction:	2	0	0	2	0	0	1	0	0	1.000	8	1	0	8	1	0	8	0	0	0.618
Impaired skin integrity:	2	0	0	2	0	0	1	0	0	1.000	7	2	0	8	1	0	8	0	0	0.358
Wound infection:	3	1	0	2	0	0	1	0	0	0.646	1	2	0	9	0	0	7	0	0	0.238
Vitamins and minerals deficiency	1	0	0	1	0	0	0	0	0	1.000	6	1	0	6	1	0	6	0	0	0.621
Gall stones formation:	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	-
Recurrence of obesity	3	1	0	2	0	0	1	0	0	0.646	9	3	0	9	0	0	7	0	0	0.106

Table (8): Pre and postoperative total score level of knowledge for patients about bariatric surgery for both study and control group:

variables	Knowledge score (mean±SD) Total score =45		P. value
	Pre	Post	
Study	9.1±3.9s	29.8±6.2	<0.001**
Control	7.4±3.5	8.4±3.5	0.334 <sup>ns</sup>
P. value	0.112 <sup>ns</sup>	<0.001**	

**Table (1):** this table demonstrates that; as regarded age, the sample of study and control group was (35.6±9.5 and 32.6±6.9) respectively. As regarded sex, the majority of sample in study and control group were female (88% and 92%) respectively. As regarded marital status the majority of sample in study and control group was married (64.0 % and

52.0 %) respectively. As regarded educational level, all of the sample in study and control group were read and write (92.0 % and 100 %) respectively. As regarded occupation, more than half in control group did not work (52.0 %) while about two third of study group was work (64.0 %). There is no statistically

significant difference in all of bio-socio-demographic data.

**Table (2):** this table shows that; there was statistically significant difference as regarded pre and postoperative score for level of knowledge of study group about bariatric surgery except the following: important of the efficiency of vital signs, knowledge about postoperative complications, exercise carried out and good diet after operation.

**Table (3):** this table demonstrates that; there was statistical significant difference between study and control group as regarded late complications.

**Table (4):** this table shows that there; there was statistical significant difference between knowledge and sociodemographic data in study group.

**Table (5):** this table shows that there; there was statistical significant difference between knowledge and sociodemographic data in control group.

**Table (6):** this table shows that there; there was statistical significant difference between knowledge and early complications in study and control group.

**Table (7):** this table shows that there; there was statistical significant difference between knowledge and late complications in study and control group.

**Table (8):** this table shows that there; there were statistically significant difference in pre and postoperative total score level of knowledge for patients about bariatric surgery for both study and control group (total mean score=45).

## Discussion

This work aims to assess knowledge of patient with bariatric surgery, develop nursing guidelines to minimize postoperative complications of bariatric surgery and evaluate the impact of nursing guidelines on minimizing postoperative complications of patients with bariatric surgery.

Regarding bio-socio-demographic characteristics, two groups (study and control) were included in this study with no statistically significant differences shown between age, sex, BMI, marital status, the level of education and occupation at the beginning of the study.

The present study findings showed that as regarded age, the mean of a sample of study and control group was (35.6±9.5 and 32.6±6.9) respectively this result disagrees with (Athyros et al., 2011) who mentioned that; sixty-five participants (41 women and 24 men) with a mean age of 51.5 years.

As regarded BMI the present study stated that the sample of study and control groups were (51±9.5 and 49±7.5) respectively. This result agrees with (Dumas et al., 2014) who mentioned that; a patient who performed bariatric surgeries with a mean BMI of more than 45.

As regarded BMI and chronic diseases the present study agrees with (Damschoder et al., 2011) who reported that patients with extremely high BMIs (>50) and/or a high burden of comorbidities have a greater risk of death after surgery, compared to patients with lower BMIs and lesser comorbidity burdens.

Concerning sex, the present study showed that the majority of sample in study and control group were female, this result agrees with (Robitaille, 2012) who mentioned that; the procedure is producing some significant results that were published in a recent study in bariatric times and are based on post-operative outcomes for 66 patients (44 female).

The result in the present study revealed that as regarded type of operation more than two third of study and control groups were performed gastric bypass and this study agrees with (Buchwald & Oien, 2013) who discussed that the gastric bypass surgery is safe than other types of surgery so it is the most performing surgery to the patient. He mentioned the advantages of gastric bypass as; produces significant long-term weight loss (60 to 80 percent excess weight loss), restricts the amount of food that can be consumed, may lead to conditions that increase energy expenditure, produces favorable changes in gut hormones that reduce appetite and enhance satiety and typical maintenance of >50% excess weight loss.

This result stated that there were postoperative complications of bariatric surgery occur before implementation of nursing teaching guidelines. This result is in the same line of (McGuire et al., 2011) who mentioned that; complications occur in about 20 percent of bariatric surgical cases, 6 complications resulting from bariatric surgery include the usual risks of any surgical procedure before teaching the patient about diet and exercise, such as anesthesia problems, bleeding, and cardiovascular events incurred while on the operating table or in the early postoperative period (myocardial infarction, deep vein thrombosis, pulmonary embolism). Other complications soon after surgery include nausea and vomiting, incisional hernias, wound infections, strictures, stomach ulcers, stomach and intestine leaks or ruptures, and bowel obstruction. He mentioned that these complications don't appear after teaching the patient about diet and exercise.

The present study mentioned that; the effect of nursing guidelines on minimizing the postoperative complications of bariatric surgery and this agrees with (Mechanic et al., 2013) who mentioned that; patients who received those guidelines were improved and there is a decrease in the incidence of postoperative complications.

The present study shows that according to knowledge and sociodemographic data; married and work females have more knowledge about bariatric surgery and this agrees with (Miras et al., 2014) who mentioned that females have more knowledge than males about bariatric surgery.

The present study showed that the importance of guidelines on minimizing postoperative complications. This result agrees with (Asher et al., 2013) who compared symptoms before guidelines and 6 months after guidelines, found improvement in functional symptoms, such as abdominal distension, abdominal pain, flatus, and fecal urgency.

The result in the present study revealed that, a great improvement in the knowledge score levels obtained by patients after implementation of nursing guidelines, the majority of sample in study and control groups were poor before implementation nursing guidelines while after implementation of nursing guidelines, most of sample in study group was improved. The present study is in the lines of (Miller et al., 2013) who stated that the guidelines recommend before bariatric surgery as the most beneficial and cost-effective management for motivated individuals with severe obesity.

### Conclusion

Based on the result of the present study, it can be concluded that; the early complications in the study group were significantly better than those in the control group. There was significant difference in improvement throughout the nursing guidelines among the study group existed between late complications for both groups at time of follow-up.

### Recommendations

**Based on results of the present study, the following can be recommended**

#### For patients

- Patients who have had bariatric surgery require additional verbal and written information about guidelines for diet and physical activity using pamphlets and simply illustrated nursing guideline booklet to prevent the postoperative complications.
- Preparation and provision of information should start from the time of the surgeon's decision that surgery is required. The patients must visit the plastic surgery unit 2 weeks prior to surgery for the preoperative work up; to prepare them and provide information in the form of booklets, videos, and one to one counseling sessions.

#### For research (future study)

- Importance of doing separate studies of bariatric surgery in males and females and will helpfully lead to more effective and preventive – based strategies for future.
- Studies should be done for those patients who high risk for complications after bariatric surgery and apply the preventive measures.
- Survey of incidence of complications after bariatric surgery should be done in order to recognize the prevalence of the problem all over Egypt.
- Replication of the current study on larger probability sample is recommended to achieve generalized ability and wider utilization of the designed program.

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