

Effect of Structured Teaching Program on Physiological and Psychological Problems among Post-Bariatric Surgery Patients

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Abstract:

Background: Bariatric surgery now is considered the most effective solution for morbid obesity or obesity with associated medical conditions. Despite bariatric surgery providing significant weight loss, a considerable portion of patients do not achieve relevant outcomes which lead to physical and psychological problems. **Aim:** To evaluate the effect of a structured teaching program on physiological and psychological problems among post-bariatric surgery patients. **Subject and methods : Design:** a quasi-experimental research design was used. **Setting:** This study was applied in Surgical Outpatient Clinics at Sohag University Hospital. **Sample:** a convenient sample included 100 adult patients who were on bariatric surgery status. **Tools:** Tool I: "Structured Interview Assessment Schedule" which included three parts; Part I Patients' demographic data, Part2: Patients' clinical data, and Part III: Bariatric Surgery Patients' knowledge Assessment Sheet; Tool II: Post Bariatric Surgery patients' Physiological Assessment Tool, Tool III: Post Bariatric Surgery Patients' Psychological assessment tool; Part One: Body Image-Acceptance and Action Questionnaire; Part Two: Rosenberg self-esteem scale; and Tool IV: Eating disorders questionnaire. **Results:** There was a significant improvement in the total knowledge scores of the post-bariatric surgery patients pre and post-structured teaching program implementation. There was a significant improvement in physical problems and psychological problems among those patients. The majority of the studied patients accepted their body image post-structured teaching program implementation more than half of them had high self-esteem and more than three-fifths of them were restraining their eating post-structured teaching program implementation. **Conclusion:** Structured teaching program implementation has a positive effect on improving physiological and psychological problems among post-bariatric surgery patients. **Recommendations:** Teaching program implementation for bariatric surgery patients is recommended to identify the physiological and psychological conditions of patients post-bariatric surgery and is highly needed to achieve appropriate post-bariatric surgery outcomes for a longtime.

Keywords: Physiological problems, Post-bariatric surgery patients, Psychological Problems, Structured teaching program

Introduction:

Several researches has recently begun to focus on obesity as it has become a medical disaster. The accumulation of excessive adipose tissue is a pathological condition. It is one of the main risk factors for numerous illnesses, including cancer, cardiovascular diseases, and is frequently evaluated using the body mass index (BMI) measurement (Larson, 2021). In addition

to having a detrimental effect on all bodily systems, obesity raises the chance of developing diabetes mellitus, hypertension, asthma, arthritis, sleep apnea, low self-esteem, depression, and strained interpersonal connections. Comorbid medical problems refer to the elevated risk of developing one or more medical conditions connected with obesity in patients (Lawson, 2020).

Such procedures are currently performed on an exponential scale throughout the world, especially in Asia. Globally, almost 700,000 procedures were performed in 2016 alone. In addition to the West, the East has also seen a significant increase in the prevalence of obesity, particularly in Egypt. In addition to its detrimental effects on appearance, obesity raises the risk of several illnesses and conditions, including hypertension, type 2 diabetes, and cardiovascular disease, and it can seriously compromise patients' quality of life. According to **Vuori (2022)**, bariatric surgery is regarded as one of the more efficient and widely accessible therapies for obesity and associated comorbidities. Egypt is the country with the greatest global obesity prevalence, ranking 18th. Furthermore, obesity costs the Egyptian economy some 62 billion pounds a year. This value is the cost of treating diseases attributable to obesity among adults (**Zafar and Ismail 2018, Aboulghate, 2021**)

In this context, bariatric surgery started to be considered the most effective alternative to treat obesity. It could be suggested when other weight loss methods had been tried and failed. Bariatric surgery is currently the most effective therapy for inducing long-term weight loss and for reducing comorbidity burden and mortality rate among patients with severe obesity (**Bettini et al, 2020**). Management of obesity has demanded efforts by nurses, medical staff, and other health professionals to find new alternatives for treatment.

Surgery for extreme overweight or morbid obesity is referred to as "Bariatric Treatment." Restrictions on food intake, impaired caloric absorption from food, an increase in metabolic rate, reduced appetite, enhanced satiety, and a host of other hormonal pathways are some of the ways bariatric surgery works. Reduced food intake following bariatric surgery is essentially the primary factor contributing to weight loss in the first half-year after the procedure. Bariatric surgery modifies the digestive tract to help

patients lose weight by restricting their food intake, decreasing their absorption of nutrients, or utilizing both strategies. Patients with a BMI of more than 40 are considered candidates for bariatric surgery; According to **Ann, 2020**, and **Calcaterra et al. (2021)**, having a BMI between 35 and 40 is linked to substantial comorbidities such as diabetes mellitus, hypertension, arthritis, and sleep apnea.

Not only does bariatric surgery result in large and long-lasting weight loss, but it also significantly improves patients' quality of life and comorbidities related to obesity. Additionally, non-Hodgkin lymphoma, breast cancer, and endometrial cancer in women are among the cancers for which bariatric surgery may lower the risk. It may also lower the chance of developing stomach, colon, rectum, liver, gallbladder, pancreatic, kidney, and thyroid cancers. Moreover, improved comorbidities such as type 2 diabetes mellitus, hypertension, sleep apnea, dyslipidemia, sexual functioning, and increased activity are additional benefits of bariatric surgery. Given the link between type 2 diabetes mellitus and obesity, one could anticipate that bariatric surgery would result in better blood sugar regulation. In addition, the psychological benefits of bariatric surgery include remission of depression and anxiety symptoms (**Alison et al, 2019, Tao et al, 2020**).

Unfortunately, weight loss following bariatric surgery may result in some physiological, social, and psychological issues, even if it has been shown to enhance patients' quality of life. Despite its growing popularity globally, bariatric surgery carries a risk of severe physical side effects and stress. However, psychological variables may play a major role in the difficulty of sustaining long-term weight loss, as well as the potential for weight gain. In general, bariatric surgery is safe and beneficial; nonetheless, there is a risk of catastrophic consequences, some of which could be fatal if not promptly addressed. I.e. The gastrointestinal anatomy of a patient is

permanently altered after bariatric surgery, which may result in several restrictions, particularly after restrictive bariatric procedures (Larson, 2021).

The outcomes of bariatric surgery are variable in some studies. They show that depressive symptoms may worsen in some patients (Ivezaj & Grilo, 2023). Further studies have also reported that up to 65% of bariatric surgery patients endorsed a history of depression or mood disturbance (Duarte-Guerra et al., 2021; Alsubaie et al., 2021). Studies focusing on psychological changes and psychiatric disorders among bariatric patients are limited in Saudi Arabia (Dawes et al., 2023, Sait et al., 2019)

Malabsorptive bariatric surgery may also impact a patient's nutritional condition, which may have existed before surgery, independent of the patient's body mass index. To make informed decisions and plan treatments, it may be necessary to analyze a patient's nutritional, cardiovascular, and psychological health (Dumon and Daniel ;2019).

Moreover, several studies have discovered that, in the first year following bariatric surgery, a patient's physiological and psychological state may have an impact on their ability to lose weight. Extreme obesity can lead to psychosocial issues occasionally, which makes individuals who have had bariatric surgery more susceptible to these conditions. Several studies highlighted the possibility of post-bariatric surgery issues, which included increased challenges with weight loss following surgery, in around one-third of individuals who had undergone bariatric surgery. This may be the cause of some bariatric surgery patients' failure to shed excess weight and the potential for weight increase in the initial years following surgery in other patients. (Joshua et al., 2020; Nawfal et al. , 2021)

Professional nurses with experience in the field of bariatric surgery should also evaluate

patients before and after the procedure. When it comes to providing patients with care both before and after bariatric surgery, bariatric nurse practitioners are crucial. Assessing the patient's issues and delivering well-planned, efficient care could accomplish this. Bariatric nurses therefore prioritize the providing continuity of care for their patients by utilizing the nursing process, which involves working with the patient to detect potential health issues early on (Bellicha et al., 2021).

Finding health issues in patients who have had bariatric surgery is the duty of the nurse and is regarded as essential to nursing practice. In addition to the early discovery of health-related complications following bariatric surgery, the patient-nurse relationship is crucial for the execution of a weight loss program and the maintenance of subsequent weight loss. Patients recovering from bariatric surgery need the assistance of bariatric nurses to identify common issues and implement the necessary lifestyle modifications to help control the patient's weight (Sharon, 2017, Schlottmann et al., 2018, Conceição et al., 2020). Following these recommended guidelines, bariatric surgery patients must ensure long-term postoperative success. After bariatric surgery, physical activity can be improved for blood sugar control, speed up recovery, wound curing, improve circulation, and strengthen bones and heart. It can also help patients lose weight and maintain a healthy lifestyle (Bellicha et al., 2021).

Medical-surgical nurses play a significant role in assessing malnutrition. The primary role of nutritionists is to teach patients about appropriate eating habits and how to rationalize their intake of liquids, protein, carbohydrates, and fat. Patients who are menstruating are more likely to be iron deficient and anemic, so it is advised that they should take 325 mg of iron sulfate with vitamin C to strengthen their absorption. Chronic malnutrition difficulties might manifest as muscle discomfort and tingling in the hands, feet, and legs. These

disorders arise from altered nutrient absorption following surgery. So that Energy needs will be estimated by a Registered Dietitian (RD) or bariatric nurse such Estimated energy intake should be adjusted according to the severity and type of illness or surgery. Energy requirements may be calculated either through simplistic formulas (25-30 kcal/kg/d), published predictive equations, or the use of indirect calorimetry (Sabera et al., 2021).

When Obesity BMI >29.9 post bariatric surgery the plan of energy needs are calculated as Mifflin St. Jeor Equation: Men: $(10 \times \text{kg}) + (6.25 \times \text{cm}) - (5 \times \text{age}) + 5$ Women: $(10 \times \text{kg}) + (6.25 \times \text{cm}) - (5 \times \text{age}) - 161$. Also, protein needs post-surgery will be estimated for patients with a BMI <30 protein requirements and should be in the range of 1.2-2.0 g/kg actual body weight per day. Protein should be provided in a range of ≥ 2.0 g/kg ideal body weight per day for Class I and II patients (BMI 30-40) and ≥ 2.5 g/kg ideal body weight per day for Class III (BMI ≥ 40). Patients should constantly take vitamin/mineral supplements as directed by their physician to prevent malnutrition (Balsiger et al., 2022).

Whereas a medical surgical nurse has a crucial role in the management of obesity for inpatient and outpatient as following up the dietary regimen and nutritional status assessment, She has a major factor in helping people maintain stable weight following surgery by encouraging good habits like exercise and a balanced healthy diet. Additionally, after bariatric surgery, nurses should support, inform, and provide patients with best practice standards (Pearce et al., 2019). In addition to treating and caring for patients, nurses also help patients plan for surgery, educate them about potential post-operative complications, and get ready for discharge.

The nurse plays acting crucial part in the follow-up process to guarantee optimal weight reduction outcomes with the least amount of nutritional danger. Standardized nutrition

protocols are necessary for the treatment and monitoring of patients after obesity surgery. After bariatric surgery, identifying, and treating common and rare undernutrition that may develop both soon after the procedure and over time, as well as identifying and treating deficiency symptoms, are critical to improving long-term health (Akkayaoglu & Çelik, 2020).

Significance of the study:

According to the estimation from 2018, there could be about 3 million fatalities globally as a result of rising morbidity and mortality from obesity that are linked to shorter life spans. On the other hand, the number of obesity-related premature deaths rose to almost 4.7 million in 2021. The sixth most common preventable cause of death was listed as having this condition. Obesity affects several comorbidities associated with obesity, such as type 2 diabetes mellitus, hypertension, elevated serum cholesterol, gallbladder disease, and coronary heart disease. It also lowers work performance and social relationships, according to the World Health Organization (WHO, 2023). For the majority of people, bariatric surgery represents the only long-term and reliable means of achieving substantial weight loss and improving comorbidities associated with obesity. It can improve quality of life, prevent several cancers, and decrease overall mortality (Upton, 2019).

Aim of the study:

To evaluate the effect of structured teaching programs on physiological and psychological problems among post-bariatric surgery patients.

Research hypothesis:

H1: Structured teaching program implementation is expected to have a positive effect on improving the mean score of knowledge among post-bariatric surgery patients.

H2: Post-bariatric surgery patients who receive the structured teaching program are expected to have fewer physiological problems.

H3: Post-bariatric surgery patients who receive the structured teaching program are expected to have low levels of psychological problems post-structured teaching program implementation.

Subjects and Methods

Research design:

To achieve the aim of this study a quasi-experimental research design was used (one group, pre-posttest).

Research Setting:

This study was applied in Surgical Outpatient Clinics at Sohag University Hospital, Egypt.

Subjects:

A convenient sample included 100 adult patients who had been in post-bariatric surgery status for six months.

Tool of the study:-

Four tools were used:

Tool I: "Structured Interview Assessment schedule "

This tool was developed by the researcher after reviewing the recent related literature (Al-Mutawa & Anderson, 2018, Valina et al., 2019, Ann, 2020, Meyer et al 2021, WHO, 2023) to obtain the necessary data. It included three main parts as follows

Part one: "Patients' Demographic Data Sheet: which included data about code, age, gender, level of education, occupation, and area of residence.

Part two: "Patient's Clinical Data Questionnaire" such as smoking, body mass index, type of bariatric surgery, comorbid conditions such as D.M, hypertension, dyslipidemia and arthritis, past medical and

surgical history, previous diet and exercise regimen, laboratory investigations, the post-operative success of weight reduction and previous history of psychological problems such as anxiety, depression, and eating disorders.

Part three: Bariatric Surgery Patients' Knowledge Assessment Sheet: To find out how much patients knew about bariatric surgery, the researcher created this section. fifteen closed and open-ended questions covering topics such as the definition of bariatric surgery, indications, contraindications, preoperative instructions, and preparation, laboratory and radiological investigations, pre/postoperative care, postoperative complications, postoperative diet, exercise, and discharge instructions were included.

Scoring system:

Each question was revised, categorized, and scored. Each correct and complete answer was given 2 grades, correct and complete was given one, and incorrect answer was given zero. The score of each part of knowledge was added and converted into a percentage score. A total score was 30 was categorized as a score less than 60% was considered unsatisfactory level and a score of more than 60% was considered satisfactory level of knowledge.

Tool II: "Post Bariatric Surgery Patients' Physiological Assessment tool" :

This questionnaire was constructed and developed by the researcher after reviewing the related literature and aimed to assess the necessary data about common physiological problems experienced by patients' post-bariatric surgery. This part included a comprehensive assessment of the different body systems to evaluate post-bariatric surgery patients for physiological problems. It contained 20 items covering the main physical problems such as dumping syndrome, wound infections, stenosis, hemorrhage anastomotic leak, deep venous

thrombosis, and pulmonary embolism. The assessment tool was established according to 3 levels of Likert scale.

Scoring system

Each item had a set of answers; the chosen answer was given one mark. The first response is 1, second response 2, third response 3. The total score equals 60.

Low physical problems <30, Moderate physical problems [30-45], and High physical problems [46-60].

Tool III: Post Bariatric Surgery Patients' Psychological Assessment tool:

This part was constructed and developed by the researchers after reviewing the related literature and aimed to assess the necessary data about patients' psychological conditions and problems post-bariatric surgery. It is comprised of four main parts as follows:

Part one: The Beck Depression Inventory-II (BDI-II): Created by Aaron Beck and was modified by the researcher. It contains 16 items to identify related symptoms of depression such as sadness, pessimism, past failure, loss of pleasure, guilt, punishment feeling, and self-dislike.

Scoring system:

Each item has a set of responses ranging in intensity. The first response is 1, second response 2, third response 3, fourth response 4. The total score equals 50.

Mild depression [16 <24], Moderate depression [24-38] & Severe depression [>38-50].

Higher total scores indicate more severe depressive symptoms

Part two: Body image-Acceptance and action questionnaire:

Created by **Emily, Sandoz & Kelly in 2006**. After reviewing the literature, the researcher

modified it. It consists of 14 items on a 5-point Likert scale that assess body image concerns, acceptance, and dissatisfaction. Some of the items are: I get by in life even when I feel self-conscious about my appearance; worrying about my weight makes it difficult for me to live a life that I value; I care too much about my weight and body shape; and How I feel about my body has very little to do with the decisions I make daily.

Scoring system:

For every item, the replies were scored on a Likert scale: never, seldom, sometimes, frequently, and always. Each response received a score between 1 and 5, with the following possible outcomes: never = 1, seldom = 2, occasionally = 3, frequently = 4, and always = 5.

The total score equals 70. Higher scores indicate more acceptance.

Part three: "Rosenberg self-esteem scale":

developed by "Morris Rosenberg in 1965". The researcher utilized it exactly as it is to gauge the subject's degree of self-worth. The 10 items on the Likert-type scale are rated on a four-point scale that runs from strongly disagree to strongly agree. There are five statements with positive wording and five with negative wording in each item. To gauge the respondents' level of self-esteem, the scale asks them to consider their current feelings, such as how content they are with themselves overall or how sometimes they feel like they are completely unworthy. I believe I possess many positive traits and can perform most tasks just as effectively as most others.

Scoring system:

For items 1, 2, 4, 6, and 7, the numbers are as follows: strongly disagree = 0, strongly agree = 3, and agree=2. For the valence-reversed elements 3, 5, 8, 9, and 10: Strongly agree = 3. Strongly disagree = 0, disagree = 1, and agree = 2.

The total score equals 30. How do you calculate low self-esteem or moderate or high

Tool IV: "Eating disorders questionnaire":

This questionnaire was created by the researcher following a comprehensive analysis of pertinent literature (**Bethany and Christina, 2022**). Its purpose is to evaluate eating disorders following bariatric surgery, whether they are allowed or not. An Arabic translation was done by the researcher. It had fifteen questions covering the main points of eating disorders, like how often you feel hungry, what kind of food you eat, how attentive are you to what you eat, how often you eat, how many calories you count, and how slowly you eat and chew.

Scoring system:

The answer for each item is either yes or no, scoring as follows: yes=1, no=0, the total score equals 15. Restrain [0-8], NotRestrain [9-15].

Research methods:

I. Administrative Design:

After submitting an official letter outlining the study's objectives to the dean of Sohag University's nursing faculty and receiving her consent, the director of Sohag University Hospitals was contacted to request permission to conduct the research. The director of Sohag University Hospitals provided formal approval for the study to be carried out.

II. Ethical Consideration:

At Sohag University Hospital, the research proposal was accepted by the nursing faculty's ethical committee. The study subject did not face any risks while the research was being applied. Clinical research ethics guidelines were adhered to by the study. Additionally, after describing the nature and goals of the study to each patient, a signed agreement was acquired. Every volunteer was advised by the researcher that they could decline to take part in the study at any time or leave it without

giving a reason. We guarantee privacy and confidentiality.

Data collection: started in July 2023 and ended at the end of December 2023, the data collection process took six months to be completed. Three days a week, on Saturday, Sunday, and Tuesday, the researcher gathers data in the morning (from 8 am to 12 pm) and afternoon shift (from 1 pm to 8 pm) from surgical words.

Fieldwork:

To gather comprehensive knowledge for creating the study instruments, the researcher studied the contemporary, historical, local, and international literature about the various facets of medical and mental issues. The patients are given the tools by the researcher once they have been informed of the purpose and goals of the study. Patients spent twenty to thirty minutes to finish the page. The patients' replied sheets were collected by the researcher.

The fieldwork included three phases (preparatory and assessment phase, planning phase, implementation phase, and evaluation phase).

1-The Preparatory phase:

After studying current and relevant literature, the researcher created instructional materials and a curriculum during this step. Teaching aids and media, including photos, posters, and films, as well as educational places and Arabic guidelines booklets, were produced to help with the implementation of the structured teaching program. Pilot research and reliability marked the end of this phase.

Validity:

The tools (I&IV) state that a panel of five knowledgeable academics with expertise in mental and psychiatric health nursing, medical-surgical nursing, and nursing determined the face and content validity. Reviewing the instruments to ensure that they were clear, relevant, thorough, applicable, and easy to

administer did not result in any corrections being made.

Pilot Study:

Pilot research was conducted on ten adult patients (10% of the sample) who had recently undergone bariatric surgery to assess the tools' clarity, applicability, timeliness, and potential problems that might have affected the data-gathering procedure. The 10 patients who participated in the pilot trial were included in the main study sample after the data from the study were examined and no modifications were made to the assessment instruments.

Reliability:

The following instruments were used to test the reliability and determine consistency: the body image acceptance tool ($r = 0.92$), the physical problems questionnaire ($r = 0.78$), the Beck depression inventory ($r = 0.87$), the Rosenberg self-esteem scale ($r = 0.88$), the patient knowledge related to bariatric surgery tool ($r = 0.89$), and the eating disorder questionnaire ($r = 0.90$).

2- Planning Phase :

At the initial interview, the researcher simply explained the aim & purpose of the structured teaching program.

The objectives of a structured teaching program for post-bariatric patients are as follows:

- Define bariatric surgery
- Recognize preoperative instructions, preparation, and postoperative care.
- List the advantages and disadvantages of bariatric surgery.
- Discuss nutritional principles following bariatric surgery
- Recognize how to and what type of eating after bariatric surgery.
- List common nutritional problems following bariatric surgery.

- Identify follow-up and recommended exercises following bariatric surgery.

3. Implementation phase:

- The patient's informed consent was obtained for voluntary participation, and after that, all studied patients answered the following tools. Small teaching sessions were used to introduce the patients to the material in addition to receiving standard hospital care on an individual basis.

In addition to the initial interview session, a total of four sessions were conducted separately for each patient. These sessions were repeated for each patient, and they lasted anywhere from thirty to forty-five minutes, plus an additional ten minutes for discussion and feedback.

Patients were notified about the time and location of the first session, which began with an orientation on the program and its goals (15-20 patients). A handout was developed by the researcher and distributed to each study participant. Following the initial consultation, the patient was informed about the meaning of bariatric surgery, laboratory and radiological procedures, preoperative instructions and preparation, risks and advantages, and postoperative care.

During the **second session**, patients received information regarding what to eat after bariatric surgery. This included eating small, balanced meals, chewing food thoroughly, eating slowly, and keeping a daily log of their protein and calorie intake. Additionally, patients were instructed to follow a diet low in calories, fats, and sweets. Post-operative dietary progression, lifelong vitamin and mineral supplements, protein and fluid requirements, nutritional principles following bariatric surgery, and behavioral modification by planned instructional phases.

(compliance means maintaining lifestyle changes through eating healthy food, health monitoring, and practicing exercise), recognizing the appropriate portion size (the

amount of meat, dairy, fruits, vegetables, and grains that one should eat at a time), maintaining a daily food diary, and keeping an eye on one's weight and body mass index. The handout also includes typical nutritional issues, a clinical presentation of nutritional issues and strategies for preventing them, food-related complications, a quick guide to good eating, and advice for leading an active lifestyle.

In the **third session**, patients received the instructions related to follow-up and the recommended exercise after bariatric surgery such as the importance of physical exercise, duration of physical exercise per day, and types of physical exercise, walking, aerobic exercise, and strength training to maintain the weight loss, strengthen heart and bones, burn calories, develop muscles, increase metabolic rate after calculation of BMR and giving dietary food allowances and avoidance for each patient, improve mood, relieve stress, and also increase the control of blood sugar, and late postoperative complications. Every session usually started with a summary of what had been given during the preceding session and the goals of the new session. After every session, there were five minutes for discussion and give feedback.

- The researcher used the teaching aids and media for illustration, besides discussion as a teaching method, and every person within the study group obtained an Arabic copy of the educational instructions booklet. - The researcher collected data 3 days/week, during the morning and afternoon shifts from the patients.

In the fourth session:

It consisted of techniques to cope with depression among patients post-bariatric surgery about meditation (definition, steps of meditation), and the importance of practicing exercises such as deep breathing exercises, muscle relaxation exercises, and yoga exercises.

3-Evaluation phase:

The patients were re-assessed after three months

of the study implementation (post-test) using the same pre-test to evaluate the effect of a structured teaching program on physiological and psychological problems among post-bariatric surgery patients.

Statistical design:

After being examined, the data were coded, examined, tabulated, and ready for computer entry. The SPSS version 22 computer application was used to do descriptive statistics, such as frequencies, percentages, means, standard deviation, etc. The frequency, percentage, mean, and standard deviation tests for significance were applied. The significance of numeric variables was assessed using the Mann-Whitney test, and the significance of categorical variables was assessed using Chi-Square. ANOVA, t-test, and Pearson correlation were also utilized to compare means and ascertain group correlation. Statistical significance was defined as P-values less than 0.05.

Results:

Table (1): Shows that 42% of the studied patients were in the age group 29 >40 years with a mean age of 37.22 ± 3.34 and 68% of them were females. Regarding the level of education, 35% of the studied patients were illiterate. Regarding the patients' residence and occupation, it could be noticed that the highest percentage of them are from urban and not occupied (58%, and 60%) respectively.

Table (2): Illustrates that 63% of the studied patients never had previous bariatric surgery. As regards to type of bariatric surgery; 56% of the studied patients have performed sleeve gastrectomy and 42% of patients have no associated medical disorders. Additionally, the table showed that 75% had previous surgery,

and 92% had a previous diet regimen. Regarding the success of weight reduction, the majority of studied patients (82%) had success in weight reduction. Concerning previous psychological problems, it was observed that more than half of the studied patients (57%) had anxiety disorders.

Table (3); shows the mean score of knowledge pre/post- structured teaching program implementation among post-bariatric surgery patients. It was observed that, the knowledge score among post-bariatric surgery patients after structured teaching program implementation had improved compared to before application, with high statistically significant differences between pre and post-structured teaching program implementation regarding knowledge about bariatric surgery (at <0.001).

Figure (1) demonstrates that 16% of the post-bariatric surgery patients had a satisfactory level of total knowledge of pre-structured teaching program implementation. Compared to the intervention, this total knowledge level improved and became satisfactory among 92% of the post-bariatric surgery patients.

Table (4): Represents that, there was a statistically significant improvement and reduction regarding physiological problems of the studied patient post bariatric surgery pre and post-structured teaching program implementation at $p = 0.001$.

Figure 2 illustrates that there was a reduction in physical problems, where 8% of the studied patients had high physical problems post-structured teaching program implementation and 50% in pre-structured teaching program implementation.

Figure 3 illustrates that there was an improvement in the Total level of depression among patients post-bariatric surgery, where 70% of the studied patients had a low Total level of depression post-structured teaching

program implementation compared to no one in pre-structured teaching program implementation.

Figure 4 clarifies that there was an improvement in the level of body image acceptance among patients post-bariatric surgery, where 75% of the studied patients do not accept their body image pre-structured teaching program implementation but post-structured teaching program implementation (68%) of them accept their body image.

Figure 5 clarifies that there was an improvement in the level of self-esteem among patients post-bariatric surgery, where 28% of the studied patients had low self-esteem pre-structured teaching program implementation but post-structured teaching program implementation (46%) of them had high self-esteem.

Figure 6 shows that there was an improvement in the level of **eating disorders** among patients post-bariatric surgery, where 75% of the studied patients were not restraining eating pre-structured teaching program implementation but post-structured teaching program implementation increased to be (65%) of them were restraining eating.

Table (1): Demographic data distribution of the studied patient post-bariatric surgery (n=100).

Demographic Data	No.	%
Age (years)		
21 - 29 years	20	20.0%
>29 - 40 years	42	42.0%
>40 - 50 years	25	25.0%
>50 - 55 years	13	13.0%
Mean \pmSD	37.22 \pm 8.34	
Gender		
Male	32	32.0%
Female	68	68.0 %
Educational level		
Illiterate	35	35%
Primary	10	10%
Secondary	23	23%
University	29	29%
Postgraduate	3	3%
Occupation		
Working	42	42.0%
Not working	58	58.0%
Residence		
Urban	60	60%
Rural	40	40%

Table (2): Clinical data distribution of the studied patient post bariatric surgery (n=100).

Clinical data	No.	%
Previous bariatric surgery		
Yes	37	37%
No	63	63%
Type of bariatric surgery		
Adjustable gastric band	0	0.0%
Sleeve Gastrostomy	56	56%
Gastric bypass	44	44%
Other associated medical disorders		
No	63	42.0
GIT	44	28.0
Cardiovascular	19	10.0
Endocrine	24	20.0
Previous surgery		
Yes	75	75.0
No	25	25.0
History of diet regimen		
Yes	92	92.0
No	8	8.0
Successful weight reduction		
Yes	82	82.0
No	18	18.0
History of psychological problems		
Eating disorder	6	6.0
Anxiety disorder	57	57.0
Depression	14	14.0
No	23	23.0

Table (3): Mean Scores Differences of Knowledge regarding bariatric surgery among the Studied patients Pre- and Post- -structured teaching program implementation (n= 100)

Items	Pre- structured teaching program implementation	Post-structured teaching program implementation	X ²	P-value
Meaning of bariatric surgery	2.7 ± 0.9	3.7 ± 0.4	19.44	0.0001**
Indications	3.6 ± 1.4	8.1 ± 1.0	17.33	0.0001**
Contraindications	3.1 ± 1.5	6.8 ± 0.4	16.56	0.0001**
Preoperative instructions and preparation	2.7 ± 0.9	3.7 ± 0.4	19.77	0.0001**
Radiological and laboratory investigations	3.6 ± 1.4	8.1 ± 1.0	17.88	0.0001**
Pre/post-operative care	3.1 ± 1.5	6.8 ± 0.4	16.99	0.0001**
Postoperative complications	2.7 ± 0.9	3.7 ± 0.4	19.23	0.0001**
Postoperative diet	3.6 ± 1.4	8.1 ± 1.0	17.79	0.0001**
Exercise	3.1 ± 1.5	6.8 ± 0.4	16.64	0.0001**
Instructions on discharge	3.6 ± 1.4	8.1 ± 1.0	17.77	0.0001**

(**) highly statistical significance at p < 0.001

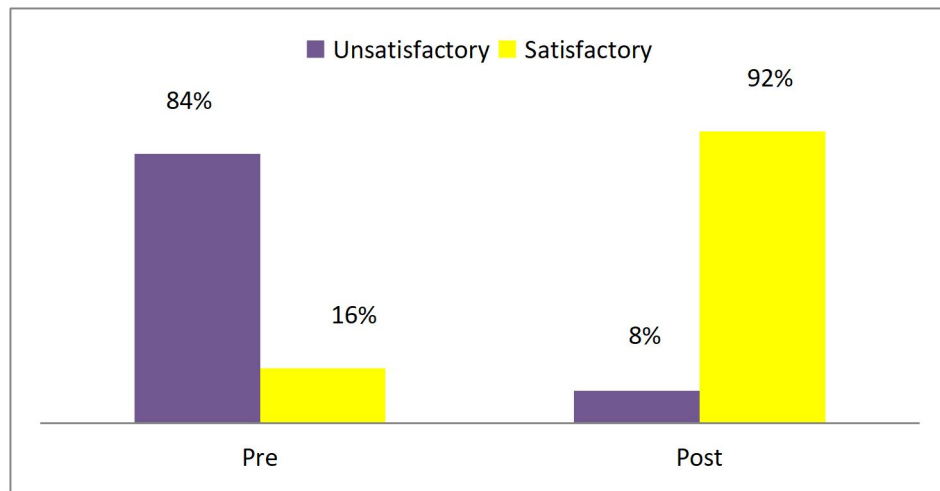


Figure (1): Total patients' Knowledge Level Distribution as regards bariatric surgery pre and post-structured teaching program implementation (n= 100)

Table (4): Comparison between physiological problems of the studied patient post bariatric surgery pre and post-structured teaching program implementation (n= 100)

Physiological problems post-bariatric surgery	Pre- structured teaching program implementation		Post-structured teaching program implementation	
	No.	%	No.	%
1. Dumping syndrome:				
Nausea	69	69%	66	33%
Vomiting	67	67%	58	36%
Diarrhea	36	36%	98	29%
Weakness	32	32%	102	18%
No symptoms	25	25%	116	15%
2. Vit B12 deficiency:				
Depression	33	33.0%	72	25.0%
Neuropathy	10	10.0%	144	8.0%
Pernicious anemia	6	6.0%	156	5%
No symptoms	43	43%	94	87%
3. Iron deficiency:				
General malaise	77	77%	42	26%
Anemia	65	65.0%	56	35%
Pale skin and nails	55	55.0%	72	35.0%
Dizziness/lightheadedness	80	80.0%	32	20.0%
No symptoms	15	15%	10	10%
4. Vit A deficiency:				
Decreased vision	13	13%	7	7%
Night vision difficulty	46	46%	14	14%
Itching	50	50.0%	20	20.0%
Dry hair	71	71%	28	28%
No symptoms	52	52%	18	18%
5. Vit D deficiency:				
Osteopenia	52	52.0%	25	25%
Osteoporosis	65	65.0%	35	35.0%
Bone aches	63	63%	33	33%
No symptoms	42	42%	38	38%
6. Zinc deficiency:				
Nail dystrophy	48	48%	22	22%
Skin eruptions	43	43%	27	27%
Poor wound healing	41	41%	17	17%
Hair loss	35	35%	25	25%
No symptoms	25	25%	15	15%
7. Copper deficiency:				
Anemia	35	35%	15	15%
Unexplained bleeding under the skin	25	25%	5	5 %
Fatigue	25	25%	9	9%
Difficulty learning and remembering	35	35.0%	10	10%
No symptoms	37	37%	15	15%
8. Folate deficiency:				
Sore tongue and redness	27	27%	15	15%
General weakness	30	30%	10	10.0%
Anemia	65	65.0%	25	25.0%
No symptoms	32	32.0%	20	20.0%
9. Steatorrhea.	90	90.0%	20	20.0%
10. Sagging skin.	65	65%	35	35%

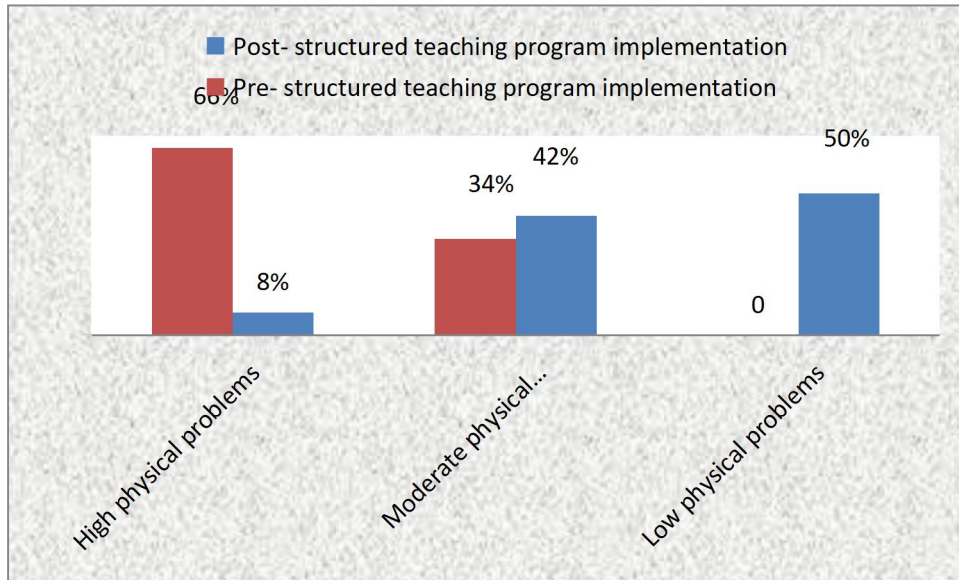


Figure (2): Level of physical problems among patients post bariatric surgery pre and post-structured teaching program implementation.

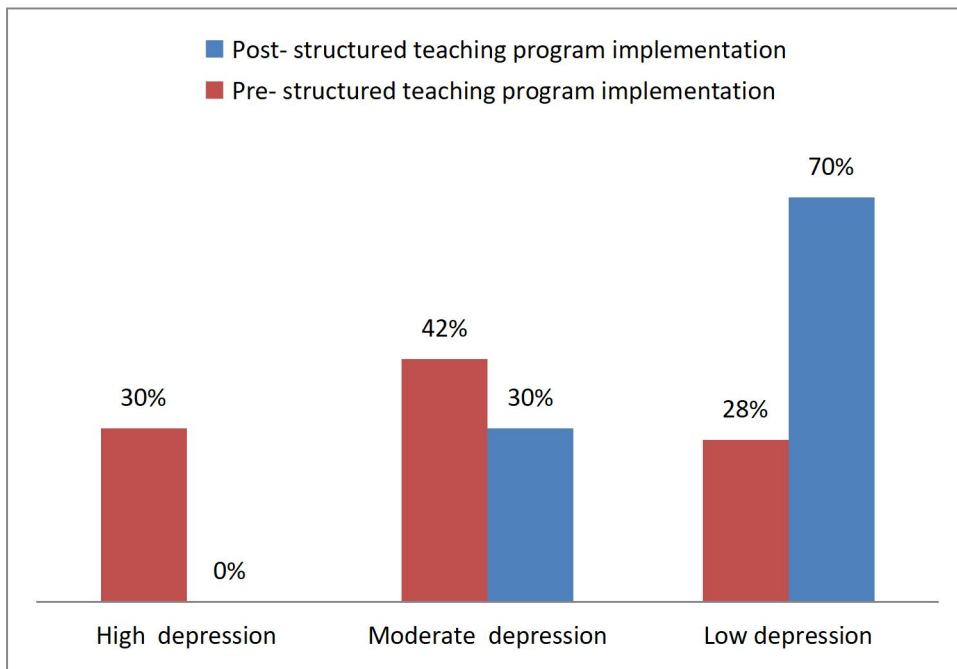


Figure (3): Total level of depression among patients post bariatric surgery pre and post-structured teaching program implementation

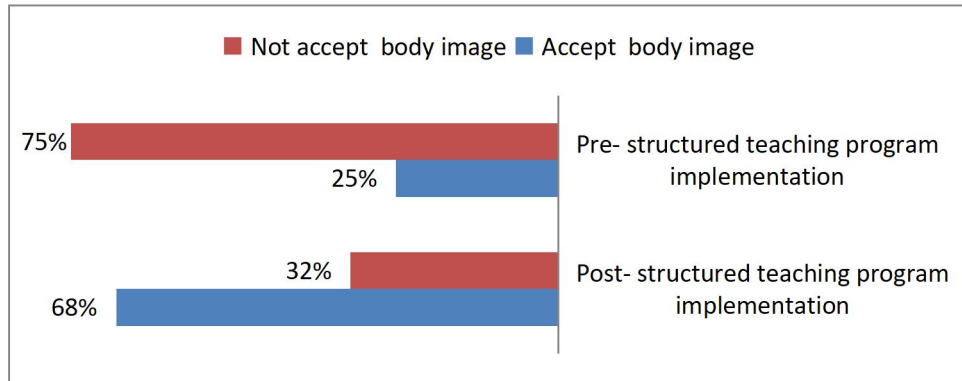


Figure (4): Total level of body image acceptance among patients post bariatric surgery pre and post-structured teaching program implementation

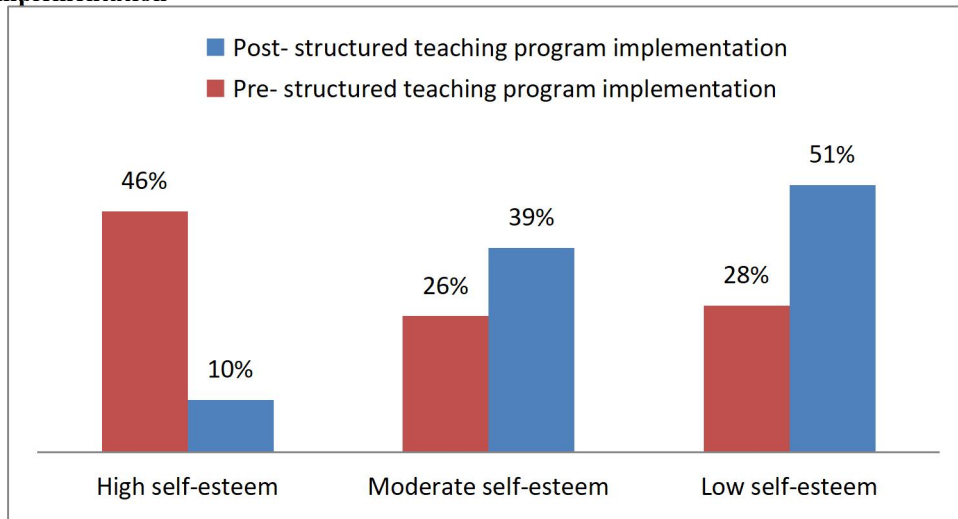


Figure (5): Total level of self-esteem among patients post bariatric surgery pre and post-structured teaching program implementation

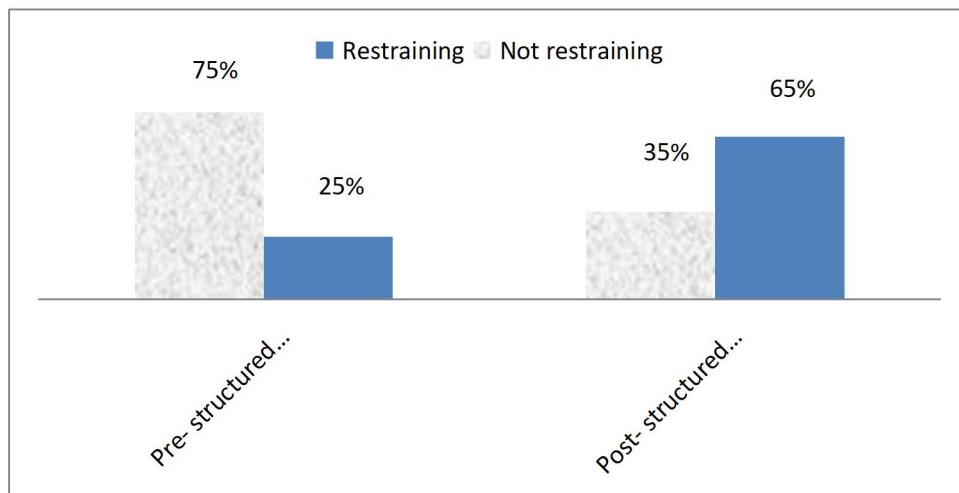


Figure (6): Total level of eating disorders among patients post bariatric surgery pre and post-structured teaching program implementation

Discussion:

A series of surgical procedures intended to enhance and maintain weight loss, bariatric surgery is the most effective way for patients with obesity to lose a significant amount of weight and see improvements in obesity-related comorbid medical conditions improve quality of life, prevent several cancers, and lower overall mortality (Hall & Guo, 2019). The detrimental effects of obesity on patients' health and associated diseases, such as cardio-metabolic disease and other diseases, especially in females, can be avoided through nursing guidelines that are offered before and after bariatric surgeries for patients with morbid obesity. Today, governmental organizations like the Governmental Institute for Health and Care Excellence promote bariatric surgery as an effective treatment for severe and complex obesity. One of the most important ways to prevent excessive weight gain is to engage in regular physical activity (Nuijten et al., 2021).

Also, Bariatric patients may be at risk of failing to comply with the recommended supplements and need close follow-up for a long period. During the first six months, patients need standardized nutrition guidelines regularly followed up to improve their long-term health after bariatric surgery and to ensure compliance which is often missing (Bruce, 2019). So, this study aimed to evaluate the effect of structured teaching programs on physiological and psychological problems among post-bariatric surgery patients.

Regarding the demographic information of patients who had undergone bariatric surgery, the study found that the average age of these patients was 37.22 ± 3.34 and that women made up the majority of the sample. These findings were consistent with Omar et al., (2020), who reported that women made up the majority of participants who complained of obesity; additionally, Alebshehy et al., (2019) noted that there is a notable rise in obesity in Egypt, with over one-third of the population classified as obese. One particular concern in Egypt is that women account for more than twice as many cases of obesity as males do. These findings could be justified by the fact that obesity rates are higher among females than males and so the bariatric surgery rate is increased among females (WHO, 2021).

These findings were also derived from a study conducted in Ethiopia by Darebo et al. (2019), who discovered that the majority of the sample was roughly 35 years old and that women were more representative than men. Additionally, the majority of responders could read

and write with ease. Furthermore, a high prevalence of adult obesity has been found in Egypt, especially in women (Mehanna et al., 2020). Our results are in contrast to those of Chung et al. (2018), who did the study in South Korea, and Reilly et al. (2018), who discovered that men had much higher rates of obesity than women. The discrepancies, in my opinion, are what caused the discrepancy between their studies in sample size.

The present study revealed that more than half of post-bariatric surgery patients have associated medical disorders. These findings were supported by the findings of a study done by Meyer et al, (2021) who mentioned that they found that obesity always had been associated with multiple medical comorbidities.

Regarding the type of bariatric surgery, this study made it clear that over half of the patients were Sleeve Gastrectomy recipients. This conclusion might result from the fact that sleeve gastrectomy procedures had fewer problems than other procedures. Our study's results are consistent with those of Angrisani et al. (2017), who concluded that sleeve gastrectomy was the most often performed treatment worldwide.

Regarding the success of weight reduction, the present study results revealed that the majority of studied patients had success in weight reduction which means that they have achieved the objective of bariatric surgery. This finding agrees with Alison et al (2019) who found that the majority of the studied patients in their study had effective weight loss post-bariatric surgery. This highlights the basic and primary role of bariatric surgery in the management of obesity.

The present study findings revealed that the knowledge score among post-bariatric surgery patients after structured teaching program implementation had improved compared to before application, with high statistically significant differences between pre and post-structured teaching program implementation regarding knowledge about bariatric surgery. From the researcher's point of view, it reflected the positive effects of structured teaching program implementation for post-bariatric surgery patients.

Regarding the total post-bariatric surgery patients' total knowledge level as regards bariatric surgery pre and post-structured teaching program implementation, the present study revealed that less than one-fifth of the post-bariatric surgery patients had a satisfactory level of total knowledge of pre-structured teaching program implementation. Compared to post-structured teaching program implementation, this total knowledge level improved and became satisfactory among almost all post-bariatric surgery patients. These results come in

agreement with a study done by **Goldstein & Hadid, (2020)** about the impact of bariatric preoperative education on patient knowledge and satisfaction with overall hospital experience, who revealed that the majority of the patients who attended preoperative education about bariatric surgery and follow-up, obtained high scores in knowledge and high levels of satisfaction. From the researcher's point of view, the low level of knowledge of pre-structured teaching program implementation confirmed the need for structured teaching program implementation for post-bariatric surgery patients to improve their knowledge.

Regarding the physiological problems post-bariatric surgery according to the postoperative period, the current study results showed that there was a statistically significant improvement and reduction regarding physiological problems of the studied post-bariatric surgery patients pre and post-structured teaching program implementation. From the researcher's point of view, the high level of knowledge post structured teaching program implementation confirmed the success of structured teaching program implementation for post-bariatric surgery patients that provides them with knowledge that helps them in reducing their physiological problems in the postoperative period. This finding is supported by a study conducted by **Chang et al., (2018)** who reported in their similar studies that most of the physical problems had started just after bariatric surgery. These results might be attributed to the anatomical changes caused by bariatric surgery which includes smaller stomach size and changes in the way through which food moves in the GIT. On the contrary, **Adil et al (2019)** were not in agreement with this finding and emphasized that post-bariatric assessment of the patient's physical activity did not show significant improvement post-bariatric surgery.

The present study findings revealed that there was a reduction in physical problems, where less than one percent of the studied post-bariatric surgery patients had high physical problems post-structured teaching program implementation compared to half pre- pre-structured teaching program implementation. It could be rationalized by several factors such as the normal aging process, lack of fluid intake especially post bariatric surgery because of patients' fear of abdominal distension and emesis, and also nutritional deficiencies following bariatric surgery such as vitamin D that affects dermatological health conditions. This agreed with the study done by **Whitlock (2021)** who found the same results in his previous similar study.

Concerning post-bariatric surgery patients' psychological problems, the present study findings revealed that there was an improvement in the total level of depression among patients post-bariatric surgery,

where the majority of the studied patients had a low total level of depression post-structured teaching program implementation. It might be due to many reasons such as the young age of the studied patients with unrealistic expectations of weight loss associated with fear of inability to achieve the goal of bariatric surgery. Furthermore, the presence of preoperative psychological disorders and lack of social support might delay successful weight loss and so could lead to post-bariatric psychological problems. This finding is supported by the finding of a study done by **Usubini et al (2020)** who found that post bariatric surgery patients demonstrated a psychological disturbance, such as depression as well as a high prevalence of binge eating disorder. This finding agreement with **Ivezaj et al., (2019)** and **Faria, et al., (2019)** proposed that depression post-surgery was 58.8%.

Others suggested that some patients may have a higher chance of depression, anxiety, and other psychiatric illnesses (**Kubik et al., 2023**). Elevated levels of depression post-surgery may contribute to the experience of suboptimal outcomes after surgery, including unsatisfactory weight loss or weight regain, comorbid psychopathology, and reduced health-related quality of life (**White et al., 2023; Sarwer et al., 2019**).

The results of the current study revealed that there was an improvement in the level of body image acceptance among patients post-bariatric surgery, where three-quarters of the studied patients do not accept their body image pre-structured teaching program implementation but post-structured teaching program implementation more than three-fifths of them accept their body image. This result might be attributed to increased stress, efforts, and life burden on female patients due to increased responsibilities, and in another way, body image and weight might have greater importance among female rather than male patients. In this context, psychological problems because of fear of unachieved weight reduction goal of surgery or weight regain post-surgery. This finding is on the same line with a study done by **Sarwer, Dilks & West-Smith (2019)**, assured that more than two-thirds of post-bariatric surgery patients reported body image dissatisfaction, and **Biørserud et al., (2018)**, proposed that, self-image is lower among those who experience a high degree of discomfort of excess skin after bariatric surgery.

The results of the current study revealed that there was an improvement in the level of self-esteem among patients post-bariatric surgery, where more than one-quarter of the studied patients had low self-esteem after pre-structured teaching program implementation but post-structured teaching program implementation more than two-fifths of them had high self-esteem. It reflected the

effectiveness of interventions that help to overcome these post-surgical consequences and achieve better postoperative successful weight reduction as well as all of the best health outcomes. According to a study by **Aldaqa & Sehlo (2018)**, self-esteem considerably increased following surgery, which runs counter to this finding. **Ghanbari et al. (2019)** further stated that there was no discernible difference in self-esteem before and after the procedure, concluding that self-esteem was not enhanced by weight loss following bariatric surgery.

The current study revealed that there was an improvement in the level of eating disorders among patients post-bariatric surgery, where three-quarters of the studied patients were not restraining eating pre-structured teaching program implementation but post-structured teaching program implementation increased to slightly less than two-thirds of them were restraining eating. From the researchers' point of view, it confirmed the good impact of structured teaching program implementation. This finding goes on the same line as **Sioka et al., (2019)** explained that, eating disorders and emotional patterns had the worst excessive weight loss. While **Kofman et al., (2020)** reported that, nearly half of the subjects could not stop eating or control how much they were eating. Also, **Colles et al., (2018)** noted the same results.

Conclusion:

Based on the present study results, the study concluded that structured teaching program implementation has a positive effect on improving physiological and psychological problems among post-bariatric surgery patients. There was an improvement in the Total level of depression among patients post-bariatric surgery. there was an improvement in the level of body image acceptance among patients post-bariatric surgery. there was an improvement in the level of self-esteem among patients post-bariatric surgery. There was an improvement in the level of **eating disorders** among patients post-bariatric surgery

Recommendations:

Based on the study findings, the following recommendations are suggested:

- Teaching program implementation for bariatric surgery patients is recommended to identify the physiological and psychological conditions of patients post-bariatric surgery are highly needed to achieve appropriate post-bariatric surgery outcomes for a longtime.
- Appropriate counseling and education should be

provided by bariatric nurses for post-bariatric surgery patients regarding any health problems that possibly might occur and ways of prevention.

- Further study is recommended about lifestyle modification for patients post-bariatric surgery.
- Replication of the study on a large sample and different settings is recommended.

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