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Original Article

Effect of an Educational Instructions on Lifestyle Modification and Self-esteem in Morbid Obese Patients undergoing Bariatric Surgery

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ABSTRACT

Background: Obesity is a widespread health issue worldwide, linked to various medical conditions. Bariatric surgery is recognized as an effective and safe intervention for individuals with morbid obesity. However, the surgery to be successful and patients maintain long-term weight loss without relapses, significant changes in lifestyle habits are essential. **Aim:** To evaluate the effect of educational instructions on lifestyle modification and self-esteem in morbid obese patients undergoing bariatric surgery. **Method:** The study employed a quasi-experimental design, selecting 42 patients as a purposive sample. **Tools: I)**. A structured Interview Sheet, **II)**. Knowledge Assessment Questionnaire, **III)**. Lifestyle Modification Tool, & **IV)**. Rosenberg Self-Esteem Scale (RSE). **Results:** There was a statistically significant improvement in patients' knowledge about morbid obesity, bariatric surgery, lifestyle modification, and self-esteem following the educational intervention compared to their pre-intervention levels. **Conclusion:** Application of an educational instructions' intervention led to a marked improvement in patients' knowledge, self-esteem, and adherence to lifestyle modification at both one- and six-months post-intervention as compared to their pre-intervention. **Recommendations:** Bariatric educational programs should be delivered by a multidisciplinary healthcare team to support sustained and effective weight loss following bariatric surgery and utilizing digital communication tools such as social media, telephone support, and online platforms can help overcome common barriers including cost, time constraints, and geographic distance.

Key words: Bariatric Surgery, Educational Instructions, Lifestyle Modification, Morbid Obese.

Introduction

Obesity is recognized globally as a major public health issue, with the World Health Organization (WHO) classifying it as an epidemic. It is a chronic and potentially life-threatening condition associated with numerous serious health complications, including type 2 diabetes, cardiovascular disease, high blood pressure, sleep apnea, asthma, osteoarthritis, and various forms of cancer **(World Health Organization, 2019)**.

Over recent decades, the prevalence of obesity has rapidly increased, particularly in

developed countries **(World Health Organization, 2021)**. In Egypt, obesity represents a significant public health concern, with consequences that go beyond health, affecting the economic productivity of the population. Rates of obesity differ based on geographic region, gender, and socioeconomic status. Furthermore, obesity is a major risk factor for various non-communicable diseases (NCDs), including diabetes **(Sedky et al., 2021)**.

Obesity is characterized as a pathological condition in which excessive adipose tissue accumulates relative to the body's size **(Mansour, Abellatif, & Yassien, 2019)**. Individuals with obesity often face weight-related stigma, which can negatively affect their body image and self-esteem. Obese women may experience discrimination and sarcasm, contributing to social isolation, feelings of loneliness, dissatisfaction with body image, and low self-esteem **(Altaheri et al., 2021**).

Obesity-related health conditions often increase the urgency for weight loss and play a key role in determining eligibility for bariatric surgery. Common obesity-associated medical issues include diabetes, hypertension, high cholesterol, and liver dysfunction. The primary goal of obesity treatment is to achieve and maintain a healthy weight, which can improve overall health and reduce the risk of obesity-related complications. Treatment approaches may involve dietary modifications, behavioral interventions, regular exercise, and, in some cases, bariatric surgery. Individuals are generally considered eligible for bariatric surgery if they have a body mass index (BMI) greater than 40 kg/m², or over 35 kg/m² when accompanied by related comorbid conditions **(Wu & Berri, 2022)**.

Bariatric surgery is increasingly acknowledged as the most effective treatment option for individuals with severe obesity. Beyond promoting significant weight loss, it also contributes to the improvement of obesity-related health conditions, raises self-esteem, enhances quality of life (QoL), and body image satisfaction. Patients typically lose around 30% of their total body weight following surgery, which helps alleviate many obesity-related comorbidities **(Parrott et al., 2020** & **El-Maghawry et al., 2021)**.

In recent years, the Middle East and North Africa (MENA) region has witnessed a rise in bariatric surgeries. While these procedures are generally considered safe and effective, they may lead to serious complications if not managed promptly **(Lim et al., 2018 & Inocian et al., 2021)**. Such complications can negatively impact body image and self-esteem. For instance, up to 89.2% of patients experience loose or sagging skin post-surgery, which contributes to dissatisfaction with body image. Additionally, prominent surgical scars and post-operative alopecia particularly among female patients can further affect body image and contribute to lowered self-esteem **(Altaheri et al., 2021).**

Enhancing self-esteem after bariatric surgery is crucial for both emotional and physical success. It begins with setting realistic expectations and

accepting that change takes time and effort. Building a support system through friends, support groups, or a therapist can help navigate emotional and body image challenges. Focusing on small victories like improved mobility or reduced medications boosts confidence more than the number on the scale. Practicing self-care, wearing comfortable clothes, and using daily affirmations are powerful tools to strengthen self-worth. Understanding the psychological effects of bariatric surgery also reduces guilt and promotes self-acceptance and empowerment **(Sarwer, Dilks, & West-Smith, 2024)**.

Patient education plays a vital role in nursing practice, as it enables individuals to actively participate in managing their own health. Nurses act as educators, equipping patients and their families with the knowledge and skills necessary to make informed decisions regarding their care and overall well-being. Educating patients enhances their understanding of medical conditions, available treatments, and effective self-care practices, ultimately contributing to improved health outcomes **(Bettencourt, 2023)**. Patients are often motivated to learn more about their health, and providing them with accurate, up-to-date, and consistent information greatly supports both the care process and informed decision-making for themselves and their families (**Bhattad & Pacifico, 2022)**.

A bariatric nurse delivers comprehensive care to patients diagnosed with morbid obesity, including those undergoing bariatric surgery. Their role encompasses both inpatient and outpatient settings, where they provide direct clinical care and ongoing support. In addition to clinical duties, bariatric nurses play a key role in patient education, guiding individuals on maintaining a balanced diet, incorporating multivitamins and supplements to prevent nutritional deficiencies, and preserving muscle mass. They also monitor patients' progress post-surgery and coordinate with the bariatric surgical team to prepare patients for discharge. This includes providing detailed instructions on follow-up appointments and encouraging adherence to physical activity, which supports better blood sugar regulation, faster recovery, effective wound healing, and improved circulation **(Mansour et al., 2019)**.

Study significance:

Morbid obesity is rapidly emerging as a major global health issue, fueled by economic growth that has contributed to increasingly sedentary lifestyles and greater consumption of high-calorie foods. This condition affects individuals of all ages, genders, and ethnic backgrounds, and significantly deteriorates overall health. Obese adolescents face a 70% likelihood of remaining obese into adulthood. In the Eastern Mediterranean Region, the prevalence of overweight and obesity ranges between 74% to 86% among females and 69% to 77% among males. Egypt has one of the highest obesity rates globally, with approximately 19 million obese individuals, representing 35% of the adult population (**Al-Daydamouni, 2019)**.

In Egypt, findings from the 2019 "100 million Health" survey-which screened 49.7 million adults aged 18 and above revealed that 39.8% of the adult population was classified as obese (BMI ≥ 30 kg/m²). The data also showed a significant gender disparity, with obesity affecting 49.5% of adult women compared to 29.5% of adult men **(Abouelghate et al., 2021)**.

Study aim:

The current research study aimed to evaluate the effect of educational instructions on lifestyle modification and self-esteem in morbid obese patients undergoing bariatric surgery.

Hypotheses:

H1: Patients undergoing bariatric surgery will have higher level knowledge scores after receiving educational instructions.

H2: Patients undergoing bariatric surgery will exhibit improvement in lifestyle and self-esteem after receiving educational instructions.

Methodology:

Research design:

The current study used a quasi-experimental approach (pre-test/post-test). An approach to study that enables the development of a cause-and-effect link between dependent and independent variables is known as a quasi-experimental design **(Thomas, 2022).**

Study setting:

The current research study was carried out at surgical departments and out-patient bariatric surgery clinic at a gastrointestinal surgical center affiliated with Mansoura University belonging to Dakhahlia Governorate, Egypt. This setting was chosen because they have a significant number of patients with morbid obesity undergoing bariatric surgery, which is relevant to the research topic.

Study subject:

A purposive sample of 42 patients of both genders was chosen based on specific inclusion criteria. Participants were diagnosed with morbid obesity, defined as having a BMI greater than 40 kg/m² and a history of unsuccessful attempts with diet, exercise, and medication. Additionally, patients with a BMI of 35 kg/m² who had serious obesity-related comorbidities such as osteoarthritis, type 2 diabetes, obstructive sleep apnea, or high blood pressure and who were scheduled to undergo bariatric surgery and agreed to participate in the study, were also included.

Sample size:

Based on the study by **El-Maghawry et al., 2021**, using significance level of 5%, and study power of 80%, the sample size was determined by using the following equation:

$$n = \frac{2(Z\alpha/2 + Z\beta)^2 \times p\,(1-p)}{(d)^2}$$

Where, p = pooled proportion from the previous study; d = expected difference in proportions.

$Z_{\alpha/2}$ =1.96 (for 5% level of significance) and Z_{β} = 0.84 (for 80% study power). Therefore,

$$n = \frac{2(1.96 + 0.84)^2 \times 0.816\,(1-0.816)}{(0.238)\text{^}2} = 41.6.$$

Thus, the required sample size was calculated to be 42 participants.

Data collection tools:

Four distinct tools were utilized to collect data for this study, as outlined below:

Tool I: **A structured Interview Sheet:** This tool was developed by the researchers based on a comprehensive review of relevant literature and previous studies **(Mansy et al., 2021; & Ibrahiem et al., 2021)**. It consisted of two main parts:

Part (1): Socio-demographic characteristics: This section was concerned with patients' age, gender, marital status, place of residence, educational level, occupation, and monthly income.

Part (2): Clinical data, which included the history of chronic diseases such as diabetes mellitus (DM), hypertension (HTN), hyperlipidemias, sleep apnea, reflux, and joint pain, measuring weight, height, and body mass index (BMI).

Tool (II): Knowledge Assessment Questionnaire: This tool was designed by the researchers after an extensive review of relevant literature and previous studies **(Ali, 2019; Aboulkhair et al., 2022; & El-Maghawry et al., 2021)** to assess patients' knowledge regarding morbid obesity and bariatric surgery. It consisted of 15 open- and closed-ended questions about the meaning of morbid obesity, causes, and complications; the meaning of bariatric surgery; types of bariatric surgery; benefits; surgical indications and contraindications; preoperative preparation and instructions; required radiological and laboratory investigations; perioperative care; potential postoperative complications; nutritional guidelines; physical activity after surgery; and discharge instructions.

Scoring system: Each item in the knowledge questionnaire was reviewed, categorized, and assigned a score. A correct answer was awarded 2 points, while an incorrect response received 1 point. The total knowledge score was calculated out of 30 and then converted into a percentage. Based on the percentage scores, knowledge levels were classified as follows:

- **Poor**: less than 50% of the total score (<15 points)
- **Fair**: 50% to 70% of the total score (from 15 <21points)
- **Good**: greater than 70% of the total score (≥21 points)

Tool (III): Lifestyle Modification Tool: This tool was developed by researchers following an in-depth review of relevant literature and previous studies **(Ali, 2019; Aboulkhair et al., 2022; & El-Maghawry et al., 2021)** to assess patients' adjustment regarding lifestyle domains. It included seven questions about adequate nutrition, sleep hours, rest, physical activity, weight reduction, attending follow-up medical appointments, and taking prescribed medications and supplements.

Scoring system: Each item was reviewed and assigned a score. If the patient had an adjustment with educational instructions regarding lifestyle modification, they were given a score of 1, while if the patient had no adjustment with an educational instruction regarding lifestyle modification, they were given a score of 0. The total possible score ranged from zero to 7. The highest score indicated more adjustment with lifestyle modification. Based on the percentage scores, adjustment with lifestyle modification were classified as follows:

- **Non-lifestyle modification**: less than 60% of the total score (from 0 <4 points)
- **Lifestyle modification**: ≥60% of the total score (≥ 4 points)

Tool (IV): Rosenberg Self-Esteem Scale (RSE): It was adapted from **Garvey et al**. **(2014)** and was designed to assess overall self-esteem to determine both positive and negative self-perceptions. It consists of 10 statements, including: "1. On the whole, I am satisfied with myself; 2. At times I think I am no good at all; 3. I feel that I have a number of good qualities; 4. I am able to do things as well as most other people; 5. I feel I do not have much to be proud of; 6. I certainly feel useless at times; 7. I feel that I'm a person of worth; 8. I wish I could have more respect for myself; 9. All in all, I am inclined to think that I am a failure; and 10. I take a positive attitude toward myself." Responses were recorded on a 4-point Likert scale ranging from strongly agrees to strongly disagree.

Scoring system: Each item was rated on a 4-point Likert scale as follows: give "Strongly Disagree" a score (1), "Disagree" a score (2), "Agree" a score (3), and "Strongly Agree" a score (4); For negatively worded items (items 2, 5, 6, 8, and 9), reverse scoring was applied. The total score ranged from 10 to 40 and was interpreted as follows: 34-40 scores were considered high self-esteem, 23-33 scores were considered moderate self-esteem, and ≤ 22 scores were considered low self-esteem.

Ethical considerations:

Ethical approval to conduct the study was obtained from the Research Ethics Committee of the Faculty of Nursing, Mansoura University (Ref. No. P.0547). Subsequently, formal permissions were secured from the relevant hospital authorities. Verbally informed consent was obtained from all participants after clearly explaining the study's objectives. Participants were assured of the confidentiality and anonymity of their information. They were also informed of their right to ask questions, seek clarification, and withdraw from the study at any point without providing a reason or facing any negative consequences.

Tools validity:

The content validity of the data collection tools was ensured through evaluation by a panel of seven experts specializing in medical-surgical nursing and gastrointestinal surgery. The experts assessed the tools for clarity, relevance, comprehensiveness, appropriateness, and ease of administration to confirm alignment with the study's objectives. Based on their feedback, minor

modifications were made, and the final versions of the tools were subsequently developed.

Reliability (Internal Consistency):

The reliability of the study tools was assessed using Cronbach's alpha coefficient to determine internal consistency. The pre/post-operative patients' knowledge assessment questionnaire demonstrated a high level of reliability with Cronbach's alpha of **0.969**. The lifestyle modification tool showed a strong reliability score of **0.898**, while the Rosenberg Self-Esteem Scale (RSE) also demonstrated acceptable reliability with a value of **0.820**.

Fieldwork:

The fieldwork for the study was conducted in four phases: preparation and assessment, planning, implementation, and evaluation. Prior to conducting the study, official permission was obtained from the Faculty of Nursing at Mansoura University and submitted to the relevant authorities at the selected setting. After explaining the study's objectives, permission was granted to proceed, and cooperation was ensured during the data collection process. A thorough review of both local and international literature was conducted, utilizing published scientific articles, web searches, and textbooks. The study was carried out over a one-year period, from October 2023 to October 2024.

1. Preparation and assessment phase:

After conducting an extensive review of relevant literature and theoretical frameworks, the researchers developed data collection tools. A pilot study was then carried out to evaluate the clarity, relevance, applicability, and effectiveness of these tools. This pilot study involved 5 patients, representing 10% of the total sample. Based on the feedback and results, necessary modifications were made to the tools. The participants from the pilot study were excluded from the main study.

The assessment phase began with the researchers explaining the study's objectives to the patients and obtaining their informed consent for voluntary participation. A pretest was conducted to assess baseline knowledge, lifestyle, and self-esteem, which informed the subsequent educational sessions. The time taken for each patient to complete the interview questionnaire was approximately 15 minutes.

The researchers visited the surgical departments and the outpatient bariatric surgery clinic twice a week, from 9:00 AM to 12:00 PM, to collect data.

2. Planning phase:

Based on the outcomes of the assessment phase, the educational instruction sessions and booklet were designed in simple Arabic, drawing on relevant literature to enhance patients' knowledge, lifestyle, and self-esteem.

3. Implementation phase:

The researchers conducted the educational instruction sessions by interviewing patients at the study settings twice a week, from 9:00 AM to 12:00 PM. The sessions were delivered in four separate stages, with each session lasting approximately 20 minutes, depending on the

content. Various teaching strategies were employed to accommodate patients' levels of understanding. Each session typically began with greeting the patients as well as a brief review of the previous session's content, followed by the objectives of the current session. After each session, there was a 10-minute period dedicated to discussion and feedback. The studied patients received the educational instructions on an individual basis, in addition to their routine hospital care, through small teaching sessions tailored to their specific needs.

The first session was conducted within the first 24 hours following the patients' admission. Preoperatively, patients were provided with information regarding the meaning of morbid obesity, its causes and complications, as well as an explanation of bariatric surgery. The session covered the different types of bariatric surgery, their indications and contraindications, required radiological and laboratory investigations, preoperative preparation and instructions, the advantages and disadvantages of surgery, and postoperative care.

In the second session, conducted preoperatively, the focus was on enhancing self-esteem by improving mood and relieving stress. This was achieved by providing educational instructions on the psychological impact of morbid obesity and promoting emotional readiness for the lifestyle changes required after bariatric surgery. The educational content specifically addressed how morbid obesity negatively affects self-esteem and included practical strategies to help patients build confidence and maintain motivation both before and after surgery. During the group sharing segment, patients were encouraged to express their feelings and experiences, which created a supportive environment and helped, reduce feelings of isolation. Although most participants initially exhibited signs of low self-esteem, they responded positively to the session, showing greater engagement and an overall improvement in optimism and emotional readiness.

In the third session, conducted 24 hours post-operatively, patients were educated on the nutritional guidelines following bariatric surgery. This included advice on consuming balanced meals in small portions, adhering to a diet low in calories, fats, and sweets, eating slowly, chewing food thoroughly, taking vitamin and mineral supplements, and maintaining a daily record of calorie and protein intake.

In the fourth session, held 48 hours post-operatively, patients were provided with discharge instructions, which included guidance on attending follow-up medical appointments. They were also educated about the recommended physical activities following bariatric surgery, such as walking, aerobic exercises, and strength training. These activities were emphasized to help maintain weight loss, strengthen the heart and bones, burn calories, build muscle, boost metabolic rate, and

improve blood glucose, blood pressure, and cholesterol control.

The researchers utilized teaching aids and media for illustration, in addition to bedside discussion as primary teaching methods. Each participant in the study received an Arabic version of the educational instruction booklet. Before discharge, the researchers stressed the importance of medical follow-up and coordinated the time and location for follow-up visits, which were scheduled for one month and six months post-operatively at the outpatient bariatric surgery clinic at the Gastrointestinal Surgical Center, Mansoura University. The patients' phone numbers were also collected for follow-up communication.

4. Evaluation phase:

Evaluation was conducted twice using the same tools as the pretest: once after one month and again after six months post-intervention, during patient follow-up at the outpatient clinic. Additionally, phone-based follow-up was implemented to monitor progress, provide feedback, offer necessary consultations and assistance, and assess the effectiveness of the intervention.

Statistical analysis:

All statistical analyses were conducted using SPSS for Windows version 20.0 (SPSS, Chicago, IL). Continuous data, which were normally distributed, were presented as mean ± standard deviation (SD). Categorical data were expressed in terms of number and percentage. The student's t-test was applied to compare two variables with continuous data, while one-way analysis of variance (ANOVA) was used for comparisons among more than two variables with continuous data. The chi-square test was used to compare variables with categorical data. The correlation coefficient test was employed to examine the relationships between two variables with continuous data. The reliability (internal consistency) of the questionnaires used in the study was also assessed. Statistical significance was considered at $p<0.05$.

Results:

Table (1): shows that 40.5% of the studied patients were aged < 30 years old with a mean ± SD age of 36.2 ± 36.2±12.8, while 66.7% of them were female, and 54.8% were married. As regards the place of residence, 59.5% lived in urban areas. Furthermore, 38.1% had a basic education level, and 57.1% weren't working. As far as monthly income, 23.8% had fairly sufficient.

Table (2): reveals that there were statistically significant differences between pre-intervention and one- and six-month post-intervention regarding high blood glucose level, elevated blood pressure, hyperlipidemia, sleep apnea, reflux, joint pain, and BMI at P values of <0.001**, <0.001**, 0.005*, 0.009*, 0.005*, 0.005*, and <0.001**, respectively.

Table (3): shows that improvement in the patients' knowledge in all items pre- and post-intervention, with a highly statistically significant difference in the total mean scores of knowledge (mean ± SD 9.38±1.82, 24.64±1.59 & 26.81±3.47) at the pre-intervention and one- and six-month post-intervention points, respectively, P<0.001**.

Table (4): Illustrates that, there was a highly statistically significant difference between pre-intervention and one- and six-month post-intervention among the studied patients' lifestyle modification, according to adequate nutrition, sleep hours, rest, physical activity, weight reduction, attending follow-up, and intake of prescribed medications and supplements at p-values of 0.002*, <0.001**, <0.001**, <0.001**, <0.001**, <0.001**, and <0.001**, respectively.

Figure (1): illustrates improvement in the studied patients' self-esteem at one- and six-months post-intervention as compared to their pre-intervention, with a highly statistically significant difference between them. The total self-esteem score (mean ± SD 19.29 ± ±4.23, 25.19 ± 3.83, and ±3.83&30.05 6.74) at the pre-intervention and one- and six-month post-intervention, respectively.

Table (5): Reveals that, there was a statistically significant relation between total scores of self-esteems among the studied patients as regards their socio-demographic characteristics as patients' employment at a p-value of <0.001**. Also, there was no statistically significant relation between total scores of lifestyle modifications among the studied patients as regards all their socio-demographic characteristics six months post-intervention at P > 0.05.

Table (6): shows that there was no statistically significant relation between level of knowledge and socio-demographic characteristics regarding age, gender, marital status, place of residence, education level, and income of the studied patients six months post-intervention at a p-value > 0.05. Also, there was a statistically significant relation between total knowledge score among the studied patients as regards their socio-demographic characteristics as patients' employment at a p-value of <0.001**.

Table (7): illustrates that there was no statistically significant relation between lifestyle modifications and socio-demographic characteristics of the studied patients six months post-intervention regarding age, gender, marital status, place of residence, level of education, and monthly income (at a P value > 0.05). However, there was a statistically significant relation between lifestyle modification and socio-demographic characteristics (employment) of the studied patients with a p-value < 0.05.

Table (1): Socio-demographic characteristics of the studied patients (N=42)

Socio-demographic characteristics	N	%
Age category (years)		
<30	17	40.5
30 – 40	12	28.6
>40	13	31.0
Mean ± SD	36.2±12.8	
Gender		
Male	14	33.3
Female	28	66.7
Marital status		
Married	23	54.8
Unmarried	19	45.2
Place of residence		
Rural	17	40.5
Urban	25	59.5
Educational Level		
Read and write	11	26.2
Basic education	16	38.1
Secondary education	8	19.0
University education	7	16.7
Employment		
Working	18	42.9
Not working	24	57.1
Monthly income		
Sufficient	16	38.1
Fairly sufficient	10	23.8
Insufficient	16	38.1

Table (2): Clinical data of the studied patients pre, one-, and six-months post intervention (N=42)

Clinical data	Pre intervention		One month post intervention		Six months post intervention		χ^2	P
	N	%	N	%	N	%		
High blood glucose level	33	78.6	21	50.0	16	38.1	14.721	<0.001**
Elevated blood pressure	29	69.0	13	31.0	9	21.4	22.136	<0.001**
Hyperlipidemia	27	64.3	16	38.1	13	31.0	10.479	0.005*
Sleep apnea	31	73.8	20	47.6	18	42.9	9.419	0.009*
Reflux	28	66.7	20	47.6	13	31.0	10.741	0.005*
Joint pain	29	69.0	21	50.0	14	33.3	10.733	0.005*
Weight (Mean ± SD)	102.29±10.67		-		94.1±9.8		3.659	<0.001**
Height (Mean ± SD)			162.33±6.38				-	-
BMI (Mean ± SD)	38.73±2.17		-		35.6±2.0		6.796	<0.001**

* Statistically significant $p \leq 0.05$ ** Highly statistically significant $p \leq 0.001$

Table (3): Level of knowledge of the studied patients pre, one-, and six-months post intervention (N=42)

Level of knowledge	Pre intervention		One month post intervention		Six months post intervention		Significance	
	N	%	N	%	N	%	χ^2/F	P
Morbid obesity								
Poor	37	88.1	12	28.6	1	2.4		
Fair	4	9.5	9	21.4	6	14.3		
Good	1	2.4	21	50.0	35	83.3	73.577	<0.001**
Score (Mean ±SD)	1.52±0.89		3.64±1.25		4.19±1.77		46.498	<0.001**
Bariatric surgery								
Poor	29	69.0	9	21.4	1	2.4		
Fair	10	23.8	8	19.0	8	19.0		
Good	3	7.1	25	59.5	33	78.6	56.045	<0.001**
Score (Mean ±SD)	5.76 ±2.69		16.88±2.57		19.24±3.05		32.651	<0.001**
Total knowledge score								
Poor	36	85.7	15	35.7	2	4.8		
Fair	5	11.9	7	16.7	7	16.7		
Good	1	2.4	20	47.6	33	78.6	62.520	<0.001**
Score (Mean ±SD)	9.38±1.82		24.64±1.59		26.81±3.47		43.474	<0.001**

* Statistically significant $p \leq 0.05$ ** Highly statistically significant $p \leq 0.001$

Table (4): Lifestyle modification of studied patients pre, one-, and six-months post intervention (N=42)

Lifestyle modification	Pre intervention		One month post intervention		Six months post intervention			
	N	%	N	%	N	%	χ^2	P
Adequate nutrition intake	18	42.9	29	69.0	33	78.6	12.395	0.002*
Adequate sleep hours	15	35.7	28	66.7	31	73.8	14.211	<0.001**
Adequate rest period	15	35.7	32	76.2	34	81.0	22.607	<0.001**
Regular physical activity	14	33.3	29	69.0	36	85.7	25.723	<0.001**
Weight reduction	8	19.0	32	76.2	36	85.7	45.625	<0.001**
Attending follow-up medical appointments	11	26.2	33	78.6	39	92.9	40.036	<0.001**
Intake prescribed medications and supplements	10	23.8	19	45.2	32	76.2	23.325	<0.001**
Total Life-style modification score (Mean ±SD)	1.08 ±1.01		4.19 ±2.92		5.64 ±2.39		45.831	<0.001**

* Statistically significant p ≤ 0.05 ** Highly statistically significant p ≤ 0.001

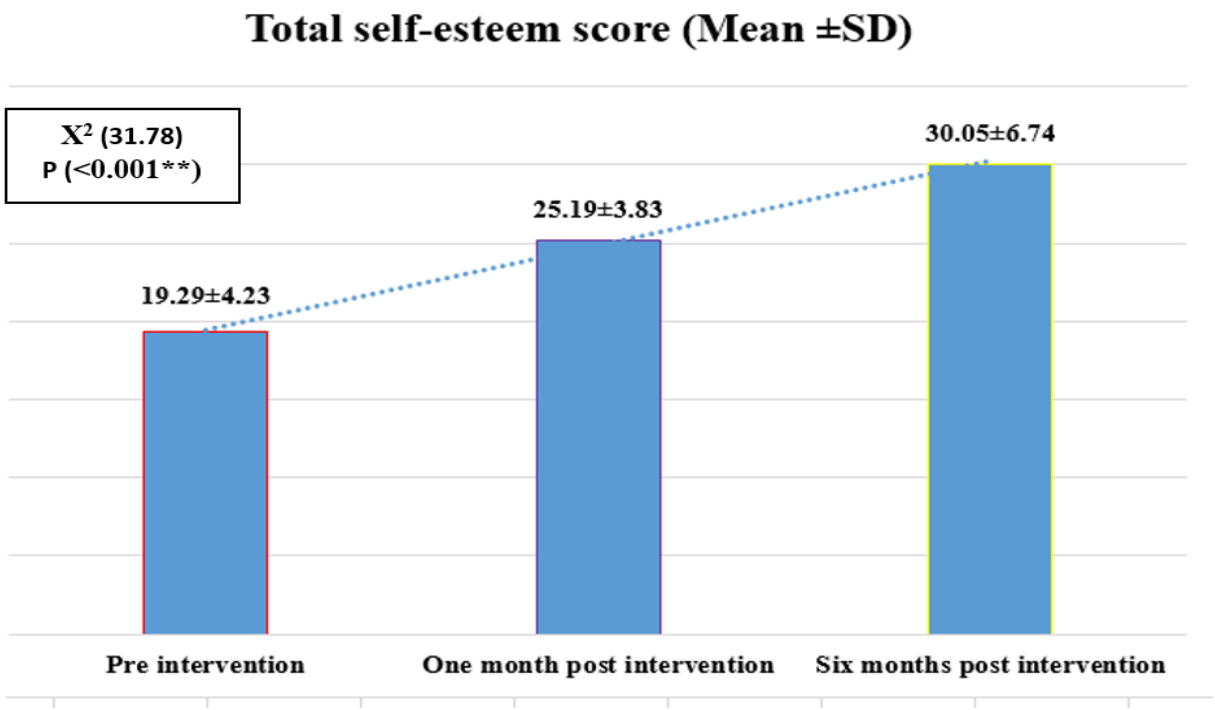

Figure (1): Mean differences of the studied patients' self-esteem scores pre, one-month post-intervention, and six months post-intervention

* Statistically significant p ≤ 0.05 ** Highly statistically significant p ≤ 0.001

Table (5): Relation between socio-demographic characteristics, self-esteem, and lifestyle modification scores six months post-intervention

Socio-demographic characteristics	Self-esteem score		Lifestyle modification score	
	Mean ±SD	Significance	Mean ±SD	Significance
Age category (years)				
<30	29.9 ±6.7	F= 0.639 P= 0.533	4.1 ±1.9	F= 0.197 P= 0.822
30 – 40	31.8 ±7.9		5.0 ±0.7	
>40	28.7 ±5.7		4.0 ±1.5	
Gender				
Male	31.2 ±6.8	t= 0.790	5.9 ±0.3	t=0.221
Female	29.5 ±6.8	P=0.434	5.2 ±1.5	P=0.824
Marital Status				
Married	30.8 ±6.8	t= 0.820	6.1 ±0.4	t= 0.085
Unmarried	29.1 ±6.7	P=0.417	5.6 ±1.4	P=0.933
Place of residence				
Rural	28.5 ±6.6	t=1.211	6.3 ±0.7	t=0.420
Urban	31.1 ±6.8	P=0.233	6.2 ±0.3	P=0.676
Educational level				
Read and write	30.0 ±6.2	F=0.059 P=0.981	5.3 ±1.0	F=0.030 P=0.993
Basic education	29.5 ±8.1		5.8 ±2.0	
Secondary education	30.6 ±7.1		4.6 ±2.5	
University education	30.6 ±5.4		5.9 ±1.9	
Employment				
Working	25.1 ±3.3	t= 5.297	5.8 ±2.7	t=1.109
Not working	33.8 ±6.3	P<0.001**	5.3 ±1.2	P=0.274
Monthly income				
Sufficient	31.9 ±6.9	F=1.281 P=0.289	5.1 ±1.1	F=0.321 P=0.727
Fairly sufficient	27.6 ±7.1		6.7 ±0.7	
Insufficient	29.8 ±6.3		5.8 ±1.3	

* Statistically significant $p \leq 0.05$ ** Highly statistically significant $p \leq 0.001$

Table (6): Relation between socio-demographic characteristics and level of knowledge score six months post-intervention

Socio-demographic characteristics	Level of knowledge							
	Poor		Fair		Good		Significance	
	N	%	N	%	N	%	χ^2	P
Age category (years)							6.353	0.174
<30	2	100.0	2	28.6	13	39.4		
30 – 40	0	0.0	4	57.1	8	24.2		
>40	0	0.0	1	14.3	12	36.4		
Gender								
Male	1	50.0	3	42.9	10	30.3		
Female	1	50.0	4	57.1	23	69.7	0.672	0.715
Marital Status								
Married	2	100.0	4	57.1	17	51.5		
Unmarried	0	0.0	3	42.9	16	48.5	1.805	0.405
Place of residence								
Rural	2	100.0	1	14.3	14	42.4		
Urban	0	0.0	6	85.7	19	57.6	4.986	0.083
Educational level								
Read and write	1	50.0	0	0.0	11	33.3		
Basic education	0	0.0	4	57.1	11	33.3		
Secondary education	1	50.0	2	28.6	5	15.2		
University education	0	0.0	1	14.3	6	18.2	6.255	0.395
Employment								
Working	0	0.0	0	0.0	18	54.5		
Not working	2	100.0	7	100.0	15	45.5	8.591	0.014
Monthly income								
Sufficient	1	50.0	3	42.9	12	36.4		
Fairly sufficient	0	0.0	2	28.6	8	24.2		
Insufficient	1	50.0	2	28.6	13	39.4	0.943	0.918

* Statistically significant $p \leq 0.05$. ** Highly statistically significant $p \leq 0.001$.

Table (7): Relation between socio-demographic characteristics and lifestyle modifications six months post-intervention

Socio-demographic characteristics	Lifestyle modification		Non- lifestyle modification		Significance	
	N	%	N	%	χ^2	P
Age (years)						
<30	4	28.6	13	46.4		
30 – 40	6	42.9	6	21.4		
> 40	4	28.6	9	32.1	2.274	0.321
Gender						
Male	6	42.9	8	28.6		
Female	8	57.1	20	71.4	0.857	0.355
Marital Status						
Married	8	57.1	15	53.6		
Unmarried	6	42.9	13	46.4	0.048	0.826
Place of residence						
Rural	4	28.6	13	46.4		
Urban	10	71.4	15	53.6	1.235	0.266
Educational level						
Read and write	5	35.7	7	25.0	0.809	0.847
Basic education	4	28.6	11	39.3		
Secondary education	3	21.4	5	17.9		
University education	2	14.3	5	17.9		
Employment						
Working	10	71.4	8	28.6	7.000	0.008
Not working	4	28.6	20	71.4		
Monthly income						
Sufficient	6	42.9	10	35.7	2.906	0.234
Fairly sufficient	5	35.7	5	17.9		
Insufficient	3	21.4	13	46.4		

*** Statistically significant p ≤ 0.05.** **** Highly statistically significant p ≤ 0.001.**

Discussion:

Bariatric surgery is increasingly recognized as an effective intervention for managing severe and complex obesity and is endorsed by national authorities such as the National Institute for Health and Care Excellence **(Olsen, 2021)**. The variation in its success may be linked to differences in patients' adherence to healthy lifestyle practices after surgery, including dietary changes, physical activity, and overall life quality **(Thompson & Farrell, 2020)**. While bariatric surgery remains the most effective clinical approach for individuals with severe obesity, the long-term psychosocial outcomes are still not clearly understood. Despite the acknowledged importance of postoperative care, there is a lack of clear guidelines on what this care should entail, especially in terms of mental and social health. Since incorporating patients' views is essential in shaping effective follow-up care **(Coulman et al., 2020)**. So, the current research study aimed to evaluate the effect of educational instructions on lifestyle modifications and self-esteem in patients with morbid obesity undergoing bariatric surgery.

Concerning age, the current research study results indicated that the mean age was 36.2 ± 12.8. This finding agrees with **Mohammed, Kotb, & Osman, (2022)**, whose study done in Assiut University Hospital among bariatric surgery patients showed that the mean age was 34.50 ± 12.52. These findings go in line with **Ustundag, (2020**), who studied the quality of life and healthy lifestyle behaviors among patients after sleeve gastrectomy and found an average participant age was 37.36 ± 9.45 years. These findings collectively suggest that bariatric surgery is commonly performed among individuals in their mid-thirties.

Regarding gender, the current research study results found that two-thirds of the participants were female. This finding is in accordance with **Dafalla et al. (2020),** conducted a study in Saudi Arabia to assess lifestyle and bowel habits after bariatric surgery, and showed that more than two-thirds were female. Also, this study agreed with **Omar, (2020)**, who noted that females represented the majority of individuals reporting obesity-related issues in Egypt. The prevalence of obesity among Egyptian females is more than double that of males. From the researchers' point of view, this gender disparity may be attributed to anatomical, physiological, and metabolic factors that make females more susceptible to obesity.

In the same context, this result is congruent with **Maghrabi, (2019)**, who revealed that more than half of patients undergoing bariatric surgery were female, while this result is in disagreement with **Chung et al. (2018)**, who conducted a study in South Korea and found significantly higher levels of obesity among men compared to women. This discrepancy may be attributed to differences in sample size, socioeconomic conditions across countries, and the use of varying assessment tools to measure obesity prevalence by gender in the respective studies.

Considering place of residence, the present research study indicated that more than half of the participants resided in urban areas. This result is in

accordance with **Craig et al. (2020) & Porcelli, (2019)**, who reported that overweight and obesity are more prevalent in urban settings, and that urbanization is significantly associated with increased obesity rates. Similarly, **Tabrizi et al. (2018)** found that the prevalence of overweight, obesity, and abdominal obesity varied significantly between urban and regional areas in the Iranian population, with statistically significant differences reported ($P < 0.05$).

Relating to patients' educational level, the current research study result indicated that about one-third of the participants have basic education. This finding is in agreement with the results of **Mohammed, Kotb, & Osman, (2022),** as well as **Ustundag, (2020)**, who also reported a similar educational distribution among bariatric surgery patients. While the current results disagree with **Dafalla et al. (2020**) in their study, who clarified that the majority of their participants were university graduates.

As regards employment, the present study's finding clarified that more than half of the participants were not working. The current result is inconsistent with **Dafalla et al. (2020**), who clarified that the majority of their participants were employed. In terms of monthly income, the current study revealed that participants were equally divided between having sufficient and insufficient income. In comparison, a study by **Mohammed, Kotb, & Osman, (2022)**, which examined socioeconomic status, showed that less than half of the participants were classified as belonging to the middle-income level.

Concerning the related and recent literature, the indications for undergoing bariatric surgery are primarily based on BMI and the presence of comorbid conditions. Candidates for bariatric procedures typically include individuals with a BMI of 40 kg/m² or higher, even in the absence of coexisting medical conditions, provided that the surgical risk is not excessive. Furthermore, patients who adopt healthy lifestyle practices such as controlled dietary intake and regular physical activity tend to achieve more favorable weight loss outcomes following surgery **(Lawson, 2020)**.

In the current study, BMI prior to the intervention was 38.73 ± 2.17. Six months following bariatric surgery and the implementation of the educational instructions, the mean BMI decreased to 35.6 ± 2.0. These findings are supported by **Mohammed, Kotb, & Osman, (2022)**, whose study reported a preoperative BMI of 45.79 ± 6.13, which decreased to 36.91 ± 5.47 three months after surgery and the application of an educational program. Similarly, the results are consistent with those of **Olsén, (2021)**, who found that the mean preoperative BMI among bariatric surgery patients was 43.5 (±4.4), which significantly declined to 36.6 (±3.6) two months postoperatively.

The findings of the present study support the research hypotheses, demonstrating a significant improvement in patients' knowledge levels and lifestyle modifications following the implementation of the educational intervention, compared to the pre-intervention phase. From the researchers' perspective, this improvement can be

attributed to the structured educational instructions provided before and after surgery, which delivered practical knowledge, guidance, and support. These educational efforts likely empowered patients to adopt necessary lifestyle changes and contributed to effective weight reduction.

The current study is congruent with **El-Maghawry et al. (2021),** who investigated the impact of an educational program on lifestyle modification among patients undergoing laparoscopic sleeve gastrectomy. Their study demonstrated a statistically significant improvement in patients' knowledge levels between the pre- and post-intervention phases ($p < 0.005$). Similarly, a Canadian study by **Taube-Schiff et al. (2016)** supported the hypothesis that educational and training sessions lead to enhanced patient knowledge. In alignment with these results, **McGrice & Don Paul, (2015)** found that bariatric surgery patients who attended at least 12 follow-up visits during the first six months post-surgery experienced significantly greater weight loss. Likewise, **Westerdahl et al. (2021)** observed notable improvements in patients' lifestyle over the duration of an educational program when compared to baseline.

The current research study revealed a significant improvement in patients' self-esteem at both one- and six-months post-intervention, compared to their pre-intervention levels, with a highly statistically significant difference ($p < 0.001$**). However, this finding contrasts with the results of **Ghanbari et al. (2016),** who reported no significant difference in self-esteem before and after bariatric surgery ($p = 0.321$). Their study concluded that weight loss following bariatric surgery did not necessarily lead to improvements in self-esteem.

Regarding the relationship between socio-demographic characteristics and lifestyle modification six months post-intervention, the present study found no statistically significant association between most socio-demographic variables including age, gender, marital status, place of residence, level of education, and monthly income and lifestyle modifications ($p > 0.05$). However, a statistically significant relationship was observed between employment status and lifestyle modifications ($p < 0.05$). These findings are consistent with those of **Tabrizi et al. (2018)**, who also reported no significant association between education level and obesity in his study.

In contrast, the present study's findings differ from those of **Mosli, (2020)**, who reported a significant association between lower education levels, higher income, and obesity, particularly among wealthier individuals. Similarly, studies by **Cadena-Obando, Ramírez-Rentería, & Ferreira-Hermosillo, (2020),** as well as **Panteliou & Miras, (2017)**, indicated that women with lower educational attainment (primary school or less) were more likely to be obese compared to those with higher levels of education. Additionally, **Köhler, (2020)** found a significant positive association between low educational levels and obesity among women.

Hence, this research study was conducted to enhance patients' level of knowledge, self-esteem, personal care, employment, leisure activities, and social engagement through living a healthier lifestyle, engaging in physical activity without fatigue, maintaining proper nutrition, performing better at work, and enjoying more active social interactions. To maintain these benefits, patients must consistently adhere to postoperative educational instructions, which include specific dietary and hydration practices, regular physical activity, daily intake of prescribed medications or supplements, and routine follow-up visits for ongoing health monitoring and evaluation.

Conclusion:

Application of an educational instructions' intervention led to a marked improvement in patients' knowledge, self-esteem, and adherence to lifestyle modification at both one- and six-months post-intervention as compared to their pre-intervention as follows:

There was a significant improvement in patients' knowledge across all items related to morbid obesity and bariatric surgery at both one- and six-months post-intervention, compared to pre-intervention levels, with a highly statistically significant difference observed.

There was a highly statistically significant difference in patients' lifestyle modifications between the pre-intervention and the one- and six-month post-intervention assessments. This included improvements in intake of adequate nutrition, adequate sleep hours, adequate rest, physical activity, weight reduction, attending follow-up medical appointments, and intake of prescribed medications and supplements.

There was no statistically significant relationship between the total self-esteem scores of the studied patients and their socio-demographic characteristics such as age, gender, marital status, place of residence, level of education, and monthly income six months post-intervention. However, a statistically significant relationship was found between self-esteem scores and the patients' employment status. Similarly, no statistically significant relationship was observed between the total scores for lifestyle modifications and socio-demographic characteristics such as age, gender, marital status, place of residence, level of education, employment, and monthly income six months post-intervention.

Recommendations:

- Bariatric educational programs should be delivered by a multidisciplinary healthcare team to support sustained and effective weight loss following bariatric surgery. Utilizing digital communication tools such as social media, telephone support, and online platforms can help overcome common barriers including cost, time constraints, and geographic distance.
- Individuals seeking weight loss should engage in physical activity for at least 60 minutes per day. Bariatric patients who are not currently involved in regular physical exercise must incorporate consistent physical activity into their daily routines to maintain weight loss.

- Overweight and obese individuals should perform regular psychological, medical, and dietary assessments to effectively monitor their health status and ensure the success of weight management strategies.
- Future studies should investigate follow-up care options that are suitable and efficient for those who have had bariatric surgery.
- Follow-up after surgery is important to ensure patient compliance regarding post-surgery instructions.
- Psychoeducational programs should be routinely offered to individuals undergoing bariatric surgery as an essential and integrated component of their healthcare to support both psychological well-being and long-term weight management.

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