



Psychological Outcomes 1 Year After Restrictive Bariatric Surgery

Kısıtlayıcı Bariatrik Cerrahiden 1 Yıl Sonraki Psikolojik Sonuçlar

✉ Derya GEZER¹, ✉ Şeyma YURTSEVEN², ✉ Dudu ALPTEKİN³, ✉ Sevilay ERDEN⁴, ✉ Sevban ARSLAN⁴

¹Tarsus University Faculty of Health Sciences, Department of Nursing, Mersin, Turkey

²Çukurova University Faculty of Medicine, Department of Urology, Adana, Turkey

³Çukurova University Abdi Sütçü Health Services Vocational School, Adana, Turkey

⁴Çukurova University Faculty of Health Sciences, Department of Surgical Nursing, Adana, Turkey

ABSTRACT

Objective: To reveal the depression and body image changes observed in patients undergoing bariatric surgery.

Methods: This prospective study followed a descriptive-correlational study design. The study population consisted of patients hospitalized in the general surgery clinic of a university hospital in order to evaluate the depression symptom level and body image of patients undergoing bariatric surgery. The study sample comprised 22 patients who were admitted to the general surgery clinic of the same hospital and met the following criteria: being over 18 years of age, being fully oriented (time, person, place) and conscious, being able to see, hear, being able to read, write, speak and understand Turkish, being diagnosed as having obesity, being hospitalized for sleeve gastrectomy, and willing to participate in the study. The data for the study were collected using a Personal Information Form prepared by the investigators, the body cathexis scale (BCS) and the beck depression inventory (BDI)

Results: Twenty two patients, 16 of whom were female, with a mean age of 31.18±7.79 years were included. The body mass index (BMI) (kg/m²) values recorded 1 year after the operation were significantly lower than the baseline levels (Z=-4.107; p=0.000). The mean BCS score 1 year after the operation was significantly lower than at the time of the baseline evaluation (t=3.447; p=0.002). The baseline BMI (kg/m²) value and BDI score were found to be positively correlated (r=0.448; p=0.036). The baseline BDI score increased

ÖZ

Amaç: Bu çalışmanın amacı bariatrik cerrahi geçiren hastalarda gözlenen depresyon ve beden algısı değişimlerini ortaya koymaktır.

Yöntemler: Prospektif çalışma tanımlayıcı ve ilişki arayıcı niteliktedir. Bariatrik cerrahi geçiren hastaların depresyon belirti düzeyi ve beden algısının sürece bağlı değerlendirilmesi amacıyla bir üniversite hastanesinin genel cerrahi kliniğinde yatan hastalar çalışma evrenini oluşturmuştur. Örnekleme ise aynı hastanenin genel cerrahi kliniğinde; 18 yaşından büyük, yönelimi tam (zaman, kişi, yer) ve bilinci açık, görebilen, işitebilen, Türkçeyi okuma, yazma, konuşabilme ve anlayabilme becerisine sahip, obezite tanısı konmuş, ameliyat olmak üzere hastaneye yatırılmış ve araştırmaya katılmayı kabul eden 22 hasta oluşturmuştur. Çalışma verileri Kişisel Bilgi Formu ile beden algısı ölçeği (BAÖ) ve beck depresyon ölçeği (BDÖ) kullanılarak toplanmıştır.

Bulgular: Çalışma yaş ortalaması 31,18±7,79 yıl olan 16'sı kadın 22 hasta üzerinde gerçekleştirildi. Ameliyattan bir yıl sonraki beden kütle indeksi (BKİ) (kg/m²) değerleri, ilk değerlendirmeye göre anlamlı ölçüde daha düşüktür (Z=-4,107; p=0,000). Ameliyattan bir yıl sonraki BAÖ puan ortalamaları, ilk değerlendirmeye göre anlamlı ölçüde daha düşüktür (t=3,447; p=0,002). Ön test BKİ (kg/m²) ile BDÖ skoru arasında pozitif yönde, zayıf derecede istatistiksel olarak anlamlı ilişki tespit edilmiştir (r=0,448; p=0,036). BKİ (kg/m²) arttıkça ön test BDÖ puanları artmış aynı şekilde, BKİ (kg/m²) azaldıkça, ön test BDÖ puanları azalmıştır.

Address for Correspondence: Derya GEZER, Tarsus University Faculty of Health Sciences, Department of Nursing, Mersin, Turkey

E-mail: deryagezer@tarsus.edu.tr **ORCID ID:** orcid.org/0000-0003-4576-2204

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ABSTRACT

with increased BMI (kg/m²) value, and baseline BDI score decreased with decreased BMI (kg/m²) value.

Conclusion: The patients were found to have lost a significant amount of body weight one year after the bariatric surgery. The baseline borderline clinical depression and an intermediate level of depression were found to change to mild depression one year after bariatric surgery. Bariatric surgery was determined to have a positive effect on body image perception.

Keywords: Obesity, bariatric surgery, depression, perception of body image

ÖZ

Sonuç: Hastaların bariatrik cerrahiden bir yıl sonra önemli bir kilo kaybı yaşadığı, ameliyat öncesi sınırdaki klinik depresyonun veya orta düzey depresyonun, bir yıl sonra hafif depresyon olarak değişim gösterdiği ve bariatrik cerrahinin beden algısını olumlu yönde etkilediği belirlendi.

Anahtar Sözcükler: Obezite, bariatrik cerrahi, depresyon, beden algısı

Introduction

Obesity, which is defined as abnormal or excess fat storage in the body, is a complex, chronic and multifactorial disease that adversely affects health (1,2). The increase in obesity prevalence has caused the disease to become a worldwide public health problem (2-4). Obesity is the cause of chronic somatic comorbidities such as type 2 diabetes and metabolic syndrome, cardiovascular diseases, obstructive sleep apnea, osteoarthritis, gastroesophageal reflux disease, hepatobiliary diseases and polycystic ovary syndrome (5-7).

There are studies showing that bariatric surgery, which is applied in patients in whom there is no response to traditional methods such as diet, calorie restriction, exercise, or malabsorptive medical treatments, generally results in effective and permanent weight loss, resulting in improvement in somatic comorbidities and long-term survival (2,8-12). In the current literature, the indications of bariatric surgery are still controversial, and bariatric surgery is generally recommended for class 2 obese patients with somatic comorbidities and class 3-4 obese patients with or without comorbidity (13). In addition to restricting food intake, bariatric surgery is an effective treatment method in the recovery of obesity and related diseases caused by hormonal and neural changes (14).

Many bariatric surgery candidates are known to suffer from mental health disorders, particularly depression symptoms and binge eating disorder (15). Therefore, psychological evaluations and interventions before and after bariatric surgery, and a multidisciplinary approach to the treatment of obesity are important (16,17). A recent meta-analysis reports that the preoperative depression score is not predictive of postoperative weight change (18). However, it has been suggested that weight loss after bariatric surgery is associated with a short- and medium-term decrease in depression levels (19,20). According to long-term follow-up data, it has been reported that some patients did not receive psychological benefits after bariatric surgery, new depressive symptoms developed, or depressive symptoms that initially resolved after surgery returned back (12).

In the literature, a limited number of studies evaluating body image and depression symptoms in patients undergoing bariatric surgery have not reached the desired level (12,21-24). In the

studies, it was determined that the changes specific to the society were not adequately examined. With this study, we aimed to analyze this. The aim of this study is to reveal the depression symptom level and body image changes observed in patients undergoing bariatric surgery.

Methods

This prospective study was descriptive and correlational. The population of the study consisted of 31 patients hospitalized in the general surgery clinic of a university hospital between January 2015 and January 2016 in order to evaluate the depression and body image of patients undergoing bariatric surgery. In the study, it was aimed to reach the whole universe, which was not used for sampling. Inclusion criteria for the study were; being over 18 years of age, being fully oriented (time, person, place) and conscious, being able to see, hear, being able to read, write, speak and understand Turkish, being diagnosed as having obesity, being hospitalized for sleeve gastrectomy, and willing to participate in the study. Patients with a psychiatric diagnosis were excluded from the study. Twenty two patients in follow-up were reached again one year after surgery. Five patients who were diagnosed as having depression and received drug therapy were excluded from the study. Four patients did not participate in the study voluntarily. The general surgery clinic had a total of 37 beds and 46 patients underwent bariatric surgery in the same time period. Sleeve gastrectomy was performed in 31 patients and gastric bypass was performed in 15 patients. A total of 12 nurses worked in the clinic and three physicians were responsible for the same patient group. Patients were routinely evaluated by a psychiatrist before surgery.

Ethical Approval

The study was conducted after obtaining ethics committee approval (date: 23.08.2013, number: 22 decision no: 15) from the Non-Invasive Clinical Research Ethics Committee of Çukurova University Faculty of Medicine and institutional permissions from the hospital where the research was conducted. The patients who accepted to participate in the study were given detailed information about the study and their written consent was obtained. In addition, the study was carried out in accordance with the principles of the Declaration of Helsinki 2008.

Data Collection Tools

The data of the study were collected using three different forms before bariatric surgery. These forms were the Personal Information Form prepared by the researchers, the Body Perception Questionnaire and the Beck Depression Inventory (BDI). Personal Information Form, which was one of the pre-test data, was interviewed face-to-face with the patients by the researcher, and the other forms were filled in by the patients under the supervision of the researcher. Post-test data were collected at the 1st postoperative year during the outpatient follow-up.

Personal Information Form

The form prepared by the researchers was a literature-based questionnaire consisting of six questions in which descriptive characteristics were recorded (age, gender, marital status, educational status, family history of obesity, and body mass index (BMI) (20).

Body Cathexis Scale

The body cathexis scale (BCS) developed by Secord and Jourard aims to measure how satisfied individuals are with various body parts and body functions (25). The validity study of the questionnaire in Turkey was conducted by Hovardaoğlu and the Cronbach alpha reliability coefficient was determined as 0.91 (26). In this study, the Cronbach's alpha value was found to be 0.87. The Turkish version of the scale consists of 40 items, each of which is related to an organ or body part (such as arm, leg, face) or a function (such as sexual activity level). Each item is scored on a 5-point Likert-type scale ranging from 1 to 5 (1= I like it very much, 2= I like it a lot, 3= I am undecided, 4= I don't like it very much, 5= I don't like it at all). The most positive statement gets 1 point and the most negative statement gets 5 points. Accordingly, the lowest total score that can be obtained is 40, and the highest total score is 200. An increase in the total score obtained from the scale indicates a decrease in the person's satisfaction with his/her body parts or function, while a decrease in the score indicates an increase in satisfaction (26).

Beck Depression Inventory

Developed by Beck et al. (26), BDI was adapted into Turkish by Hisli (27). The Cronbach's alpha coefficient for BDI was 0.74 in the Turkish population. In this study, the Cronbach's alpha value was found to be 0.78. BDI is a 21-item, four-point scale used to evaluate depressive symptoms, ranging from seldom or never (0) to often or always (3), with a maximum score of 63 (1-10 normal, 11-16 mild depression, 17-20 borderline clinical depression, 21-30 moderate depression, 31-40 severe depression, and >40 major depression) (28).

Statistical analysis

Statistical analyzes were performed using the package program SPSS (IBM SPSS Statistics 24). Frequency tables and descriptive statistics were used during the interpretation of the findings. Kolmogorov-Smirnov normality test was applied to examine the distribution of the data. Parametric methods were used for measurement values suitable for normal distribution.

"Independent Sample-t" test (Z-table value) was used when comparing the measurement values of two independent groups. The "Paired Sample" test (t-table value) was used when comparing the measurement values of two dependent groups, and the "Analysis of Variance" (F-table value) method was used when comparing the measurement values of three or more independent groups.

Non-parametric methods were applied to the measurement values that did not conform to the normal distribution. "Mann-Whitney U" test (Z-table value) was used when comparing the measured values of two independent groups. The "Wilcoxon" test (Z-table value) method was used when comparing the measurement values of the two dependent groups. Pearson correlation coefficient was used to analyze the relationships of two quantitative variables with normal distribution, and Spearman correlation coefficient was used in cases where at least one of them did not show normal distribution.

Results

It was determined that the mean age of the participants was 31.18 ± 7.79 years, 72.7% were women, 50% were married, 50% were at secondary education level and 72.7% had obese individuals in their families. It was determined that 72.7% of the patients were morbidly obese in the first preoperative evaluations, and 59.1% of them were obese in the first-year follow-ups (Table 1). The mean weight at baseline (Z1) was 131.6 kg (± 23.6), 1 year later (Z2) was 92.0 kg (± 19.4). It was determined that the participants lost an average of 69.9% of their initial weight 1 year after the surgery.

BMI (kg/m^2) values differed significantly according to the processes ($Z = -4.107$; $p = 0.000$). One year post-operative BMI (kg/m^2) values were significantly lower than the initial evaluation. BCS score averages did not differ significantly according to the processes ($p > 0.05$). BDI score averages differed significantly according to the processes ($t = 3.447$; $p = 0.002$). Satisfaction with body parts and body functions increased one year after surgery (Table 2).

The mean scores of BDI and BCS before and after surgery did not differ significantly according to the variables ($p > 0.05$) (Table 3).

A positive, weak, statistically significant relationship was found between pre-test BMI (kg/m^2) and BDI ($r = 0.448$; $p = 0.036$). As BMI (kg/m^2) increased, pre-test BDI scores increased, and as BMI (kg/m^2) decreased, pre-test BDI scores decreased. There was no statistically significant correlation between post-test BDI scores and BMI (kg/m^2) ($p > 0.05$). No statistically significant correlation was found between pretest-posttest BCS scores and BMI (kg/m^2) ($p > 0.05$) (Table 4).

Discussion

The results of the study revealing the differences between BMI, depression symptom level and body image levels in obese patients before and 1 year after bariatric surgery, and the relationship

between BMI before and 1 year after surgery and depression symptom level and body image levels were discussed in the light of the literature.

It was determined that patients experienced significant weight loss 1 year after bariatric surgery. In addition, the mean BMI scores one year after bariatric surgery differed significantly. BMI score averages were significantly lower in the second evaluation than in the first evaluation. These results were consistent with the

findings of the study and meta-analysis (20,29,30). According to these results, it can be concluded that bariatric surgery used in the treatment of obesity has positive effects on weight loss and reducing BMI.

In the study, the mean BCS scores differed significantly one year after bariatric surgery. BCS score averages were significantly lower than the initial assessment. According to these findings, it can be concluded that bariatric surgery affects body image positively. In a study examining the effects of bariatric surgery on body image, it was found that there was a significant improvement in variables such as general body image, appearance evaluation, orientation and body satisfaction 3 months after surgery compared to preoperatively (31). Similar to the study in the literature, it was shown that body image changed positively after bariatric surgery (19,32-34,30). According to these findings; it can be concluded that bariatric surgery has a positive effect on body image.

It is not clear whether the negative body image observed in obese individuals is a result of obesity or a cause. Studies related to obesity show that there is a relationship between BMI and body image (35-37). This situation can be evaluated as the change in physical appearance with the decrease in BMI, as well as the positive effect on body image. However, an important issue to understand is that body image has a powerful effect on psychological health.

In the study, as preoperative BMI (kg/m²) increased, pre-test BDI scores increased, and as BMI (kg/m²) decreased, pre-test BDI scores decreased. Lifelong mental disorders are common in bariatric surgery candidates (38-40). It is known that obesity is associated with depression in particular (19,41,42). In addition, although the preoperative and one year post-operative BDI mean scores did not differ significantly, borderline clinical depression (27.3%) or moderate depression (18%) changed to mild depression one year later (72.6%). In this case, it can be concluded that the level of depression symptoms decreases with the weight loss experienced. However, unlike the change in weight and BMI, no significant difference was observed in terms of depression symptom levels. While this result is consistent with some studies in the literature (19,20), some studies show that existing depression persists and even increases after bariatric surgery (30,31,43,44). In addition, these findings suggest that depression may be another obesity comorbidity that can be

Table 1. Distribution of descriptive characteristics (n=22)

Variables	n	%
Age [$\bar{X} \pm SD \rightarrow 31.18 \pm 7.79$ (years)]		
<30	10	45.5
30-40	7	31.8
>40	5	22.7
Gender		
Male	6	27.3
Female	16	72.7
Marital status		
Married	11	50.0
Single	11	50.0
Education status		
Primary education	5	22.7
Secondary education	11	50.0
High education	6	27.3
Obesity in family		
Yes	16	72.7
No	6	27.3
BMI (Z1)		
Moderately obese (35-40)	2	9.1
Morbidly obese (41-49)	16	72.7
Super obese (≥ 50)	4	18.2
BMI (Z2)		
1 st degree obese <34	13	59.1
Moderately obese (35-40)	7	31.8
Morbidly obese (41-49)	2	9.1
Preoperative (Z1) 1 year later (Z2)		

BMI: Body mass index, SD: Standard deviation

Table 2. Comparison of parameters by time

Variable (n=22)	Z1	Z2		Statistical analysis* Possibility
	$\bar{X} \pm SD$	Median (IQR)	$\bar{X} \pm SD$	
BMI (kg/m ²)	46.83±7.84	44.1 [6.5]	32.59±5.90	32.9 [9.3] Z=-4.107 p=0.000
Beck depression inventory	16.18±7.10	16.5 [10.0]	11.86±7.98	11.0 [13.5] t=1.936 p=0.066
Body cathexis scale	109.64±22.59	115.0 [25.0]	91.41±21.51	95.5 [38.5] t=3.447 p=0.002

*Paired Sample test (t-table value) was used to compare the measurement values of two dependent groups in data with normal distribution, and "Wilcoxon" test (Z-table value) statistics were used in data without normal distribution. Preoperative (Z1), 1 year later (Z2)
BMI: Body mass index, SD: Standard deviation, IQR: Inter quantile range

affected by weight loss and weight regain. There are different biological and psychological ways of explaining the relationship between depression and obesity (19). From a psychological perspective, weight-related stigma, increased body dissatisfaction, and decreased self-esteem are risk factors for depression (45). Also, low weight loss and weight regain after an invasive weight loss treatment such as bariatric surgery can cause feelings of failure and helplessness and increase the risk of depression.

Study Limitations

The limitation of the study was that it was performed in a limited number of groups who underwent restrictive bariatric surgery in a single center. The results of this study could only be generalized to the study group. In addition, examining the results one year after bariatric surgery was also within the limitations of the study.

Table 3. Comparison of beck depression inventory and body cathexis scale scores according to variables

Variables (n=22)	n	Z1		Z2		BDI		BCS	
		X̄ ± SD	Median (IQR)	X̄ ± SD	Median (IQR)	X̄ ± SD	Median (IQR)	X̄ ± SD	Median (IQR)
Age									
<30	10	16.50±8.36	16.5 (15.0)	106.40±22.12	115.0 (28.0)	15.80±8.35	15.5 (12.3)	93.10±22.33	95.5 (44.8)
30-40	7	12.86±4.45	12.0 (8.0)	114.57±15.33	121.0 (22.0)	7.43±7.43	5.0 (10.0)	96.14±19.04	104.0 (31.0)
>40	5	20.20±6.14	17.0 (11.0)	109.20±33.99	112.0 (54.0)	10.20±4.21	11.0 (6.0)	81.40±24.35	82.0 (41.5)
Statistical analysis* Possibility		F=1.683 p=0.212		F=0.251 p=0.780		F=2.826 p=0.084		F=0.722 p=0.499	
Gender									
Male	6	16.17±8.66	15.5 (13.0)	96.50±33.60	102.5 (68.0)	10.00±5.93	11.5 (10.8)	82.33±15.50	85.5 (27.8)
Female	16	16.19±6.74	16.5 (12.0)	114.56±15.59	116.5 (20.0)	12.56±8.69	11.0 (17.0)	94.81±22.96	103.5 (43.5)
Statistical analysis Possibility		t=-0.006 p=0.995		t=-1.267 p=0.254		t=-0.662 p=0.516		t=-1.226 p=0.234	
Marital status									
Married	11	18.09±5.92	17.0 (11.0)	116.45±23.04	117.0 (13.0)	10.18±6.11	11.0 (7.0)	91.82±21.74	96.0 (39.0)
Single	11	14.27±7.91	16.0 (9.0)	102.82±20.94	101.0 (30.0)	13.55±9.49	14.0 (19.0)	91.00±22.33	95.0 (38.0)
Statistical analysis Possibility		t=1.281 p=0.215		Z=-1.610 p=0.107		t=-0.988 p=0.335		t=0.087 p=0.931	
Education status									
Primary education	5	18.00±6.12	16.0 (12.0)	123.40±17.83	117.0 (26.0)	7.60±8.85	3.0 (14.5)	96.40±25.37	107.0 (46.5)
Secondary education	11	15.91±9.12	16.0 (15.0)	106.55±21.49	114.0 (28.0)	15.46±7.85	14.0 (11.0)	91.90±17.22	95.0 (28.0)
High education	6	15.17±3.25	17.0 (4.0)	103.83±26.72	108.0 (42.0)	8.83±4.88	10.5 (8.5)	86.33±27.92	80.5 (56.3)
Statistical analysis Possibility		F=0.216 p=0.807		F=1.260 p=0.306		F=2.607 p=0.100		F=0.284 p=0.756	
Obesity in family									
Yes	16	16.06±6.70	16.0 (12.0)	112.56±20.11	116.5 (20.0)	13.69±8.13	11.5 (11.8)	91.31±22.54	90.0 (42.3)
No	6	16.50±8.76	17.0 (14.0)	101.83±28.79	101.5 (46.0)	7.00±5.48	7.5 (10.8)	91.67±20.49	95.5 (37.8)
Statistical analysis Possibility		t=-0.126 p=0.901		t=0.992 p=0.333		t=1.849 p=0.079		t=-0.034 p=0.974	

*In the data with normal distribution, the "Independent Sample"-test (t-table value) was used to compare the measurement values of two independent groups, and the "ANOVA" test (F-table value) statistics were used for the comparison of three or more independent groups. The "Mann-Whitney U" test (Z-table value) statistics were used to compare the measurement values of two independent groups in the data that did not have a normal distribution. Preoperative (Z1), 1 year later (Z2). BMI: Body mass index, SD: Standard deviation, IQR: Inter quantile range

Table 4. Correlation between weight loss and improvements in psychological variables

Correlation* (n=22)	Z1 BMI (kg/m ²)		Z2 BMI (kg/m ²)	
	r	p	r	p
Beck depression inventory	r	0.448	r	-0.025
	p	0.036	p	0.913
Body cathexis scale	r	0.394	r	0.289
	p	0.069	p	0.192

*Pearson correlation coefficient was used in the analysis of the relationships between two quantitative variables with normal distribution, and Spearman correlation coefficient was used in cases where at least one of them did not show normal distribution. Preoperative (Z1), 1 year later (Z2)
BMI: Body mass index

Conclusion

As a result, it was determined that patients experienced a significant weight loss one year after bariatric surgery, that borderline clinical depression or moderate depression before surgery changed to mild depression one year later, and that bariatric surgery had a positive effect on body image.

Considering the multifactorial characteristics of obesity, a multidisciplinary approach should be used, such as preparing and educating bariatric surgery patients for postoperative life changes. In addition, patients should be evaluated psychiatrically. For bariatric surgery to be successful, it is also important that patients be included in a program that combines recommendations on diet, physical activity, and psychosocial problems both pre- and post-operatively. In addition, new studies with longer follow-up periods are recommended by evaluating the effect of different factors with larger sample groups.

Ethics

Ethics Committee Approval: The study was conducted after obtaining ethics committee approval (date: 23.08.2013, number: 22 decision no: 15) from the Non-Invasive Clinical Research Ethics Committee of Çukurova University Faculty of Medicine and institutional permissions from the hospital where the research was conducted.

Informed Consent: The patients who accepted to participate in the study were given detailed information about the study and their written consent was obtained.

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Authorship Contributions

Concept: D.G., Ş.Y., D.A., S.E., S.A., Design: D.G., Ş.Y., D.A., S.E., S.A., Data Collection or Processing: D.G., Ş.Y., D.A., S.E., S.A., Analysis or Interpretation: D.G., Ş.Y., D.A., S.E., S.A., Literature Search: D.G., Ş.Y., D.A., S.E., S.A., Writing: D.G., Ş.Y., D.A., S.E., S.A.

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