

Original article / Araştırma**Eating disorders in bariatric surgery candidates admitted to Haydarpaşa Numune Training and Research Hospital****Meliha ZENGİN EROĞLU,¹ Şencan SERTÇELİK,¹ Lut TAMAM²****ABSTRACT**

Objective: Bariatric surgery is used more commonly than recent years among obesity treatment methods. The prevalence of eating disorders and its effect on surgical outcomes in bariatric surgery candidates are frequently discussed. The present study was planned to assess the prevalence of eating disorders in bariatric surgery candidates. **Methods:** A psychiatrist in routine procedure evaluated 108 bariatric surgery patients. Eating disorders diagnosis (binge eating disorder (BED), anorexia nervosa (AN), bulimia nervosa (BN)) were based to Diagnostic and Statistical Manual of Mental Disorders (DSM-5) and night eating syndrome (NES) diagnosis was based to Allison criteria. Eating Attitudes Test (EAT) and Beck Depression Inventory (BDI) were administered to all participants. **Results:** The prevalence of any kind of eating disorder (BED, NES or both) was 23.1% (n=25). BED was 11.1% (n=12), NES 5.6% (n=6), both BED and NES 6.5% (n=7). We could not determine any patient with diagnosis of AN or BN in our sample. There was no significant difference at Body Mass Index (BMI) between people with eating disorders and without eating disorders. The mean point of BDI score was 13.8±9.8. The 50% of sample had family history about psychiatric disease. 63.9% of the sample (n=69) had comorbid other medical conditions. **Conclusion:** Prevalence of eating disorders is substantially high in this group (23.1%). As we exactly not know the effect of eating disorders at surgery success and weight loss, it is important to determine the maladaptive eating behaviors at the beginning of surgery procedure. (*Anatolian Journal of Psychiatry* 2018; 19(4):355-361)

Key words: bariatric surgery, eating disorders, obesity, binge eating disorder, night eating syndrome

Haydarpaşa Numune Eğitim ve Araştırma Hastanesi'ne başvuran bariatrik cerrahi adaylarında yeme bozukluğu**ÖZ**

Amaç: Bariatrik cerrahi obezite tedavi yöntemleri arasında geçmiş yıllara göre daha sık kullanılmaktadır. Bariatrik cerrahiye aday hastalarda yeme bozukluğunun önemi ve cerrahi sonuçlarına etkisi sıklıkla tartışılmaktadır. Bu çalışma bariatrik cerrahi adaylarında yeme bozukluğu sıklığını belirlemek için planlanmıştır. **Yöntem:** Yüz sekiz bariatrik cerrahi hastası bir psikiyatrist tarafından rutin prosedür çerçevesinde değerlendirildi. Yeme bozukluğu tanısı (tıkinırcasına yeme bozukluğu-TYB), anoreksiya nervoza-AN), bulimia nervoza-BN) DSM-5'e, gece yeme sendromu (GYS) tanısı Allison'un ölçütlerine dayandırıldı. **Bulgular:** Herhangi bir yeme bozukluğu (TYB, BN veya her ikisi) yaygınlığı %23.1'di (s=25). Örneklem grubumuzda AN veya BN tanılı hiç bir hasta saptamadık. Yeme bozukluğu olan ve olmayanların Beden Kitle İndeksleri (BKİ) arasında istatistiksel olarak fark yoktu. Tüm katılımcılara Yeme Tutumu Testi (YTT) ve Beck Depresyon Ölçeği (BDÖ) uygulandı. **Sonuç:** Bu grupta yeme bozukluğu yaygınlığı önemli derecede yüksektir (%23.1). Yeme bozukluğunun kilo kaybı ve cerrahi başarı üzerindeki etkisinin ne olduğunu tam olarak bilmesek de, cerrahi prosedürün başlangıcında maladaptif yeme davranışını saptamak önemlidir. (*Anadolu Psikiyatri Derg* 2018; 19(4):355-361)

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Anahtar sözcükler: Bariatrik cerrahi, yeme bozukluğu, obezite, tıknırcasına yeme bozukluğu, gece yeme sendromu

INTRODUCTION

Bariatric surgery results in long-term marked weight loss and significant improvement or remission of medical comorbidities compared to other obesity treatment methods (dietary programs, cognitive behavioral therapy, appetite inhibiting drugs, physical exercise) for individuals with severe obesity.¹ Obesity-associated mortality and comorbidities such as type 2 diabetes, hypertension, dyslipidemia, obstructive sleep apnea and renal dysfunction improve significantly with bariatric surgery.² Therefore, bariatric surgery is increasingly popular at all over the world as well as in Turkey.

Dysfunctional eating patterns occur nearly 10-25% of bariatric surgery candidates or people, completing bariatric surgery.³ Binge eating disorder (BED) and night eating syndrome (NES) are the most common eating disorders among this group of patients.^{4,5}

Because of bariatric surgery, the eating habits of candidates change immediately and radically. Preoperative psychiatric examination by a psychiatrist for eating disorders is very important. Substantial proportion of patients report problematic eating behaviors before and after bariatric surgery.⁶ We aimed to evaluate the prevalence of eating disorders (anorexia nervosa (AN), bulimia nervosa (BN), BED and NES) and related clinical characteristics of bariatric surgery candidates in our hospital within this study.

METHODS

Participants and study setting

Between January 01st 2016 and June 31st 2016, consecutive bariatric surgery candidates, evaluated for a routine preoperative psychiatric examination at Haydarpaşa Numune Training and Research Hospital, were invited to participate in this study on a volunteer basis.

All bariatric surgery candidates are first evaluated by the departments such as general surgery, endocrinology, psychiatry and a dietitian individually before the operation. Then, all patients are evaluated in a bariatric surgical council, consisting of a psychiatrist, an endocrinologist and at least a general surgeon through a multidisciplinary perspective. Data for this study were obtained from pre-surgical evaluation phase. The patients with obesity grade 2 (BMI

35.0-39.9 kg/m²) and at least one obesity-related comorbidity or obesity grade 3 (BMI ≥ 40.0 kg/m²) were included in this study. Patients, <18 and >65 years-old, with alcohol/drug problems, mental retardation, psychosis and dementia diagnoses were excluded from the study. The sample consisted of 116 adult bariatric surgery candidates who underwent a pre-surgical psychiatric evaluation. 8 patients were excluded from the study due to exclusion criterias.

Procedures and assessment instruments

All candidates were monitored by a psychiatrist for psychiatric disorder diagnoses with a semi-structured form, based on Diagnostic and Statistical Manual of Mental Disorders (DSM-5) prior to bariatric surgery.⁷ A Sociodemographic Form, including clinical features, NES diagnose, psychiatric history and other medical conditions, was designed for this study. Data were also retrieved from patients' medical records. The study was approved by Haydarpaşa Numune Training and Research Hospital Ethics Committee. All participants gave written informed consent prior to the study.

NES does not take place under its own name at DSM5 so Allison's proposed research criteria were used for diagnosis of NES (Table 1).⁸

Measures

Beck Depression Inventory (BDS): It was developed by Beck.⁹ It is a self report questionnaire. The highest score is 63. Reliability and validity of the BDS in Turkish was demonstrated by Hisli.¹⁰

Eating Attitudes Test (EAT): EAT-40 is used to evaluate disturbances in individuals' eating behaviors and attitudes.¹¹ A score greater than 30 is considered to be an indicator anorectic disorder. Erol and Savaşır in Turkey made the validity study of this scale.¹²

Body-Mass Index (BMI): BMI was calculated according to the BMI formula, weight in kilograms divided by the square of the height in meters (kg/m²).

Diagnoses of other medical conditions: Diagnoses were based on patients' statements during referrals and medical tests, made in our hospital.

Statistical analysis

Student's t test and correlation analysis were used to analyze continuous and normal

Table 1. Proposed research criteria for night eating syndrome

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- A. The daily pattern of eating demonstrates a significantly increased intake in the evening and/or nighttime, as manifested by one or both of the following:
1. At least 25% caloric intake after the evening meal
 2. At least two episodes of nocturnal eating per week
- B. Awareness and recall of evening-eating and nocturnal-eating episodes are present.
- C. The clinical picture is characterized by at least three of the following features:
1. Morning anorexia (lack of desire to eat in the morning) and/or skipped breakfast four or more mornings per week
 2. Presence of a strong urge to eat between dinner and sleep onset and/or during the night
 3. Sleep onset and/or sleep maintenance insomnia are present four or more nights per week
 4. Presence of a belief that one must eat in order to initiate to return to sleep
 5. Mood is frequently depressed, and/or mood worsens in the evening.
- D. The disorder is associated with significant distress and/or impairment in functioning.
- E. The disordered pattern of eating has been maintained for at least three months.
- F. The disorder is not secondary to substance abuse or dependence, medical disorder, medication or another psychiatric disorder.
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From Allison et al. (2010). Proposed diagnostic criteria for night eating syndrome.⁸

tion matching data. Mann Whitney U test and Kruskal Wallis analysis were used in the analysis of continuous but not normal distribution data. Categorical data were analyzed by using chi-square and Fisher's exact test. The level of statistical significance was considered as $p < 0.05$.

RESULTS

The sample was consisted of 87 woman (80.6%) and 21 men (19.4%). The mean age of candidates was 37.5 ± 9.1 years. The mean BMI at woman was 45.45 ± 4.70 kg/m² and the one at man was 45.77 ± 6.16 kg/m² ($p = 0.786$). There was no relationship between BMI and marital status ($p = 0.296$) 63.9% of the sample ($n = 69$) had comorbid other medical conditions. 16 of these patients also had at least one eating disorder. Demographic characteristics of patients had shown Table 2.

The prevalence of any kind of eating disorder (BED, NES or both) was 23.1% ($n = 25$). There was no significant relationship between gender and having an eating disorder ($p = 0.620$) but eating disorders were higher at women (21 women vs four men). BED was 11.1% ($n = 12$, 11 women and one man), NES 5.6% ($n = 6$, 5 women and one man), both BED and NES 6.5% ($n = 7$, five women and two men). We could not determine any patient with diagnose of AN or BN in our sample.

There was no relationship between education level and having any kind of eating disorder ($p = 0.730$). Comparison of patients with and with-

out eating disorders is shown in Table 3.

When BED group ($n = 12$) and NES ($n = 6$) group were compared, no significant difference was found in BMI, BDS scores and EAT parameters ($p = 0.111$, $p = 0.672$, $p = 0.638$).

Ten of these 25 patients who were diagnosed as having an eating disorder, had comorbid depressive disorder. The prevalence of depressive disorder in those who were diagnosed with eating disorder was statistically higher than that without eating disorder ($p = 0.007$).

The mean point of EAT was 23.2 ± 9.9 . 23.1% of the candidates ($n = 25$) had impaired eating behavior (EAT score > 30). There was no significant difference for BMI between people with and without impaired eating behaviour ($p = 0.251$).

Patients who had comorbid psychiatric disease had also more eating disorder diagnosis ($p = 0.014$). Also EAT points are significantly higher in this group ($p = 0.045$).

At least one type of eating disorder was present in 10 (four people had BED, three had NES, three had both BED and NES) of 21 patients with depressive disorder. Also seven of these 21 patients had impaired eating behavior (EAT score > 30).

There was no significant relationship between having impaired eating attitude and depressive disorder diagnose ($p = 0.252$).

EAT scores of patients with dysthymic disorder and obsessive compulsive disorder (OCD) were higher than patients without these disorders

Table 2. Demographic characteristics of patients

		n	%
Gender	Woman	87	80.6
	Man	21	19.4
Marital status	Single	38	35.2
	Married	63	58.3
	Divorced-widowed-separated	7	6.5
Education level	Elementary	41	38.0
	High school	30	27.8
	University	37	34.2
Family history of psychiatric disorder	Yes	54	50
	No	54	50
Current psychiatric disorders	Major depressive disorder	21	19.4
	OCD	5	4.6
	Generalized anxiety disorder	7	6.5
	Social phobia	7	6.5
	Specific phobia	18	16.7
	ADHD	3	2.8
	Dysthymic disorder	4	3.7
	Any kind of eating disorder	25	23.1
Comorbid medical conditions	Yes	69	63.9
	No	39	36.1

Table 3. Comparison of patients with and without eating disorder

	Eating disorders (+) (n=25) Mean±SD		Eating disorders (-) (n=83) Mean±SD		Total (n=108) Mean±SD		p
BMI	45.55±4.25		45.5±5.21		45.51±4.98		0.729*
Age	4.96±8.21		38.28±9.35		37.51±9.17		0.159*
EATS	27.12±8.42		22.02±10.08		23.20±9.93		0.900*
Beck-D score	16.40±11.78		13.06±9.12		13.83±9.85		0.319*
	n	%	n	%	n	%	
Gender							0.777***
Male	4	16.0	17	20.5	21	19.4	
Female	21	84.0	66	79.5	87	80.6	
Marital status							0.927**
Single	9	36.0	29	34.9	38	35.2	
Married	14	56.0	49	59.0	63	58.3	
Other(widowed, divorced)	2	8.0	5	6.0	7	6.5	
Additional organic disease							0.989**
Yes	16	64.0	53	63.9	69	63.9	
No	9	36.0	30	36.1	39	36.1	
Family history of psychiatric disease							0.254**
Yes	10	40.0	44	53.0	54	50.0	
No	15	60.0	39	47.0	54	50.0	
Additional psychiatric disease							0.014**
Yes	16	64.0	30	36.1	46	42.6	
No	9	36.0	53	63.9	62	57.4	

*: Mann Whitney U test; **: Pearson's chi-square test; ***: Fisher's exact test.

($p=0.040$, $p=0.013$).

Impaired eating behavior was statistically higher in patients with dysthymic disorder, OCD and social phobia than in patients without these disorders ($p=0.038$, $p=0.010$, $p=0.007$).

Patients with family history of psychiatric disease have significantly higher impaired eating behavior (EAT points are >30) ($p=0.040$). The mean point of BDS score was 13.8 ± 9.8 . Twenty-nine of the patients had BDS scores above 17 points. 34.5% of these 29 patients ($n=10$) had at least one type of eating disorder. Six of them had BED, three of them had NES and one of them had multiple type eating disorders.

There was no significant relationship between having eating disorders and BDS scores ($p=0.091$). Also there was no significant difference for BDS scores when two groups compared ($p=0.530$). There was no significant relationship between EAT scores and BDS scores ($p=0.714$).

There was a negative correlation between BDS scores and BMI ($r=-0.197$). As the BMI increased BDS scores decreased.

When we divided BDS scores into two groups as below 17 points and 17 points and above, no significant difference was found between BMI and EAT scores ($p=0.342$ and $p=0.857$).

There was no significant difference between BMI, BDS score and EAT score in the comparison of depressed and non-depressed groups. ($p=0.704$, $p=0.846$, $p=0.938$).

DISCUSSION

Our major finding in the study was that 23.1% of the sample has any kind of eating disorder. This result was compatible with the literature.¹³⁻¹⁵

Many researchers have focused on BED, 'loss of control' on eating and other maladaptive eating behaviors such as 'grazing' and NES, since they have been fairly consistently linked to unsuccessful weight loss and/or greater weight regain after bariatric surgery.^{3,16} Generally two types of eating disorders were seen in obese people. One of them is BED the other is NES. We also focused on the prevalence of these two kinds of eating disorders in our study. Prevalence rates of BED (27-49%) were high for patients undergoing bariatric surgery.¹⁷⁻¹⁹

According to a new meta-analysis, the prevalence of BED (based on random effects) among patients seeking and undergoing bariatric surgery was 17%.²⁰ The prevalence of BED in our study was 11.1%. It was higher for women as in

the literature.¹⁷ Prevalence rates of BED change widely depending on assessment methods.

The prevalence of NES was found 5.6% in our study. It was more common for women. This percentage has been found similar to the literature. Because of the differences of diagnostic criteria and assessment methods in studies, the prevalence of NES in bariatric surgery is 2-55%.¹⁸ The prevalence of NES was found 2-20% in studies, made by using stricter diagnostic criteria in bariatric surgery samples.^{4,5}

In addition, studies suggest comorbidity with NES and BED partly. Baldofski et al., reported that 8.2% of their bariatric sample had NES diagnosis and 4.3% had BED diagnosis and 3.9% of the sample had both.⁴ 6.5% of our sample had both BED and NES diagnosis. In our study, the prevalence rate of overlap was higher than Baldofski et al.'s (6.5% vs. 3.9%). Baldofski et al. used same scales according to DSM5 criteria for diagnosing eating disorders as we did. The different prevalence of eating disorders between aforementioned study and our study can be attributed to the changing of eating attitudes between different sociocultural populations.

There are some known differences, between bariatric patients with BED and the ones with NES. BED patients have more psychopathology about eating, restraint and weight concerns. BED patients have more objective binge eating episodes. There is no difference between BED and NES patients on subjective binge eating episodes and other disordered eating like emotional eating and food addiction.^{4,5}

All eating disorders prevalence rates in our study were lower than we predicted. Also there was no significant relationship between having any kind of eating disorder and sociodemographic variables, comorbid medical conditions (Table 3). The lower prevalence of disordered eating we found was associated with the absence of objective tests for diagnosing eating disorders and the embarrassment of patients. Patients might not express themselves enough during the psychiatric examination.

Emotional eating, uncontrolled eating and cognitive restraint of eating are the most known dysfunctional eating patterns, seen at obese people. Emotional eating succors to regulate negative mood states. The literature suggests that 38-59% of candidates may engage in emotional eating.¹⁸ The other type of maladaptive eating behaviors such as 'grazing', 'picking and nibbling' have been reported at a prevalence rate of 19.5% to 60% and food addiction 17% to 54%.

in bariatric surgery patients.^{6,18,21} We didn't evaluate these other maladaptive eating behaviors for our sample.

There is a lack of literature about the development of eating disorders such as anorexia nervosa, bulimia nervosa, eating disorder not otherwise specified as well as subsyndromal eating disorders in pre-bariatric surgery samples. There was no patient diagnosed with anorexia nervosa, bulimia nervosa and eating disorder not otherwise specified in our study sample.

Prevalence of comorbid medical conditions and other psychiatric diseases are also high in pre-bariatric surgery samples. According to the same meta-analysis as we mentioned above, the prevalence of depression (based on random effects) among bariatric surgery candidates or patients undergoing bariatric surgery was 19%. The other common psychiatric diagnosis were any kind of mood disorder 23%, and any kind of anxiety disorder 12%.²⁰ Usually depression is a common comorbid condition in patients, seeking bariatric surgery.²² Depression is known to disrupt self-regulatory sleep and eating behaviors and related to impaired motivation and anhedonia.²³

The most common current psychiatric disease was major depression in our sample (19.4%) too. Specific phobia was the second most prevalent disorder (16.7%). Prevalence of depression in our study was similar to the literature. The mean point of BDS score was 13.8 ± 9.8 in our study. Matini et al. found prevalence of depression as 23.9% and prevalence of generalized anxiety disorder as 25.4% for prebariatric patients by using SCID(Structured Clinical Interview for DSM-IV).²⁴ The mean value of BDS score was 13.8 ± 9.8 in our study. There was a negative correlation between BDS score and BMI in our study. This relationship is known as 'jolly fat hypotheses in literature. It proposes that there is an important relationship between substantial obesity and low levels of depression. This occasion was explained by deprivation concept and sustained that restriction of diet could be an important inductor of depression. It may also be the result of compensatory mechanism to depression. Also there are some theories about the relationship between Neuropeptide Y, leptin and depression.^{25,26} Depressive symptoms decreased as BMI increased in both men and women ($p < 0.05$) in a study from China.²⁶

Relationship between eating disorders and other psychiatric diseases was shown in literature. For example Müller et al. reported that depressive

symptoms were higher in pre-bariatric patients with comorbid binge eating disorder.²⁷ In our study when we compare patients with and without eating disorders we found no significant difference between BDS scores ($p = 0.319$). It seemed that patients with eating disorders had more comorbid psychiatric disorders than patients without eating disorders ($p = 0.014$). Also patients with comorbid psychiatric disorders had more impaired eating attitudes than patients without comorbid psychiatric diseases ($p = 0.045$).

63.9% of the sample ($n = 69$) had comorbid general medical condition. Sixteen of these 69 patients had also any kind of eating disorder. Surprisingly there was no relationship between having medical conditions and eating disorders ($p = 0.989$). We did not detailed statistical analysis because of the small sample size; but it is reported that symptoms of NES are related with poor metabolic health in the literature.⁵

Limitations of the study include the cross-sectional design and the small sample size. The findings pertain to a group of extremely obese patients who seek bariatric surgery at a metro pole general medical centre. The findings may not generalize to all obese patients.

The current study confirms previous findings. Despite having some limitations, it provides provisional new insights to the prevalence of eating disorders for bariatric surgery candidates especially in our country. Secondly, the study highlights the association between eating disorders and general medical or other psychiatric diseases for bariatric surgery candidates.

The effect of pre-surgery eating disorders on bariatric surgery success is uncertain. There is no evidence that pre-surgery NES negatively impacts weight loss following surgery.⁵ The exact opposite of this, some authors propose that pre-surgical eating pathologies are more likely to be retained after surgery. These group patients have poorer outcomes about weight loss.

On the other hand, the candidates have high expectations about bariatric surgery. They usually seem to believe that bariatric surgery will solve their eating problems and guarantee a healthy eating pattern. At this point, a careful evaluation of eating disorders becomes substantial. Psychiatrists should strike a balance between patient's expectations and potential risks. Overall as relatively a new area of investigation, eating disorders in bariatric surgery seems to be

a research of topic worth pursuing. In addition, much more follow up researches needed for

understanding exact effect of eating disorders about weight loss in this group.

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