








# Eating disorders in the preoperative phase of bariatric surgery

## Transtornos alimentares durante o pré-operatório de cirurgia bariátrica

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### ABSTRACT

**Introduction:** Bariatric surgery is considered the most effective obesity treatment. Obese patients have a high prevalence of eating disorders. **Objectives:** Evaluate the occurrence of eating disorders and eating patterns in candidates for bariatric surgery and associate eating disorders with sociodemographic and clinical characteristics. **Methods:** A retrospective study was conducted using electronic charts of candidates for bariatric surgery. Data were collected on sex, age, marital status, schooling, occupation, non-communicable diseases, body mass index (BMI), eating disorders, and eating patterns. **Results:** Among the 281 patients evaluated, eating disorders were detected in 26.7%; 10.3% had binge eating disorder, 6.6% had bulimia nervosa, and 5.3% had the night-eating syndrome. The specific eating patterns were overeating (46.6%), binge eating during periods of stress (9.3%), eating sweets (4%), and snacking (1.3%). BMI ranged from 35.38 to 59.03 kg/m<sup>2</sup> (mean: 44.37 ± 5.89). All individuals (100%) had systemic arterial hypertension, and 23.3% had type 2 diabetes mellitus or dyslipidemia. **Conclusions:** The frequency of eating disorders was low in the sample studied, the most common of which was binge eating disorder. Non-communicable diseases were associated with eating disorders. Among the eating patterns observed, the most frequent was overeating.

**Keywords:** Bariatric surgery, Obesity, Eating disorder, Eating pattern, Gastroplasty.

### RESUMO

**Introdução:** A cirurgia bariátrica é considerada o tratamento mais eficaz para a obesidade. Pacientes obesos possuem elevada prevalência de transtornos alimentares. **Objetivos:** Avaliar a presença de transtornos alimentares e padrões alimentares em candidatos à cirurgia bariátrica, associando os transtornos alimentares aos dados sociodemográficos e clínicos. **Métodos:** Estudo retrospectivo de cunho documental, com base em prontuários eletrônicos de pacientes candidatos à cirurgia bariátrica. Foram obtidas variáveis como sexo, idade, estado civil, nível de escolaridade, ocupação, doenças crônicas não transmissíveis, índice de massa corporal (IMC), transtorno e padrão alimentar. **Resultados:** Dos 281 pacientes avaliados, foi detectado 26,7% de transtornos alimentares, sendo 10,3% transtorno de compulsão alimentar periódica, 6,6% de bulimia nervosa e 5,3% de síndrome do comer noturno. Os padrões alimentares específicos encontrados foram: glutões (46,6%), compulsivos alimentares em períodos de estresse (9,3%), comedores de doces (4%) e beliscadores (1,3%). O IMC variou de 35,38 a 59,03 kg/m<sup>2</sup> (44,37±5,89), com 100% do grupo apresentando Hipertensão Arterial Sistêmica e 23,3% com Diabetes Mellitus tipo 2 ou dislipidemia. **Conclusões:** Constatou-se baixa frequência de transtornos alimentares na amostra estudada, sendo o transtorno de compulsão alimentar periódica o mais observado. Doenças crônicas não transmissíveis foram associadas com a presença de transtornos alimentares. Dentre os padrões alimentares observados, os glutões foram os mais frequentes.

**Palavras-chave:** Palavras-chave: Cirurgia bariátrica, Obesidade, Transtorno alimentar, Padrão alimentar, Gastroplastia.

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## INTRODUCTION

Patients with obesity and diabetes and those candidates for bariatric surgery have a high frequency of eating disorders<sup>1,2</sup>. Bariatric surgery is considered the most effective treatment of severe obesity in the long term. Although associated with the resolution of the problem and improvements in clinical comorbidities, weight regain is a possible outcome. Evidence points to binge eating disorder as one of the risk factors associated with weight recover in the postoperative period of bariatric surgery<sup>3</sup>.

According to Stunkard et al.<sup>4</sup> the psychological burden related to the discrimination that individuals with obesity experience generates insecurity and feelings of isolation, failure, and humiliation, which can trigger an eating disorder. Obese individuals generally eat a larger amount of food than individuals in the ideal weight range. However, there are subgroups who do not fit the normal eating patterns, such as those who binge eating disorder and night-eating syndrome<sup>5</sup>.

Petribú et al.<sup>6</sup> conducted a study with 67 obese individuals on the waiting list for bariatric surgery and found that 56.7% of the sample had a binge eating disorder. This demonstrates the importance of identifying eating disorders in the preoperative period since treating such disorders could reduce the risk of compromising the positive results of surgery<sup>7</sup>.

A study conducted by Brunault et al.<sup>8</sup> involving candidates for bariatric surgery found that eating disorders were prevalent in this population and those with such disorders had a poorer quality of physical, psychosocial, and sexual life as well as a greater occurrence of depression and compulsive eating. Indeed, several studies suggest that binge eating disorder is more common among candidates for bariatric surgery than among obese individuals who are not candidates for surgery<sup>9</sup>.

When bariatric surgery is indicated, there is a concern that the patient's eating behavior may lead to postoperative complications and compromise the surgery results.<sup>10</sup> Besides compulsive eating, there are other eating patterns described in the literature, such as eating sweets, grazing, night eating, emotional eating, and overeating<sup>7,9</sup>.

Considering the findings described in the literature, it is important to evaluate the occurrence of eating disorders in a bariatric surgery program, as the nutritionist needs to be aware of such disorders and refer affected individuals to a psychological and/

or psychiatric service for treatment and control before and after surgery. The previous treatment of eating disorders associated with obesity is fundamental to the success of the surgical procedure. Therefore, the present study aimed to determine the occurrence of eating disorders and eating patterns in candidates for bariatric surgery and associate eating disorders with sociodemographic and clinical characteristics.

## METHODS

A retrospective study was conducted using the electronic records of 659 patients submitted for bariatric surgery between 2005 and 2010 at the São João Hospital Center in Porto, Portugal. This study received approval from the local human research ethics committee. The following were the inclusion criteria: age  $\geq 20$  years, pre-surgical accompaniment by a multidisciplinary team (nutritionist, endocrinologist, surgeon, psychiatrist, and psychologist), complete records of the appointments, eating disorders, and associated diseases diagnosed by a specialist.

The variables investigated were selected based on the literature on this topic: sex, age, marital status, schooling, occupation, body mass index (BMI), surgical technique, eating disorders, and eating patterns. All data were obtained from electronic patient charts.

In Statistical analysis, the data were analyzed descriptively, with the calculation of mean, standard deviation, and median values for numerical variables as well as absolute and percentage values for categorical variables. The Shapiro-Wilk test was used to determine the normality of the data. As non-normal distribution was demonstrated, differences between groups with and without eating disorders regarding numerical variables were evaluated using the Mann-Whitney test. Pearson's chi-square test was used for the evaluation of differences between groups regarding categorical variables. A 5% margin of error was considered in the decision of the statistical tests. The IBM SPSS version 23 was used for the statistical calculations.

## RESULTS

Among the 281 patients evaluated, eating disorders were detected in 26.7%; 10.3% had binge eating disorder, 6.6% had bulimia nervosa and

5.3% had the night-eating syndrome. The specific eating patterns with the highest frequencies were overeating (46.6%), binge eating during stress (9.3%), eating sweets (4%), and grazing (1.3%).

Table 1 displays the sociodemographic and clinical characteristics of the sample as well as associations with the independent variables. The female sex accounted for 92% of the sample, and mean age was  $41 \pm 10.76$  years; these variables were not associated with eating disorders. In contrast, significant associations were found between eating disorders and both systemic arterial hypertension and dyslipidemia. The mean BMI was  $44.37 \pm 5.89$  kg/m<sup>2</sup>. The mean weight was  $115 \pm 17.04$  kg and 77.3% of the sample had a BMI  $\geq 40$  kg/m<sup>2</sup>.

## DISCUSSION

The present study was conducted with candidates for bariatric (bypass, gastric band, and sleeve) surgery. Candidates for this type of surgery have severe obesity and constitute a heterogeneous group in terms of psychiatric comorbidities<sup>11</sup>. Psychiatric disorders are often considered contraindications to bariatric surgery, although there are no precise data or adequately studied and/or proven predictors of a good or poor prognosis for such cases<sup>1</sup>.

The literature reports a 16.5 to 94% prevalence rate of eating disorders among candidates for bariatric surgery. This variation depends on the eating behavior considered, diagnostic methods, and differences in populations from different countries and regions<sup>6,8,10,12</sup>.

A study addressing psychiatric disorders in the preoperative period of bariatric surgery conducted in northeastern Brazil detected a 56.7% prevalence rate of binge eating among the different disorders<sup>6</sup>, which is a higher frequency than that found for obese individuals who seek specialized services for the treatment of obesity<sup>13,14,15,16</sup>. The age of the participants in the study ranged from 19 to 57 years, 73.1% were women, 35.8% had less than ten years of schooling, 43.3% were homemakers, and mean preoperative BMI was  $48.51$  kg/m<sup>2</sup>. The findings on age range, sex, and occupation were similar to those in the present study.

In a study conducted in central Brazil, Costa and Pinto<sup>12</sup> detected a higher prevalence of binge

eating disorder in the 38-year-old age range. This range differs from that found in the present study, but the findings on the frequency of the female sex, marital status, lower level of schooling, and severe obesity are in agreement with the present results. In contrast, Brunalt et al.<sup>8</sup> found that the frequency of food addiction and compulsive eating was higher among unmarried individuals in a study conducted in France. The authors observed two classes of eating behavior: persistent desire to control the consumption of certain foods (93.1%) and continuing to eat certain foods despite physical or psychological problems (40.4%). Another finding of the study was that 36% of the patients with food addiction had no significant binge eating.

Data from an integrative review show that binge eating disorder rates range from 3% to 61%. This is considered the most prevalent form of eating disorder not only in the bariatric population but also in the general population. In studies stratifying the findings by sex, binge eating disorder ranged from 3% to 84% among women and from 0.8% to 25% among men. The high rate of binge eating among bariatric patients is associated with less weight loss and weight regain, especially when combined with "emotional eating". The prevalence of this type of eating disorder is high in both the preoperative and postoperative periods of bariatric surgery and does not necessarily improve over time after surgery<sup>17</sup>.

Regarding the association with the degree of obesity, only Costa and Pinto<sup>12</sup> found a positive association between nutritional status (overweight and different degrees of obesity) and binge eating disorder in a study conducted in central Brazil.

Among the eating patterns found in the preoperative period of bariatric surgery, Machado et al.<sup>18</sup> found that 2% grazed, 12% ate sweets, and 64% were overeaters. These rates are higher than those in the present study, which demonstrates differences in populations from different regions of the same country.

Analyzing the data related to non-communicable diseases, Petribu et al.<sup>6</sup> found that 100% of patients had systemic arterial hypertension, which is in agreement with the present findings. In the present investigation, a high percentage of the participants also had type 2 diabetes mellitus or dyslipidemia (23.3%). Unfortunately, this finding cannot be compared to results in previous studies due to the scarcity of data in the literature on these variables related to

**Table 1**

Associations between eating disorders and sociodemographic and clinical characteristics of obese individuals in the preoperative period of bariatric surgery. Porto, Portugal, 2013.

Variable	Yes	No	Total group	p-value	OR (95%CI)
TOTAL	75 (100.0)	206 (100.0)	281 (100.0)		
	41.01 ± 10.76	42.71 ± 10.35	42.26 ± 10.47		
Age: mean ± SD (median)	(41.00)	(42.00)	(42.00)	p± = 0.243	
Age group: n (%)				p§ = 0.487	
22 to 40	37 (49.3)	92 (44.7)	129 (45.9)		1.21 (0.71 to 2.05)
41 to 66	38 (50.7)	114 (55.3)	152 (54.1)		1.00
Sex: n (%)				p§ = 0.440	
Male	6 (8.0)	23 (11.2)	29 (10.3)		1.00
Female	69 (92.0)	183 (88.8)	252 (89.7)		1.45 (0.56 to 3.70)
Marital status: n (%)				p§ = 0.835	
Single	18 (24.0)	47 (22.8)	65 (23.1)		1.07 (0.57 to 1.99)
Married/Common-law marriage	57 (76.0)	159 (77.2)	216 (76.9)		1.00
Years of study: n (%)				p§ = 0.545	
<10	58 (77.3)	152 (73.8)	210 (74.7)		1.21 (0.65 to 2.26)
≥10	17 (22.7)	54 (26.2)	71 (25.3)		1.00
Occupation: n (%)				p§ = 0.408	
Active/homemaker	64 (85.3)	167 (81.1)	231 (82.2)		1.36 (0.66 to 2.82)
Retired/unemployed	11 (14.7)	39 (18.9)	50 (17.8)		1.00
Hypertension: n (%)				p§ < 0.001*	
Yes	60 (100.0)	106 (67.1)	166 (76.1)		
No	-	52 (32.9)	52 (23.9)		†
Dyslipidemia: n (%)				p§ < 0.001*	
Yes	14 (23.3)	92 (58.2)	106 (48.6)		1.00
No	46 (76.7)	66 (41.8)	112 (51.4)		4.58 (2.33 to 9.01)
Diabetes mellitus: n (%)				p§ = 0.123	
Yes	14 (23.3)	54 (34.2)	68 (31.2)		1.00
No	46 (76.7)	104 (65.8)	150 (68.8)		1.71 (0.86 to 3.38)

Type of surgery: n (%)				p§ < 0.176	
Bypass	23 (30.7)	64 (31.1)	87 (31.0)		†
Gastric band	52 (69.3)	133 (64.6)	185 (65.8)		†
Sleeve	-	9 (4.4)	9 (3.2)		†
Height: mean ± SD (median)	1.6 ± 0.07 (1.59)	1.6 ± 0.08 (1.59)	1.6 ± 0.08 (1.59)	p‡ = 0.966	
Weight: mean ± SD (median)	116.00 ± 17.04 (115.00)	114.24 ± 14.86 (111.00)	114.71 ± 15.46 (112.00)	p‡ = 0.308	
Ideal weight: mean ± SD (median)	64.01 ± 5.85 (63.20)	64.05 ± 6.68 (63.20)	64.04 ± 6.46 (63.20)	p‡ = 0.870	
BMI: mean ± SD (median)	45.38 ± 5.89 (44.37)	44.75 ± 5.01 (44.50)	44.92 ± 5.25 (44.46)	p‡ = 0.630	
BMI classification: n (%)				p‡ = 0.236	
<40	17 (22.7)	34 (16.5)	51 (18.1)		1.48 (0.77 to 2.85)
≥40	58 (77.3)	172 (83.5)	230 (81.9)		1

\*Significant difference (p<0.05); †Unable to determine due to null frequency; ‡Mann-Whitney test; §Pearson's chi-square test.

groups of eating disorders in the preoperative phase of bariatric surgery.

The limitations of the present study are the small sample size and the cross-sectional study design. Randomized prospective studies with a larger number of patients are needed.

## CONCLUSION

The frequency of eating disorders was low in the sample studied and the most common was binge eating disorder. Women accounted for the majority of the sample with eating disorders. Systemic arterial hypertension and dyslipidemia were associated with eating disorders. Among the eating patterns observed, the most frequent was overeating.

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**Authors contribution**

Shirley Kelly dos Santos Simões: Participation in the review and approval of the final version;  
Renata Maria Gonçalves Pedrosa: Participation in the writing of the preliminary version;  
Cinthia Katiane Martins Calado: Participation in the writing of the preliminary version;  
Poliana Coelho Cabral: Substantial contribution to the study design or data interpretation;  
Regiane Maio: Participation in the writing of the preliminary version;  
Maria Flora Correia: Substantial contribution to the study design or data interpretation;  
Maria Goretti Pessoa de Araújo Burgos: Contribution in being responsible for the accuracy or integrity of the study.

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