

## PSYCHIATRIC COMORBIDITY IN BARIATRIC SURGERY: A RETROSPECTIVE STUDY IN A GENERAL HOSPITAL

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### SUMMARY

**Background:** Candidates for bariatric surgery undergo a multidisciplinary evaluation in the pre-operative phase, including a psychiatric visit aimed at the screening for psychiatric comorbidities, including feeding and eating disorders (FEDs), which are shortcomings to the intervention or predictors of worse prognosis. The presence of FEDs, such as Binge Eating Disorder (BED) and Bulimia Nervosa (BN), is associated with higher rates of other psychiatric disorders. Furthermore, there is evidence of the association between obesity and Depressive Disorders, as well as B and C Cluster Personality Disorders. The aim of this study was to evaluate the presence of psychiatric comorbidities among a population of candidates for bariatric surgery.

**Subjects and methods:** Subjects were recruited at the outpatient service of the Section of Psychiatry, Clinical Psychology and Rehabilitation of the General Hospital/University of Perugia after being referred by surgeons. Psychiatric comorbidities were investigated by means of the Structured Clinical Interview for DSM-5 Disorders. Subjects underwent specific assessment with scales for the evaluation of FEDs, namely Binge Eating Scale, Obesity Questionnaire, Bulimia Test-Revised and Body Shape Questionnaire.

**Results:** The sample consisted of 101 subjects: 43 (42.6%) were diagnosed with at least one psychiatric disorder, including FEDs. In particular, 30 subjects (29.7%) presented at least one FED, among which the most frequent were FED not otherwise specified (24.1%) and BED (6.8%). Moreover, 26 subjects (25.7%) were diagnosed with at least one psychiatric disorder other than FEDs, such as Personality Disorders (17.1%), with a higher prevalence of B and C Cluster Disorders. Depressive Disorders were detected in 5% of the sample.

**Conclusions:** Subjects undergoing bariatric surgery often display psychiatric comorbidities, more frequently one or more FEDs. The systematic screening of these conditions should be implemented in the clinical practice in order to provide early intervention strategies and adequate monitoring.

**Key words:** bariatric surgery - psychiatric disorders - feeding and eating disorders - comorbidity - personality disorders

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### INTRODUCTION

Bariatric surgery aims to induce long-term weight loss and improve quality of life with a reduction in risk of obesity-associated mortality rates (Christou et al. 2004, Busetto et al. 2007, Pontiroli & Morabito 2011). Candidates for bariatric surgery undergo a multidisciplinary evaluation in the pre-operative phase, which also includes a psychiatric consultation. The latter is performed in order to detect the presence of psychiatric comorbidities, including feeding and eating disorders (FEDs). Indeed, these represent contraindications to the intervention itself or predictive factors of worse post-operative outcomes (SICOB 2016, Colquitt et al. 2014, Livhits et al. 2012).

The diagnosis of Binge Eating Disorder (BED) constitutes one of the main contraindications to bariatric surgery, since it may cause major difficulties in adopting the required lifestyle changes (SICOB 2016, Meany et al. 2014). Subsequently, this treatment should be proposed only after an assessment of psychological conditions. When necessary, multidimensional sequential approaches aimed at treating BED should be implemented before surgery is carried out (Sarwer 2009, Mechanick

et al. 2013). In order to obtain a good outcome, it is essential to provide subjects a nutritional-metabolic and psychological rehabilitation framework, aimed at promoting an active collaboration with clinicians, thus enhancing treatment adherence (Anderson & Chacko 2018). Over time, however, several studies have been carried out in order to demonstrate the correlation between obesity in candidates for bariatric surgery and psychiatric disorders, particularly those that are not directly related to nutrition. The presence of FEDs, particularly BED and bulimia nervosa (BN), is associated with higher rates of other psychiatric disorders (Ulfvebrand et al. 2015). There is a strong evidence of association between Depressive Disorder and obesity with longitudinal studies showing a bidirectional link between the two conditions. As for further affective symptoms, the relative lack of longitudinal studies evaluating the relationship between anxiety disorders and obesity precludes clear conclusions on the direction of the association (Rajan & Menon 2017).

Rates of personality disorders in obese individuals are also higher than the general population, and a specific correlation has been highlighted between Cluster B and C disorders and obesity (Rajan & Menon

2017). Furthermore, the presence of a personality disorder, such as borderline personality disorder, leads to greater difficulties in post-intervention adaptation. Specific therapeutic interventions, such as cognitive-behavioral therapy (CBT), were also proposed for candidates to bariatric surgery that display psychiatric comorbidities, since this population of subjects may deserve an accurate monitoring and targeted treatments (Gallé et al. 2017).

In consideration of what stated above, psychiatric evaluation can be an important component of comprehensive obesity care and deserves further evaluation. In fact, it can be expected that a timely diagnosis of psychiatric comorbidities may also optimize therapeutic and functional outcomes since, as the bidirectional link becomes evident, the treatment of psychiatric illness can reduce the burden of obesity and vice versa (Rajan & Menon 2017).

The present study was aimed at detecting the prevalence of psychiatric comorbidities in candidates for bariatric surgery and at characterizing such comorbidities in this population. Moreover, sociodemographic and clinical features associated with psychiatric comorbidities in our sample were investigated.

## SUBJECTS AND METHODS

This research is a retrospective analysis including subjects aged  $\geq 18$  years, with good knowledge of Italian language, and who signed informed consent to participate in the study. Criteria for exclusion were: age  $< 18$  years, inadequate knowledge of the Italian language, severe cognitive deficits, refusal to sign the informed consent. Clinical charts of subjects evaluated from January 2016 to May 2021 at the Section of Psychiatry, Clinical Psychology and Psychiatric Rehabilitation of the General Hospital/University of Perugia were screened for inclusion in the analysis. All subjects had been referred by the Section of General Surgery of the General Hospital of Perugia. Socio-demographic and clinical information were collected in clinical charts. Medical conditions that could be most frequently associated with obesity were investigated. In particular, the presence of metabolic syndrome, hypertension, diabetes mellitus, and dyslipidemia was assessed. Psychiatric comorbidities were investigated through the Structured Clinical Interview for DSM-5 Disorders, clinician version (SCID 5-CV) (First et al. 2017). Personality disorders were assessed by using the Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) (First et al. 1997). Further scales were used for assessing FEDs, namely Binge Eating Scale (BES), Body Shape Questionnaire (BSQ) and Bulimia Test-Revised (BULIT-R).

The BES can be considered a valid tool for screening the severity of BED. It is composed of 16 items developed in order to evaluate behavioral manifestations

of binge eating, such as eating fast and overeating, as well as to evaluate clinical features associated with BED, such as feeling guilty after eating in an uncontrolled way (Greeno et al. 1995). The BSQ is a self-assessment tool that allows to investigate the role of body shape. The original scale was made up of 34 items, but scales of 16 items and 8 items were also constructed which proved to have practically overlapping psychometric characteristics (Cooper et al. 1987). The BULIT-R is a psychometric test that allows the evaluation of BN and the symptoms of BED. It consists of a multiple choice scale of 28 items and it is generally considered a good predictor of BN (Welch et al. 1993).

Data were collected and entered into an electronic dataset, then analyzed through the software "Statistical Package for Social Science" (SPSS), version 21. Descriptive analyses were performed to evaluate the distribution of the variables within the sample. Bivariate analyses (t-test and Chi-square test) were carried out in order to assess significant association with the presence of psychiatric comorbidities in the sample and specific socio-demographic and clinical features. The statistical analysis was divided in two steps: in the first one, two subgroups were created according to the presence of the psychiatric comorbidities including FEDs, whilst in the following psychiatric comorbidities were evaluated without taking into account FEDs. Tests were two-tailed and statistical significance was considered for  $p$  values  $< 0.05$ .

## RESULTS

The sample was composed of 101 subjects, of which 71 (70.3%) were females. The mean age of the sample was  $48.19 \pm 9.94$  years, with a minimum of 25 and a maximum of 69. The majority of subjects (43.5%,  $N=40$ ) had obtained high school diploma. Regarding marital status, most subjects in the sample were married ( $N=50$ , 52.1%). As for employment, 65.4% ( $N=66$ ) were students or had a paid job. The mean body mass index (BMI) of the included subjects was  $43.51 \pm 6.54$   $\text{kg/m}^2$  with a minimum of 30  $\text{kg/m}^2$  and a maximum of 61  $\text{kg/m}^2$ .

When considering diagnostic features, 43 subjects (42.3%) had more than one medical comorbidity, while 58 (57.7%) had only one or none. As for family history, most subjects ( $N=53$ , 52.5%) had at least one obese family member. Moreover, 22.7% subjects ( $N=23$ ) had at least one first-degree relative with psychiatric disorders other than FEDs. When assessing FED familiar history, 5% subjects ( $N=5$ ) reported at least one first-degree relative suffering from FEDs.

Concerning personal history of psychiatric disorders, at the time of the interview 35.6% of subjects ( $N=36$ ) reported the presence of one or more conditions, including FEDs. In particular, 13.7% subjects ( $N=12$ ) had a positive personal history for FEDs and 27.7% ( $N=28$ ) reported at least one psychiatric disorder different from FEDs.

When assessing psychiatric comorbidities, 42.6% (N=43) of the sample had at least one psychiatric disorder, including FEDs. In particular, 29.7% subjects (N= 30) were diagnosed with at least one FEDs while 25.7% (N=26) suffered from at least one psychiatric disorder different from FEDs.

Furthermore, 13 subjects (12.9%) had both a FED and a psychiatric disorder. For details concerning the distribution of FEDs and other psychiatric disorders in the sample, see Table 1.

**Table 1.** Distribution of psychiatric comorbidities including FEDs in the sample

| Psychiatric comorbidity  | N (%)     |
|--|-----------|
| FEDs   | 30 (29.7) |
| FED with no other specification  | 21 (24.1) |
| FED with other specification   | 1 (1.1)   |
| Binge Eating Disorder  | 6 (6.9)   |
| Mild Binge eating Disorder   | 1 (1.1)   |
| In remission Binge Eating Disorder                                       | 1 (1.1)   |
| Personality Disorders  | 15 (17.1) |
| Borderline Personality Disorder  | 4 (4.6)   |
| Obsessive-compulsive Personality Disorder                                | 3 (3.4)   |
| Paranoid Personality Disorder  | 2 (2.3)   |
| Narcissistic Personality Disorder  | 2 (2.3)   |
| Dependent Personality Disorder   | 2 (2.3)   |
| Hystrionic Personality Disorder  | 1 (1.1)   |
| Depressive Personality Disorder  | 1 (1.1)   |
| Depressive Disorders   | 5 (5.6)   |
| Persistent Depressive Disorder   | 3 (3.4)   |
| Recurrent Major Depressive Disorder in partial remission                 | 1 (1.1)   |
| Previous Major Depressive Disorder. single episode in complete remission | 1 (1.1)   |
| Other  | 6 (6.6)   |
| Adjustment disorder without other specification                          | 1 (1.1)   |
| Panic disorder   | 1 (1.1)   |
| Moderate intellectual disability   | 1 (1.1)   |
| Chronic Schizoaffective Disorder   | 1 (1.1)   |
| Bipolar Disorder type 1  | 1 (1.1)   |
| Mixed-type Schizoaffective Disorder                                      | 1 (1.1)   |

FEDs = feeding and eating disorders

When evaluating the intake of drugs at the time of psychiatric evaluation, 25 (25.5%) subjects were prescribed with at least one psychotropic agent. Particularly, 21.4% of the sample (N=21) assumed antidepressants, 9.2% (N=9) benzodiazepines, 6.1% (N=6) antipsychotics, and 1% (N=1) mood stabilizers.

### Comparison between subjects with and without psychiatric comorbidities

Subjects affected by a psychiatric comorbidity, including FEDs, were 43 (42.6%), while excluding FED they were 26 (25.7%).

When comparing socio-demographic characteristics, no statistically significant differences were found between subejects with psychiatric comorbidities, including FEDs, and subjects without psychiatric comorbidities, except for marital status (34.1% versus 11.9%,  $p=0.032$ ). No statistically significant differences were detected between the two groups both in terms of BMI and family history of obesity. As for medical comorbidities, there were no statistically significant differences between the two subgroups.

In the evaluation of the differences between the subgroup of subjects with psychiatric comorbidities other than FEDs and that of subjects without comorbidities, no statistically significant differences were found in sociodemographic characteristics, except for marital status (40% vs 15.5%,  $p=0.031$ ).

Statistically significant differences were found in the prescription of benzodiazepines and antipsychotics (19.2% versus 3.3%,  $p=0.041$ ; 15.4% versus 1.6%,  $p=0.044$ ).

## DISCUSSION

In the present study, a psychiatric comorbidity rate of 42.6% was detected in our sample of candidates for bariatric surgery after performing the whole psychometric assessment. This finding suggests that pre-operative psychiatric evaluation constitutes a fundamental screening moment for psychiatric comorbidities detection in this population. Focusing on FEDs, these were detected almost 30% of the sample. Moreover, more than one-quarter (25.7%) subjects in the sample were diagnosed with at least one psychiatric disorder other than FEDs, such as personality disorders (17.1%), with a higher prevalence of B and C cluster disorders. Depressive disorders were detected in 5% of the sample.

Data concerning the prevalence of FEDs in the sample is similar to available literature findings, where the prevalence of these disorders is also reported around 30% (Mitchell et al. 2012). Similarly, despite a higher prevalence of BED was previously highlighted (Da Luz et al. 2018), it is evident that prevalence in the present sample greatly exceeds that in the general population (Mitchell et al. 2012). As for the other psychiatric comorbidities, as already reported by previous research, candidates for bariatric surgery frequently present psychiatric disorders other than FEDs, particularly depressive disorders (Mühlhans et al. 2009) and personality disorders (Peterhänsel et al. 2018). As for personality disorders, few studies have explored possible correlations with obesity, and a high probability of a correlation between cluster B and C disorders and obesity has been highlighted (Rajan & Menon 2017), which was confirmed by our results. The correlation between obesity and anxiety disorders seems less tight (Rajan & Menon 2017).

As for socio-demographic factors, BED shows a higher prevalence among females, which is also consistent with previous research (Kessler et al. 2013), although not reaching statistical significance.

Furthermore, the present study found that candidates for bariatric surgery with psychiatric comorbidities were more frequently unmarried. This is consistent with data from the WHO World Mental Health Survey, according to which BED would lead to a reduction in possibilities of marriage (Kessler et al. 2013).

Regarding pharmacological treatment, when FEDs were considered as a psychiatric comorbidity no statistical significance was highlighted, since usually FEDs are not treated pharmacologically as first line intervention (NICE 2017). In the group of subjects with psychiatric comorbidities other than FEDs, a statistical significance was highlighted for benzodiazepines and antipsychotics prescription. Except for these two classes of drugs, the others were not significantly prescribed in the subgroup with psychiatric comorbidities, possibly because a significant percentage of subjects who would need specific pharmacological treatments may not receive any. For example, antidepressants are rarely used despite depressive disorders were detected in a moderate percentage of cases. Furthermore, it was shown that 3.3% of subjects without psychiatric comorbidities take benzodiazepines and 1.6% take antipsychotics. On the bases of what above described, it can be underlined how pre-operative psychiatric evaluation of candidates for bariatric surgery is an important moment, not only for the identification of subjects suffering from psychiatric disorders and for directing them towards the right treatment, but also for adjusting pharmacological treatment. This study presents limitations. First, its observational nature and size of the sample do not allow a generalization of results. Furthermore, it was not possible to compare subgroups of comorbid subjects stratified by diagnosis because the sample was too small. Future prospective studies will explore subgroups of candidates for bariatric surgery who also present psychiatric comorbidities in order to better characterize this subgroup based on the type of comorbidity presented.

## CONCLUSIONS

The psychiatric evaluation for bariatric surgery must be a crucial step both for the diagnosis of psychiatric comorbidities in this population and for treatment. Indeed, preoperative psychiatric evaluation is crucial to identify subjects and start an individualized and multidisciplinary treatment that is essential to obtain a weight reduction and an improvement of specific psychopathological features.

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### Contribution of individual authors:

Cecilia Giulietti & Patrizia Moretti conceived and designed the study;

Cecilia Giulietti, Maria Teresa Paganelli & Patrizia Moretti collected the data;

Cecilia Giulietti, Eleonora Valentini & Valentina Pierotti administered the tests;

Cecilia Giulietti, Giulia Menculini, Marta Barbi & Eleonora Valentini created the original dataset;

Cecilia Giulietti, Giulia Menculini & Marta Barbi performed the statistical analysis;

Cecilia Giulietti, Giulia Menculini, Francesca Brufani, Eleonora Valentini, Giorgio Pomili & Valentina Pierotti wrote the first draft of the manuscript;

Maria Teresa Paganelli & Patrizia Moretti revised the first draft of the manuscript;

Alfonso Tortorella supervised all phases of the study design and writing of the manuscript.

## References

1. Anderson LM & Chacko TP: *Bariatric Outcomes: Self-Management for Sustained Surgical Success: A Multi-component Treatment for Dysregulated Overeating in Bariatric Surgery Patients. J Addict Nurs* 2018; 29:32-42
2. Busetto L, Mirabelli D, Petroni ML et al.: *Comparative long-term mortality after laparoscopic adjustable gastric banding versus nonsurgical controls. Surg Obes Relat Dis* 2007; 3:496-502
3. Chooi YC, Ding C, Magkos F: *The epidemiology of obesity. Metabolism* 2019; 92:6-10
4. Christou NV, Sampalis JS, Liberman M et al.: *Surgery decreases long-term mortality, morbidity, and health care use in morbidly obese patients. Ann Surg* 2004; 240:416-23
5. Colquitt JL, Pickett K, Loveman E, Frampton GK: *Surgery for weight loss in adults. Cochrane Database Syst Rev.* 2014; 8:CD003641
6. Cooper PJ, Melanie J, Taylor B, Cooper Z, Christopher G, Fairbum MD: *The development and validation of the body shape questionnaire. International Journal of eating disorders* 1987
7. Da Luz FQ, Hay P, Touyz S, Sainsbury A: *Obesity with Comorbid Eating Disorders: Associated Health Risks and Treatment Approaches. Nutrients* 2018; 10:829
8. First MB, Gibbon M, Spitzer RL, Williams JBW, Benjamin LS: *User's Guide for Structured Clinical Interview for DSM-IV Axis II Personality Disorders (SCID-II). American Psychiatric Press, Washington DC, 1997*
9. First MB, Williams JBW, Karg RS, Spitzer RL: *Structured Clinical Interview for DSM-5 Disorders – Clinician Version, SCID-5-CV, 2016, American Psychiatric Association Publishing, Arlington, VA Tr. It.; a cura di Fossati A e Borroni S- SCID-5-CV. Intervista Clinica Strutturata per i Disturbi del DSM-5. Versione per il Clinico. Raffaello Cortina Editore, Milano, 2017*

10. Gallé F, Maida P, Cirella A, Giuliano E, Belfiore P et al.: Does Post-Operative Psychotherapy Contribute to Improved Comorbidities in Bariatric Patients with Borderline Personality Disorder Traits and Bulimia Tendencies? A Prospective Study. *Obes Surg* 2017; 27:1872-1878
11. Greeno CG, Marcus MD, Wing RR: Diagnosis of binge eating disorder: discrepancies between a questionnaire and clinical interview. *Int J Eat Disord* 1995; 17:153-60
12. Hörz-Sagstetter S, Caligor E, Preti E, Stern BL, De Panfilis C et al.: Clinician-Guided Assessment of Personality Using the Structural Interview and the Structured Interview of Personality Organization (STIPO). *J Pers Assess* 2018; 100:30-42
13. Kessler RC, Berglund PA, Chiu WT, Deitz AC, Hudson JI et al.: The prevalence and correlates of binge eating disorder in the World Health Organization World Mental Health Surveys. *Biol Psychiatry* 2013;73:904-14
14. Livhits M, Mercado C, Yermilov I et al.: Preoperative predictors of weight loss following bariatric surgery: systematic review. *Obes Surg* 2012; 22:70-89
15. Meany G, Conceição E, Mitchell JE: Binge eating, binge eating disorder and loss of control eating: effects on weight outcomes after bariatric surgery. *Eur Eat Disorders Rev* 2014; 22:87-91
16. Mechanick JI, Youdim A, Jones DB et al.: Clinical Practice Guidelines for the Perioperative Nutritional, Metabolic, and Nonsurgical Support of the Bariatric Surgery Patient—2013 Update: Cosponsored by American Association of Clinical Endocrinologists, The Obesity Society, and American Society for Metabolic & Bariatric Surgery. *Obesity* 2013; 21: S1-27
17. Mitchell JE, Selzer F, Kalarchian MA, Devlin MJ, Strain GW et al.: Psychopathology before surgery in the longitudinal assessment of bariatric surgery-3 (LABS-3) psychosocial study. *Surg Obes Relat Dis* 2012; 8:533-41
18. Mühlhans B, Horbach T, de Zwaan M: Psychiatric disorders in bariatric surgery candidates: a review of the literature and results of a German prebariatric surgery sample. *GenHospPsychiatry* 2009; 31:414-21
19. NICE (National Institute for Health and Care Excellence) guideline NG69: Eating disorders: recognition and treatment. Published: 23 May 2017
20. Peterhänsel C, Linde K, Wagner B, Dietrich A, Kersting A: Subtypes of Personality and 'Locus of Control' in Bariatric Patients and their Effect on Weight Loss, Eating Disorder and Depressive Symptoms, and Quality of Life. *Eur Eat Disord Rev* 2017; 5:397-405
21. Pontiroli AE, Morabito A: Long-term prevention of mortality in morbid obesity through bariatric surgery. A systematic review and meta-analysis of trials performed with gastric banding and gastric bypass. *Ann Surg* 2011; 253:484-7
22. Rajan TM & Menon V: Psychiatric disorders and obesity: A review of association studies. *J Postgrad Med* 2017; 63:182-190
23. Sarwer DB: Comment on: brief, four session group CBT reduces binge eating behaviors among bariatric surgery candidates (Ashton K et al. 2009;5:257-62). *Surg Obes Relat Dis* 2009; 5:407-408
24. SICOB 2016: Linee Guida della Società Italiana di Chirurgia dell'Obesità, 2016
25. Striegel RH, Bedrosian R, Wang C: Comparing work productivity in obesity and binge eating. *Int J Eat Disord* 2012; 45:995-8
26. Ulfvebrand S, Birgegård A, Norring C, Högdahl L, von Hausswolff-Juhlin Y: Psychiatric comorbidity in women and men with eating disorders results from a large clinical database. *Psychiatry Res* 2015; 230:294-9
27. Welch G, Thompson L, Hall A: The BULIT-R: its reliability and clinical validity as a screening tool for DSM-III-R bulimia nervosa in a female tertiary education population. *Int J Eat Disord* 1993; 14:95-105

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