

Bariatric surgery and binge eating disorder: should surgeons care about it? A literature review of prevalence and assessment tools

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ABSTRACT – Background – Eating pathologies among bariatric surgery candidates are common and associated with adverse surgical outcomes, including weight regain and low quality of life. However, their assessment is made difficult by the great variety and inconsistent use of standardized measures. **Objective** – The purpose of this review was to synthesize current knowledge on the prevalence of binge eating disorder (BED) in presurgical patients and to make a critical appraisal of assessment tools for BED. **Methods** – A search was conducted on PubMed, Scopus, and Web of Science databases from January 1994 to March 2017. Data were extracted, tabulated and summarized using a narrative approach. **Results** – A total of 21 observational studies were reviewed for data extraction and analysis. Prevalence of BED in bariatric populations ranged from 2% to 53%. Considerable variation in patient characteristics and in BED assessment measures was evident among the studies. In addition, several methodological weaknesses were recognized in most of the studies. Ten different psychometric instruments were used to assess BED. Clinical interviews were used in only 12 studies, though this is the preferred tool to diagnose BED. **Conclusion** – Study heterogeneity accounted for the variability of the results from different centers and methodological flaws such as insufficient sample size and selection bias impaired the evidence on the magnitude of BED in surgical settings. For the sake of comparability and generalizability of the findings in future studies, researchers must recruit representative samples of treatment-seeking candidates for bariatric surgery and systematically apply standard instruments for the assessment of BED.

HEADINGS – Obesity. Bariatric surgery. Binge-eating disorder. Adult. Prevalence. Review.

INTRODUCTION

Bariatric surgery is now considered the most effective treatment for severe obesity. Reports from randomized controlled trials have indicated positive long-term results in terms of weight loss, resolution of comorbidities and improved life expectancy^(1,2). However, although surgery has an important role in the care of patients with severe obesity, some psychopathological features, specifically disordered eating behavior, may jeopardize postsurgical outcomes^(3,4). Binge eating disorder (BED) has been claimed as one such behavior⁽⁵⁾.

Binge eating symptoms were first noted in 1959 by psychiatrist Albert Stunkard when describing the abnormal eating pattern of a 30-year-old salesman⁽⁶⁾, but the American Psychiatric Association has only recently recognized BED as a formal category of psychiatric disorder⁽⁷⁾. There is a wide spectrum of clinical manifestations of eating behaviors, from overeating and gluttony to variable binge symptoms until full Diagnostic and Statistical Manual of Mental Disorders 5th edition (DSM-5) BED-criteria are met⁽⁸⁾. Therefore, the diagnosis of BED is challenging, due to its complexity and variability in phenotypic presentation⁽⁹⁾.

BED is not limited to individuals with obesity but it is most common in this group. Diverse populations have been the target of BED research. These have comprised samples of individuals with varying degrees of obesity who were identified among the general population, treatment-seeking overweight individuals and those

with obesity presenting for bariatric surgery⁽¹⁰⁻¹²⁾. The diversity of study populations has contributed to the wide variation in estimates of BED prevalence. A recent meta-analysis estimated that 13% to 21% of presurgical patients received a diagnosis of BED⁽³⁾, but BED prevalence varied as broadly as 4% to 49% in earlier review articles⁽¹²⁻¹⁴⁾. The use of heterogeneous diagnostic criteria, study design and assessment methods may explain the wide variation of BED recognition across diverse high-body mass index (BMI) groups.

Although there is conflicting evidence regarding the association between preoperative BED and postoperative weight loss^(3,4,15), today it is generally recommended that treatment should first be directed at disordered eating and associated psychopathology in these patients, before bariatric surgery is indicated⁽¹⁶⁾.

Surgeons and multidisciplinary teams need practical strategies as far as BED diagnoses and treatment in bariatric patients are concerned. Thus there is a real need to focalize and summarize current knowledge on how to practically assess BED in bariatric patients to better inform surgeons and healthcare providers. By improving the diagnosis and treatment of BED, surgery outcomes may be improved in BED-obese bariatric candidates. In this review, we synthesize original studies that aimed at estimating the prevalence of BED among bariatric samples. Then, we use these data to discuss the diverse assessment tools used to measure BED. We conclude with recommendations for the management of bariatric surgery patients and future research.

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METHODS

Search strategy and inclusion criteria

We performed literature searches of three electronic databases (PubMed, Scopus, and Web of Science) applying combinations of the key terms “binge eating disorder”, “eating disorder”, “obesity”, “epidemiology”, and “prevalence”. The search was delimited to original studies published from 1st January 1994 to 20th March 2017. The lower data limit was chosen in order to include BED provisional criteria in the Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV)⁽⁷⁾.

To meet the inclusion criteria, the article had to report findings from primary research, address the specific aim of estimating point-prevalence or frequency of BED, report data for adults (≥ 18 year-old) with a body mass index (BMI) of at least 30 kg/m², assess BED by standardized outcome criteria (i.e., DSM-IV or DSM-5) and be published in English.

Duplicates were removed from the list of 882 retrieved references. Two reviewers (BHT and LMF) independently assessed the information in the remaining 519 articles, to check they met the inclusion criteria. We first looked titles and abstracts then reviewed the full-text articles of 51 selected abstracts. We considered studies irrespective of the type of bariatric surgery. Following consensus on disagreement between reviewers, 21 articles were included in this review.

Parameters for data extraction were established in accordance with the goals of this review. For each article, we collected basic study information (first author, source, year of publication, country, and design), population characteristics (sample size, sex, age, BMI), methods used (diagnostic criteria and methods of outcome assessment) and results (prevalence estimates for total sample). In cases of mixed populations, when bariatric and non-bariatric subgroups were reported, only data relating to bariatric patients were extracted.

Assessment tools

Assessment methods were retrieved from selected articles and described. Reviewed BED assessment tools from the 21 papers were classified into two groups according to their nature: I) observer-rated instruments, or structured clinical interviews, that provided a detailed appraisal of patients’ mental health status by trained interviewers; and II) patient-rated instruments, through which subjects self-reported the presence or absence of abnormal eating behavior using an answer sheet or computer screen. Advantages and shortcomings of common measurement tools were discussed in terms of the number of items, content coverage, measurement purpose, psychometric qualities and the number of studies in the present review that have used each tool.

RESULTS

Characteristics of studies and study samples

Summary characteristics of the included studies are provided in TABLE 1. All 21 studies⁽¹⁷⁻³⁷⁾ had a cross-sectional design but presented substantial methodological diversity, including variations in data presentation. For this reason, this review of the literature took the form of a narrative synthesis.

Year of publication was between 1995 and 2016; eight studies (38%) were conducted in the USA^(18-22,24,33,37), eight (38%) in Europe^(17,23,25-29,31), three (14%) in Australia^(32,34,35), one (5%) in Taiwan⁽³⁰⁾

and one (5%) in Brazil⁽³⁶⁾. Sample sizes ranged from 50⁽³¹⁾ to 1283 participants⁽³³⁾. Most studies (86%) included individuals of both sexes, with a women/men ratio of around 3:1. Participants’ mean age ranged from 34.1⁽³⁰⁾ to 46.2 years⁽²⁴⁾ and mean BMI from 35.4⁽³⁵⁾ to 54.1 kg/m²^(20,21).

The DSM-IV criteria for the diagnosis of BED were adopted in all 21 studies. Two also applied the DSM-5 criteria to their population samples in order to compare both classifications^(33,34). In terms of use of the instruments to assess BED, 12 studies (57%)^(17,21,23-26,28-30,32,36,37) only used structured interviews, five^(18,19,27,34,35) only self-report questionnaires, and four^(20,22,31,33) used both observer-rated interview and self-report questionnaire. Only one⁽²²⁾ compared both methods regarding prevalence of BED, which was as low as 4.2% for clinical interview but increased more than threefold, to 15.7%, when self-report QEWP-R was used. In four studies^(17,22,28,33), there was incomplete information about the clinical interviews that had been applied.

Point-prevalence estimates for BED ranged widely from 2%, based on the DSM-IV criteria applied to a sample of 153 patients⁽²³⁾, to 53% based on the DSM-5 criteria in a sample of 197 Australian women⁽³⁴⁾.

Assessment of diagnosis instruments

TABLE 2 summarizes the characteristics of 10 different types of BED assessment tool identified in the 21 included studies. Most structured interview-based studies used the Structured Clinical Interview for DSM Disorders (SCID). Typically, the application of these structured interviews lasts between 60 and 120 minutes, according to the number of items, which ranged from eight to 28. While clinician-based structured interviews can be used to diagnose BED, these tools are time-consuming and require previous standardization.

Self-report scale-based studies used a number of instruments to detect eating disorder symptoms [e.g., Binge Eating Scale (BES), Binge Scale (BS), Eating Disorder Examination Questionnaire (EDE-Q), Eating Disorders in Obesity (EDO)], general eating or weight and eating-related symptoms [e.g., Questionnaire on Eating and Weight Patterns (QEWP-R), Eating Disorder Related Quality of Life (QOL-ED)]. The time taken to complete the scales ranges from 5 to 20 minutes, according to the length of the scale (11 to 32 items). These tools can be rapidly administered to screen and monitor eating disorder symptoms in large number of individuals, but do not allow diagnosis of BED. In this review, comparability of tools with similar content coverage, validation, and reliability verification was not consistently observed across included studies.

DISCUSSION

The prevalence rates of BED in presurgical patients vary widely in the literature and have been reported to be higher than in population-based estimates. In the past 10 years, several review studies have been published with differences in study inclusion and exclusion criteria and have found that prevalence of BED ranged from 6% to 49%^(3,4). Derived from 21 studies, our prevalence estimates of BED ranged from 2% to 53%, which is consistent with results from previous publications.

This review confirms that there is a paucity of high-quality evidence regarding BED in bariatric populations contributing to uncertainty about the validity of study findings. Existing evidence is based on short-term observational studies with widespread methodological weakness. Additionally, variations in the type of

TABLE 1. Study characteristics and point-prevalence of binge eating disorder in pre-surgery bariatric patients (k=21).

First author, year of publication	Sample size	Study population characteristics			Diagnostic criteria	Method of assessment		Prevalence (%)	95%CI (%)
		% Women	Mean age (±SD) or (range)	Mean BMI (±SD)		Interview	Self-report		
Adami, 1995 ⁽¹⁷⁾	68	72.1	37 (18-56)	48 (34.4-85.5)**	DSM-IV*	CI		44.1	32.1-56.7
Powers, 1999 ⁽¹⁸⁾	116	83	39.6 (9.3)	53.4 (10.9)	DSM-IV		BS	16	10.2-24.4
De Zwaan, 2003 ⁽¹⁹⁾	110	87.3	39.6 (19-62)	48.4 (35.4-86.9)**	DSM-IV		QEWP-R	17.3	10.7-25.7
Sánchez-Johnsen, 2003 ⁽²⁰⁾	210	100	20-65	54.1 (10.2)	DSM-IV	SCID-I	QEWP-R	26.3	20.4-32.7
Latner, 2004 ⁽²¹⁾	65	100	39.5 (19-67)	54.1	DSM-IV	EDE		48	35.1-60.5
Allison, 2006 ⁽²²⁾	210	81.9	44.4 (10.7)	50.4 (8.1)	DSM-IV	CI	QEWP-R	CI: 4.2 QEWP-R: 15.7	2-8 11.1-21.4
Herpertz, 2006 ⁽²³⁾	153	67.3	38.7 (10.3)	50.9 (8)	DSM-IV	CIDI		2	0.4-5.6
Kalarchian, 2007 ⁽²⁴⁾	288	83.3	46.2 (9.4)	52.2 (9.7)	DSM-IV	SCID-I		16	11.9-20.7
Puglisi, 2007 ⁽²⁵⁾	75	16	39.5 (8.2)	39-55	DSM-IV	SCID-I		20	11.6-30.8
Mauri, 2008 ⁽²⁶⁾	282	79.8	42.1 (18-65)	43.5 (7)	DSM-IV	SCID-I		6.7	4.1-10.3
Dahl, 2010 ⁽²⁷⁾	157	73.2	41 (10.4)	47.1 (5.7)	DSM-IV		EDO	13.4	8.4-19.7
Noli, 2010 ⁽²⁸⁾	150	64.7	42 (11)	46.6 (10.4)	DSM-IV*	CI		16	10.5-22.9
Lier, 2013 ⁽²⁹⁾	127	74	41.3 (10.3)	45.3 (5.2)	DSM-IV	MINI		10	5.6-16.9
Lin, 2013 ⁽³⁰⁾	455	70.5	34.1(10.8)	39.5 (8.3)	DSM-IV	SCID-I		10.3	7.7-13.5
Georgiadou, 2014 ⁽³¹⁾	50	86	42 (18-65)	48 (6.6)	DSM-IV	SCID-I	EDE-Q	32	19.5-46.7
Hayden, 2014 ⁽³²⁾	204	82.4	45.2 (11.5)	42.7 (6.1)	DSM-IV	SCID-I		13.6	9.3-19.2
Marek, 2014 ⁽³³⁾	1283	72.4	46 (11.6)	49.2 (11)	DSM-IV DSM-5	CI	BES	DSM-IV: 23.2 DSM-5: 26.6	20.9-25.6 24.2-29.1
Coker, 2015 ⁽³⁴⁾	197	100	39.8 (20-65)	43 (6.7)	DSM-IV DSM-5		QOL-ED	DSM-IV: 22 DSM-5: 53	16.3-28.2 45.6-59.9
Dixon, 2015 ⁽³⁵⁾	149	90.6	40 (18-55)	35.4	DSM-IV		QEWP-R	13.4	8.4-20
Duarte-Guerra, 2015 ⁽³⁶⁾	393	79.1	43 (11.5)	47.8 (7.5)	DSM-IV	SCID-I		16.5	13-20.6
Kalarchian, 2016 ⁽³⁷⁾	165	81.1	46 (21-68)	44.8 (33.5-76)**	DSM-IV	SCID-I		6.1	3-10.9

BMI: body mass index, expressed as kg/m². SD: standard deviation.

* Spitzer's criteria (1992) were similar to DSM-IV. The "clinical interview" was applied to meet these criteria. ** BMI range (min-max).

EDE: Eating Disorder Examination (version: interviewer-administered); MINI: The Mini International Neuropsychiatric Interview; SCID: Structured Clinical Interview for DSM disorders (versions: SCID-I, SCID-II); CIDI: Composite International Diagnostic Interview; CI: Clinical Interview; BES: Binge Eating Scale; BS: Binge Scale; EDE-Q: Eating Disorder Examination Questionnaire (version: self-administered); EDO: Eating Disorders in Obesity; QEWP: Questionnaire on Eating and Weight Patterns (revised version: QEWP-R); QOL-ED: Eating Disorder Related Quality of life.

TABLE 2. Characteristics of assessment tools for binge eating disorder used in 21 reviewed studies.

Tools (acronym)	Number of items	Content coverage	Measurement purpose	Number of studies using specific tool	Study (Reference number)
Structured interview					
Composite International Diagnostic Interview (CIDI)	25 (8 [†])	DSM and ICD-based criteria for main categories of psychiatric diagnosis	Diagnosis of general psychopathology	1	(23)
Eating Disorder Examination (EDE)	28	Restraint, eating, weight and shape concern, plus binge eating frequency and compensatory behaviors	Specific diagnosis (eating disorders)	1	(21)
Mini International Neuropsychiatry Interview (MINI)	8 [†]	DSM-based criteria for main categories of psychiatric diagnosis	Diagnosis of general psychopathology	1	(29)
Structured Clinical Interview for DSM Axis I disorders (SCID)	10 [†]	DSM-based criteria for main categories of psychiatric diagnosis	Diagnosis of general psychopathology	9	(20,24-26, 30-32,36,37)
Self-report scale					
Binge Eating Scale (BES)	16	Binge eating severity	Binge symptoms	1	(33)
Binge Scale (BS)	19	Behaviors and attitudes of bulimia	Binge symptoms	1	(18)
Eating Disorder Examination Questionnaire (EDE-Q)	32	Restraint, eating, weight, and shape concern	General eating symptoms	1	(31)
Eating Disorders in Obesity (EDO)	11	DSM-based assessment for use in weight loss treatment settings	General eating symptoms in obesity	1	(27)
Questionnaire of Eating and Weight Patterns – Revised (QEWPR)	28	Episodes of binge eating, weight history, body image	Weight and eating symptoms	4	(19,20,22,35)
Quality of Life for Eating Disorders (QOL-ED)	20	Domains of behavior, eating and psychological feelings, effects on daily life, medical status and body weight	Quality of life with eating-related symptoms	1	(34)

DSM: diagnostic and statistical manual for mental disorders, ICD: international classification of diseases. [†] Specific items for diagnosing binge eating disorder.

assessment tool used make it difficult to identify clear and consistent trends in the prevalence of BED.

Despite the vast number of studies reporting on pre-surgery psychopathological prevalence, no consensus has been reached on the association between preoperative BED and worse weight loss outcomes after surgery. Several studies found that BED may jeopardize weight loss or increase the risk of weight regain⁽⁶⁾. Furthermore, some studies have reported that BED-obese individuals need specialized interventions since they tend to have more severe obesity^(38,39), poorer surgical outcomes⁽⁴⁰⁾, higher rates of mental disorders (such as depression, bipolar, and anxiety) and worse quality of life⁽⁴¹⁻⁴³⁾ than non-BED-obese people. As a treatable disorder, early identification of BED, together with the treatment of abnormal eating habits must be integrated into routine medical encounters before weight-loss surgery is considered.

The goal of identifying psychological factors that may negatively affect bariatric surgery outcomes is to provide recommendations for intervention before surgery. Therefore, a comprehensive summary of current knowledge on how to assess BED in bariatric candidates is much needed to better inform surgeons about the extent to which under-recognized diagnosis and under-treatment of BED may adversely influence surgery outcomes.

Clinical interview schedules are the gold standard method for the diagnosis of eating disorders. However, their routine application is not always feasible as they are laborious and must be performed

by trained mental health professionals. Therefore, self-report questionnaires are preferred as a screening method for the assessment of eating behavior in busy routine clinical conditions. Ideally, a good screening instrument should be highly sensitive in order to identify the majority of affected patients with BED. On the other hand, its specificity is less relevant, since the diagnosis of eating disorders needs to be confirmed by clinical interview.

According to the guidelines for assessment and multidisciplinary follow-up of patients who are candidates for bariatric surgery, the evaluation of mental health is the responsibility of the psychologist or the psychiatrist⁽¹⁶⁾. In practice, the vast majority of services are structured with a psychology team and few use routine psychiatric evaluation. This fact may explain the great variability between the tools used in the diagnosis of eating disorders and the difference in specific attention given to this aspect of psychopathology. We therefore reiterate that the systematic participation of a liaison-psychiatrist in the preoperative evaluation could greatly improve the detection of eating disorders and behaviors, and thus, contribute to a better postoperative result.

Obesity is not a homogeneous condition and it has now been recognized as having a wide variety of phenotype manifestations. Diagnosing pre-surgery eating disorders may help surgeons and health services manage adult bariatric surgery candidates, taking into account this diversity of phenotypes and individualizing treatment procedures. Drawing a parallel with oncological surgery, it

corresponds to an examination of the image (e.g., computerized tomography scan or magnetic resonance imaging). The bariatric surgeon, in turn, must understand the tools most frequently used and demand standardization of assessment protocols that could provide practical answers to better deal with the surgical patient. In the postoperative follow-up, the surgeon should be able to identify BED and other eating behaviors that may compromise the outcomes of surgery, so that the patient can be referred to the most appropriate treatment. Although in a multidisciplinary team each member has his/her specific vision of the patient, it is up to the bariatric surgeon to have an overall view of what happens to the patient, including his/her mental health status.

CONCLUSION

The primary objective of BED evaluation is to provide screening and identification of risk factors or potential postoperative challenges that may contribute to a poor postoperative outcome. The ultimate aim of preoperative psychosocial evaluations is to enhance all domains of surgical outcomes. Study heterogeneity may account for the variability in the results from different centers.

Methodological flaws such as insufficient sample size and selection bias curbed the agreed-upon evidence base of the role of BED in the bariatric context. For the sake of comparability and generalizability of the findings in future studies, researchers must prioritize representative samples of treatment-seeking candidates for bariatric surgery and systematically apply criterion-based instruments for the assessment of BED. By using self-report questionnaires, bariatric services would be able to screen a large number of patients, and then confirm the diagnosis of eating disorders by clinical interview.

Authors' contribution

Tess BH: research execution, text writing. Maximiano-Ferreira L: research execution, data collection. Pajecki D: text writing. Wang YP: research execution. Tess BH and Maximiano-Ferreira L are joint first authors of this work.

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Tess BH, Maximiano-Ferreira L, Pajecki D, Wang YP. Cirurgia bariátrica e transtorno de compulsão alimentar: os cirurgiões devem se preocupar com isso? Uma revisão da literatura sobre a prevalência e os métodos de diagnóstico. *Arq Gastroenterol.* 2019;56(1):55-60.

RESUMO – Contexto – Os transtornos alimentares entre os candidatos à cirurgia bariátrica são comuns e estão associados a resultados cirúrgicos adversos, incluindo recuperação de peso e baixa qualidade de vida. No entanto, sua avaliação é difícil pela grande variedade e uso inconsistente de métodos de avaliação padronizados. **Objetivo** – O objetivo desta revisão foi sintetizar o conhecimento atual sobre a prevalência do transtorno de compulsão alimentar (TCA) em pacientes pré-cirúrgicos e fazer uma avaliação crítica dos instrumentos de avaliação para TCA. **Métodos** – A busca foi realizada nas bases de dados PubMed, Scopus e Web of Science de janeiro de 1994 a março de 2017. Os dados foram extraídos, tabulados e resumidos usando uma abordagem narrativa. **Resultados** – Um total de 21 estudos observacionais foram revisados para extração e análise de dados. A prevalência de TCA nas populações bariátricas variou de 2% a 53%. Variações consideráveis nas características dos pacientes e nas medidas de avaliação do TCA foram evidentes entre os estudos. Além disso, várias fragilidades metodológicas na maioria dos estudos foram reconhecidas. Estudos utilizaram 10 diferentes instrumentos psicométricos para avaliar a TCA. Entrevistas clínicas foram utilizadas em 12 estudos, embora seja a ferramenta preferencial para diagnosticar o TCA. **Conclusão** – A heterogeneidade dos estudos foi responsável pela variabilidade dos resultados nos diferentes centros e falhas metodológicas, como tamanho insuficiente da amostra e vies de seleção, prejudicaram a estimativa da magnitude do TCA em cenários cirúrgicos. Para fins de comparabilidade e generalização dos achados em estudos futuros, os pesquisadores devem recrutar amostras representativas de candidatos à cirurgia bariátrica e fazer a aplicação sistemática de instrumentos padronizados para a avaliação do TCA.

DESCRITORES – Obesidade. Cirurgia bariátrica. Transtorno de compulsão alimentar. Adulto. Prevalência. Revisão.

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