Anxiety and depression symptoms in women with and without binge eating disorder enrolled in weight loss programs

Sintomas de ansiedade e depressão em mulheres com e sem compulsão alimentar participantes de programas de redução de peso

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Abstract

Objectives: 1) To investigate the association between binge eating scores, anxiety and depression symptoms, and body mass index (BMI), and 2) to assess the presence of differences in severity of anxiety symptoms, severity of depression symptoms, and BMI in women with and without binge eating disorder.
Method: The sample comprised 113 women aged between 22 and 60 years (39.35±10.85) enrolled in weight loss programs in Porto Alegre, southern Brazil. The following instruments were used: structured interview, Brazilian Economic Classification Criteria, Beck Anxiety Inventory, Beck Depression Inventory, and Binge Eating Scale. Data were analyzed using descriptive and inferential statistics.
Results: A positive association was found between binge eating scores and the severity of anxiety symptoms (p < 0.001) and depression symptoms (p < 0.001). No significant association was observed between BMI and binge eating scores (p = 0.341). There were significant differences between women with and without binge eating disorder with regard to severity of anxiety symptoms (p < 0.001) and severity of depression symptoms (p < 0.001). Conversely, no significant differences were observed between the groups concerning BMI (p = 0.103).
Conclusion: Our findings showed that binge eating is associated with symptoms of anxiety and depression, but not with BMI.
Keywords: Anxiety, depression, feeding behavior, compulsive behavior.

Resumo

Objetivos: 1) Investigar a associação entre escores de compulsão alimentar, sintomas de ansiedade e de depressão e índice de massa corporal (IMC); e 2) verificar se existe diferença na intensidade dos sintomas de ansiedade, dos sintomas depressivos e no IMC em mulheres com e sem compulsão alimentar.
Método: A amostra foi composta de 113 mulheres com idade entre 22 e 60 anos (39,35±10,85), participantes de programas de redução de peso na cidade de Porto Alegre, sul do Brasil. Foram aplicados os seguintes instrumentos: entrevista estruturada, Critérios de Classificação Econômica Brasil, Inventário de Ansiedade de Beck, Inventário de Depressão de Beck e Escala de Compulsão Alimentar Periódica. Os dados foram analisados utilizando-se estatística descritiva e inferencial.
Resultados: Houve associação positiva entre os escores de compulsão alimentar e a intensidade dos sintomas de ansiedade (p < 0,001) e de depressão (p < 0,001). Não foi observada associação significativa (p = 0,341) entre IMC e escores de compulsão alimentar. Houve diferença significativa entre mulheres com e sem co mpulsão alimentar com relação à intensidade dos sintomas de ansiedade (p < 0,001) e depressão (p < 0,001). Não foi encontrada diferença significativa entre os grupos com relação ao IMC (p = 0,103).
Conclusão: Os achados deste estudo mostraram que a compulsão alimentar está associada a sintomas de ansiedade e de depressão, porém não está associada ao IMC.
Descritores: Ansiedade, depressão, comportamento alimentar, comportamento compulsivo.

Introduction

Obesity is a condition in which excess fat accumulates to the extent of having adverse effects on health. In 2006, there were approximately 1 billion and 600 million people aged 15 years and older with overweight worldwide, and at least 400 million adults with obesity. It is estimated that, by 2015, the number of overweight adults will reach approximately 2 billion and 300 million, and over 700 million adults will be obese. Overweight and obesity were originally considered diseases of developed countries, however their rates have been drastically increasing in developing countries, especially in urban areas.[1]

Overweight and obesity cause serious consequences to health, once a high body mass index (BMI) is an important risk factor for a variety of chronic conditions, such as: cardiovascular disease (cardiopathies and stroke), which is the main cause of death worldwide, with 17 million of deaths every year; diabetes, which has become a worldwide epidemic, with estimates of a 50% increase in deaths from diabetes by 2015; cancer (endometrium, breast, and colon), in addition to locomotor conditions (e.g. arthrosis).[1]

Obese adults and adolescents are openly discriminated in their professional and academic lives, increasing the risk for the development of psychiatric conditions in this population, e.g. depression, anxiety disorders, drug abuse, and eating behaviors.[2]

Several studies have been conducted with the aim of improving our understanding of obesity.[3-5] The wide interest in the topic is justified by the alarming rates of obesity in the general population, by the risks associated with the condition, and by the economic costs imposed on society.[6] The impacts of obesity are strong, once eating behaviors are multidetermined, regulated by interactions among physiologic, psychological, genetic and environmental factors to which each individual is exposed.[7] In view of the multifactorial nature of obesity, treatment is difficult, and the patient's physical and mental health and quality of life are frequently compromised. This is why most studies on obesity include the assessment of comorbidities and associated variables.[8]

Obesity is knowingly associated with high rates of psychopathologies, including depression, anxiety, eating disorders, personality disorders,[9] and schizophrenia.[10] For example, it has long been known that the prevalence of people with overweight or obesity among patients with unipolar or bipolar depression is higher than in the general population, reaching 20 to 45% higher frequencies among obese patients.[11] Tapia & Masson[12] have pointed out to the fact that obesity and depression independently increase the risk of cardiovascular disease, which seems to suggest that the association between obesity and depression could further increase the incidence of cardiovascular conditions. With regard to the quality of life of obese individuals, the review conducted by Kushner & Foster,[13] which had the aim of analyzing the impact of obesity on quality of life, found that obesity has negative consequences on quality of life, both in terms of physical aspects and of psychosocial functioning.

Finally, a high prevalence of severe binge eating disorders (BEDs) is also observed in obese populations. In fact, BED patients account for the majority of people seeking assistance at health care services that offer weight loss programs.[6]

BED is characterized by recurrent episodes of compulsive eating behavior in the absence of other compensatory behaviors aimed at avoiding weight gain. During a binge episode, the subject experiences a feeling of loss of control combined with the intake of high amounts of food, even when not really hungry, resulting in great discomfort. Binge episodes are followed by strong subjective ill-being, characterized by feelings of anguish, sadness, guilt, shame, and self-loathing.[14,15] BED has been widely studied, with a special focus on binge episodes, which are the main manifestation and form of evaluation of the disease, frequently accompanied by hyperphagia and social isolation.[16]

In Brazil, the prevalence of BED in the general population ranges from 1.8 to 4.6%; in contrast, approximately 30% of obese individuals seeking weight loss treatment present the disorder.[15] In the majority of cases, obese patients with BED do not lose clinically significant amounts of weight with conventional weight loss therapies,[16] which may be explained, to a great extent, by the comorbidities associated with the disorder. Individuals with BED seem to present psychopathological conditions at higher rates when compared with individuals without the disorder.[16,17]

The combination of binge eating and food restriction behaviors is frequent among obese patients, and can explain, at least in part, the recurrent failure of interventions aimed at treating obesity. Moreover, some other psychological aspects that also regulate feeding behaviors, e.g. depressive mood and anxiety, are frequently present and can influence treatment results.[18]

A prospective study covering a 4-year follow-up period aimed to investigate the impact of anxiety, depression, and binge eating behaviors on weight loss in obese individuals submitted to different therapies (obese patients submitted to bariatric surgery, obese patients enrolled in a conventional weight loss program, and a group of control obese patients). The study reached the following conclusions: 1) there was a tendency toward

weight gain in the control group among obese individuals with current depressive or anxiety disorder, whereas individuals in the same group without mental disorders lost some weight at the beginning of treatment; 2) obese patients submitted to bariatric surgery and with a current diagnosis of depressive or anxiety disorder lost significantly less weight when compared with obese patients in the same group without a diagnosis of mental disorder; and 3) patients presenting with binge eating at baseline did not lose weight after 4 years of follow-up.[19] These results underscore the importance of developing a better understanding of binge eating and related anxiety and/or depression symptoms in patients seeking weight loss treatment, especially in view of the strong influence these symptoms have on treatment success.

Considering all the damage that obesity can potentially cause, the loss of weight comes up as a possible solution for the problem. Losing weight can significantly reduce the risk for the development of most comorbidities associated with obesity,[5] and it is therefore important that therapies specifically targeted at obesity be developed and implemented in the public health care system in Brazil.[20]

Moreover, for the development and implementation of effective therapies specifically aimed at weight loss, it becomes extremely important to study in detail the psychiatric comorbidities most frequently associated with obesity in the literature. Attention should be given not only to the identification of behavioral and psychological variables, but also to the implementation of interventions tailored to the specific characteristics of this population, taking into consideration the high prevalence of such comorbidities. Appropriate interventions will have greater chances of succeeding and consequently reducing the risks associated with the obesity epidemic.

Taking into consideration the wide range of aspects related with obesity, the high prevalence of BED among patients enrolled in weight loss programs, and also the difficulties faced by binge eaters while trying to lose weight, the aims of the present study were 1) to investigate the association between binge eating scores, anxiety and depression symptoms, and body mass index (BMI), and 2) to assess the presence of differences in severity of anxiety symptoms, severity of depression symptoms, and BMI in women with and without BED.

Method

This is a cross-sectional and quantitative study. Data analysis was performed using descriptive and inferential statistics. The association between variables was also assessed.

Instruments

A structured interview was specifically designed for the present study to collect sample characteristics.

The Brazilian Economic Classification Criteria were used to determine the economic status of participants.[21] A questionnaire was applied and yielded a score that determined the economic status of each individual according to the following categories (from higher to lower income): A1, A2, B1, B2, C, D, and E.

The Brazilian version of the Beck Depression Inventory was used to measure severity of depression.[22,23] The instrument comprises 21 questions, each one with four answer options. Subjects should choose the answer that best described them. The total score is a sum of the scores obtained at each individual item. The following cutoff points have been established for psychiatric patients in Brazil: 0-11 (minimal depression), 12-19 (mild), 20-35 (moderate), and 36-63 (severe).

The Brazilian version of the Beck Anxiety Inventory was used to assess the severity of anxiety among participants.[23,24] This scale also comprises 21 items that subjects should rate using a four-point scale so as to reflect their symptoms. Again, the total score is a sum of the scores obtained at each individual item. The following cutoff points have been established for psychiatric patients: 0-10 (minimal anxiety), 11-19 (mild), 20-30 (moderate), and 31-63 (severe).

Finally, the Binge Eating Scale[25] was used to assess the presence and severity of binge episodes. The instrument has been translated into Brazilian Portuguese and validated for use in Brazil.[26] The scale is a Likert-style instrument comprising 62 statements arranged in 16 items. Subjects should select the response option that best describes their perception. Each statement is assigned scores from 0 to 3, which correspond to total absence (score 0) up to presence of severe compulsion (score 3). The total score (sum of individual scores) is interpreted according to the following classification[25]: ≤ 17, absence of compulsive behavior (participants in this score category were allocated to the control/non-binging group); 18-25, moderate binging; ≥ 26, severe binging (participants in the two latter categories were allocated to the group with BED).

The following inclusion criteria were taken into consideration: being enrolled in weight loss programs in the municipality of Porto Alegre, southern Brazil, female sex (given the higher prevalence of eating disorders among females[27]; the male:female ratio has been reported to range from 1:10 up to 1:20[28]), age between 18 and 60 years,[1] and at least 5 years of formal education. Patients presenting with acute psychotic episodes or any other conditions that could interfere with

the understanding of the instruments used in the study were excluded from the sample.

Ethical considerations

The present study was nested in a broader research project submitted and approved by the Research Ethics Committee of Pontifícia Universidade do Rio Grande do Sul (protocol no. 364/05-CEP). Prior to inclusion in the study, all patients were asked to sign an informed consent form containing the objectives of the study. All participants were informed of the purpose of the research project and were given guarantees of confidentiality and anonymity by the research team.

Following presentation and approval of the study at the different participating centers, the instruments included in the research protocol were applied individually by previously trained research team members.

Statistical analysis

Data were entered into the Statistical Package for the Social Sciences (SPSS) version 17.0. Descriptive and inferential analyses were conducted using the following statistical tests: Kolmogorov-Smirnov, Fisher's exact test, Pearson's chi-square test, Mann-Whitney test, and Spearman's correlation. Significance was set at 5%.

Results

The sample comprised 113 women enrolled in weight loss programs in the municipality of Porto Alegre, southern Brazil. Mean age was 39.35±10.85 years, and it ranged from 22 to 60 years.

Based on the scores of the Binge Eating Scale, patients were first classified as non-binging, moderate binging, or severe binging (Figure 1).
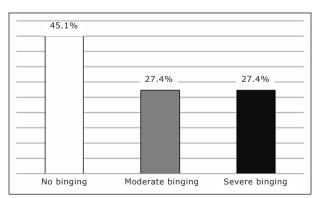

Figure 1 – Classification of binge eating symptoms in a sample of women enrolled in weight loss programs in Porto Alegre, southern Brazil

For the subsequent analyses, the sample was divided into two groups: patients with binge episodes and patients without binge episodes. The chi-square test showed that both groups were homogeneous with regard to the number of subjects (p = 0.301).

Approximately 18.6% (21 patients) of the sample was not attending school; 76.1% (86) were working. Again, according to the chi-square test, both groups were statistically similar with regard to education (p = 0.459) and working status (p = 0.421). Also, no significant differences were observed between the groups in terms of marital status, education level, and economic status (Table 1).

Table 1 – Sociodemographic characteristics of patients with and without BED

	Frequency	%	No BED n (%)	BED n (%)	p
Marital status					
Single	39	34.5	14 (35.9)	25 (64.1)	
Married	63	55.8	33 (52.4)	30 (47.6)	
Divorced	11	9.7	4 (36.4)	7 (63.6)	0.221*
Education level					
Elementary school	9	8	2 (22.2)	7 (77.8)	
High school	45	39.8	19 (42.2)	26 (57.8)	
College	59	52.2	30 (50.8)	29 (49.2)	0.272†
Economic status					
A	16	14.2	11 (68.8)	5 (31.3)	
B	41	36.3	19 (46.3)	22 (53.7)	
C	41	36.3	16 (39.0)	25 (61)	
D	15	13.3	5 (33.3)	10 (66.7)	0.165*

BED = binge eating disorder.
* Pearson's chi-square test.
† Fisher's exact test.

The following variables were tested for normality in both groups using the Kolmogorov-Smirnov test: age, anxiety, depression, and BMI (Table 2). Abnormal distributions were observed for all variables in at least one of the groups. Therefore, the Mann-Whitney test was used to compare groups, and Spearman correlation to assess associations between variables.

Table 2 – Kolmogorov-Smirnov's normality test

Variable	No BED (p)	BED (p)
Age	0.163	0.005
Anxiety (total BAI score)	0.001	0.200*
Depression (total BDI score)	0.007	0.200*
BMI	0.200*	0.011

BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory; BED = binge eating disorder; BMI = body mass index.
* p value ≥ 0.200.

The Mann-Whitney test revealed statistically significant differences between patients with and without binge episodes in terms of severity of anxiety symptoms and severity of depression symptoms. Conversely, no significant differences were observed in BMI between patients with and without binge episodes (Table 3).

Table 3 – Relationship between presence/absence of BED and severity of anxiety symptoms, severity of depression symptoms, and BMI

Variable/group	n	Mean rank	p
Anxiety			
No BED	51	37.73	
BED	62	72.85	0.000*
Depression			
No BED	51	34.01	
BED	62	75.91	0.000*
BMI			
No BED	51	51.45	
BED	62	61.56	0.103*

BED = binge eating disorder; BMI = body mass index.
* Mann-Whitney's test.

Spearman correlation revealed a positive association between binge eating scores and severity of anxiety symptoms (r = 0.598; p < 0.001) and severity of depression symptoms (r = 0.766; p < 0.001). No significant association was found between BMI and binge eating scores (r = 0.104; p = 0.082).

Discussion

Of the total sample, 54.8% presented binge episodes: 27.4% showed moderate binging, and 27.4% showed severe binging. These results are similar to those of a previous study[29] conducted with morbidly obese patients, which observed an overall BED prevalence of 56.7%, namely 25.4% with moderate binging and 31.3% with severe binging. In turn, higher rates of BED have been reported for patients seeking weight loss treatment,[30] which is compatible with the characteristics of our sample.

Significant differences were observed in our study between patients with and without BED with relation to severity of depression symptoms. Also, higher BED scores were associated with more severe depression symptoms. Similar results have been reported in a previous study designed to assess the prevalence of psychiatric disorders according to the presence of absence of BED in morbidly obese patients.[29] In that study, the group with BED showed a high prevalence of major depression (42.1%), with a significant difference (p = 0.001) between patients with and without the disorder.[29] Another study[31] carried out with obese patients enrolled in weight loss programs found an association between depression and a higher chance of having BED (57%) when compared with patients without depression (21%), also at a statistically significant difference (p = 0.001). Moreover, Geliebter et al.[32] concluded that patients with BED presented higher depression scores when compared with patients without the disorder, and Jirik-Babb & Geliebter[33] observed that obese women with

BED showed higher levels of both depression and anxiety when compared with women without BED.

In our study, significant differences were also observed between the groups in relation to anxiety levels: higher anxiety levels were associated with increased binge eating scores. A previous study[34] also found significant differences between individuals with and without BED with regard to depression (p < 0.001) and anxiety levels (p < 0.008), in both male and female patients, with higher levels among binge eaters than among controls.

Total BMI did not differ between patients with and without BED, and no significant association was observed between BMI and binge eating scores. This findings suggest that a higher BMI is not necessarily associated with BED, which is in accordance with the report by Jirik-Babb & Norring,[34] who also did not observe differences between patients with and without BED in relation to BMI.

Binge eaters account for a substantial part of the patients seeking weight loss programs. In this sense, the findings of the present study underscore the paramount importance of assessing anxiety and depression symptoms in BED patients, as well as of defining intervention strategies to deal specifically with these symptoms, which seem to affect treatment results.

Further studies are warranted to further investigate these populations, preferably follow-up studies designed to investigate possible predictive factors of feeding behaviors, aimed at establishing causal relationships and broadening our scientific knowledge of the variables associated with eating disorders.

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