

Binge eating prevalence according to obesity degrees and associated factors in women

Prevalência de compulsão alimentar periódica conforme grau de obesidade e fatores associados em mulheres

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ABSTRACT

Objective: Investigate binge eating (BE) prevalence in women according to the obesity degree and assess the associated factors. **Methods:** Cross-sectional study with female adults presenting body mass index (BMI) ≥ 35 kg/m². The analyzed variables were: sociodemographics, health status, obesity history, lifestyle, eating behavior and obesity degree. In order to analyse BE it was used the Binge Eating Scale (BES), which is considered positive when BES ≥ 18 points. Prevalence and prevalence ratios (PR) were calculated with confidence intervals (CI) of 95%. Multivariate analysis was carried out using Poisson regression. **Results:** BE prevalence was 53.2%, and the prevalence in super superobese women (BMI ≥ 60 kg/m²) was 75%. After multivariate analysis, associations were observed between the age group 40-49 years old (PR = 2.0; 95% CI = 1.2-3.4) and the "snacking habit" (PR = 1.9; 95% CI = 1.2-2.9). **Conclusion:** The prevalence of BE in severe obese women was high. Association with the "snacking habit" can be a BE marker that should be monitored in the severely obese individuals that fit this profile.

Keywords

Obesity, women, eating behavior.

RESUMO

Objetivo: Investigar a prevalência de compulsão alimentar periódica (CAP) em mulheres conforme grau de obesidade e avaliar os fatores associados. **Métodos:** Estudo transversal realizado com adultas e índice de massa corporal (IMC) ≥ 35 kg/m². Variáveis analisadas: sociodemográficas, condições de saúde, história de obesidade, estilo de vida, comportamento alimentar e grau de obesidade. Para análise da CAP, foi utilizada Escala de Compulsão Alimentar Periódica, sendo CAP aquelas com ≥ 18 pontos. Calcularam-se prevalência e razões de prevalências, com intervalos de confiança de 95%. Realizou análise multivariada pela regressão de Poisson. **Resultados:** A prevalência de CAP foi de 53,2%, sendo a prevalência em super superobesas (IMC ≥ 60 kg/m²) de 75%. Após análise multivariada, foram associadas idade de 40 a 49 anos (RP = 2,0; IC 95% = 1,2-3,4) e "hábito de beliscar" (RP = 1,9; IC 95% = 1,2-2,9). **Conclusão:** A prevalência de CAP em obesas graves foi elevada. A associação com "hábito de beliscar" pode ser um marcador de CAP, devendo ser monitorado em obesas graves com esse perfil.

Palavras-chave

Obesidade, mulheres, comportamento alimentar.

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INTRODUCTION

Obesity is considered a serious public health problem that affects approximately 500 million adults worldwide¹. This illness afflicts different age groups, all social levels, both genders and its prevalence has been increasing significantly in recent decades². In Brazil, 49% of the adult population are overweight and 14.8% are obese, according to the Family Budget Survey (FBS) 2008-2009³. Besides, severe obesity incidence has increased and it represents between 0.5 and 1% of the adult Brazilian population⁴.

Due the fact that obesity is a chronic disease with multifactorial etiology²; obese individuals present emotional alterations that can be classified either as determining factors or as a consequence of obesity⁵. Obese individuals can show psychological suffering related to social discrimination, self-image depreciation, insecurity, and a general feeling of failure related to weight loss. Women are more exposed to media and western society demands for a beauty ideal, related to slenderness, which can generate emotional stress^{6,7}.

Bariatric surgery is a treatment option, widely used in severe obesity cases^{8,9}. Psychological disorders presence is commonly an exclusion criteria for bariatric surgery candidates; however, due to lack of consensus in the scientific literature, these are not considered as a formal counter indication for this procedure¹⁰. Nevertheless, psychological and psychiatric monitoring are recommended in the pre- and post-surgery periods, as bariatric surgery candidates usually demonstrate association with psychiatric disorders and the proper treatment will promote better prognostic after the surgery^{9,10}.

Due to the close relationship between binge eating (BE) and severe obesity, it is important to know the magnitude of this problem and its associated factors in obese patients that seek treatment, mainly because BE is a risk factor for comorbidities, such as: psychiatric disorders, and also hinders adherence to dietotherapeutic treatments^{11,12}. This study aimed to investigate BE prevalence in women according to the obesity degree as well as to evaluate the associated factors.

METHODS

It was used a cross-sectional study carried out at the Severe Obesity Nutrition Ambulatory, at the Federal University of Goiás School Hospital (in Portuguese: *Ambulatório de Nutrição em Obesidade Grave* – ANOG). The invitation to participate of the research occurred sequentially to all patients that had appointments at ANOG; however inclusion in the research was not sequential. Some patients did not fulfill the eligibility criteria and some did not sign the informed consent form (ICF).

The inclusion criteria considered adult women (20-59 years old), who presented obesity degree II or superior, *i.e.*, body mass index (BMI) ≥ 35 kg/m², and sought nutritional

treatment at ANOG and/or were bariatric surgery candidates. It was included in the research the women who fit the criteria above and accepted to be part of the study as well as signed the ICF. The exclusion criteria were: pregnant women; women who were breastfeeding; women with special needs; and post-bariatric surgery patients.

Data were collected between February, 2008 and June, 2012, during the first consultation. It was done through standardized pre-tested anamnesis application and anthropometric data collection by nutritionists or licensed nutrition academics. During consultation, the Binge Eating Scale (BES)¹³ was applied. At this moment patients chose the affirmatives that best described their feelings regarding eating behavior. In order to avoid comprehension difficulties, as most patients verified low schooling level, it was done a simple instrument reading for all patients, following the literature recommendation¹³.

BES is a translated and validated Likert scale for the Brazilian population, considered an investigative instrument that allows the evaluation of symptoms severity during binge eating episodes as well as tracking binge eating disorders (BED) occurrence in obese individuals during weight loss treatments^{13,14}. BES classifies BE severity degrees, categorized by the following scores: ≤ 17 points no BE, 18 to 26 points moderate BE, and score ≥ 27 severe BE¹³. BE was the outcome variable in this study, defined as a BES score ≥ 18 points.

A multidisciplinary team accompanied the patients in this research, but it did not include a psychiatrist. Therefore, a BE-tracking instrument was selected in order to achieve the research goals and the individuals monitored with BE were forwarded to psychiatric follow-ups. The term BE is used to describe the feeding behaviour characterized by moments of extreme food ingestion in short periods of time, followed by a loss of control feeling by the individual, not followed by compensatory methods^{14,15}.

The studied variables included: sociodemographical data (age, marital status, schooling, and family income); health conditions (actual comorbidities and weight loss medication use); obesity clinical history (obesity onset, obesity in the family, and previous weight loss treatments); lifestyle (physical activities practice, use of tobacco or alcohol); eating behavior (number of meals per day, "snacking habit", Binge Eating – BE), and anthropometric data (weight, height, and BMI).

Patients were questioned about: age in full years, which was then categorized in 20-29 years old, 30-39 years old, 40-49 years old, 50-59 years old; marital status (with partner/without partner), schooling years, which was then categorized in less than 9 years and ≥ 9 years; and family income calculated by minimum wage (MW)*. It was categorized as < 1 MW/ 1 to 2 MW/ > 2 MW. Current comorbidities presence (yes/no) and weight loss medication use were confirmed by medical prescriptions for

* In 2012 the minimum wage in Brazil was R\$ 622.00.

continuous or mandatory medication and/or medical records. Regarding weight loss medication, anorexigen and psychiatric medications were considered, and to this second variable were included anxiolytics and antidepressives (yes/no).

Other variables studied included: obesity onset (childhood/adolescence/post-gestation/adulthood); obesity in family (yes/no); previous weight loss treatment (self-initiated or with a health professional help); physical activity practice (regular, irregular or none). In this category were considered as regular at least 150 minutes per week of moderate-intense aerobic activity¹⁶; use of tobacco (yes/no) for which ex-smokers were counted as smokers; alcoholic beverages consumption (yes/no); number of meals per day ($< 4/\geq 4$ meals/day) and if "snacking" was a habit. For the "snacking habit", the question asked was: "Do you have the habit of eating any food or drinking beverages, with the exception of water, in an unplanned manner and outside established periods for main meals and snacks? If yes, do you consider this a regular habit, as part of your routine at least once a day?" (yes/no)¹⁷.

The anthropometric variables evaluated were weight and height and later it was calculated the BMI. Platform-type mechanical scales, with a maximum capacity of 300 kg and 100 g precision, were used to determine weight. Height measurement was carried by using a stadiometer, coupled to the scales, with a 0.1 cm precision.

Before weight measurements, the scales were calibrated, and then the surveyee was positioned in the center of the scale, in a firm position, barefoot and with the minimum amount of clothes possible, with arms parallel to the body. Weight measurements were verified in the front of the scale¹⁷. It is important to highlight that the examiners participated of preliminary training. They were qualified to correctly carry out the anthropometric evaluation procedure in order to guarantee higher data reliability.

To classify obesity it was used the criteria from the World Health Organization (WHO) as well as from the Brazilian Association of Obesity Study and Metabolic Syndrome (in Portuguese: *Associação Brasileira para o Estudo da Obesidade e da Síndrome Metabólica – Abeso*). It was considered a BMI between 35 and 39.9 kg/m² obesity degree II and ≥ 40.0 kg/m² as degree III^{9,18}. It was also considered the criteria defined by the American Society for Metabolic and Bariatric Surgery (ASMBS), which considers superobesity if the BMI is between 50 and 59.9 kg/m² and super superobesity if the BMI is ≥ 60 kg/m²¹⁹.

Database structure was built using the Epi-info software, version 3.5.3. Data were typed in double entries and only after data validation entry the statistical analysis was carried out using the Stata software, version 8.0.

Because this research is part of a wider study²¹, the number of patients for the study was calculated *a posteriori* through the Epi-Info 6.0 software. It was selected the cross-sectional studies option and the Statcalc tool. The parameters utilized were: 80% power, confidence level 95%. Ex-

position variables considered were "snacking habit" with a 40% prevalence in non-exposed and 1:1 ratio (one exposed to one non-exposed) and weight loss medication use with a 50% prevalence among non-exposed and 1:5 ratio (1 exposed to 5 non-exposed). As a result, it would be necessary 90 patients to analyze the association between medicine and 92 patients to analyse "snacking habit". Thereby the sample size considered was enough to carry out the research.

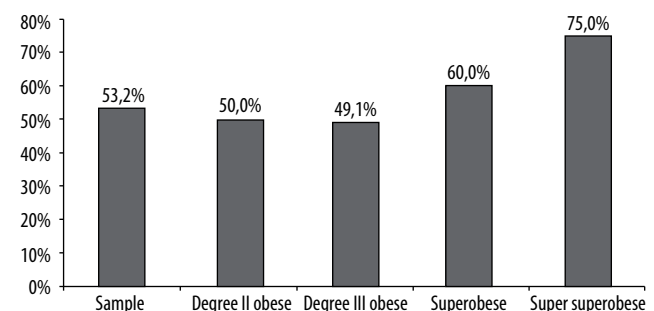
Statistical analysis included BE prevalence and prevalence ratios measurement (PR), with corresponding 95% confidence intervals (CI 95%). Pearson's Chi-Square Test or Fisher's Exact Test were used to verify the association between BE and the studied variables. Variables that presented $p < 0.20$ in bivariate analysis were selected for multivariate analysis through a Poisson regression, with 5% significance level.

This study was approved by the Federal University of Goiás School Hospital Ethics Committee (in Portuguese: *Comitê de Ética do Hospital das Clínicas da Universidade Federal de Goiás – CEP/HC/UFG*).

RESULTS

Ninety-seven female patients were invited to participate of the study. Three of them refused to participate, so the final sample had 94 patients. Patients presented an average age 37.7 ± 10.4 years, average weight 119.2 ± 17.3 kg, average height 1.59 ± 0.1 m, and average BMI 47.4 ± 6.6 kg/m². This way, 10.6% ($n = 10$) were classified as obese individuals degree II, 58.5% ($n = 55$) classified as obese individuals degree III, 26.6% ($n = 25$) as superobese, and 4.3% ($n = 4$) as super superobese.

Binge eating prevalence was 53.2% ($n = 50$). From those 28.7% ($n = 27$) were classified as moderate BE and 24.5% ($n = 23$) as severe BE. When analyzing BE prevalence according to obesity degrees, it was observed a higher BE occurrence in super superobese (75.0%). Although it was not found significant association between BE and obesity degrees ($p = 0.675$) (Figure 1).



Degree II obese = BMI from 35.0 to 39.9 kg/m²; Degree III obese = BMI from 40.0 to 49.9 kg/m²; Superobese = BMI from 50.0 to 59.9 kg/m²; Super superobese = BMI ≥ 60.0 kg/m². $p = 0.675$ (Fisher's exact test).

Figure 1. Binge Eating (BE) prevalence in severe obese women according to obesity degree, at the Severe Obesity Nutrition Ambulatory, Federal University of Goiás School Hospital (ANOG/HC/UFG), 2008-2012 ($n = 94$).

The majority of patients (69.9%) were either married or in a consensual relationship, 51.6% had at least 9 years of schooling, and 43.9% achieved a family income between 1 and 2 minimum wages (Table 1).

The highest BE prevalence was verified in women between 40 and 49 years old (76.2%), with less than 9 years of schooling (60.0%), family income between one and two minimum wages per month (60.0%), obesity onset in their adolescence (60.0%), that had undergone through previous weight loss self-treatment (62.5%), who eat four or more

meals per day (62.0%), and that present "snacking habit" (64.4%). This last variable was the only one that showed significant association ($p = 0.020$) (Table 2).

The current comorbidity that presented highest BE prevalence was dyslipidemia (69.2%). Regarding weight loss medication use, BE frequency in those making use of psychiatric medication was higher in relation to the use of anorexigens. Only one patient reported the use of anxiolytics, but did not present BE. BE was more frequent in sedentary women or in those practicing irregular physical activity (55.8%), in non-

Table 1. Binge Eating (BE) prevalence and brute prevalence ratio according to the following variables: sociodemographical data, obesity clinical history and eating behavior in women at the Severe Obesity Nutrition Ambulatory, Federal University of Goiás School Hospital (ANOG/HC/UFG), 2008-2012 (n = 94)

Variables	n	%	BE prevalence		PR (CI 95%)*	p**
			n	%		
Age						0.082
20-29 years old	24	25.5	13	54.2	1.3 (0.8-2.3)	
30-39 years old	34	36.2	14	41.2	1.0	
40-49 years old	21	22.3	16	76.2	1.8 (1.2-3.0)	
50-59 years old	15	16.0	7	46.7	1.1 (0.6-2.2)	
Marital status ^a						0.981
No partner	28	30.1	15	53.6	1.0	
With partner	65	69.9	35	53.8	1.0 (0.7-1.5)	
Schooling ^a						0.243
< 9 years	45	48.4	27	60.0	1.2 (0.8-1.8)	
≥ 9 years	48	51.6	23	47.9	1.0	
Family income ^b						0.246
< 1 MW	30	33.0	17	56.7	1.5 (0.8-2.8)	
1 a 2 MW	40	43.9	24	60.0	1.6 (0.9-2.9)	
> 2 MW	21	23.1	8	38.1	1.0	
Obesity onset ^b						0.927
Childhood	34	37.3	17	50.0	1.0	
Adolescence	15	16.5	9	60.0	1.2 (0.7-2.0)	
Post-gestational	27	29.7	15	55.6	1.1 (0.7-1.8)	
Adulthood	15	16.5	8	53.3	1.1 (0.6-1.9)	
Obesity in family ^a						0.981
No	28	30.1	15	53.6	1.0 (0.7-1.5)	
Yes	65	69.9	35	53.8	1.0	
Previous weight loss treatments						0.581
Self-treatment	8	8.5	5	62.5	1.2 (0.7-2.1)	
Supervised by health professional	86	91.5	45	52.3	1.0	
Number of meals per day ^c						0.108
< 4 meals/day	42	45.6	19	45.2	1.0	
≥ 4 meals/day	50	54.4	31	62.0	1.4 (0.9-2.0)	
"Snacking habit" ^d						0.020
No	45	50.0	18	40.0	1.0	
Yes	45	50.0	29	64.4	1.6 (1.0-2.4)	

MW = Minimum Wage (R\$ 622,00); ^a n = 93; ^b n = 91; ^c n = 92; ^d n = 90; * PR (CI 95%) = brute prevalence rate and 95% confidence interval; ** Pearson's Chi-Squared Test.

smokers (54.4%), and those who did not consume alcohol (55.0%), but no significant association was observed (Table 2).

Current comorbidity that showed more BE prevalence was dyslipidemia (69.2%). About weight loss medication, BE frequency in those women who used psychiatric medication was bigger when compared to women who used anorexigen medication. Only one patient mentioned using anxiolytics, but did not present BE. BE was more frequent in women that practiced physical activity in an irregular way or were sedentary (55.8%), in those who were non-smokers (54.5%)

and those who did not use alcoholic beverages (55.0%). However, it was not noticed significant association (Table 2).

The variables included in multivariate analysis were: age ($p = 0.082$), number of meals per day ($p = 0.018$), "snacking habit" ($p = 0.020$), and dyslipidemia ($p = 0.185$). Association with BE was maintained only in the age group of 40-49 years old, with BE prevalence twice as higher in relation to the age group of 30-39 years old, as well as with the "snacking habit" with a BE prevalence 1.9 times higher regarding those that did not present this behavior (Table 3).

Table 2. Binge Eating (BE) prevalence and brute prevalence ratio according to health conditions and lifestyle variables in women at the Severe Obesity Nutrition Ambulatory, Federal University of Goiás School Hospital (ANOG/HC/UFG), 2008-2012 (n = 94)

Variables	n	%	BE prevalence		PR (CI 95%)*	p**
			n	%		
Current comorbidities						
Dyslipidemia ^a	13	14.8	9	69.2	1.4 (0.9-2.2)	0.185
GIT disease ^b	20	21.5	8	40.0	0.7 (0.4-1.3)	0.200
Hypertension	47	50.0	26	55.3	1.1 (0.7-1.6)	0.679
Cardiopathies	3	3.2	2	66.7	1.3 (0.5-2.9)	0.999***
Diabetes mellitus	10	10.6	7	70.0	1.4 (0.9-2.2)	0.260
Weight loss medication^b						
Anorexigen	10	10.6	7	70	1.4 (0.9-2.2)	0.260
Psychiatric	8	8.6	5	71.4	1.4 (0.8-2.3)	0.330
Physical activity practice						
Regular	17	18.1	7	41.2	1.0	0.273
Irregular/None	77	81.9	43	55.8	1.4 (0.7-2.5)	
Use of tobacco						
No	77	81.9	42	54.5	1.0	0.576
Yes	17	18.1	8	47.1	0.9 (0.5-1.5)	
Alcoholic beverages consumption^c						
No	80	87.0	44	55.0	1.3 (0.6-2.7)	0.388
Yes	12	13.0	5	41.7	1.0	

GIT = gastrointestinal tract; ^a n = 88; ^b n = 93; ^c n = 92; * PR (CI 95%) = brute prevalence rate and confidence interval 95%; ** Pearson's Chi-Squared Test; *** Fisher's Exact Test.

Table 3. Multivariate analysis and adjusted prevalence rate (PR) between the studied variables and Binge Eating (BE), in women at the Severe Obesity Nutrition Ambulatory, Federal University of Goiás School Hospital (ANOG/HC/UFG), 2008-2012 (n = 94)

Variables	Adjusted PR (CI 95%)*	p**
Age		
20-29 years old	1.5 (0.9-2.7)	0.113
30-39 years old	1.0	
40-49 years old	2.0 (1.2-3.4)	0.011
50-59 years old	1.0 (0.5-2.1)	0.928
Number of meals per day		
< 4 meals/day	1.0	
≥ 4 meals/day	1.1 (0.7-1.7)	0.721
"Snacking habit"		
No	1.0	
Yes	1.9 (1.2-2.9)	0.003
Dyslipidemia		
No	1.0	
Yes	1.5 (0.9-2.3)	0.075

* (CI 95%) = confidence interval 95%; ** Poisson regression – Wald statistics.

DISCUSSION

This study detected a high BE prevalence (53.2%) in women suffering from severe obesity, who sought nutritional treatment at ANOG and part of them were bariatric surgery candidates. High BE prevalence in severe obese individuals was also observed in a study encompassing patients of both genders, in pre-operative bariatric surgery conditions, with 44% prevalence²² and in a research including women in pre-operative bariatric surgery treatment, with 77.3% prevalence²³.

A research that used the same instrument to track BE in obese patients waiting for bariatric surgery observed a 56.7% BE prevalence. From those, 25.4% were considered moderate BE and 31.3% were considered severe BE²⁴. Such a high occurrence of BE was found as well in obese individuals who did not seek weight loss treatment⁶ and among college female students, who did not seek weight loss programs, with 54.5% BE prevalence in those overweight and obese²⁵.

Although the initial hypothesis that BE prevalence would increase along with the obesity degree, the increase observed was not statistically significant, even though it reached 75% among the super superobeses. Several studies have found elevated BE prevalence in obese individuals, although the association with obesity degrees was not assessed^{6,25,26} in the same manner as this study. Only one prospective study in Brazil, evaluated 28 adults who suffered from overweight or obesity, found a higher BE occurrence associated with a higher degree of obesity²⁷. In the current study, there was no association between BE and obesity degrees, which could be due to the patients profile. All patients were severely obese with an average BMI of 47.4 ± 6.6 kg/m², 58.5% presented obesity degree III and 26.6% presented superobesity. Also, the women showed very specific characteristics, such as low education levels (48.4% attended school for less than 9 years), and low family income (43.9% reported income between 1 and 2 minimum wages).

In a population-based transversal-type study carried out with 2097 adults, a BE prevalence of 7.9% was verified, being more prevalent in women (9.6%) and among younger individuals, between 20 and 29 years old (11.0%), with a decreasing trend as age advances²⁶. Another study evaluated 2855 adults and elderlies who often visited shopping malls in five Brazilian cities observed a higher BE prevalence in the female gender (13.0%), and in younger women, between 18 and 40 years old (17.5%)²⁸. Regarding age, the findings mentioned above do not match with this study findings, as the age group presenting higher BE prevalence was 40 to 49 years of age (76.2%), with a BE risk twice as higher regarding women in the age group 30-39 years old. The age group 20-29 years old was not associated with BE. These findings might have occurred due to different characteristics of the study sample, revealing that in women suffering from severe obesity the association with age does not follow the same trend of gen-

eral female population. The association verified between BE and the age group 40-49 years old raises the hypothesis of a relationship with menopause, as the age group is concomitant to this process. Women in menopause show a higher prevalence of anxiety²⁹, which could cause the beginning of eating disorders.

The "snacking habit" is a frequent eating pattern in obese patients submitted to surgical techniques with gastric restrictions¹². Especially after the first six months post-operatory, this behaviour is observed as it is impossible for patients to eat excessive amounts of food, and then they usually develop a "snacking behavior"¹². This habit is a factor that prevents adherence to dietotherapeutic treatment and presents as consequences unsatisfactory weight loss and difficulty in maintaining weight loss¹². Research carried out with post-operative bariatric surgery patients have found the prevalence of "snacking habit" between 37.0%³⁰ and 44.0%³¹. However, the few existing research that assessed this behaviour in severely obese individuals within the pre-operative period found prevalence between 26.4%³² and 19.5%³³.

Results presented by this research are worrying, as 50% of severe obese patients presented "snacking habit" before undergoing bariatric surgery, which is a percentage higher than observed in other studies. This "snacking habit" could compromise weight loss both while preparing for the surgery as well as after the surgery. This study is, to the best of the authors' knowledge and after systematic reviews, the only study that analyzes the association between BE and "snacking habit" in Brazilian women with severe obesity, candidates to bariatric surgery. The "snacking habit" affected 64.4% of those women with BE, and was significantly associated even after multivariate analysis. Thereby these findings are relevant and contribute to scientific knowledge in the field.

The primary hypothesis is that eating impulsivity can occur because of very restrictive diets and/or frustrations caused by unsuccessful and slow treatments. Satisfactory weight loss and its maintenance require a longer time than what is expected by the patient, which are factors that could also contribute for the occurrence of BE and "snacking habit". This highlights the relevance of a multidisciplinary team in severe obesity treatment, with the participation of psychologists, psychiatrists and nutritionists, reinforcing the several questions involved in "snacking habit" and binge eating.

The fact that BES is a tracking instrument and not a diagnosis instrument could be cited as this research limitation; however this point was discussed in the methodology section. BES is an easy analysis and low cost questionnaire; it is also useful to analyze BE occurrence but not to diagnose BED. However, BES, as BE a tracking instrument in severely obese individuals is useful to clinical support as well as to nutritional treatment. It can also increase obese patients comprehension of their own situation and, therefore, optimize intervention strategies.

A high prevalence of binge eating was observed in severely obese women, with a statistically significant association with the age group 40-49 years old as well as with "snacking habit". The association between BE and "snacking habit" is an important finding and can contribute to evaluation development, monitoring and treatment strategies for severely obese individuals. Research on BE and "snacking habit" must be part of severely obese individuals anamnesis, candidates or not for bariatric surgery, during pre- and post-operative periods. The goal is to increase effectiveness in the pondered loss treatment, in the adoption of more healthy eating habits, and also when forwarding a patient to psychiatrist binge eating disorder diagnosis and treatment.

INDIVIDUAL CONTRIBUTIONS

All authors contributed significantly in the conception and design of the study, analysis and interpretation of data; also contributed to the drafting of the article, critical revision of intellectual content and approved the final version to be published.

CONFLICTS OF INTEREST

No conflicts of interest between authors.

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