

PREVALENCE OF BINGE EATING AND ASSESSMENT OF FOOD CONSUMPTION IN PEOPLE WITH EXCESS WEIGHT

Prevalência de compulsão alimentar periódica e avaliação do consumo alimentar de indivíduos com excesso de peso

Prevalencia de compulsión alimentaria periódica y valoración del consumo alimentario de individuos con exceso de peso

Original Article

ABSTRACT

Objective: To determine the prevalence of binge eating and assess food consumption in individuals with excess weight. **Methods:** This is an observational cross-sectional study conducted with patients with BMI equal to or greater than 25kg/m², aged 20 to 59 years, attending two Family Health Care Centers in the heart of the city of Quixeré, Ceará. The sample comprised 100 people. An interview was carried out in order to screen for binge eating. Participants answered a questionnaire on socioeconomic aspects, underwent anthropometric (weight, height) assessment, and food consumption was assessed based on two dietary recalls. **Results:** Among respondents, 3% were diagnosed with severe BE, 20% with moderate BE and 77% did not have Binge Eating. Patients with higher degrees of BE presented greater excess weight, which was not statistically significant ($p=0.257$). Respondents with moderate and severe binge eating, when compared to those without BE, presented a greater and unbalanced food consumption in terms of quality of food consumption; however, this was not significant (p ranging from 0.171 to 0.567). **Conclusion:** One third of participants had some degree of binge eating, which was not related to changes in nutritional status, although participants with moderate and severe binge eating showed a dietary pattern with more calories and less fiber.

Descriptors: Compulsive Behavior; Obesity; Food Consumption.

RESUMO

Objetivo: Verificar a prevalência de compulsão alimentar periódica e avaliar o consumo alimentar de indivíduos com excesso de peso. **Métodos:** Trata-se de um estudo observacional, de caráter transversal, realizado com pacientes com IMC igual ou superior a 25Kg/m², pertencentes à faixa etária de 20 a 59 anos, atendidos nas duas Unidades de Saúde da Família do centro da cidade de Quixeré-CE. A amostra consistiu de 100 pessoas. Foi realizada uma entrevista para triagem da compulsão alimentar periódica. Os participantes responderam a um questionário sobre aspectos socioeconômicos, foram submetidos a uma avaliação antropométrica (peso, altura) e a ingestão alimentar foi avaliada com base em dois recordatórios alimentares. **Resultados:** Entre os entrevistados, 3% foram diagnosticados com CAP grave, 20% com CAP moderada e 77% não tinham Compulsão Alimentar Periódica. Pacientes com graus mais elevados de CAP apresentaram-se com maior excesso ponderal ($p=0,03$). Os entrevistados com a compulsão moderada e grave, em comparação àqueles sem CAP, mostraram ter um consumo alimentar maior e em desequilíbrio, em se tratando de qualidade de consumo alimentar, para calorias e fibras ($p=0,000$ e $p=0,047$, respectivamente). **Conclusão:** Um terço dos participantes apresentou algum grau de compulsão alimentar, relacionado com alteração de estado nutricional, destacando que os participantes com compulsão alimentar periódica moderada e grave apresentaram um padrão alimentar com mais calorias e menos fibra.

Descritores: Comportamento Compulsivo; Obesidade; Consumo de Alimentos.

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RESUMEN

Objetivo: Verificar la prevalencia de compulsión alimentaria periódica (CAP) y valorar el consumo alimentario de individuos con exceso de peso. **Métodos:** Se trata de un estudio observacional, de carácter transversal realizado con pacientes con el IMC igual o mayor que 25Kg/m² en la franja de edad entre 20 y 59 años asistidos en las dos Unidades de Salud de la Familia del centro de la ciudad de Quixeré-Ceará. La muestra consistió de 100 personas. Se realizó una entrevista para selección de la compulsión alimentaria periódica. Los participantes contestaron a una encuesta sobre los aspectos socioeconómicos y participaron de una evaluación antropométrica (peso, altura) y la ingesta de alimentos fue valorada basándose en dos recordatorios de alimentos. **Resultados:** El 3% de los entrevistados recibió el diagnóstico de CAP grave, el 20% de CAP moderada y el 77% no presentaron Compulsión Alimentaria Periódica. Los pacientes con grados más elevados de CAP presentaron más exceso ponderal estadísticamente no significativo ($p=0,257$). Los entrevistados con compulsión de moderada a grave comparados a los sin CAP, presentaron mayor consumo de alimentos y en desequilibrio respecto la calidad del consumo de alimentos pero no significativo (variación de p entre 0,171 y 0,567). **Conclusión:** Un tercio de los participantes presentó algún grado de compulsión alimentaria sin relación con la alteración del estado nutricional aunque los participantes con compulsión alimentaria periódica moderada y grave presentaron un patrón alimentario con más calorías y menos fibras.

Descriptor: Conducta Compulsiva; Obesidad; Consumo de Alimentos.

INTRODUCTION

Obesity is a multifactorial chronic disease that represents a risk factor for several other morbidities. It is determined by the association of several factors, including organic, genetic, environmental, cultural, and lifestyle factors such as food and physical inactivity⁽¹⁾.

In recent years, this disease has become focus of academic study among researchers due to the alarming increase in overweight and obese individuals, especially in developed countries⁽¹⁾.

In addition to being frequently associated with physical and metabolic diseases, obesity is directly related to inadequate food intake and physical inactivity, which result in a positive energy balance – energy intake is greater than energy expenditure – and hence lead to obesity^(2,3). It should be said that in addition to maintaining body weight, regular physical activity also contributes to the prevention of cardiovascular and osteoarticular diseases and to the control of blood pressure and cholesterol levels⁽⁴⁾.

Inadequate food intake consists mainly of excessive consumption of simple sugars, saturated fats and proteins and low fiber intake. Inadequate food intake due to the occurrence of Binge Eating (BE) or Binge Eating Disorder (BED) is also included among the causes of obesity. The first refers to eating, within a 2-hour period, an amount of food that is larger than what most people would eat in a similar period of time and under similar circumstances and is associated with a sense of lack of control over eating. In order to be characterized as a disorder (BED), it is necessary that – in addition to BE criteria – the episode has occurred at least two days a week in the last six months and is associated with a sense of loss of control without compensatory behavior for weight loss^(5,6).

The prevalence of binge eating may range from 1.5% to 5% in the general population with or without excess weight. Among individuals undergoing clinical treatment for weight loss, the prevalence varies from 5 to 30%⁽⁷⁾. Regarding BED, a study shows a prevalence of 2% in the general population and 30% in obese patients undergoing treatment⁽⁷⁾. Another study suggests a prevalence of 3% in the population and 7.5%-46% in obese individuals⁽⁸⁾. In Brazil, 15% to 22% of patients seeking weight loss treatment are estimated to have BED. Among patients who undergo weight loss surgery, the disorder can affect 56% of the individuals⁽⁹⁾.

Thus, given the evidence of a significant prevalence of BE and BED in the overweight or obese population and that excess weight may lead to health complications, the present study was carried out at the Family Health Care Centers of the city of Quixeré, Ceará. The choice of these facilities was due to the fact that they are empirically shown to serve a large number of individuals with excess weight or associated comorbidities such as hypertension and diabetes. Additionally, there are even specific days for the care of this population group.

The relevance of the present study lies in the fact that once binge eating is identified in the population assessed, health managers of the municipality will be able to intervene by encouraging the adoption of a healthy lifestyle in order to prevent excess weight gain and obesity-related complications and, therefore, improve people's quality of life.

Given that, the present study aimed to determine the prevalence of binge eating and assess food consumption in individuals with excess weight.

METHODS

This is an observational cross-sectional study conducted with patients with Body Mass Index (BMI) equal to or greater than 25Kg/m², aged 20-59 years⁽¹⁰⁾ without

any diagnoses that could influence weight gain attending two Family Health Care Centers in the heart of the city of Quixeré, Ceará. The research took place in the period from October 2014 to March 2015 and data were collected during the morning and afternoon.

The sample was obtained using data provided by the coordination board of the Family Health Care Centers. The sample size was determined considering a margin of error of 5% and a population size of 3,086 individuals, which resulted in a value corresponding to 100 patients⁽¹¹⁾.

Patients were screened for BE during interviews using the Binge Eating Scale (BES)⁽¹²⁾. A researcher-developed questionnaire was also used to obtain personal data on the interviewee, anthropometric and socioeconomic data, as well as information on diseases that could lead to weight gain and on physical activity. Two 24-hour dietary recalls were also used, as they are considered gold standard instruments to estimate habitual dietary intake if applied on a serial manner on non-consecutive days, including one weekend day. These instruments allowed to quantify the amount of food and beverages consumed the day before its application using cooking measurements⁽¹³⁾.

Anthropometric data were collected as recommended by the literature⁽¹⁴⁾. Thus, body weight was measured with interviewees on barefoot on a Balmak[®] digital platform scale with a capacity of 200 kg and accuracy of 100 grams. Height was measured using an MD HealthCare[®] compact stadiometer with measurements in millimeters. The measurement was carried out with patients standing upright and barefoot with their feet together and heels against the wall staring at the horizon. Data on weight and height were used for BMI calculation and the nutritional status of individuals was categorized based on the cut-off points established by the World Health Organization^(14,15).

Data were collected in cooking measurements using dietary recalls and were then converted into grams⁽¹⁶⁾ in order to assess nutritional composition⁽¹⁷⁾. The habitual intake of calories and nutrients corresponded to the mean values obtained by each individual in the two dietary recalls used.

Data analysis was performed using mean and standard deviation to describe continuous variables. Categorical variables were described using absolute and relative frequencies in numbers and percentages. With the aid of SPSS version 20, Student's t test was used to compare BMI and nutrient intake means among interviewees according to BE diagnosis. The significance level was set at $p < 0.05$.

The present study was submitted to the Research Ethics Committee of the Federal Institute of Education, Science

and Technology of Ceará (*Instituto Federal de Educação, Ciências e Tecnologia do Ceará*), Fortaleza Campus, and it complied with Resolution No. 466/12 of the National Health Council (*Conselho Nacional de Saúde – CNS*) on research involving human beings. It was approved under Opinion No. 787.817.

RESULTS

The sample comprised 100 people, mostly women (76.00%, $n=76$). The age ranged 21 to 59 years, with a predominance of individuals aged 30 to 49 years – 62.00% ($n=62$) (mean 41.12 ± 10.40 years). It was also observed that physical activity was more common among women (36.84%, $n=28$) than men (25%, $n=6$), as shown in Table I.

Participants presented a mean monthly income of R\$ $906.32 \pm R\$ 1021.99$, and most individuals (64.00%, $n=64$) reported receiving less than 1 minimum wage. Regarding nutritional status, the majority of the interviewees (58.00%, $n=58$) were overweight, with a mean BMI of 30.00 ± 3.80 kg/m². This finding was confirmed when the analysis was carried out according to gender – 60.53% ($n=46$) of the women and 50.00% ($n=12$) of the men were overweight.

Of the total participants, 3.00% ($n=3$) were diagnosed with severe BE, 20.00% ($n=20$) presented moderate BE and 77.00% ($n=77$) did not present episodes of Binge Eating. Of the individuals who presented severe BE, 66.67% ($n=2$) were overweight and 33.33% ($n=1$) were class I obese. There was a prevalence of individuals without BE in all the categories of nutritional status investigated, except in class II obese patients, as 66.67% ($n=4$) of them presented moderate BE (Table II).

Table II shows that the mean BMI values were higher among interviewees with moderate and severe BE – 31.91 ± 4.17 and 29.92 ± 1.69 , respectively – when compared to those without BE ($p=0.03$).

With regard to food consumption, 66.67% ($n=2$) of the interviewees with severe BE and 70% ($n=14$) of those with moderate BE reported consuming more than 2,000 Kcal/day. On the other hand, the interviewees without BE presented lower caloric intake as 48.05% ($n=37$) of them consumed less than 1,500 Kcal/day.

The analysis of the dietary recalls (Table III) showed that the majority of the individuals without BE (87.01%, $n=67$), those with moderate BE (85%, $n=17$) and all the individuals with severe BE presented a lipid intake within the recommended levels. However, mean values of lipid intake in relation to TCV were higher among individuals with moderate (28.28 ± 7.79) and severe (27.94 ± 4.81) BE when compared to the general population (26.88 ± 7.07).

Table I - Description of sociodemographic profile, nutritional status, and lifestyle of excess weight individuals. Quixeré, Ceará, 2015.

Variables	Gender				Total N	Total %	Mean	SD
	Male		Female					
	n	%	n	%				
Age (Years)								
<30	4	16.67	10	13.16	14	14.00		
≥30 to <50	15	62.50	47	61.84	62	62.00	41.12	10.40
≥50	5	20.83	19	25.00	24	24.00		
Income								
≤1 minimum wage	7	29.17	57	75.00	64	64.00		
1 to 2 minimum wages	10	41.67	14	18.42	24	24.00	906.32	1021.99
>2 minimum wages	7	29.17	5	6.58	12	12.00		
Physical Activity								
Yes	6	25.00	28	36.84	34	34.00	-	-
No	18	75.00	48	63.16	66	66.00		
Nutritional Status#								
Overweight	12	50.00	46	60.53	58	58.00		
Class I obesity	9	37.50	22	28.95	31	31.00	30.00*	3.80*
Class II obesity	2	8.33	4	5.26	6	6.00		
Class III obesity	1	4.17	4	5.26	5	5.00		
Total	24	100.00	76	100.00	100	100.00		

*Calculated based on Body Mass Index (IMC). SD: standard deviation.

Table II - Distribution of excess weight individuals according to diagnosis of binge eating (BE). Quixeré, Ceará, 2015.

BE	Excess weight								Total n	Total %	Mean#	SD
	Overweight		Class I Obesity		Class II Obesity		Class III Obesity					
	n	%	n	%	n	%	n	%				
No BE	47	81.03	24	77.42	2	33.33	4	80.00	77	77.00	29.51	3.59
Moderate	9	15.52	6	19.35	4	66.67	1	20.00	20	20.00	31.91	4.17
Severe	2	3.45	1	3.23	0	0.00	0	0.00	3	3.00	29.92	1.69
Total	58	100	31	100	6	100	5	100	100	100	-	-

#Calculated based on BMI. BE: Binge Eating. SD: Standard deviation.

*p<0.05 when comparing mean weight values in each BE group (p=0.030).

Regarding the intake of carbohydrates, most of the interviewees presented an intake within the recommended limits, as described in table III. However, when it comes to daily fiber intake, a large proportion of people consumed less than 20g/day: individuals with moderate and severe BE – 70.00% (n=14) and 66.67% (n=2), respectively –

and those without the presence of Binge Eating episodes – 83.12% (n=64).

The mean values of calorie (p=0.000) and fiber (p=0.047) intake differed between individuals with and without BE. However, lipids and carbohydrates intake did not differ in relation to the TCV (p=0.305 and p=0.503, respectively).

Table III - Food consumption in individuals according to diagnosis of binge eating (BE). Quixeré, Ceará, 2015.

Food Consumption	BE						Total	Mean	SD	Pp	
	No BE		Moderate		Severe						
	n	%	n	%	n	%					
Calories (Kcal)											
<1,500	37	48.05	2	10.00	1	33.33	40	40.00			0.001
1,500 to 2,000	25	32.47	4	20.00	0	0.00	29	29.00	1.771.0	644.48	
>2,000	15	19.48	14	70.00	2	66.67	31	31.00			
Mean	1609.90		2345.55		2076.13						
SD	535.91		687.50		602.30						
Lipids#											
<10%	2	2.60	0	0.00	0	0.00	2	2.00			0.305
10-35%	67	87.01	17	85.00	3	100.00	87	87.00	26.8	7.07	
>35%	8	10.39	3	15.00	0	0.00	11	11.00			
Mean	26.47		28.26		27.94						
SD	6.89		7.79		4.81						
Carbohydrates#											
< 45%	5	6.49	3.00	15.00	0	0.00	8	8.00			0.503
45-65%	65	84.42	14.00	70.00	3	100.00	82	82.00	54.97	7.79	
>65%	7	9.09	3.00	15.00	0	0.00	10	10.00			
Mean	55.27		53.58		56.44						
SD	7.65		8.53		4.26						
Fibers											
<20g	64	83.12	14.00	70.00	2	66.67	80	80.00			0.047
20-30g	13	16.88	4.00	20.00	1	33.33	18	18.00	15.10	5.86	
>30g	0	0.00	2.00	10.00	0	0.00	2	2.00			
Mean	14.37		17.73		16.28						
SD	5.43		6.86		3.51						
Total	77	100	20	100	3	100	100	100	-	-	

BE: Binge Eating, SD: Standard deviation. #obtained considering the Total Caloric Value (TCV).

DISCUSSION

Before starting the discussions about the results found, it is necessary to remember that BE consists in eating an amount of food that is larger than what most people would eat within two hours, being associated with a sense of lack of control over eating. If episodes have occurred at least two days a week in the last six months and is associated with a sense of loss of control without compensatory behavior for weight loss, it is characterized as BED^(5,6). It should be noted that the findings of the present study are compared to those of studies on BED as there are still few national and international studies addressing binge eating as the main theme.

The present study comprised mainly women with a mean age of 41.12 years. These data are similar to those found in a study that analyzed the potential relationship

between the occurrence of Appetite Disorder and Binge Eating Disorder. The study was carried out with patients referred to the Endocrinology Outpatient Clinic of the *Hospital das Clínicas* of Porto Alegre⁽¹⁸⁾ and its results showed that 78.80% of the patients were women and presented a mean age of 44.50 years.

A study carried out with individuals aged 20 to 59 years from urban areas of Feira de Santana, Bahia⁽¹⁹⁾ aimed to estimate the prevalence of behaviors associated with eating disorders (Bulimia nervosa and BED) and found that 73.5% of the interviewees were women. This fact may be explained by women's concern with body image, which makes them vulnerable to the development of such disorder.

Regarding monthly personal income, there was a predominance of people who received less than one minimum wage per month. About this issue, it has been verified that individuals of lower socioeconomic status

can have their physical and mental well-being affected⁽²⁰⁾, leading to insecurity and stress, which can in turn intensify the frequency of episodes of binge eating.

A review study that analyzed Latin American studies conducted with individuals presenting with disorders and who met the criteria for BED according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)⁽²¹⁾ found that the mean BMI value among the participants of the studies analyzed corresponded to 30.1 kg/m², which is close to the value found in the present study. Regarding this issue, other studies have observed that individuals with a diagnosis of obesity are more susceptible to the development of compulsive episodes when compared to those at normal weight⁽¹⁹⁾.

In fact, it is known that the prevalence of BED is higher in individuals with a higher BMI as its presence has been associated with increased adiposity⁽²²⁾.

The literature has described that people diagnosed with moderate and severe BE have more severe degrees of excess weight, as identified by the BMI. The present study particularly found a prevalence of absence of BE in all categories of nutritional status, except in individuals with class II obesity, most of whom presented moderate BE. Thus, these facts may suggest that the presence of BE or BED may contribute to excess weight. It should be noted that the differences in the mean BMI values according to the presence or absence of BE were significant in the present study.

Regarding the relationship between BE and obesity, a study that aimed to assess quality of life, body image and body satisfaction in obese patients and their association with Binge Eating Disorder found that the presence of the disorder is associated with more severe obesity and greater weight variation. In addition, obese binge eaters presented an eating pattern that was characteristic of and specific to this class of patients⁽²³⁾.

Some authors suggest that BED may be associated with dietary restrictions arising from concerns that may develop in future binge eating episodes. In the present study, individuals diagnosed with moderate and severe BE predominantly consumed more than 2,000 Kcal/day (70% and 66.67%, respectively) and presented higher mean values of energy intake compared to those without BE. These results are similar to those found by a study conducted with 110 patients, of both genders and aged 18 to 59 years, with morbid obesity⁽²⁴⁾. In such study, the author noted that all the research participants followed a diet with more than 1,500 Kcal/day, suggesting, therefore, that binge eating is not associated with dietary restrictions, but with a high-energy intake that may be a result from frequent binge eating episodes.

According to the panel on Dietary Reference Intakes (DRI)⁽²⁵⁾, the ideal carbohydrate intake should be between 50% and 60% of the Total Caloric Value (TCV). Such intake is adequate among participants with and without BE. However, fiber intake, which should be 20g to 30g/day, was predominantly below 20g per day among participants with and without BE, although it was lower in patients with BE. This homogeneity in the consumption profile may characterize the dietary pattern of excess weight individuals, as detected in a previous study⁽²⁶⁾ that aimed to determine the relationship between nutritional status and dietary intake in patients treated at a clinic in Ipatinga, Minas Gerais. Such research showed that the mean fiber intake of adults aged 19 to 59 years is 18.2g among overweight individuals and 14.38g among obese individuals, suggesting that this may be a result of a diet rich in refined cereals and poor in fruits, vegetables and whole grains.

Research conducted with 158 Costa Rican adults aged 20 to 64 years and whose BMI was greater than 25 kg/m²⁽²⁷⁾ found that participants presented an inadequate dietary intake and ate foods high in fat and simple carbohydrates during binge eating episodes, which explains the lack of fibers in patients' diet. Another study that aimed to analyze signs of binge eating in 50 patients undergoing weight loss surgery⁽²⁸⁾ showed that obese binge eaters presented a higher consumption of foods rich in sugar and fat when compared to those without BE.

As for lipids, the recommended intake is 10% to 35% of the TCV⁽²⁵⁾. Individuals with moderate and severe BE presented a mean intake within the recommended values. However, the mean values, whose differences were not statistically significant, were slightly higher when compared to the total population studied. This finding may be due to the higher caloric intake in participants with such a diagnosis and may suggest the existence of a causal relationship between binge eating and inadequate nutrient intake.

A study carried out with patients aged 20 to 65 years attending the Nutrition Assessment Laboratory (*Laboratório de Avaliação Nutricional – LAN*) of the Paulista University (*Universidade Paulista*), located in Araçatuba, São Paulo⁽²⁹⁾, found carbohydrate intake values that are similar to those of the present study, which are within the recommended levels. On the other hand, individuals with moderate and severe BE consumed a lower amount of lipids in grams compared to those without BE. The opposite was observed when considering lipid intake in relation to the total calories consumed, but it was not statistically confirmed here. The lack of statistical significance may be due to the fact that the number of individuals diagnosed with BE was much smaller than that of individuals without BE. However, considering the profile of lipid intake in grams to the detriment of

statistical analysis, the lower lipid consumption among individuals with BE may have resulted from the omission of the actual consumption by individuals diagnosed with BE, which may have underestimated the actual consumption.

Thus, it can be noted that patients with higher degrees of obesity presented a higher prevalence of moderate and severe BE. It is also noted that the same individuals consume higher amounts of food than the majority of people, which can be exemplified by the higher caloric intake. They also follow an unbalanced diet in terms of macronutrients as they present with a higher intake of lipids compared to the interviewees with lower BMI levels.

Some limitations have been identified in the present research. For instance, the target population was reluctant to participate as it would take a long time for the research to be completed. It was also observed that most people did not feel comfortable about the issue, which often led to the omission of answers. In addition, there are still few studies available on BE, even outside Brazil.

Further studies should be carried out using larger samples in order to obtain more reliable analyses. They should also assess the association between the occurrence of binge eating and the submission or absence of submission, in previous moments, to methods for inducing weight loss, checking whether this could be a reason for the individual to develop binge eating.

In order not to neglect the 23% of the sample diagnosed with BE, it should be said that the treatment may require multidisciplinary follow-up – by psychotherapists, nutritionists and physical educators, for example. Knowing that obesity is a multifactorial physical condition, the treatment of binge eating will certainly bring benefits to controlling the disease given that the excessive consumption of calories is a major cause of obesity.

CONCLUSION

One third of the participants presented some degree of binge eating related to altered nutritional status. Additionally, the participants with moderate and severe binge eating presented a low-fiber and energy-dense dietary pattern.

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