Original article

Prevalence of binge eating in female university students in different fields of knowledge

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INTRODUCTION

Binge eating (BE) is the eating behavior characterized by the intake of a great amount of food in a limited period of time (up to 2 hours), followed by a feeling of losing control over what or how much one eats.[1-5]

When the BE episodes occur at least 2 days a week over a 6-month period, associated with some characteristics of loss of control, and are not followed by compensatory behaviors oriented to losing weight, recent studies indicate the presence of a syndrome called binge eating disorder (BED).[2,3,6-10] Nevertheless, it should be highlighted that this status does not have a defined diagnosis and is described in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) as an unspecified eating disorder (ED); therefore, more studies are needed to clarify this situation.[11]

The association between body image and BE is not entirely clear. In a clinical sample of women characterized as obese, those with BE do not differ from the women who do not have it in a selective silhouette procedure, used to obtain measures of the estimated current body size or the ideal (desired) body size.[12] Nonetheless, in another sample, obese women with BE reported more body dissatisfaction and evaluated their appearance more negatively than those without BE.[13]

An epidemiological study demonstrated an increase in the incidence of ED concomitant with the redefinition of the female beauty standard towards a body that is always thinner.[14] The beauty standard promoted by communication means and by the social relationship seems to have a striking effect on women. The media production around an esthetic standard seems to be, at the same time, an expression and determination of social representations about the feminine beauty, which act as a reinforcement element for the eating restriction.

The transition from adolescence to adulthood, a life cycle stage in which great part of university students are, implies individual and social tasks, such as defining a career, choosing sexual partners and lifestyles. This population is thus particularly vulnerable to current models and social representations, whether manifesting it by adherence or opposition.

The social reinforcement performed by the family, friends and the media on adolescents and young female adults in order to have a thin body is related to the presence of indicative symptoms of ED and predicts the onset of such symptoms in this population.[15]

Several studies have found an association between overweight or obesity and the presence of BE, showing values ranging from 15 to 63% in obese women who seek weight reduction programs.[2,3,5,16-19]

The present study aimed to investigate the prevalence of BE among female university students in different fields of study (exact sciences, health and humanities) and its association with body mass index (BMI) and age.

METHODOLOGY

The surveyed population consisted of university students of a private institution in the city of São Leopoldo (Brazil). To select the sample, we obtained from the enrolment department the number of female students enrolled in the second semester of 2003 in three areas (exact sciences, health and humanities), in a total of 8,477 students. The analysis according to field of study was proposed considering the initial hypothesis that women who study or work in the health field present more incidence of disorders in the eating behavior. Of the total students enrolled, 2,455 belonged to the humanities (Letters, Communication, Philosophy, Law), 4,706 to the health field (Nutrition, Psychology, Nursing, Physical Education, Biology) and 1,946 to the exact sciences (Mathematics, Engineering, Architecture). The sample calculation was based on the prevalence of BE in the general population of 5%,[20,21] considering a 95% confidence interval and 80% statistical power. Therefore, we reached a necessary sample of 187 university students in the humanities, 193 in the health field and 184 in the exact sciences.

Using a random process, for 6 weeks from October to November 2003, five nutrition students went to the classrooms of the different courses and requested permission to the professor to hand out the questionnaire to the students, with an average time of 10 minutes. It was a self-report

questionnaire that contained the questions of the periodic BE scale. Height and weight data were provided by the study subjects. The instrument used to evaluate BE was the Binge Eating Scale (BES), which was translated and validated into Portuguese.[3] Besides the 16 questions that were part of the BES, another question was added to evaluate the student's perception with regard to the occurrence of moments of excessive food intake in a short period of time. If the student answered yes, there was an option to report the frequency: once a month, twice a month, once a week, twice or more times a week.

To evaluate the association between weight and age in the occurrence of BE, the BMI was used, which is obtained by dividing the weight (kilograms) by the height (meters). Overweight/obesity was considered for those with BMI higher than or equal to 25 kg/m², according to the parameters suggested by the World Health Organization.[22]

Statistical analysis

For data analysis, the chi-square test was used to evaluate the association between the presence of BE, BMI and age; the Student's *t* test was also used to evaluate the average of the BE score according to the BMI and age; the Spearman test was used to correlate weight, BMI and age with the BE score. The ANOVA test was used to compare the age average, BMI average and BE score average between the three fields of study. The statistical significance level was established in 5% ($p < 0.05$).

The data were inserted in the Epi-Info software, version 6.4, with double data entry and validation. The analyses were performed using the software SPSS, version 11.0.

RESULTS

At the end of the data collection, 578 university students participated in the study, but 86 questionnaires were not considered. Of these, 85.9% were not considered due to inadequacy (a question with no response, erasures, absence of anthropometric data or age). We observed that all

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these invalid questionnaires belonged to the students of humanities and exact sciences. The other losses (14.1%) were due to lack of identification of the field of study and due to the exclusion of a questionnaire related to the only university student over 60 years, in a total of 491 participants and 15% of losses. Age ranged from 17 to 55 years.

Of the surveyed university students, 18.1% presented BE. The prevalence of BMI higher than or equal to 25 kg/m² was 11.4%, and the percentage of students aged less than or equal to 20 years was 24.2% (table 1).

Table 1 - Distribution of female university students according to the field of study, age, BMI and BE

	n	%
Field of study		
Humanities	121	24.6
Health	220	44.8
Exact sciences	150	30.6
Age		
ß 20	119	24.2
> 20	372	75.8
BMI		
< 18.5	44	9.0
18.5-24.9	392	79.8
≥ 25	55	11.4
PBE		
Without PBE	402	81.9
Moderate PBE	62	12.6
Severe PBE	27	5.5

PBE = periodic binge eating; BMI = body mass index.

The evaluation of age frequency, nutritional state according to the BMI cut-off points and the presence of BE showed no statistical difference between the three fields of study (table 2).

Table 2 - Distribution of age group, nutritional state and presence of PBE among the female university students of different fields of study

	Exact sciences		Health		Humanities		p
	n	%	n	%	n	%	
Age							
ß 20	41	27.5	31	25.4	47	21.4	0.384
> 20	108	72.5	91	74.6	173	78.6	
BMI							
< 18.5	15	10.0	8	6.6	21	9.5	0.285
18.5-24.9	120	80.0	94	77.7	178	80.9	
≥ 25.0	15	10.0	19	15.7	21	9.5	
PBE							
With PBE	28	18.7	25	20.7	36	16.4	0.602
Without PBE	122	81.3	96	79.3	184	83.6	

PBE = periodic binge eating; BMI = body mass index.

By analyzing the three fields, we observed that the mean age of the students in the humanities was significantly higher than the students in the exact sciences (p = 0.00). Performing the same analysis, there was no difference between the BMI average and the different fields of study.

The average of the sum of the BE score of students with BMI equal to or higher than 25 kg/m² was 18.3 ± 10.3, statistically higher when compared with the group with BMI lower than 25 25 kg/m², which was 9.9 ± 7.2. We observed a statistically significant association (p < 0,001) between the variables BMI and BE, once 54.5% of the female university students with overweight or obesity had BE, whereas the same only occurred for 13.4% of those with BMI lower than 25 kg/m² (table 3).

Table 3 - Influence of the nutritional state and age group of female university students in the occurrence of PBE

	Without PBE		With PBE	
	n	**%**	**n**	**%**
BMI (p = 0.000)				
< 25	376	86.6	58	13.4
≥ 25	25	45.5	30	54.5
Age (p = 0.499)				
ß 20	95	79.83	24	20.2
> 20	307	85.5	65	17.5

PBE = periodic binge eating; BMI = body mass index.

With regard to the variables age and BE in the general group, there were no statistically significant associations. There were differences between the fields of study; in the health field, students with less age showed greater frequency of PBE ($p < 0.01$), and in the humanities, more aged students presented lower frequency of PBE ($p < 0.05$).

The averages of the sum of the BE score related to ages less than 20 years (11.1 ± 7.8) or more than 20 years ($10,8 \pm 8,1$) did not show statistically significant differences in the general group; however, we observed that, in the humanities, the averages were 8.5 ± 5.4 and 13 ± 9.3, respectively ($p < 0.01$).

The analysis of the additional question, related to the feeling of loss of control over the food intake, showed that 14.2% of female university students who answered they lost control over food intake reported a frequency of twice or more times a week. Of those who presented BE, 36% reported the same frequency, with a statistically significant result when compared to those who did not present BE ($p < 0.01$).

DISCUSSION

The present study used a self-report questionnaire, which was validated for Portuguese, to evaluate the presence of BE.[3] Despite the measurements of weight and height not having been verified when the study was carried out, but reported by the students, which could be considered a limiting factor for the data reliability, a study performed with 1,157 men and women, aged between 15-64 years, showed that there is an association between the self-reported weight and the weight measured by the researchers.[23] Another aspect that should be stressed as limitation was the divergence in the proportions of losses between the fields of study, once the students of humanities and exact sciences seem to have had less understanding or involvement with the objective of the study. It is also possible that there might have occurred a higher adherence of the students of these fields who identified themselves with the problem, thus establishing a selection bias, which could have increased the prevalence of PBE in this group and avoided the confirmation of the initial hypothesis that female university students in the health field present a higher prevalence of BE.

The prevalence of BE episodes among the female university students was 18%, higher than the values found in previous studies. The first epidemiological studies using properly diagnosed patients, according to specific diagnostic criteria for BE and comparing samples of patients who sought treatment to lose weight with samples of the general population, indicated that 30% of patients who sought treatment to lose weight presented BE episodes, whereas 2-5% of the general population had the diagnostic criteria for these episodes.[20,21]

It is important to consider that this prevalence included men and women, therefore it is not comparable to our sample, which was composed only of women, as well as of a group belonging to a different socioeconomic level. A study[24] carried out with American university students of different ethnic groups, using the Eating Attitudes Test (EAT-26), showed that the prevalence of risk for ED was higher in females. The higher prevalence of ED in females and occupational groups (models, actresses, athletes, nutritionists) can be explained due to the demand of a lighter image. It is still not clear whether the environment has a triggering influence or whether the people with a

predisposition to develop ED tend to seek such activities.[14,15,16,25] In our study, we did not confirm the hypothesis that female university students in the health field (Nursing, Psychology and Nutrition) present a higher prevalence of BE episodes when compared to students in the exact sciences and humanities.

It should be highlighted that this study investigated the presence of periodic BE that was not considered an ED diagnosis, limiting the comparisons with other studies. Another limitation of this study is the use of a self-report questionnaire, once the diagnostic rates may present distortions. Further clinical evaluations of risk and non-risk groups are needed to confirm the results.

The studies that investigated the association between overweight and presence of BE were carried out with women who seek weight reduction programs, showing frequencies ranging from 15 to 63%.[2,3,5,16,18,19,26,27] The results of this study confirm the strong association between BE and women who present BMI higher than 25 kg/m² among university students.

Women with BE eat in the proportion of their body size.[9] A study performed with 143 female students, with mean age of 22 years, aiming to assess the relation between different social situations and specific eating behaviors verified that patients with BE disorder ate more in all situations, without considering the type of social situation involved. The comparison between obese with or without BE showed that the first group presented an earlier development of obesity and dietary behavior, as well as higher weight fluctuations.[28]

A study carried out in the city of São Paulo (Brazil) with 217 women who were taking part in a weight reduction program, aged between 15-59 years (BMI > 25 kg/m²), showed that the BE was often reported. The women with BE presented a significantly higher BMI, several attempts to lose weight and weight fluctuation, depression and alexithymia (difficulty to express affection), compared to women without BE. This shows that BE is not unusual among Brazilian women with overweight. Similarly to American and European women, it is associated with a higher prevalence of symptoms or mental disorders.[5] A study performed using the EAT-26 and the Bulimic Investigatory Test, Edinburgh (BITE) in women aged between 12 and 29 years, in the urban area of

Porto Alegre, Brazil, showed that more than 2/3 of women with normal BMI would like to reduce their weight or feel fat. There was a difference in the eating behavior according to the self-perception of body weight – more than 60% of women with normal BMI, but who felt fat, presented a risk or abnormal eating behavior.[29]

It was demonstrated that BE episodes have an early onset, usually during childhood and adolescence, and that the behavior of going on a diet starts after the eating attacks, associated with a greater concern with body shape and history of several previous treatments for weight control.[6,21] The higher frequency of BE among female university students in the health field, aged less than or equal to 20 years, corroborates these findings; however, the inverse result found in the humanities requires investigations of etiological factors that might make this process clear.

Based on the results discussed here, it is evident that the population of university students can be a focus of studies that provide more information about the determinants of eating behavior disorders and actions to minimize the suffering associated with them. Therefore, we suggest new investigations of the associations of the approaches reviewed in this article, which should evaluate age, BMI, BE, psychic suffering and relations of gender in the Brazilian female population concomitantly. The instrument used in this study – BES – proved to be useful and easy to apply for more comprehensive epidemiological studies, with the aim to identify risk individuals.

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ABSTRACT

Introduction: *Binge eating (BE) among women has been regarded as a risk factor for the diagnosis of more severe eating disorders. The present study aimed to investigate the prevalence of BE among female university students and its association with body mass index (BMI) and age.*

Material and methods: *The study evaluated 491 female university students aged between 17 and 55 years in three fields of knowledge (exact sciences, health and humanities) at the Universidade do Vale do Rio dos Sinos (Unisinos), located in São Leopoldo (Brazil). A self-*

administered questionnaire was used to evaluate BE frequency on the Binge Eating Scale (BES). Height and weight data were provided by study subjects.

Results: *Prevalence of BE among the students was 18.1%. Frequency of BMI ≥ 25 kg/m^2 was 11.4%, of which 75.8% were over 20 years old. Significant association was found between BMI and BE in the general group, since 54.5% of the overweight and obese students presented BE ($p < 0.001$). Age was not associated with BE. Students in the health field with age ≤ 20 years showed greater frequency of BE ($p < 0.05$), whereas this result was reversed in the humanities ($p < 0.05$).*

Conclusion: *The self-administered questionnaire revealed a high prevalence of BE among female university students and an association with overweight. Further investigations are necessary to confirm the results and evaluate the presence of other eating disorders.*

Keywords: *Eating disorders, binge eating, gender.*

Title: *Prevalence of binge eating in female university students in different fields of knowledge*

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