Applied nutritional investigation

Psychopathological correlates of eating behavior among Portuguese undergraduate students

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ABSTRACT

Objectives: The aim of this study was to explore the relationships between eating behavior dimensions and psychopathological symptoms among Portuguese undergraduate students.
Methods: We studied 258 participants (62.4% women) regarding eating behavior dimensions (emotional, external and binge eating, flexible and rigid control of eating behavior, and eating self-efficacy), psychopathological distress (as assessed by the Brief Symptom Inventory), and body mass index. In addition to studying bivariate associations between eating behavior dimensions and psychopathological subscales and indexes, we conducted a novel analytical approach, considering simultaneously the effects of the overall level of psychopathological distress and the relevance of specific symptoms on the eating behavior dimensions.
Results: Emotional, external, and binge eating had positive correlations with psychopathological symptomatology, whereas eating self-efficacy was negatively associated.
Conclusions: Multivariate analysis showed that the overall level of psychopathological distress (combined with body mass index, among women) had a larger effect on eating behavior than the relevance of specific symptoms.

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Introduction

Eating behavior is a multidimensional construct that refers to quantitative and qualitative features of the selection and decision of what foods to eat [1]. Three commonly assessed dimensions of eating behavior are emotional eating, external eating, and dietary restraint. Emotional eating corresponds to the tendency to overeat as an inappropriate response to negative emotions and distress [2–4]; external eating refers to eating in response to external food-related cues [2,4]; and dietary restraint implies conscious attempts to reduce food intake to control body weight [2,4]. Restrained eating may lead to eating disinhibition, as the organism cannot discriminate between restraint and low food availability [1,4–7]. Westenhoefer [8] distinguished two types of restriction: rigid and flexible control. Rigid control is characterized by dichotomous attitudes regarding which foods to exclude and is related to higher disinhibition and higher food consumption after preload. Flexible control corresponds to a less strict restriction, therefore being associated with lower disinhibition [1,9]. Binge eating is mainly characterized by the consumption of large amounts of food in brief periods of time and a sense of lack of control during those episodes [10,11].

Although not formally an eating behavior dimension, eating self-efficacy is a key construct to be assessed simultaneously with eating behavior dimensions. Self-efficacy refers to the beliefs in the ability to organize and implement the action plans needed to achieve a certain result and the feeling of control over the behaviors and environment [12], being specific for each task or domain, as for example, eating self-efficacy [12–14]. It determines the initiation, maintenance, and cessation of strategies or behaviors [15,16], being a good predictor of eating behavior [17,18].

Eating disorders are associated to psychological impairment [10,19–23], but to our knowledge, few works have studied the

relationships between psychopathologic symptoms and eating behavior dimensions. Moreover, most works have studied obese females' samples with focus on binge eating. To our knowledge, no previous research has studied the relationships of all the referred eating behavior dimensions with psychopathologic symptoms in a nonclinical sample. Knowing the relationships between eating behavior and psychopathology, even if at subclinical levels, may be helpful to improve prevention strategies and clinical approaches. In particular, it will allow earlier referencing and diagnosis of individuals prone to develop eating disorders. Assuming that even subclinical psychopathological distress is related with eating behavior, we hypothesize that psychopathological measures will be positively associated with emotional, external, and binge eating, and negatively with eating self-efficacy. Previous findings indicate distinct patterns of dietary restraint between females and males [24]; hence, we expect to find sex-specific associations with psychopathologic symptoms. Moreover, there are sex differences in eating behavior [2,20,24–28]; this indicates that analysis concerning these relationships should be performed separately for females and males.

In this context, the main aim of the present study was to examine the relationships between eating behavior dimensions and psychopathological symptoms among a nonclinical sample of undergraduate Portuguese students for each sex. We also aimed to explore results from a different analytical approach, considering simultaneously the effects of the overall level of psychopathological distress and the relevance of specific symptoms on eating behavior. Given the association of body mass index (BMI) with eating behavior [4,24,29–31], we included it in both bivariate and multivariate analyses.

Methods

Sample

This study was conducted with a convenience sample of Portuguese higher education students. The inclusion criteria were age between 18 and 27 y and absence of dependency conditions that could constrain free and informed decision making regarding participation. Students >27 y of age were excluded to reduce sociodemographic heterogeneity. Potential participants with complete or incomplete academic training in the areas of nutrition and dietetics were not included, and only students attending undergraduate or integrated master degrees were considered.

The sample size was determined by statistical power analysis. Considering a 95% confidence level, for a sample size of 85 individuals, a correlation >0.3 would be significant with 80% power. We approached 394 students, from which 32 (8.1%) refused to participate. Data from 104 participants (28.7%) were not analyzed due to incompleteness of the questionnaires. Hence, we analyzed data from 258 participants, of which 161 (62.4%) were women (Fig. 1). The larger proportion of women is consistent with the distribution by sex in Portuguese higher education students [32]. The statistical analysis was done separately for the subsamples of women and men.

Procedure

We conducted the study according to the Declaration of Helsinki and it was approved by the ethics committee of Centro Hospitalar de São João, E.P.E. (Porto, Portugal). Data was collected between February and July 2012. Before data collection, all procedures were standardized, namely regarding answers to possible queries. Students were invited to participate in classrooms or university corridors. We provided a written document with the study's conditions of participation, aims, and overall description. After clarifying doubts, we obtained written informed consent from those students willing to participate. Participants then answered a sociodemographic and anthropometric questionnaire where they reported their sex, age, education, height, and current weight (without shoes and clothing). From the self-reported values, BMI was calculated as weight (kg) divided by the square of height (m). Finally, the participants answered questionnaires assessing eating behavior dimensions and psychopathologic symptoms. All questionnaires were self-administered in a written format, in the presence of one of the investigators responsible for the research.

Measures

Emotional and external eating were assessed using the Dutch Eating Behaviour Questionnaire (DEBQ) [33]. The DEBQ is composed of 33 items forming three scales; given the different features and relationships with disinhibition of the two types of dietary restraint [1,8,9], the DEBQ's restraint scale was not used, as we considered separately the flexible and rigid control of eating behavior. Both the emotional eating (13 items) and the external eating (10 items) scales showed good internal consistency in the Portuguese version of DEBQ (Cronbach's α = 0.94 and 0.81, respectively) [28].

The flexible and rigid control of eating behavior were measured with the subscales proposed by Westenhoefer et al. [34], adapted and validated for Portuguese adults [26]. The Portuguese version of these subscales comprised 11 and 14 items, respectively, and showed acceptable internal consistency in the general population and higher education students' samples (Cronbach's α between 0.75 and 0.82).

To assess binge-eating severity, we adapted the Brazilian Portuguese version of the Binge Eating Scale (BES) [35,36], composed of 16 items. After the present study began, a European Portuguese version was published [37]. Both Portuguese versions have similar formulation of items and show good internal consistency [37,38] (Cronbach's α = 0.87 and 0.89, respectively).

The General Eating Self-Efficacy Scale (GESES) [39] was used to measure eating self-efficacy. GESES is a recently developed five-item scale that has shown to be a valid and reliable instrument to measure general features of eating self-efficacy (Cronbach's α > 0.85).

The Portuguese version of the Brief Symptom Inventory (BSI) [40,41], a short version of the Symptom Checklist 90 (SCL-90-R) [42], was used to measure psychopathologic symptoms. Its 53 items measure symptom intensity (rate of occurrence) on a Likert scale ranging from 0 (*not at all*) to 4 (*extremely*). The BSI has nine different subscales (Somatization, Obsessive-compulsive, Interpersonal sensitivity, Depression, Anxiety, Hostility, Phobic anxiety, Paranoid ideation, and Psychoticism) as well as three global psychological distress indexes [41]: The Global Severity Index (GSI; mean value of all the items), the Positive Symptoms Total (PST; number of items scored 1 or higher), and the Positive Symptoms Distress Index (PSD; mean value of positive symptoms).

Statistical analysis

Descriptive statistics included frequencies (n; %), and medians and percentiles (P25; P75). Normality was assessed using skewness and kurtosis. Before the
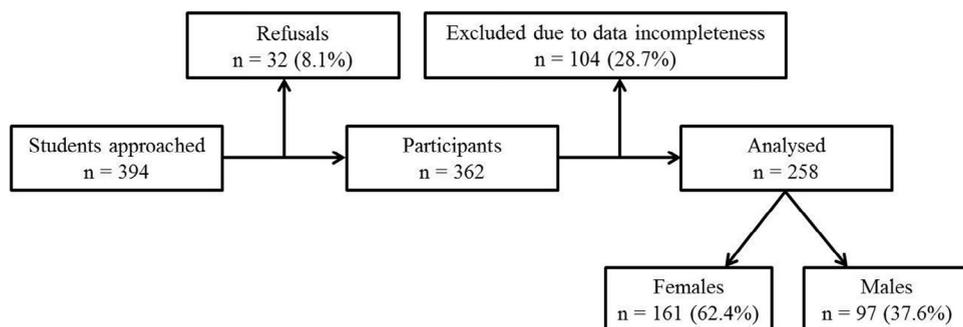

Fig. 1. Sample's flowchart.