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DIETARY RESTRAINT: ADAPTATION AND VALIDATION OF THE FLEXIBLE AND RIGID CONTROL OF EATING BEHAVIOUR SUBSCALES

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1. Introduction

Dietary restraint behaviour implies conscious attempts to reduce food intake in order to control body weight (Herman & Mack, 1975). Nevertheless, restrained eating is not clearly associated with lower body weight. The most commonly referred mechanisms to explain this are based on the discrepancy between the intention to restrain are restrictive eating behaviour, as well as in the maintenance of the restrictive behaviour (Stice et al., 2004, 2007, 2010).

The association between dietary restraint and weight may be further clarified by considering different characteristics of eating behaviour control. Westenhoefer (1991) has distinguished two types of restriction: flexible and rigid control of eating behaviour. Rigid control (RC) involves dichotomous attitudes regarding which foods to exclude, and is related to higher disinhibition and higher food consumption after preload. The self-imposed norms that define flexible control (FC) are less strict, and therefore associated to lower disinhibition (Timko & Perone, 2005; Viana, 2002; Westenhoefer et al., 1994). Based on this distinction,

Westenhoefer et al. (1999) developed the subscales of FC and RC of eating behaviour. The association between RC and disinhibition does not discard the relevance of considering both these dimensions, as shown by Gallant et al. (2010) when studying their effect on BMI.

To our knowledge there are no instruments validated for the Portuguese population to assess these two types of restraint. Therefore, our aim was to adapt and validate the FC and RC subscales proposed by Westenhoefer et al. (1999) for the Portuguese adult population and to analyse the relationship of the two types of control with socio-demographic and anthropometric variables. A more broad and comprehensive description of the work in which this communication was based is contained in Poínhos et al. (2013).

2. Sample and methods

The psychometric proprieties of the subscales were studied a convenience sample from the general population (heterogeneous regarding age and education) and another composed by higher education students (homogeneous regarding those characteristics). All the participants were 18 years-old or more, and the inclusion criteria for the higher education students' sample also included not being above 27 years old. Individuals with academic training in Nutrition or Dietetics were not included in any of the samples.

A total of 251 individuals from the general population and 351 students were invited to participate, and the participation rates were of 97.2% and 74.6%, respectively. Some participants were further excluded due to incompleteness of data (n = 13 and n = 5, respectively in the general population and students' samples).

The analysis was conducted using data from 231 participants from the general population sample (51.9% females; age: mean = 42.1 years, SD = 14,3; education: mean = 11.4 years; SD = 4.2; BMI: mean, 25,2 kg/m^2, SD = 4,0) and 257 students (50.6% females; age: 20.5 years, SD = 2.0; BMI: mean = 22,3 kg/m^2 , SD = 3,4).

The FC and RC subscales were comprised, respectively, by 12 and 16 items (identified throughout the text as FCxx or RCxx). Nine items of the FC subscale and 11 from the RC subscale were answered as "True" ou "False", while the remaining were answered in 4 points

Likert-like scales. One or two of the answers (respectively for True/ False or Likert-like items) items received 1 point, and the score of each subscale was computed as the sum of its items. Higher scores in each scale correspond to higher restraint.

The adaptation of the subscales' items involved the translation from English to Portuguese (including, when needed, their cultural adaptation), and back translation into English. The comparison between the original and back translated versions was then made by a bilingual individual with a degree in Nutrition Sciences and items with discrepancies between versions were reviewed.

The internal consistency of the subscales was assessed using Cronbach's alpha. The subscales were submitted to factorial analysis through principal component extraction. The factorial analysis models were analysed through the scree plots method (Cattell, 1966). Pearson's correlation coefficient was used to measure the association between pairs of variables, and student's t test to compare independent samples' means. Multiple linear regression models (forward stepwise method) were computed to predict BMI based on FC and RC levels. Results were considered statistically significant when $p < 0.05$.

3. Results

Initial Cronbach's alpha values for the two subscales were between 0.740 and 0.804. Despite reduced increase in the values of Cronbach's alpha, the low item-total corrected correlations (between 0.034 and 0.112) suggest the exclusion of the items FC09 and RC06. Following the factorial analysis, the scree plots method suggests a one-factor solution for the FC subscale, but two factors for RC. The associations between the items and the principal components extracted show that FC09 and RC06 also present the lowest correlation with the first component of their respective subscale. Moreover, in both samples, the item RC09 showed a higher association with the second component than with the first, suggesting its exclusion.

After exclusion of these items, both subscales showed unifactorial structure and acceptable internal consistency in any of the samples (Cronbach's alpha between 0.750 and 0.817). The two subscales present a moderate association (general population: $r = 0.705$, $p < 0.001$; students: $r = 0.676$ e $p < 0.001$).

Women present higher levels of both types of control than men (FC general population: 6.0 ± 2.9 vs. 4.3 ± 3.1; FC students: 5.7 ± 2.9 vs. 4.0 ± 2.2; RC general population: 6.0 ± 3.2 vs. 3.9 ± 2.7; RC students: 4.8 ± 3.1 vs. 3.6 ± 2.7; results in mean ± SD, with $p < 0.001$ for all comparisons).

The study of the relationships with age, education and BMI was made separately for men and women. As the higher education students' sample was homogeneous regarding age and education, the associations with these variables was only studied in the general population sample. Age was positively associated with FC among men ($r = 0.218$, $p = 0.021$), whereas education was positively associated among women with both FC ($r = 0.227$, $p = 0.013$) and RC ($r = 0.278$, $p = 0.002$).

Both types of restraint were positively associated with BMI, but only in the students' sample (FC females: $r = 0.240$, $p = 0.006$; FC males: $r = 0.225$, $p = 0.011$; RC females: $r = 0.253$, $p = 0.004$; RC males: $r = 0.380$; $p < 0.001$). Analysing the multiple linear regression models, we verified that in the students' sample only RC significantly predicted BMI, while in the general population's sample none of the restraint types showed a significant effect.

4. Discussion

The present study supplies an instrument to assess FC and RC of eating behaviour adapted to the Portuguese population. Both subscales showed acceptable reliability, and present a unifactorial structure in both samples. The final version of the subscales may be found in Poínhos et al. (2013).

The association between the two subscales is in line with the original study (Westenhoefer et al., 1999), as well as studies in samples with different characteristics (Masheb & Grilo, 2002; Shearin et al., 1994; Stewart et al., 2002). Higher levels of both types of restraint among females were also reported previously (Timko & Perone, 2005; Westenhoefer et al., 1999). Regarding the relationships with BMI, we highlight that the association between FC and BMI was found only when the two subscales were studied separately, but not when analysed together, suggesting that it may be due to the association between the two dimensions.

The relations of the FC and RC subscales with socio-demographic variables and BMI will be useful to plan future research and public health interventions.

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