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Short communication

Psychometric evaluation of the Disordered Eating Attitude Scale (DEAS). English version☆

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ABSTRACT

Eating attitudes are defined as beliefs, thoughts, feelings, behaviors and relationship with food. They could influence people's food choices and their health status. *Objective*: This study aimed to adapt from Portuguese to English the Disordered Eating Attitude Scale (DEAS) and evaluate its validity and reliability. The original scale in Portuguese was translated and adapted into English and was applied to female university students of University of Minnesota—USA ($n = 224$). Internal consistency was determined (Cronbach's Alpha). Convergent validity was assessed by correlations between Eating Attitude Test-26 (EAT-26) and Restrain Scale (RS). Reliability was evaluated applying twice the scale to a sub-sample ($n = 30$). The scale was back translated into Portuguese and compared with the original version and discrepancies were not found. The internal consistency was .76. The DEAS total score was significantly associated with EAT-26 ($r = 0.65$) and RS ($r = 0.69$) scores. The correlation between test–retest was $r = 0.9$. The English version of DEAS showed appropriate internal consistency, convergent validity and test–retest reliability and will be useful to assess eating attitudes in different population groups in English spoken countries.

Introduction

Eating attitudes measurement can be useful to understand people's relationship with food and their associated behavioral choices. It is believed that different attitudes toward food may have an effect on overall health and contribute to cultural differences in non-transmissible diseases (Roininen et al., 2001; Rozin, Fischler, Imada, Sarubin, & Wrzesniewski, 1999). Therefore, assessing eating attitudes can be helpful in the psychology and nutrition fields.

The assessment of eating attitudes is done traditionally in the field of eating disorders (ED) with questionnaires developed with focus on ED symptoms (Garner, Olmested, Bohr, & Garfinkel, 1982; Garner, Olmested, & Polivy, 1983; Herman & Mack, 1975; Stunkard & Messick, 1985; Van Strien, Frijters, Van Staveren, Defares, & Deurenberg, 1986). Besides these instruments, others evaluate eating attitudes outside the ED scenario and all of them focus on specific points of eating attitudes but they do not focus on general feelings, beliefs about food and eating, and people's relationship with food (Aikman, Crites, & Fabrigan, 2006; Bell & Marshall, 2003; Martins & Pliner, 1998; Pliner & Hobden, 1992; Steptoe, Pollard, & Wardle, 1995). Therefore, Alvarenga, Scagliusi and Philippi (2010) developed the Disordered Eating Attitude Scale (DEAS), using eating attitudes as a construct involving beliefs, thoughts, feelings, behaviors and relationship with food. This scale could be used for evaluation of clinical and non-clinical populations since many people experience distorted eating habits, beliefs and feelings toward food. The original scale was evaluated psychometrically and considered cohesive and valid (Alvarenga et al., 2010).

Since the scale was developed and evaluated in Portuguese, it will be important to evaluate its psychometric properties in other languages in order to perform comparative studies in different countries, cultures, groups, ethnicities, age groups or clinical populations. The objective of this study was to translate the DEAS from Portuguese to English and assess its internal consistency, convergent validity and test–retest reliability.

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Methods

In order to ensure its translation accuracy, the Portuguese version of DEAS was independently translated to English by two dieticians fluent in Portuguese and English; then compared and reconciled with each other also by an English as a second language instructor to create the final English version of DEAS. This final version was then independently back translated for Portuguese by another dietician fluent in English and Portuguese and compared with the original version. No discrepancies were found.

The DEAS comprises 25 questions with Likert responses, and is summed to create a score ranging from 37 to 190. The higher the score, the worse is the attitude. The scale was validated with Brazilian female undergraduate university students and the internal consistency found was 0.75. An exploratory factor analysis was conducted and it was found that DEAS includes five subscales: 1—relationship with food; 2—concerns about eating and body weight gain; 3—restrictive and compensatory practices; 4—feelings toward eating; and 5—idea of normal eating. The complete scale in Portuguese and English could be found in the article about its development and validity (Alvarenga et al., 2010).

For the English version, subjects were undergraduate female students ($n = 224$) aged 18 to 45 from Pharmacy and Nursing programs at the University of Minnesota. The groups of students were invited to participate in person during class or by email through their professors. Students were given the survey website and a brief explanation about the study and that their choice in participation would not negatively affect their grade in class. Subjects answered the survey in the website which also included questions about age, self-reported body weight and height, annual income and level of education of the head of the family. Nutritional status was classified according to body mass index (BMI) categories as defined by the World Health Organization (World Health Organization, 2006).

The instrument's internal consistency was determined using Cronbach's Alpha. To evaluate the reliability of the scale, it was applied twice, over a one-month interval, on a sub-sample of students ($n = 30$). The Spearman's correlation coefficient (r) was used to compare the test and retest scores.

To analyze the scale's convergent validity its score was correlated with the score of the Eating Attitude Test-26 (Garner et al., 1982) and the Restraint Scale (Herman & Mack, 1975) – which are questionnaires of specific domains of eating attitudes – using the Spearman's correlation coefficient (r). These scales were chosen to asses the convergent validity of the original DEAS since they measure different dimensions of eating attitudes and have already been validated in Portuguese. A statistically significant, positive correlation between the DEAS and each of the two comparative scales would provide evidence of validity. In order to establish a more precise understanding of the convergent validity of the DEAS, an analysis was performed with the total score and the scores of the subscales.

Statistical analyses were conducted using SPSS 12.0 (Statistical Package for Social Science Inc., Chicago, IL, USA). The significance level was 0.05.

The research was performed online using SurveyMonkeycom. The online survey contained information about how to contact the researchers, in addition to the survey questions. The Institutional Review Board at the University of Minnesota approved the study protocol.

Results

Table 1 shows the profile of the participating subjects. When nutritional status was assessed using the BMI, most subjects (72%; $n = 152$) were at normal range, 17% ($n = 37$) were overweight, 7% ($n = 15$) were obese and 3% ($n = 7$) were underweight.

Table 1
Characteristics of female university students ($n = 224$), the Disordered Eating Attitude Scale (DEAS) – total score and subscales, the Eating Attitude test – EAT-26, and Restraint Scale – RS – who participated in the evaluation.

Characteristics	Mean ± standard deviation (median; range)
Age (years)	23.87 ± 4.01 (23; 18–45)
Weight (kg)	64.43 ± 11.50 (62.5; 44.5–127.3)
Height (m)	1.66 ± 0.07 (1.68; 1.50–1.95)
Body Mass Index (kg/m^2)	23.35 ± 3.95 (22.54; 16.5–44.0)
DEAS total score	75.30 ± 16.83 (72.0; 49–152)
Subscale 1	22.34 ± 8.70 (19; 12–53)
Subscale 2	7.73 ± 3.20 (7; 4–19)
Subscale 3	7.25 ± 4.09 (6; 4–20)
Subscale 4	4.11 ± 2.22 (3;3–15)
Subscale 5	33.88 ± 6.43 (34; 20–60)
EAT	8.59 ± 8.82 (6.0; 0–40)
RS	12.05 ± 6.78 (10.0; 1–39)

For their individual annual income it was found that 85% ($n = 191$) answered less than U$25,000; 6% ($n = 13$) between U$25,000 and 49,999; 1% ($n = 2$) between U$50,000 and 74,999; 1% ($n = 2$) between U$75,000 and 999,999; 1% ($n = 2$) more than U$100,000 and 6% ($n = 14$) prefer not to answer. Related to education of head of household; 14% ($n = 32$) of students answered high school/GED (General Educational Development); 12% ($n = 27$) two year college; 45% ($n = 100$) four year college; 20% ($n = 46$) graduate (Master) and 8% ($n = 19$) graduate (PhD).

The internal consistency of the DEAS English version was 0.76, indicating an acceptable level. The DEAS total score and its subscales scores, as the EAT-26 and RS scores, are shown on Table 1. Table 2 shows the correlation between DEAS total score and five subscales scores with the RS and with the EAT-26. DEAS total score positively correlate with RS and EAT-26. Subscales 1 to 3 presented significant positive correlations with RS and EAT-26; subscale 4 presented a weak, but significant positive correlation with RS but not with EAT; and subscale 5 presented a weak significant positive correlation with EAT-26 but not with RS.

Independent t-test showed no difference regarding mean age, weight, height and BMI between the total students group and the students that participated on the retest (data not shown). The first time the scale was applied to the students the mean score was 75.3. On the retest, the mean score was 73.0 (SD 17.14; median 69; range 51–125). The test–retest Spearman correlation coefficient was $r = 0.9$ ($p < 0.0001$), indicating high reliability.

Discussion

A psychometric evaluation of the English version of DEAS was performed and concluded that the validity of the DEAS original scale in Portuguese was similar to that of the English version.

The results of the convergent analysis concluded that DEAS total score converged with RS and EAT-26 and were one more time

Table 2
Spearman Correlation Coefficients (SCC) of the Disordered Eating Attitude Scale (DEAS) total score and subscales (1–5) with the Restraint Scale (RS) and the Eating Attitude Test (EAT-26).

Subscales	SCC with RS (p value)	SCC with EAT-26 (p value)
DEAS total score	0.69 (<0.0001)	0.65 (<0.0001)
(1) Relationship with food	0.69 (0.0001)	0.66 (0.0001)
(2) Concern with food and weight gain	0.58 (0.0001)	0.70 (0.0001)
(3) Restrictive and compensatory practices	0.48 (0.0001)	0.43 (0.0001)
(4) Feeling toward eating	0.13 (0.053)	0.73 (0.275)
(5) Idea of normal eating	0.18 (0.06)	0.16 (0.012)