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Original article

Does body dissatisfaction have the same meaning for males and females? A measurement invariance study



L'insatisfaction des hommes et des femmes à propos du corps a-t-elle la même signification? Une étude de l'invariance de la mesure

P. Elosua*, D. Hermosilla

University of the Basque Country, Spain

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ABSTRACT

Objectives. – The aim of this study was to assess the psychometric equivalence of body dissatisfaction (BD) between males and females.

Method. – Two scales, BD and Drive to Thinness (DT), from the Eating Disorder Inventory-3 were evaluated. The sample was comprised of 1616 adolescent males and 1429 adolescent females. Factorial invariance across gender of two scales was assessed in order to evaluate the equivalence of scores.

Results. – The results showed full invariance for the DT scale items, and partial invariance for BD scale items. The content analysis of the items confirmed that items related to the perception of thighs, stomach and hips showed differential functioning across gender.

Conclusions. – Different representation of the BD construct between males and females was concluded, and caution was recommended in assessing and interpreting BD in male samples with questionnaires designed for women.

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R É S U M É

Le but de cette étude était d'évaluer l'équivalence psychométrique entre hommes et femmes concernant l'insatisfaction à propos du corps.

Méthode. – Deux échelles, celle d'insatisfaction à propos du corps et celle de la recherche de minceur, qui composent l'inventaire Eating Disorder Inventory-3, ont été évaluées. L'échantillon était composé de 3045 adolescents (1429 filles). L'invariance factorielle de ces deux échelles selon le sexe a été étudiée dans le but d'évaluer l'équivalence des mesures.

Résultats. – Les résultats ont montré une invariance complète pour l'échelle de recherche de minceur et une invariance partielle pour l'échelle d'insatisfaction à propos du corps. L'analyse du contenu des items confirme que les éléments liés à la perception des cuisses, du ventre et des hanches font l'objet de différences selon le sexe.

Conclusions. – On a trouvé des différences dans la représentation de la construction de l'insatisfaction à propos du corps en fonction du sexe des sujets. La prudence est donc recommandée dans l'évaluation et l'interprétation de l'insatisfaction corporelle dans les échantillons masculins avec des questionnaires conçus pour les femmes.

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Although studies on eating disorders and related risk factors for body dissatisfaction (BD) have traditionally focused on women (Cohen, 2006; Stice, Nathan, & Durant, 2011; Woodside et al., 2001), recent epidemiology and community studies have reported on the

incidence and prevalence of both disorders in the male population (Heinberg & Kraft, 2007). The European Study of the Epidemiology of Mental Disorders (ESEMED; Preti et al., 2009) found that lifetime prevalence of anorexia nervosa, bulimia nervosa and binge eating is 1.22% for males and 3.73% for females. In a review of epidemiology studies conducted in the United States and Europe, Hoek and van Hoeken (2003) reported the prevalence rate of anorexia nervosa of eight per 100,000 in young women and one per 100,000 in men. As

* Corresponding author. Avda. Tolosa, 70, 20018 San Sebastian.
 E-mail address: Paula.elosua@ehu.es (P. Elosua).

for BD, the data for the female population revealed a prevalence of more than 50% in the female population and more than 35% in the male population (Al Sabbah et al., 2009).

The relationship between BD and eating disorders is strong; there is evidence that BD represents a risk factor for the development of eating disorders (Becker, Diedrich, Jankowski, & Werchan, 2013; Leon, Fulkerson, Perri & Cudek, 1993; Phelps, Johnston, & Augustyniak, 1999; Polivy & Herman, 2002; Stice et al., 2011; Thompson, Coovert, & Storner, 1999). Therefore, weight and shape concerns are required for a diagnosis of anorexia nervosa and bulimia nervosa in both the International Classification of Diseases, 10th Revision and Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) systems.

Although the general definition of BD, a negative, subjective evaluation of one's physical body (Cho & Lee, 2013; Muth & Cash, 1997), is applicable to both sexes, its representation should be qualified with reference to each.

Concerns about weight are associated with female and male BD (Bully & Elosua, 2011; Cohane & Pope, 2001; Jones & Crawford, 2005; Ricciardelly & McCabe, 2004); however, in assessing BD in the male population the desire to develop muscularity is becoming increasingly relevant (Jones & Crawford, 2005; Labre, 2002; Ricciardelly & McCabe, 2004; Rodgers, Ganchou, Franko, & Chabrol, 2012). If weight and muscular build are distinct aspects of BD for males, and weight is the main concern for females, the construct representation of BD is different across gender.

Taking into account the differences in the configuration of BD, gender-specific questionnaires have been designed. Questionnaires for the female population measure body perception and the drive to thinness (DT). Included are the Eating Disorder Inventory-3 risk scales (Garner, 1991, 2004), the Body Shape Questionnaire (Pook, Tuschén-Caffier, & Brähler, 2006) and the Body Attitude Test (Probsta, Vandereyckenc, van Coppenolleb, & Vanderlindend, 1995). Given the prominence of the drive for muscularity among males, specific scales have been constructed based on this particular dimension of BD: Drive for Muscularity Scale (McCreary & Sasse, 2000), Drive for Muscularity Attitude Questionnaire (Morrison, Morrison, Hopkins, & Rowan, 2004), YT-DMS Drive for Muscularity Scale (Yelland & Tiggemann, 2003), Male Body Attitudes Scale (Tylka, Bergeron, & Schwartz, 2005). Questionnaires have also been designed to evaluate BD in both sexes. Clear examples of this group are The Body Appreciation Scale (Avalos, Tylka, & Wood-Barcalow, 2005) and The Multidimensional Body-Self Relation Questionnaire (Cash, Winstead, & Janda, 1986).

Despite the range of possibilities for assessing BD in males, it is not unusual to use questionnaires originally constructed for the female population. Many studies have used the BD and DT scales of the Eating Disorder Inventory-3 for gender comparison (Bully & Elosua, 2011; Cho y Lee, 2013; Rodgers et al., 2012; Smolak & Murner, 2008; Tod, Hall, & Edwards, 2012). But if the BD construct is different between sexes, it would not be correct to use the same assessment measurement instrument.

Several authors have underscored the need to study the dimensional structure of BD self-report measures when used with males (Carlat & Camargo, 1991), but there is no systematic research on this topic. Spillane, Boerner, Anderson and Smith (2004) conducted a factorial equivalence study of the scales of the Eating Disorder Inventory-2 (Garner, 1991) between males and females. Two of them are directly related to BD. The authors tested the equality of factor loadings and factor variances for each of the scales and concluded factorial equivalence across gender. However, they parceled items, a practice which can prove problematic in assessing factorial equivalence, since differences between groups can be masked when parcels are used as indicators for tests of metric invariance (Meade & Kriustalis, 2005). Rusticus and Hubley (2006) examined factorial invariance in the Multidimensional Body-Self Relation

Questionnaire. The authors found gender differences in the questionnaire, which was originally constructed for use in male and female populations.

Under the hypothesis that the gender comparison in BD is only methodologically valid if the structure of the test is assumed to be equivalent, the need to analyze the equivalence/non-equivalence between test-structures across potentially different groups is evident. This psychometric approach adds empirical evidences about the construct representation of the BD in males and females. Factorial invariance based methodology is applied to evaluate the internal equivalence of the scales across gender. Measurement equivalence or invariance is satisfied across groups (i.e., language, race, cultural, gender, etc.) if persons with the same level of proficiency on the latent variable (measured variable) have the same expected raw score in the observed variable at the item or test score level. In this context, the aim of this study was to assess the equivalence of the internal structure of BD and DT scales between males and females. The scales belong to Eating Disorder Inventory-3 (Garner, 2004), which is the latest version of the most widely used questionnaire in the framework of eating disorders (Garner, 1991, 2004) and BD.

1. Method

1.1. Participants

The sample consisted of 1429 adolescent females and 1616 adolescent males coming from a non-clinical population. The age distribution of the participants ranged from 14 to 18 years ($M_{\text{females}} = 15.42$; $SD = 1.23$; $M_{\text{males}} = 15.53$; $SD = 1.26$). The official Spanish version of the EDI-3 was used in this study which was approved by the Ministry of Science. The scales were administered to students at the primary, secondary, and university level by personnel trained specifically for this purpose. The parents or guardians of participating minors were informed of the purpose and procedures of the questionnaire and all participants or legal guardians thereof were asked to sign an informed consent form.

1.2. Measure

The DT and BD scales from Eating Disorder Inventory-3 (Garner, 2004) were used. The DT scale comprises seven items and assesses concern with weight and motivation for dieting. The BD scale comprises 10 items and measures body image dissatisfaction. For both scales, the response scales for each item has five ordered categories ranging from 0 to 4. The DT subscale refers to the constant desire to lose weight or constant worry about gaining weight. For example, "I am preoccupied with the desire to be thinner". The BD subscale concerns negative image questions, for example, "I feel my stomach is too big".

1.3. Data analysis

1.3.1. Measurement invariance

Mean and covariance structure analysis (MACS) was used to assess measurement invariance. It is a model-based method evaluating factorial invariance, which means that the same measurement model fits across samples. This model evaluates the factorial invariance across groups by comparing the equality of parameters in the measurement model (Meredith, 1993). According to the factor model ($y = \nu + \lambda F + \sigma^2_{e_j}$), the measurement model for an observed variable (y) includes factor loadings (λ), error variances ($\sigma^2_{e_j}$) and intercepts (ν). Depending on the number of common parameters which hold the invariance condition across groups, different levels of invariance can be defined. The simplest model is the *configural invariance* or equality of factor pattern matrices. By adding constraints we can assess the equality of the loadings

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