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**Body image shame in men: Confirmatory Factor Analysis and psychometric
properties of the Body Image Shame Scale**

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ABSTRACT

Purpose: Body image shame plays a key role in disordered eating symptoms and psychological adjustment. Nonetheless, research has been mainly focused on women. The Body Image Shame Scale (BISS) was previously developed and tested in a nonclinical sample of women. This study examines the BISS in a sample of men comprising students and community participants.

Methods: Participants were 420 men, who completed the BISS and self-report measures of shame, self-criticism, body weight and shape concerns and psychopathological symptoms.

Results: The previously identified structure of the BISS, with an external and internal dimension, fitted the data well. All items presented high reliability. The BISS total score and its subscales in men present high construct reliability, and convergent and discriminant validity. Correlation analyses indicated that BISS and its subscales in men present positive associations with general shame and self-criticism, body weight and shape concerns, and with indices of poorer psychological adjustment.

Conclusion: Findings supported that the BISS is a reliable measure to assess body shame in men.

Keywords: Body Image Shame; Body Image; gender; Psychometric properties; Confirmatory Factor Analysis.

Level of Evidence: Level III: Evidence obtained from well-designed cohort or case-control analytic studies

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Conflicts of interest

The authors declare no conflict of interest.

Availability of data and material

Data can be sent upon request to the corresponding author.

Code availability

SPSS and AMOS software (v. 21, Chicago, IL, USA) were used to conduct the analyses.

Authors' contributions

CD and CF designed the study protocol and conducted data collection; CD conducted data analysis; CD and CF contributed to results interpretation and production of the manuscript.

Ethics approval

The study was approved by the Ethics Commission of the Faculty of Psychology and Educational Sciences, University of Coimbra.

Consent to participate

All participants provided their written informed consent.

INTRODUCTION

Shame is a complex, self-conscious emotion that involves negative self-evaluations and evaluations that one is negatively viewed by others (1-6). According to Gilbert (2, 4) evolutionary biopsychosocial model of shame, shame can be categorized into two dimensions – external and internal shame – which involve specific attention, monitoring and processing systems. External shame refers to how one believes others see and judge the self. It relates to the experience of the self as existing negatively (e.g., as bad, inadequate, flawed) in the minds of others. Internal shame relates to how one judges oneself. Here, one's attention and cognitive processing are focused inwardly on one's emotions, personal attributes and behaviour. Internal shame involves self-devaluations and the internalization of perceptions of self-inadequacy, inferiority and undesirability in the form of self-criticism (1-4, 7). These evaluations are highly distressing as they involve threatening evaluations that one stands at risk of being rejected or excluded by others. As such, shame activates defensive behavioural responses, such as concealment or avoidance, or attempts to overcompensate or align one's attributes or behaviours to socially accepted or valued standards, to try to positively influence one's image in the mind of others and protect oneself from social rejection or attacks (2, 8, 9).

Research shows that shame plays a central role in a series of psychopathological difficulties (10-14). Also, studies have found an association between shame and body image and eating related psychopathology in young and adult women (e.g., (15-25).

Body shame involves evaluations that one's physical appearance (e.g., body shape, size, weight) may be the source of others' negative view about oneself (3, 26). Body image shame research has been mainly focused on women. However, there is growing evidence that body image in men is also an important domain for self-evaluation (27, 28). Body image can be a central dimension of the shame experience due to the emphasis placed on physical appearance as an indicator of social attractiveness, especially in Western societies. Social messages that

relate physical attractiveness (i.e., idealized stereotypical images of thinness for women, and muscularity for men) to desirable psychological characteristics (e.g., success, happiness, control), social acceptance and status, are widespread (29). Evaluations that one is failing to meet such standards may activate shame leading to affective-defensive responses such as desires to hide/conceal the body or avoid social situations in which physical appearance may be exposed to others and evaluated by them (3, 26). These outcomes may however paradoxically increase shame, negative affect and have a negative impact in one's life (19).

A recent meta-analysis investigated the association between shame, eating and body focused shame and eating disorders symptoms, whilst testing for the effect of age and gender as moderators of these associations (30). The authors synthesized results from 195 studies and found significant associations, with a medium to large effect size, between shame and eating disorders symptoms. Shame focused specifically on eating and body image revealed stronger associations with disordered eating symptoms compared to general shame. Gender was not a significant moderator of these relationships but the authors highlighted that this could be due to the small variation in gender samples, with most studies having been conducted in samples of women. There is evidence however, that similarly to the effects found for women, body image shame in men is associated mental health problems (e.g., (31, 32) and problematic eating behaviours (28, 33-38). These studies suggest that men may experience similar consequences to women as a result of negative self-evaluations that their physical appearance makes them inferior and may cause others to criticize or reject them. The development and examination of psychometric measures that allow the assessment of body shame in men is, thus, greatly needed to better understand the impact of body shame in this population.

Existing measures of body shame have been used to assess the cognitive and emotion dimensions of body shame and are mainly derived from theoretical models focused on women's body image. For instance, the body shame subscale of the Objectified Body

Consciousness Scale (39) measures the self-consciousness of appearance that is generated by the tendency to scrutinize one's body as an object and compare it with sociocultural idealized images. The Experiences of Shame Scale (40) includes a subscale of body shame that measures, through single items, the cognitive and emotional aspects of body shame, as well as the behavioural dimension (e.g., avoidance and concealment). However, the psychometric properties and utility of these measures to assess body shame in samples of men were never systematically examined. The Weight and Body-related Shame and Guilt Scale (41) was developed to assess shame about body shape and weight, and guilt about eating behaviour, physical activity and weight control behaviours. The validation study of this measure showed a similar factor structure between women and men. However, this scale was developed to be used in samples of individuals with excess weight or obesity and thus its use may not be generalizable to individuals from the general population with a wide range of weights.

Duarte and colleagues (26) developed the Body Image Shame Scale (BISS) to measure body shame and its internal and external affective and behavioural dimensions as conceptualized by the evolutionary biopsychosocial model of shame (2, 4, 9). The external dimension involves perceptions that one's body image may be the source of negative evaluations or criticism by others, which leads to increased distress or avoidance of contexts in which the individual is more exposed to such evaluations. The internal dimension involves negative self-evaluations and subsequent body image concealment. The scale was examined in distinct samples of women from the student and general population. The initial factorial structure of the BISS was examined through a principal component analysis, which showed that the BISS presents a two-factor structure (external and internal body shame) underlying a higher order factor of body image shame. This structure was then confirmed through a Confirmatory Factor Analysis. The BISS also revealed very good construct and discriminant validity, concurrent and divergent validity with measures of general shame, psychological adjustment and eating

behaviour, test-retest reliability, and it discriminates women with higher and normative levels of disordered eating behaviours.

The current study aimed to confirm the BISS factor structure and examine the scale's psychometric properties of in a sample of men, including college students and participants from the general community.

METHOD

Participants

A sample of 420 Portuguese men was used in this study. Participants were college students ($n = 215$) and community participants ($n = 205$) with ages ranging from 18 to 69 years, and with a mean age of 28.63 ($SD = 10.93$) and of 13.09 ($SD = 2.87$) years of education. Participants' mean Body Mass Index (BMI) was 24.01 ($SD = 3.86$).

Measures

BMI. Participants' BMI was calculated by dividing current self-reported weight (in kg) by height squared (in m).

Participants completed the following self-report measures, which were previously translated and validated in Portuguese samples:

The *Body Image Shame Scale* (BISS; (26) assesses shame focused on body image. It includes: an externalized dimension, that assesses judgements of being negatively evaluated or criticized by others because of one's physical appearance (7 items; e.g., "I feel uncomfortable in social situations because I feel that people may criticize me because of my body shape"); and an internalized dimension, which focus on negative self-evaluations based on one's physical appearance (7 items; e.g., "When I see my body in the mirror I feel I am a defective person"). A composite score of body image shame can also be calculated. Each item is rated

according to the frequency with which participants experience body image shame (from 0 = “Never”) to 4 = “Almost always”). BISS revealed a Cronbach’s alpha of .92 (Duarte et al., 2014).

The *Eating Disorder Examination Questionnaire* (EDE-Q; (42, 43) is a comprehensive measure of weight and body image problems and disordered eating behaviours. The EDE-Q comprises 36 items which focus on the past 28 days. The items are rated for frequency of occurrence of the experience/symptom described in each item (from 0 = “No days” to 6 = “Every day”) or for severity (from 0 = “Not at all” to 6 = “Markedly”). Higher scores indicate greater levels of disturbance. In the current study, we used the subscales Body Shape Concerns and Body Weight Concerns, which have been found to present high estimates of internal consistency in samples of men and women from the general community (44).

The *Other as Shamer Scale-2* (OAS-2; (45, 46) is an 8-item self-report measure that assesses external shame, that is, global judgements that other people look down on, negatively evaluate, or criticise the individual. Respondents are asked to indicate the frequency of their shame experiences, using a 5-point scale (0 = “Never” to 4 = “Almost always”). Higher scores indicate high external shame. In the original study conducted in a sample of men and women recruited from a public university and from the general community, the scale showed a Cronbach’s alpha of .92.

The *Forms of Self-Criticizing & Self-Reassuring Scale* (FSCRS; (47, 48) is a 22-item scale that assesses self-criticism in relation to setbacks or failures. The scale assesses two forms of self-criticism: inadequate-self, which involves feelings of inadequacy and inferiority; and hated-self, characterized by self-punishment and feelings of disgust and hatred for the self. In the current study, these two forms were combined to measure self-criticism. Previous research has confirmed that combining these two factors into a single self-criticism dimension provides a better fit to the data, and is recommended in nonclinical populations (49, 50). Respondents

use a 5-point scale (ranging from 0 = “not at all like me”, to 4 = “extremely like me”), to assess how much each statement applies to their experience. In a nonclinical sample of undergraduate students that included men and women the scale presented Cronbach’s alpha values of .85 to .90; (49).

The *Depression Anxiety and Stress Scales – 21* (DASS21; (51, 52) assesses symptoms of Depression, Anxiety, and Stress. Respondents are asked to indicate the frequency they experienced each symptom over the past week using a 4-point scale (0 = “did not apply anything to me” to 3 = “applied to me very much”). The scale presented Cronbach’s alpha values of .88, .82, and .90 for Depression, Anxiety, and Stress respectively in men and women from the general population (53).

Descriptive statistics (means and standard deviations) and reliability indices (Cronbach’s alpha) for each scale, in the current study, are reported in Table 2.

Procedure

Approval was obtained from the Ethic Committees and boards of the institutions involved in the study. Participants comprised a convenience sample recruited from educational and professional institutions from the central region of Portugal. The researchers contacted these institutions inviting them to take part this study, which was advertised as requiring that participants voluntarily completed a set of self-report questionnaires. Participants were not compensated for completing the surveys. Data collection took place in those who accepted to collaborate. The study was presented by the researchers at each site. All participants were informed that this study is part of a larger research project focused on emotions and behaviours related to body image and psychological wellbeing. Researchers clarified that participation was voluntary and the data confidential. Participants provided their informed consent and filled the set of self-report measures. The students completed the measures at the end of a lecture

specified by the respective Faculty's Board. The community participants were recruited from different private and public work sectors, including retail services, health services and education services. These participants completed the set of self-report measures at their workplace during a break defined and authorized by the respective institution Board. Questionnaires completion took 10-15 minutes. All participants completed the BISS, EDEQ and DASS21. One hundred and forty-three participants recruited from institutions that allowed an additional time for questionnaires completion, also completed the OAS-2 and FSCRS.

Analytic Strategy

Previous analyses of the BISS in a sample of women from the student and general population confirmed that the BISS reveals two dimensions – internal and external body shame – underlying a higher-order factor of body shame. The current study aimed to confirm the theoretically-based two-factor structure of the BISS in a sample of men through a Confirmatory Factor Analysis (CFA; (54). The Maximum Likelihood method of estimation was used. Each item was specified to load on each respective latent first-order factor – internal and external body shame – and these two latent factors were specified to load on the higher-order factor of body image shame (Figure 1). A series of model fit indices were used following the method used in the previous validation study of this measure (26). The Chi-square goodness-of-fit (which indicates good model fit at a $p > .05$ threshold) was used, but this measure suffers from limitations (55), and thus we considered the Normed Chi-Square (in which values varying between 2 and 5 show a good global adjustment of the model). The following goodness of fit indices were also considered: the Comparative Fit index (CFI) and Tucker-Lewis Index (TLI), which range from 0-1, and indicate a poor fit when values < 0.80 and a good fit when values range from .90 – .95; the Parsimony Normed Comparative Fit Index (PCFI), which varies

between 0-1, with values $< .60$ indicating a poor fit and values between $.60$ and $.80$ a good fit; and the Root Mean Square Error of Approximation (RMSEA), with the lower limit of 0 indicating perfect fit, values between $.05 - .08$ suggesting a good fit and values $> .10$ indicating a poor fit (56, 57). The model invariance of the scale was also tested between the student population sample and the general population sample. Model invariance was determined through the estimation of the change in CFI and TLI (both at < 0.01 ; (58) for both structural factor loadings and items' means. Construct reliability was examined through the calculation of the Composite Reliability (CR) coefficients for the total scale and each subscale. CR is a more appropriate estimate of internal consistency as it is based on standardized regression weights and the measurement error of each item. Values ≥ 0.70 indicates good construct reliability (54, 59). The items' convergent validity was examined through the Average Variance Extracted (AVE), which provides a measure of the average amount of variance of the construct accounted by the items of each factor. Values ≥ 0.50 indicate good convergent validity (54, 60). The discriminant validity of the subscales was examined by comparing the AVE of each factor with the squared correlation between the factors (60). The relationship between the BISS and other self-report measures was assessed through Pearson product-moment correlation coefficients. The SPSS and AMOS software (v. 21, Chicago, IL, USA) were used to conduct the analyses.

Insert Figure 1 approximately here

RESULTS

Preliminary Analysis

Preliminary analyses indicated that there was no violation of normal distribution, with skewness values ranging from 1.04 (item 1) to 2.93 (item 6), and with kurtosis values ranging from -0.40 (item 1) to 9.38 (item 10; (55)).

Confirmatory Factor Analysis

Results of the CFA (Figure 1) indicated the following model fit indices: $X^2_{(76)} = 340.72$; $p < 001$; $X^2/df = 4.48$; CFI = .94; TLI = .93; PCFI = .78; RMSEA = .09 [.08, .10]. The correlation between the errors of items 3 and 4 (Modification Index (MI) = 29.91) and 9 and 10 (MI = 19.63), which were identified in the original validation study as sharing significant method error variance (26), resulted in an improvement of the model fit: $X^2_{(74)} = 287.83$, $X^2/df = 3.89$; CFI = .95; TLI = .94; PCFI = .77; RMSEA = .08 [.07, .09]. The evaluation of the local adjustment indices (Table 1) indicated that all items had high factor loadings (i.e., standardized regression weights), ranging from .66 (item 13) to .89 (item 14) in the external subscale, and .65 (item 1) to .86 (item 5) in the internal subscale. Regarding squared multiple correlations all items presented high reliability with values ranging from .42 (item 1) to .79 (item 14).

The scale's structure was also examined separately in the student sample and general population sample. Results revealed a good model fit for each sample: students ($X^2_{(74)} = 219.03$; $p < 001$; $X^2/df = 2.96$; CFI = .94; TLI = .93; PCFI = .77; RMSEA = .10 [.08, .11]); general population ($X^2_{(74)} = 232.80$; $p < 001$; $X^2/df = 3.15$; CFI = .92.; TLI = .90; PCFI = .74; RMSEA = .10 [.09, .12]). Model invariance between students and participants from the general population was examined through a multigroup analysis. Results demonstrated invariance at

both factor loadings level ($\Delta\text{CFI} = -.02$; $\text{TLI} = -.01$) and at item level ($\Delta\text{CFI} = -.02$; $\text{TLI} = -.02$).

Insert Table 1 approximately here

Psychometric properties

Results indicated that the external subscale revealed a CR of .95, while the internal subscale showed a CR of .95. Furthermore, the BISS total score CR was .97. This indicates that the scale and respective subscales have very good construct reliability. Regarding the AVE, a value of .72 was found for the external subscale, and of .75 for the internal subscale, which confirmed the instrument convergent validity. The AVE coefficients were higher than $r^2 = .62$, indicating that the subscales have adequate discriminant validity.

Relationships between BISS and other measures

The BISS total score and the subscales external and internal body image shame were positively correlated with each other (Table 2). Furthermore, the total score and the subscales were positively associated with a general measure of shame (OAS-2). The BISS external dimension was more strongly associated, compared to the internal dimension ($Z_H = 2.93$; $p = .003$), with the OAS-2, which focuses on external social evaluation. BISS and its subscales were also positively and strongly associated with a measure of self-criticism. Results showed a positive and strong association between the BISS total score and the subscales body weight and shape concerns (EDE-Q). The BISS and each subscale were also positively and strongly associated with symptoms of depression, anxiety and stress. The BISS total score and the internal subscale revealed a positive but weak association with BMI. BISS total score and the two subscales revealed very small associations with age.

Insert Table 2 approximately here

DISCUSSION

There is a rising interest in how body image problems may negatively impact psychological adjustment in men (28, 61). The important role of body shame in disordered eating symptoms and mental health has been increasingly demonstrated in clinical and nonclinical samples (26, 28, 62-64). Nonetheless, these studies are mostly focused on women and little is known about the impact of body shame on men. A possible reason for this is the lack of body image-related measures validated for this population (27). The current study examined the dimensional structure, psychometric properties and correlates of the BISS (26) in a large sample of men comprising college students and men from the general community.

Results of the CFA confirmed the adequacy of the two-dimensional structure, underlying a higher-order factor of body image shame, previously found in women (26). This structure was found to be invariant between students and the general population sample. Moreover, the BISS total scores and the subscales, presented a high composite reliability. Also, the two subscales presented good convergent and discriminant validity.

To confirm the BISS usefulness to study body image problems in men, we further examined the associations between the BISS and other related measures of self and social evaluation and psychological adjustment. Findings showed that the BISS present good convergent validity with a general measure of shame focused on external evaluations (OAS-2). As previously found in women, results revealed higher correlations between the BISS external subscale and OAS-2. Moreover, BISS and its subscales were found to be strongly correlated with higher levels of self-criticism. Furthermore, strong associations were found between the BISS and body shape and weight concerns, similarly to previous studies conducted

with women. The BISS and its subscales also presented strong positive associations with symptoms of depression, anxiety and stress. Interestingly, these associations were stronger in men compared to other samples of women (26), which suggests that for men feelings of shame focused on physical appearance may have a detrimental effect on psychological wellbeing. The marginal or nonsignificant associations between the BISS and BMI may indicate that the relationship between body shame and weight in men may not be as linear as what research shows in samples of women (26). In women populations, a higher BMI is often the target of stigmatization, shame and criticism from others, because it equates being distant or different from the sociocultural idealized image of female physical appearance. On the contrary, a higher BMI in men may be associated with the idealized and valued male muscular physical appearance (27). However, a higher BMI in men may also be associated with overweight or obesity, which, along with being perceived as 'small' or 'skinny' is linked to negative self-evaluations and psychological and behavioural maladjustment (29). Also, evidence suggests that in men, more than body weight, muscularity and leanness (i.e., low body fat) may play a more relevant role in how men experience their body image and how they relate to it (28, 36) .

Strength and limits

This is the first study providing data on the psychometric properties and validity of the BISS in men. This data will allow the development of research in body shame and its impact in this population. This study's findings need to be interpreted taking into consideration some limitations. First, the study's sample is not representative of the general men population, and thus future research is required before the current findings can be generalized. Participants' BMI was calculated based on self-reported height and weight, which has shown inconsistencies (e.g., overestimation of height and underestimation of weight) with measured height and weight (65). It is important that future studies investigate the BISS associations with measured height

and weight. Previous research showed that the BISS discriminated women with higher versus lower levels of eating disorder symptoms (26). Future studies should investigate the scale psychometric properties and correlates in eating disorder samples and specific samples (e.g., overweight and obesity). Participants' sexual orientation was not assessed, and there is now mounting evidence that sexual orientation may play an important role in body image problems and disordered eating symptoms in men (28, 36, 37). Also, in younger men body image issues may be more prominent and play an important role in later psychosocial adjustment (38, 61). Future studies should examine the scale's dimensionality and psychometric properties in these more vulnerable populations (e.g., gay men and adolescents). Also, future research should investigate the temporal stability of the scale in populations of men. Moreover, the scale was developed and tested in Portuguese samples and thus further studies should examine the scale in different languages. The examination of the scale cross-cultural validity, i.e., the degree to which the translated or culturally adapted scale accurately reflects the performance of the items of the original scale (66) will be important to allow cross-cultural comparisons of body image shame correlates and implications in other populations.

What is already known on this subject?

The BISS is a measure of body image shame that has shown good psychometric properties and predictive validity in association with body image and eating behaviour problems. Growing evidence suggests that body image can impact men's self evaluation and eating behaviour.

What this study adds?

This study corroborated that the BISS is a brief reliable measure of shame focused on body image and related behaviours in men, and it contributes to extend research on the correlates of body shame in this population.

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Table 1*Items' standardized regression weights (SRW) and squared multiple correlations (SMC)*

Items	SRW	SMC
<i>External</i>		
2. I avoid social situations (e.g., going out, parties) because of my physical appearance.	.68	.46
6. The relationship I have with my body prevents me from having an intimate relationship with someone.	.76	.57
9. I avoid moving my body (for example, dancing) in public places because I feel I am exposing my physical appearance to the criticism of others.	.71	.51
10. I feel uncomfortable in social situations because I feel that people may criticize me because of my body shape.	.82	.67
12. My physical appearance makes me feel inferior in relation to others.	.86	.74
13. I do not like to exercise in front of others because I am afraid of how they might evaluate me.	.66	.43
14. The relationship I have with my physical appearance makes it difficult for me to feel comfortable in social situations.	.89	.79
<i>Internal</i>		
1. I avoid wearing tight clothes that reveal my body shape.	.65	.42
3. It bothers me to see my body undressed.	.79	.62
4. When I see my body in the mirror I feel I am a defective person.	.77	.59
5. I choose clothes that hide parts of my body that I consider ugly or disproportional.	.86	.75
7. I pay close attention to the movements and posture of my body to hide parts that I do not like.	.80	.64
8. I feel bad about myself when I use clothes that reveal my body shape.	.85	.73
11. There are parts of my body that I prefer to hide.	.82	.67

Table 2*Descriptive statistics and BISS association with other measures*

	<i>n</i>	<i>M</i>	<i>SD</i>	α (CI)	BISS total score	BISS external	BISS internal
BISS Total	420	0.47	0.67	.94 (.94, .95)	1		
BISS External	420	0.33	0.59	.90 (.89, .92)	.93***	1	
BISS Internal	420	0.61	0.81	.92 (.90, .93)	.96***	.79***	1
EDEQ Shape concern	420	0.77	1.01	.84 (.81, .87)	.67***	.59***	.66***
EDEQ Weight concern	420	0.86	1.07	.71 (.64, .77)	.70***	.63***	.69***
OAS-2	277	8.87	6.71	.93 (.91, .94)	.65***	.66***	.59***
FSCRS	277	7.79	5.64	.93 (.91, .94)	.65***	.69***	.59***
DASS21 Depression	420	3.65	4.38	.93 (.91, .94)	.55***	.59***	.47***
DASS21 Anxiety	420	2.85	3.34	.85 (.81, .89)	.46***	.51***	.38***
DASS21 Stress	420	4.94	4.43	.88 (.85, .91)	.44***	.45***	.39***
BMI	420	24.01	3.86	-	.13**	.06	.17***
Age	420	28.63	10.93	-	-.11**	-.11**	-.10**

*Note:**** $p < .001$; ** $p < .050$

BISS – Body Image Shame Scale; EDEQ – Eating Disorder Examination Questionnaire;

OAS-2 – Other as Shamer Scale; FSCRS – Forms of Self-criticizing and Self-reassurance

Scale; DASS21 – Depression, Anxiety and Stress Scales; BMI – Body Mass Index.

