

ORIGINAL ARTICLE

Yale-Brown Obsessive Compulsive Scale modified for Body Dysmorphic Disorder (BDD-YBOCS): Brazilian Portuguese translation, cultural adaptation and validation

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Objective: To translate, culturally adapt, and validate a Brazilian Portuguese version of the Yale-Brown Obsessive Compulsive Scale modified for Body Dysmorphic Disorder (BDD-YBOCS).

Methods: Ninety-three patients of both sexes seeking rhinoplasty were consecutively selected at the Plastic Surgery Outpatient Clinic of the Universidade Federal de São Paulo, Brazil, between May 2012 and March 2013. The BDD-YBOCS was translated into Brazilian Portuguese. Thirty patients participated in the cultural adaptation of the scale. The final version was tested for reliability in 20 patients, and for construct validity in 43 patients (correlation of the BDD-YBOCS with the Body Dysmorphic Disorder Examination [BDDE]).

Results: Total Cronbach's alpha was 0.918. The BDD-YBOCS had excellent inter-rater (intra-class correlation coefficient [ICC] = 0.934; $p < 0.001$) and intra-rater reliability (ICC = 0.999; $p < 0.001$). Significant differences in BDD-YBOCS scores were found between patients with and without BDD symptoms ($p < 0.001$), and among patients with different levels of BDD severity ($p < 0.001$). A strong correlation ($r = 0.781$; $p < 0.001$) was observed between the BDDE and the BDD-YBOCS. The area under the receiver operating characteristic curve was 0.851, suggesting a very good accuracy for discriminating between presence and absence of BDD symptoms.

Conclusion: The Brazilian Portuguese version of the BDD-YBOCS is a reliable instrument, showing face, content and construct validity.

Keywords: Body dysmorphic disorders; body image; psychiatry; plastic surgery; therapeutics

Introduction

Body dysmorphic disorder (BDD) is a relatively common and often severe psychiatric disorder that is possibly underdiagnosed and underreported.^{1,2} It is classified under obsessive-compulsive and related disorders in the DSM-5.³

According to the DSM-5, BDD is characterized by a “preoccupation with one or more perceived defects or flaws in physical appearance that are not observable or appear slight to others,” and by “repetitive behaviors (e.g., mirror checking, excessive grooming, skin picking, reassurance seeking) or mental acts (e.g., comparing his or her appearance with that of others) in response to the appearance concerns.” In addition, it causes “clinically significant distress or impairment in important areas of functioning” and its “symptoms are not better explained by normal concerns with physical appearance or by concerns with body fat or weight in individuals meeting

diagnostic criteria for eating disorders.” BDD symptoms may be associated with muscle dysmorphia. Also, BDD patients may show different degrees of insight regarding BDD beliefs of looking ugly or deformed - that is, they may recognize these beliefs as probably false or perceive them as absolutely true.³

Patients with severe BDD symptoms exhibit high suicidal ideation (80%) and suicide attempt (24%) rates.⁴⁻⁶ These rates have been observed in clinical samples and not in the general population.⁴⁻⁶ Phillips & Menard⁷ reported that the suicide rate among individuals with BDD is 45 times higher than that of the general U.S. population, with a higher mortality rate for anorexia nervosa, major depression, and bipolar disorder. Moreover, in BDD patients, impulsive traits may lead to increased levels of health-risk behaviors, including aggressiveness, self-destructiveness associated with substance abuse, indebtedness, eating disorders, repeated hospitalizations, obsessive desire to undergo cosmetic procedures, and extreme behaviors, such as “do-it-yourself” cosmetic surgery, which consists of severe self-inflicted procedures performed in an attempt to correct a perceived defect.^{1,8}

Individuals with BDD frequently seek cosmetic surgery to correct perceived defects and reduce the extreme dissatisfaction with their physical appearance.^{9,10} BDD is

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one of the most common psychiatric conditions found in patients seeking cosmetic surgery,¹¹ with rhinoplasty being one of the most sought-after cosmetic procedures by patients with BDD.^{10,12} The prevalence of BDD ranges from 1 to 6% in the general population, reaches up to 16% among psychiatric patients, and varies from 7 to 53% in plastic surgery settings.¹³⁻¹⁷

An excessive concern with appearance can conceal psychopathological traits that are not always easy to recognize and may result in iatrogenic and medico-legal problems if neglected.^{1,18,19} Thus, patient-reported outcome scales are important tools for the identification of BDD symptoms among cosmetic surgery patients, so as to determine whether these procedures are indicated or contraindicated in this population.^{1,20,21} The Yale-Brown Obsessive Compulsive Scale modified for Body Dysmorphic Disorder (BDD-YBOCS) has been shown to be sensitive to changes in the severity of BDD symptoms, revealing its importance for studies assessing the efficacy of treatments.²² Thus, a Brazilian version of the BDD-YBOCS will be useful for clinical trials evaluating the efficacy of interventions to reduce the severity of BDD symptoms.

The aim of this study was to translate, culturally adapt, and validate the BDD-YBOCS for Brazilian Portuguese. Internal consistency, test-retest reliability, and convergent and divergent validity were also determined for the Brazilian version of the instrument.

Methods

The study was approved by the research ethics committee of Universidade Federal de São Paulo. Patient selection was conducted between May 2012 and March 2013. Written informed consent was obtained from all participants after the procedures had been fully explained and prior to their inclusion in the study; anonymity was assured.

A total of 95 patients of both sexes showing excessive concern with physical appearance associated with clinically significant subjective distress and seeking rhinoplasty were consecutively selected at the Plastic Surgery Outpatient Clinic of the Universidade Federal de São Paulo, Brazil. Exclusion criteria were inability to understand the interview questions, severe physical deformities resulting from tumors or other conditions, and psychotic disorders.

No patient declined participation, but two patients with very noticeable (not slight) physical defects and indication for orthognathic surgery were excluded from the study, for a final sample of 93 patients. Total sample and subsample sizes for the cross-cultural adaptation, reliability, and validity phases were calculated based on the methodology of Guillemín et al.,²³⁻²⁵ and Gandek & Ware.²⁶

One of the authors (MJB), a psychologist with expertise in BDD, performed the initial clinical assessment of the patients and applied the Brazilian Portuguese version of the Body Dysmorphic Disorder Examination (BDDE).²⁷ The 34-item BDDE is a specific questionnaire that measures symptoms of severely negative body image.^{27,28} Besides assessing body image dissatisfaction, specific

items of the BDDE (items 9-11, 13, 23-26) are also used for the diagnosis of BDD.²⁸ To meet diagnostic criteria, patients are required to have a score of 4 or greater on these items. Patients with BDD symptoms were classified as having mild to moderate or severe symptoms,^{1,10} based on their level of subjective distress and avoidance behavior (BDDE scores on the specific items).¹

The instrument

The BDD-YBOCS²² was derived from the Yale-Brown Obsessive Compulsive Scale (Y-BOCS).^{29,30} Permission to translate, culturally adapt, and validate the instrument for Brazilian Portuguese was obtained from Dr. Katharine A. Phillips, senior author and copyright holder of the original version of the BDD-YBOCS. The BDD-YBOCS is a 12-item semi-structured clinician-rated instrument designed to measure severity of BDD symptoms in individuals showing excessive preoccupation and subjective distress with physical appearance.²² It is an outcome measure in clinical studies and in the treatment of BDD.²² The 12 items are rated on a 0-4 scale, where 0 indicates no symptoms and 4 indicates extreme BDD symptoms. The first 10 items assess excessive preoccupation, obsessions, and compulsive behaviors associated with dissatisfaction with physical appearance. The first 3 items are based on the BDD diagnostic criteria and assess preoccupation, impairment of global functioning, and subjective distress, which are related to both excessive preoccupation and compulsive behaviors. Items 11 and 12 assess insight and avoidance respectively. The total score is calculated as the sum of ratings for the 12 items, for a maximum score of 48.²²

Translation

The original version of the BDD-YBOCS was translated from English into Brazilian Portuguese by two independent translators. Only one of the translators was informed about the objectives of the study, so as to produce a conceptual rather literal translation of the scale.²³ Both translations were evaluated by a multidisciplinary committee composed of two psychologists, two psychiatrists, and three plastic surgeons. All items were checked for translation errors and evaluated for content validity. A consensus Brazilian Portuguese version of the scale was then obtained by combining elements from both translations. The consensus version was adequately adapted to the linguistic context and care was taken to preserve all essential characteristics of the original instrument. Idiomatic, semantic, conceptual, and cultural equivalences were considered during the translation phase.

Next, the consensus version was back-translated into English by two independent translators who did not have any knowledge about the original scale or purpose of the study. Both back-translated versions were evaluated and compared with the original instrument by the same multidisciplinary committee to check for possible errors made during back-translation. A consensus back-translated version was produced and compared with the original English version. Minor differences were resolved

by discussion. This analysis resulted in the development of consensus version 1 of the BDD-YBOCS in Brazilian Portuguese, which was appropriately adapted to the linguistic and cultural context of the target population, maintaining all the essential characteristics of the original scale in English.

Application of the instrument

During the cultural adaptation phase, a psychologist with a doctoral degree and expertise in BDD (MJB) applied the BDD-YBOCS to the first 10 patients and supervised a second psychologist during the application of the instrument to the next 20 patients. The cultural adaptation phase served to train the second psychologist for the inter-rater reliability phase.

Cultural adaptation or pretest

Version 1 of the scale was administered to 30 patients to test eventual failures of the respondents to comprehend the items. After informed consent, patients were given the opportunity to express their comprehension of the scale and suggest any changes they considered necessary. All patients understood that the scale items were related to concerns and dissatisfaction with physical appearance. Interviews were conducted face to face. The final version was obtained when patients, translators, and health professionals reached a consensus (Appendix 1, available as online-only supplementary material).

Psychometric documentation

After translation and cultural adaptation, the final version of the scale was tested for reliability in 20 patients, and for face, content, and construct validity in 43 patients. These 63 patients did not participate in the cultural adaptation phase.

Reliability

Cronbach's alpha was used to estimate the internal consistency reliability of the instrument. Test-retest reliability (reproducibility) is the ability of an instrument to produce stable or similar results on repeated administration when no change in patient characteristics has occurred. The instrument was assessed by test-retest procedures in three interviews conducted by two independent interviewers (two experienced psychologists). Twenty patients were interviewed by psychologist #1. The interview was repeated three hours later on the same day by psychologist #2. Two weeks later, the instrument was again administered to the same patients by psychologist #1 only. Inter- and intra-rater reliability analyses were performed. This phase of testing is used to verify the precision of the instrument in measuring the properties for which it was designed.^{24,25}

Statistical analysis of test-retest reliability was performed using Pearson's correlation coefficient and the intra-class correlation coefficient (ICC).

Validity

Face validity evaluates whether the instrument appears to measure what it was designed to measure. In this study, face validity was determined by consensus of the multi-disciplinary committee responsible for the Brazilian version of the scale.

Content validity is defined as the degree to which each item is relevant to measure the target content, and examines if a scale represents the universe of concepts or domains to which it corresponds. This is usually established by specialists in the field before the items (questions) are worded. Establishing content validity requires a defining standard against which the content of a measure is compared.²⁶

Construct validity is the process through which the correlation of a measure with other variables is tested for theoretical consistency. In testing construct validity, hypotheses are stated regarding the direction and strength of expected relationships.²⁶ Our hypothesis was that preoccupations and excessive levels of body investment associated with clinically significant distress in patients seeking cosmetic surgery would reveal symptoms of BDD, which may be present in different severity levels. Construct validity was tested by comparing the BDD-YBOCS with factors considered correlated with symptoms of severely negative body image and with the degree of dissatisfaction with appearance. Convergent validity was assessed using the Brazilian-Portuguese version of the Body Dysmorphic Disorder Examination (BDDE) in the interview format.²⁷

Construct validity of the BDD-YBOCS was measured in 43 patients by studying the association between domains of the BDD-YBOCS and the BDDE, using Pearson's linear correlation. Discriminant validity was determined by comparing mean BDD-YBOCS scores of patients with and without BDD symptoms, and scores of patients with different levels of BDD severity, using Student's *t* test for independent samples or analysis of variance (ANOVA). The Kolmogorov-Smirnov test was used to test the data for normal distribution. Duncan's multiple range test was carried out to determine significant differences between ANOVA results at the different levels.

The level of significance was set at 0.05 ($p < 0.05$) for all tests.

A cutoff point for symptom severity and the corresponding sensitivity and specificity were estimated by receiver operating characteristic (ROC) analysis. A ROC curve was constructed based on clinical evaluation and BDDE assessment of patients.

Data are expressed as means \pm standard deviation (SD).

Results

The purpose of the cultural adaptation or pretest was to evaluate if the items of the translated instrument had been clearly formulated. Thus, the 30 patients who participated in the pretest were not included in the statistical analysis. The patients had no doubts about the questionnaire items and found the instrument easy to understand. The mean time to respond to the questionnaire was 10 min.

The Brazilian-Portuguese version of the BDD-YBOCS (Appendix 1, available online) was administered to 63 patients after a clinical interview. Thirty seven (58.7%) patients met diagnostic criteria for BDD,³ with 27 (42.9%) of them having mild/moderate symptoms, and 10 (15.9%) showing severe symptoms (BDDE).^{1,10}

The mean BDD-YBOCS score for patients with BDD was 25.5 ± 7.1 . When considering the severity of symptoms, mean BDD-YBOCS scores were 23.4 ± 6.5 for patients with mild/moderate symptoms (according to the BDDE) and 31.2 ± 5.5 for patients with severe symptoms.

Overall, most patients were women (84.1%), Caucasian (60.3%), and single (57.1%). Mean age was 34.7 ± 10.6 years. Almost half (46%) of the participants had complete primary education. Seventy-three percent of patients reported that they had first experienced body dissatisfaction in adolescence; 41.3% spent more than 3 hours daily worrying about their physical appearance. Thirty (32.3%) patients had high scores (more severe BDD symptoms) on item 8, and 56 (60.2%) had high scores on item 11, which assess distress and insight, respectively.

The instrument showed excellent internal consistency (Cronbach's alpha = 0.918). All items favorably contributed to the internal consistency of the scale (Table 1).

The BDD-YBOCS demonstrated excellent inter-rater ($r = 0.944$; ICC = 0.934; 95% confidence interval [95%CI] 0.843-0.973; $p < 0.001$) and intra-rater reliability ($r = 0.999$; ICC = 0.999; 95%CI 0.998-1.000; $p < 0.001$).

Inter-rater reliability showed that 10% of the scores were outside the 95% limits of agreement (-4.5 to 7.2). The mean difference was 1.4 ± 3.0 . Mean scores ranged from 6.5 to 36.0. Intra-rater reliability revealed that 10% of the scores were outside the 95% limits of agreement (-0.6 to 0.6). The mean difference was 0 ± 0.3 . Mean scores ranged from 8 to 40.0.

There were significant differences in BDD-YBOCS scores between patients with and without BDD symptoms ($p < 0.001$), and among patients with different levels of BDD severity ($p < 0.001$), as depicted in Table 2.

Patients without BDD symptoms had significantly lower BDD-YBOCS scores compared to those with BDD symptoms. Also, the mean BDD-YBOCS score of patients with mild/moderate BDD symptoms was significantly lower than that of patients with severe BDD symptoms (Figure 1).

A strong correlation ($r = 0.781$; $p < 0.001$) was found between the BDDE and BDD-YBOCS (Figure 2).

The cutoff score of 19 for the BDD-YBOCS was determined using a ROC curve (Figure 3). The cutoff score was associated with a sensitivity of 86.5% and specificity of 73.1%, meaning that 73.1% of patients without BDD symptoms according to the BDD-YBOCS probably did not have BDD. The area under the ROC curve was 0.851, suggesting very good accuracy for discriminating between presence and absence of BDD symptoms.

Discussion

The BDD-YBOCS is a specific instrument that measures the severity of BDD symptoms.²² It is a short and easy-to-administer scale that captures specific information about BDD symptoms.

In the present study, general guidelines for cross-cultural adaptation of quality of life instruments were followed to ensure the elaboration of an adequate version of the BDD-YBOCS in Brazilian Portuguese (Appendix 1, available online). Patients and health professionals with experience in the management of BDD patients participated in the evaluation of this version.²³

Table 1 Internal consistency analysis: statistical summary for BDD-YBOCS scores

BDD-YBOCS (n=63)	Min	Max	Quartile 1	Median	Quartile 3	Corrected item-total correlation	Cronbach's alpha if item is deleted
Cronbach's alpha = 0.918							
1. Time spent thinking about the body defect	0.00	4.00	1.00	2.00	3.00	0.534	0.917
2. Interference due to thoughts about the body defect	0.00	3.00	0.00	1.00	2.00	0.711	0.910
3. Distress associated with thoughts about the body defect	0.00	4.00	2.00	2.00	3.00	0.640	0.913
4. Resistance against thoughts about the body defect	0.00	4.00	1.00	2.00	2.00	0.589	0.915
5. Degree of control over thoughts related to the body defect	0.00	4.00	1.00	2.00	2.00	0.691	0.910
6. Time spent in activities related to the body defect	0.00	4.00	1.00	2.00	2.00	0.627	0.914
7. Interference due to activities related to the body defect	0.00	4.00	0.00	1.00	2.00	0.776	0.907
8. Distress associated with activities related to the body defect	0.00	4.00	1.00	2.00	3.00	0.695	0.910
9. Resistance to compulsions	0.00	4.00	0.00	2.00	2.00	0.653	0.913
10. Degree of control over compulsive behavior	0.00	4.00	0.00	2.00	2.00	0.805	0.905
11. Insight	0.00	4.00	2.00	3.00	3.00	0.561	0.916
12. Avoidance	0.00	4.00	0.00	1.00	2.00	0.741	0.908

BDD-YBOCS = Yale-Brown Obsessive Compulsive Scale modified for Body Dysmorphic Disorder; Max = maximum; Min = minimum.

Table 2 Statistical summary of BDD-YBOCS scores in patients with and without BDD symptoms and patients with different levels of BDD severity

	Mean	SD	Min	Max	Quartile 1	Median	Quartile 3	n
BDD*	20.5	9.5	3.0	40.0	11.0	22.0	26.0	63
With symptoms	13.4	7.9	3.0	28.0	7.0	10.0	21.0	26
Without symptoms	25.5	7.1	10.0	40.0	21.0	24.0	30.5	37
BDD severity [†]	20.5	9.5	3.0	40.0	11.0	22.0	26.0	63
Absent	13.4 ^a	7.9	3.0	28.0	7.0	10.0	21.0	26
Mild/moderate	23.4 ^b	6.5	10.0	37.0	21.0	23.0	27.0	27
Severe	31.2 ^c	5.5	24.0	40.0	25.8	31.0	35.8	10

ANOVA = analysis of variance; BDD = body dysmorphic disorder; BDD-YBOCS = Yale-Brown Obsessive Compulsive Scale modified for Body Dysmorphic Disorder; SD = standard deviation.

*Kolmogorov-Smirnov test ($p = 0.332$), $t = 6.34$ ($p < 0.001$).

[†]Kolmogorov-Smirnov test ($p = 0.432$), ANOVA: $F_{2,60} = 27.33$ ($p < 0.001$).

Different letters indicate significant differences between means. Duncan's multiple range test ($p < 0.05$).

Thirty patients, who were interviewed to assess the cultural equivalence of the translated BDD-YBOCS,²⁵ found the instrument easy to understand. The mean time to respond to the questionnaire was 10 min.

The Brazilian-Portuguese version of the BDD-YBOCS, validated in a sample of cosmetic surgery patients ($n=63$), shows excellent internal consistency (Cronbach's alpha coefficient of 0.91 compared to 0.80 for the original measure),²² test-retest reliability of 0.93 (compared to 0.88 for the original instrument),²² and intra-rater reliability of 0.99. ROC curve analysis indicated that a cutoff score of 19 for the BDD-YBOCS was able to discriminate patients with body dissatisfaction from those with BDD. This suggests that the BDD-YBOCS can be used to identify individuals who are dissatisfied with their physical appearance, but do not meet all diagnostic criteria for BDD. According to the authors of the original BDD-YBOCS,²² the instrument should only be applied after checking if an individual meets all BDD criteria.

The BDD-YBOCS assesses the severity of BDD symptoms; it was compared with a similar tool to be validated. To

assess the construct validity, the literature recommends evaluating the relationships of comparable constructs with similar operational concepts.²⁶ The BDDE²⁷ is the only instrument translated and validated for Brazilian Portuguese that measures the degree of dissatisfaction with a given physical feature and contributes to the diagnosis of BDD.²⁸ The strong correlation observed between the BDD-YBOCS and the BDDE indicates that both instruments identify the pattern of neurocognitive deficits (obsessive thoughts and compulsive behaviors) present in BDD. The assessment of discriminant validity showed a significant difference in mean BDD-YBOCS scores between patients with and without BDD symptoms and among patients with different levels of BDD symptoms.

In the present study, 30 and 56 patients reported high scores (more severe BDD symptoms) on item 8 (distress) and item 11 (insight), respectively, which are the factors that most strongly interfere with the global functioning of BDD patients. The level of subjective distress and psychosocial impairment associated with physical appearance may be the most important factor to be evaluated in cosmetic surgery patients.¹ Conversely, it is hard to assess the degree of insight, because patients are often convinced

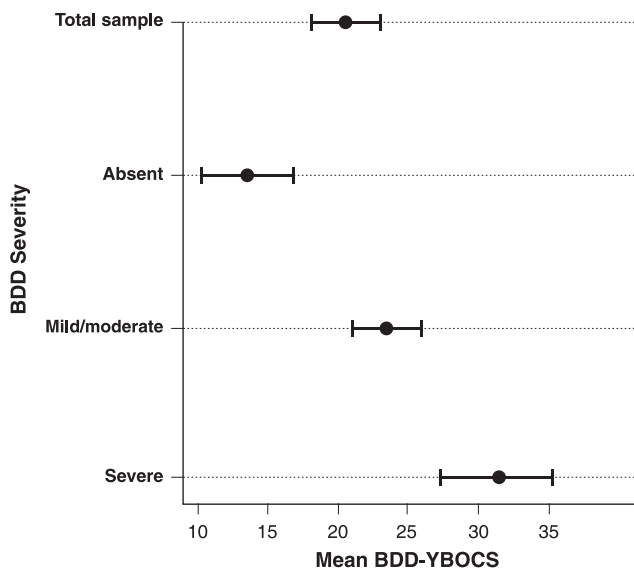


Figure 1 Mean Yale-Brown Obsessive Compulsive Scale modified for Body Dysmorphic Disorder (BDD-YBOCS) scores and respective 95% confidence intervals for patients with different levels of body dysmorphic disorder (BDD) severity.

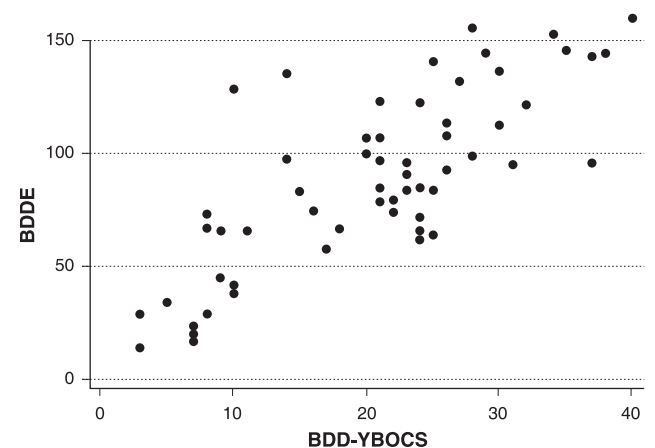


Figure 2 Dispersion plot of Yale-Brown Obsessive Compulsive Scale modified for Body Dysmorphic Disorder (BDD-YBOCS) scores vs. Body Dysmorphic Disorder Examination (BDDE) scores.

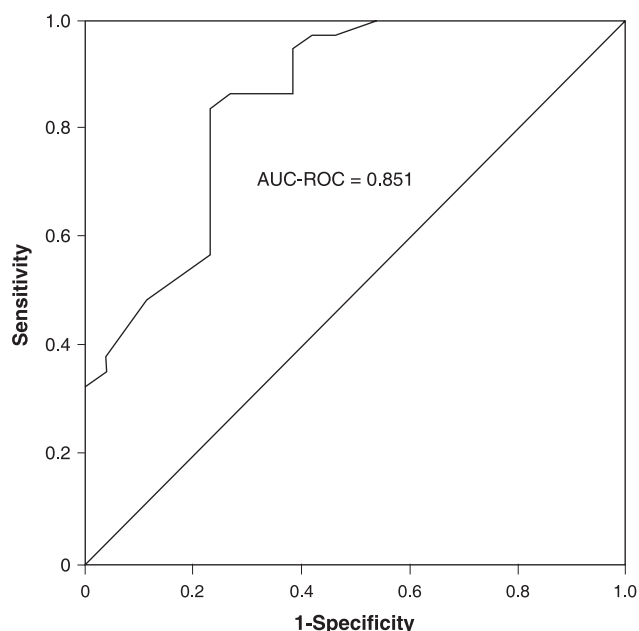


Figure 3 Receiver operating characteristic (ROC) curve for the Brazilian version of the Yale-Brown Obsessive Compulsive Scale modified for Body Dysmorphic Disorder (BDD-YBOCS). AUC = area under the curve.

about the presence of the perceived defect and have fixed ideas about their perception. However, this belief appears to be more related to an overvaluation of the defect than to a delusional perception. This may explain why item 11 (insight) contributed the least to the internal consistency of the BDD-YBOCS - in other words, the exclusion of item 11 would result in a Cronbach's alpha of 0.916, which is very similar to 0.918 (Table 1). This result is consistent with the original findings of Phillips et al.,²² and may reflect the difficulty in evaluating this variable. Nevertheless, insight is an important part of clinical investigations, and degree of insight plays a role in predicting treatment response and prognosis in BDD patients.

Items 11 and 12 assess the degree of insight and avoidance behavior associated with appearance, respectively, and differentiate the BDD-YBOCS from the YBOCS.²² Individuals with BDD are unable to see the "bigger picture" as they are over-focused on small details. This neural dynamics seems to have an impact on thinking and overall perception, which in individuals with BDD appears fragmented, affecting their level of insight.¹⁸ In addition, avoidance and social withdrawal have been appointed as contributors to BDD severity^{1,10} and chronicity.³¹⁻³³

In the study population, the prevalence of BDD symptoms was 58.7%; 73% of patients began to experience body dissatisfaction in adolescence and 41.3% spent more than 3 hours daily with appearance-related concerns and behaviors, showing increased subjective distress.

The mean age (34.7 ± 10.6 years) of the participants at the time of the interview was not associated with the onset of BDD symptoms, which is consistent with the original study.²² It is interesting to note that a similar amount of time elapsed between the onset of body dissatisfaction

and the patient's decision to seek either cosmetic treatment (about 15 years) or mental health treatment, showing different profiles of this population. This means that patients with BDD who seek cosmetic surgery will not necessarily seek psychiatric treatment later.³⁴

In conclusion, the translated BDD-YBOCS was successfully adapted and validated for Brazilian Portuguese; it is a reliable instrument, showing face, content, and construct validity.

Disclosure

The authors report no conflicts of interest.

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