Original Article

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The Validation and Reliability Study of Turkish Versions of Yale-Brown Obsessive Compulsive Scale Modified for Body Dysmorphic Disorder and Body Image Disturbance Questionnaire

Yale-Brown Obsesif Kompulsif Ölçeğinin Beden Dismorfik Bozukluğu Modifikasyonu ve Beden Görünüşü Rahatsızlığı Testinin Türkçe Versiyonlarının Güvenirlik ve Geçerlik Çalışması

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ABSTRACT

Objective: Body dysmorphic disorder (BDD) is a relatively common disorder and accepted as one of the obsessive-compulsive spectrum disorders group. No tests for BDD have been translated into Turkish yet. This study aimed to perform validity and reliability tests on the Turkish version of the Yale-Brown Obsessive-Compulsive scale Modified for BDD (T-YBOCS-BDD) and the Body Image Disturbance Questionnaire (T-BIDQ).

Methods: The patients who were admitted to the clinics of the dentistry faculty with the aesthetic problems were selected as the study group (n=80) and the control group was designed with the patients with non-aesthetic problems (n=81). The tests were administered to the patients within one week with the test and re-test method. Factor analysis was performed, and the statistical significance was accepted as p<0.05.

Results: In the evaluation of reliability, Cronbach's alpha was 0.808 for the T-YBOCS-BDD and it was 0.780 for the T-BIDQ. The factor analysis scores were 0.705 and 0.736, whereas and the values

ÖZ

Amaç: Beden dismorfik bozukluk (BDB) nispeten yaygındır ve obsesif kompulsif spektrum bozuklukları gruplarından biri olarak kabul edilmektedir. Literatürde henüz Türkçe'ye çevrilmiş BDB testi bulunmamaktadır. Bu çalışmada, Yale-Brown Obsesif Kompulsif ölçeği BDB modifikasyonunun (YBOKB-BDB) ve beden görünüşü rahatsızlığı testinin (BGRT) Türkçe versiyonları üzerinde geçerlik ve güvenirlik testleri gerçekleştirilmesi amaçlanmıştır.

Yöntemler: Diş hekimliği fakültesi kliniklerine estetik problemler ile başvuran hastalar çalışma grubu (n=80) olarak seçilmiş olup kontrol grubu ise estetik problemi olmayan hastalar (n=81) arasından seçilmiştir. Testler, bir hafta ara ile tekrarlanarak hastalara uygulanmıştır. Veriler faktör analizi ile değerlendirilmiş olup istatistiksel anlamlılık p<0,05 olarak kabul edilmiştir.

Bulgular: Türkçeye çevrilmiş YBOKB-BDB ölçeği ve BGRT için skorların sonuçlarının güvenirlik yönünden değerlendirmesinde Cronbach alfa değeri sırasıyla; 0,808 ve 0,780 olarak bulunmuştur. Faktör analizi puanları 0,705 ve 0,736 iken, Bartlett'in küresellik testi sırasıyla; 677.296 (df=66, p<0,001) ve 336.069 (df=21,

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of the Bartlett's test of sphericity were 677,296 (df=66, p<0.001) and 336,069 (df=21, p<0.001), respectively. Total mean scores of T-YBOCS-BDD revealed statistically significant results (p=0.006).

Conclusion: The tests resulted in high validity and reliability, therefore the results of this study highly recommended clinicians to perform these tests in the Turkish language-speaking countries.

Keywords: Body dysmorphic disorder, body image, obsession, reliability, validity

p<0,001) olarak saptanmıştır. T-YBOKB-BDB ölçeğinin ortalama puanları istatistiksel olarak anlamlı sonuçlar ortaya çıkmıştır (p=0,006).

Sonuç: Testler yüksek geçerlik ve güvenirlik ile sonuçlanmıştır. Bu nedenle bu çalışmanın sonuçlarına göre klinisyenlerin Türkçe konuşulan ülkelerde bu testleri yapmaları şiddetle önerilmektedir.

Anahtar Sözcükler: Vücut dismorfik bozukluğu, beden imajı, obsesyon, güvenilirlik, geçerlilik

Introduction

The appearance of most individuals would not be satisfactory according to them whereas some of them could be worried about a slight or imaginary flaw about how they look alike. These people might have physically & psychiatric problems simultaneously. Body dysmorphic disorder (BDD) is characterized with an excessive and persistent preoccupation with perceived defects or flaws in the appearance, which are unnoticeable to others, and associated repetitive behaviors (1). This disorder is a severe illness and relatively common and these patients are generally admitted to both psychiatric and non-psychiatric physicians and they have significant unrest or impaired functionality (2). BDD is currently accepted as a disorder of the obsessive-compulsive spectrum disorders (OCD) according to DSM-5 (3). Moreover, BDD is also engaged with eating, social anxiety and mood disorders (4).

Patients with BDD are often admitted to non-psychiatric physicians, especially aesthetic surgeons, to eliminate the perceived physical defects even though they are expected to consult with psychiatrists (2). Dealing with a mild/imaginary physical defect that is leading them to serious clinical stress or functionality loss in social, work and private life is considered as the major problem in BDD. Moreover, the worries about more than one body regions are reported in 68-98% of patients with BDD and the suicidality rates are significantly higher in them (5).

The Yale-Brown Obsessive-Compulsive scale Modified for BDD (YBOCS-BDD) is a 12-item, semi-structured, rater-administered measure that evaluates BDD severity in one-week-time (6). This likert-scale (0-4) aims to measure the severity of BDD in different factors such as; time & activity stress; defect; resistance & control; thoughts, interference, and avoidance. It was adapted from the Y-BOCS, which was the most widely used measure of OCD severity (7). Body Image Disorder Questionnaire (BIDQ) aims to diagnose the BDD with specific questions and includes a likert-scaled items (1-5) that are associated to resultant impairment in social, occupational, or other important areas of functioning, appearance-related concerns, associated experiences of emotional distress, interference with social life or with school, job, or role functioning, consequential behavioral avoidance and corresponding mental preoccupation (8). The evidence was provided in the validity and reliability of the BIDQ in a healthy sample and the BIDQ was reported as accurate questionnaire to evaluate the impairment in functioning and appearance-related anxiety (9).

The study aims to perform validity and reliability tests on the Turkish version of the YBOCS-BDD (T-YBOCS-BDD) and BIDQ (T-BIDQ), which are the most preferred on evaluation and measuring the severity of BDD, and to make these versions possible for use for the clinicians and academicians who study in countries where the Turkish language is spoken.

Methods

Ethical Statement

The study was approved by the research Ethics Committee of Bezmialem Vakıf University (22.10.2019 & 20/375). Written informed consent was obtained from all participants after the procedures were fully explained and before their inclusion in the study, anonymity was assured.

Turkish Translation

The original versions of BIDQ and YBOCS-BDD were translated from English into Turkish by two authors of this study who were fluent in English. Both translations were evaluated by a multidisciplinary committee composed of an orthodontist, an oral maxillofacial surgeon and two psychiatrists. During the translation phase, semantic, idiomatic, conceptual and cultural equivalences were provided. Translation errors were checked for all items and they were evaluated for content validity. Then, the back-translation into English by two independent translators. The back-translated versions of YBOCS-BDD and BIDQ were checked and compared with the original instrument by the same committee to perform the corrections for possible errors made during back-translation. A pilot study was carried out with 35 patients. The outcomes were satisfactory, therefore, the final versions of both tests were decided.

Subject Selection and Administration Methods

Power analysis in this study showed that 76 patients were needed in each group. Thus, 161 patients who were aged between 18 and 65 years were included in the study. Exclusion criteria were the inability to understand the interview questions, having severe physical deformities resulting from tumors or other conditions, and being previously diagnosed as having BDD or another psychiatric disease. The patients in study groups were obtained among the individuals who were admitted to the university hospital, faculty of dentistry with the complaint of dental anterior region aesthetics (n=80). The patients who were admitted to the same clinic without any esthetic considerations (such as pain, wisdom teeth, bleeding in the mouth, etc.) were selected

for the control group (n=81). T-BIDQ and T-YBOCS-BDD were performed to all patients with the face-to-face interview method. Within the first week, the scale and questionnaire were re-administered to individuals for reliability study (test-retest) because YBOCS-BDD was used to measure the BDD status within one week. Retesting of T-BIDQ and T-YBOCS-BDD was also performed.

In this study, the validity and reliability of the T-BIDQ and T-YBOCS-BDDwere compared in both control and study groups. The content validity analysis was applied to show the extent to each item in the scale and its contribution to the measurement of the phenomenon together with other items.

Statistical Analysis

The internal consistency of the scale was evaluated using the Cronbach's alpha coefficient, the additivity was evaluated using the Tukey additivity test, the sufficiency of the sample size was evaluated with the Kaiser-Meyer-Olkin test, factorability was evaluated with the Bartlett test, and the determination of the factor structures was through the Principal Component Factor Analysis. The Varimax method was used as the factor rotation method. The reliability of the scale was determined using the test-retest method, intragroup correlation coefficients, and the t-test for the matched subjects. The comparisons between groups with normal distribution were performed using for Mann-Whitney U test. The relationships between numerical data were analyzed with the Pearson or Spearman correlation analysis tests. A $p<0.05$ was considered as statistically significant. Distribution of the variable data was evaluated using the Shapiro-Wilk normality test and the Q-Q graphs. The threshold of statistical significance was set at $p<0.05$. Analyzes were conducted using TURCOSA (Turcosa Analytics Ltd Co, Turkey, www.turcosa.com.tr) statistical software.

Results

Validity

Content Validity

Content validity analysis of T-BIDQ and T-YBOCS-BDD was performed and conformity contents were arranged by adhering to the original version.

It was found that the total score of T-BIDQ did not differ between the patient and the control groups according to the median value. (p=0.059). The median value of the patient group was 10.00 and the 25th percentile value was 8.75 and the 75th percentile value was 12.00. The median of the control group was 10.00 and 25th percentile value was 10.00 and the 75th percentile value was -12.00. There was a difference between the patient and control groups according to the median T-YBOCS-BDD total score (p=0.006). The median of the patient group was 8.00 and the 25th percentile value was 3.50 and 75th percentile value was -15.00. The median of the patient group was 11.50 and the 25th percentile value was 6.25 and the 75th percentile value was -18.00 (Table 1).

The Results of Factor Analysis for T-BIDQ

The scores obtained from the sub-areas of the BIDQ were analyzed with the Principal Componet Factor Analysis. According to the analysis results, two factors which corresponded to 63.037% of the total variance and having an eigenvalue above 1.00 were determined. The cumulative explanation rates of the total variance were explained by the first component for 44.271%, and the second component for 63.037%. While the eigenvalue was 3,099 for the first component, this value was found to be 1,314 for the second component. Factor loadings for scale questions in each sub-area of these factors are included in Table 2. Varimax rotation was used to present results on factoring items. According to the results of the axis rotation analysis, the Factor 1 contained items 1, 2 and 7, while Factor 2 included items 3, 4, 5 and 6. The items were collected in 2 factors. The factor analysis score was 0.736, and Bartlett's test of sphericity was measured as 336,069 (df=21, $p<0.001$) for BIDQ in the KMO test. A sufficient significant correlation to perform a factor analysis for the assessment of the construct validity was demonstrated and shown in Table 2. Factor loadings for all items were noted above 0.40.

The results of factor analysis for T-YBOCS-BDD Scale

The scores obtained from the sub-areas of the T-YBOCS-BDD were analyzed by using the Principal Component Factor Analysis. According to the results of the analysis, four factors which corresponded to 67.816% of the total variance and had an Eigenvalue above 1.00 were determined. The cumulative explanation rates of the total variance were explained by the first component for 34.153% the second component for 47.973%, the third component for 58.419%, and the fourth component for 67.816%. While the Eigenvalue was 4,098 for the first component, this value was 1,658 for the second component, 1.254 for the third component, and 1,128 for the fourth component. Factor loads for scale questions in each sub-area of these factors are included in Table 3. Varimax rotation was used to present results on factoring items. According to the results of the rotation analysis, the first factor had items 3, 4 and 11, while the second factor had items 2, 7, and 12, the third factors had items 5,6,8 and 9, and the fourth factors had items 1 and 10. Articles were included. The items were collected in 4 factors. The factor analysis score was0.705 and Bartlett's test of sphericity was measured as 677.296 (df=66, $p<0.001$) for T-YBOCS-BDD in the KMO test. A sufficient significant correlation to perform a factor analysis for the assessment of the construct validity was demonstrated and shown in Table 3. Factor loadings for all items were noted above 0.40.

Table 1. Total mean scores of T-BIDQ and T-YBOCS-BDD

Tests (total scale)	Group: Control median (25p-75p)	Patients median (25p-75p)	p
T-BIDQ	10.00 (10.00-12.0)	10.00 (8.75-12.00)	**0.059**
T-YBOCS-BDD	11.50 (6.25-18.00)	8.00 (3.50-15.00)	**0.006**

Reliability

Internal Consistency Analysis- Cronbach's Alpha

A proof of construct validity in scale studies is the high internal consistency coefficient (Cronbach's alpha) of the scale. After the factor analysis results of this study, the factored items were found to have internal consistency coefficient as 0.780 for the T-BIDQ and 0.808 for the T-YBOCS-BDD, providing the evidence for the construct validity. The scores of ICC analysis for both tests are shown in Tables 4, 5.

The internal consistency coefficients (Cronbach's alpha) of items 1, 2 and 3 for the sub-factor groups formed for the T-BIDQ were determined as 0.735 and 0.730.

Discussion

The diagnosis of BDD could be challenging in clinical settings even though the incidence and severity of BDD were relatively common. Generally, patients with BDD consult dermatologists, dentists, oral & maxillofacial surgeons and more often plastic surgeons, rather than psychiatrists. For that, the determination of the prevalence of BDD in the psychiatric clinics is difficult and the aesthetic clinicians must be aware and have knowledge about this disease (10). In the literature, the prevalence of BDD in the general population is reported as 0.7-5.3% (11). Clinical studies have revealed higher rates such as, 8.8-12% in dermatology patients (12), 7% in cosmetic surgery patients (13), 14-42% in patients with atypical major depression (14), 11-13% in patients with social anxiety (15,16), 8-37% in patients with OCD (16), and 39% in patients with anorexia nervosa (17).

Moreover, the patients with aesthetic complaints are not only admitted to the plastic surgery and dermatology departments but also the dentistry faculty. Furthermore, they are usually admitted to almost all departments of the dentistry, but the maxillofacial

Table 2. Factor analysis results for T-BIDQ

Item	Mean	SD	Corrrected item-total correlation	Croncbach's alpha if item deleted	Factor loading
Factor 1 (concern)					
Q1	1.987	0.874	0.567	0.731	0.870
Q2	1.696	0.850	0.409	0.768	0.826
Q7	1.575	0.670	0.612	0.724	0.558
Factor 2 (defect)					
Q3	1.607	0.694	0.468	0.751	0.651
Q4	1.424	0.742	0.668	0.709	0.729
Q5	1.322	0.544	0.545	0.742	0.747
Q6	1.310	0.627	0.264	0.786	0.744

Table 3. Factor analysis results for T-YBOCS-BDD scale

Item	Mean	SD	Corrrected item-total correlation	Croncbach's alpha if item deleted	Factor loading
Factor 1 (time & activity distress)					
Q3	0.764	0.685	0.561	0.789	0.668
Q4	1.024	1.279	0.584	0.780	0.685
Q11	1.310	1.256	0.667	0.770	0.769
Factor 2 (time & insight)					
Q2	0.379	0.591	0.452	0.797	0.590
Q7	1.149	0.624	0.324	0.804	0.461
Q12	0.420	0.739	0.361	0.801	0.508
Factor 3 (resistance & control) **Q5**	0.925	1.087	0.508	0.788	0.619
Q6	0.341	0.798	0.516	0.790	0.559
Q8	1.546	1.014	0.384	0.800	0.468
Q9	0.695	1.593	0.506	0.797	0.595
Factor 4 (thoughts & interference/avoidance)					
Q1	1.229	0.584	0.397	0.800	0.702
Q10	1.310	0.895	0.379	0.800	0.492

surgery, orthodontics, prosthetic and restorative dentistry departments are the most preferred ones by patients with BDD.

In a study, Hepburn et al. (18) reported that patients with BDD who were admitted to the department of orthodontics revealed high requisition for the orthodontic treatment. Moreover, another study reported the rate of whitening and orthodontic treatment of those who had BDD was nine times higher (19). Therefore, the clinicians should keep in mind the situation of these patients and get knowledge about evaluating and managing the patients suspected from BDD (20).

Due to nature of the difficulties on detecting the patients with BDD, it is generally emphasized that the satisfaction of the treatment is negatively and adversely affected. Besides, the prevalence of BDD patients who are admitted to dental clinics still remains unknown. Because the rates of suicide attempts range from 3% to63% and the reported rates of suicidal ideation range from 17% to77%, high rates of suicidality have also been associated with BDD (5).

Table 4. Test-retest reliability and ICC between the T-BIDQ and 2 subscales (n=161)

Factors	Item	Croncbach's alpha	ICC	95 %CI
Factor 1 (concern)	**Q1**	0.735	0.735	(0.655-0.800)
	Q2			
	Q7			
Factor 2 (defect)	**Q3**	0.730	0.725	(0.648-0.789)
	Q4			
	Q5			
	Q6			

ICC: Intraclass correlation coefficient,

Table 5. Test-retest reliability and ICC between the T-YBOCS-BDD and 4 subscales (n=161)

Factors	Item	Croncbach's alpha	ICC	95% CI
Factor 1 (time & activity distress)	**Q3**	0.763	0.733	(0.652-0.797)
	Q4			
	Q11			
Factor 2 (time & insight)	**Q2**	0.648	0.533	(0.393-0.645)
	Q7			
	Q12			
Factor 3 (resistance & control)	**Q5**	0.681	0.681	(0.593-0.755)
	Q6			
	Q8			
	Q9			
Factor 4 (thoughts & interference/ avoidance)	**Q1**	0.492	0.460	(0.263-0.604)
	Q10			

ICC: Intraclass Correlation Coefficient, CI: Confidence interval,

The YBOCS-BDD and BIDQ-S (a modification for scoliosis disease) were translated into different languages such as Brazilian, Portuguese, Persian, Greek, Spanish, German and Chinese and these studies revealed successful outcomes (21-27). To our knowledge, the YBOCS-BDD was translated more times than the BIDQ. BIDQ was able to be found only in English, however, the BIDQ-S was translated into German and Chinese.

When it came to the evaluation of the reliability, Brito et al. (25) reported a YBOCS-BDD translation in Brazilian Portuguese. It was carried out with 93 patients who underwent rhinoplasty operation and the outcomes were highly satisfactory. Also, the test-retest method was applied for reliability at one-week intervals. In their study, they performed statistical analysis using correlation coefficient and ICC as well as the same statistical analysis were performed in the present study (25). On the other hand, Wetterkamp et al. (27) performed the German translated version of BIDQ-S in 259 patients with idiopathic scoliosis and revealed successful outcomes. In our study, the validity and reliability tests on the Turkish version of the BIDQ were performed with a translated version of the YBOCS-BDD simultaneously, and the results were also promising (Tables 1-5).

While evaluating the validity, in the original validation of the YBOCS-BDD study by Phillips et al. (28) three factors were accounted for 60% of the total variance: Factor-1 as core symptoms (time, interference and distress due to thoughts, interference due to compulsions, insight, and avoidance), Factor-2 as compulsions and Factor-3 as resistance and control of thoughts. The Turkish translated version of YBOCS-BDD and BIDQ demonstrated successful outcomes in which both tests revealed a sufficient significant correlation to perform a factor analysis, allowing the evaluation of the construct validity. Significant correlations could be established between T-YBOCS-BDD and global question as indicated by total and subscale scores of the corrected item-total correlations. These outcomes were indicative of a fair to excellent convergent validity. Factor loadings were noted for all items as above 0.60.

Four factors were extracted from the factor analysis and were accountable for a total of 67.816% of the variance.

On the other hand, the same factor analysis procedures were also performed for the T-BIDQ. Similar to the present study, Collison et al. (29) reported that the KMO test was excellent (i.e.,0.95), and Bartlett's test was significant ($p<0.001$), indicating suitability for factor analysis. According to their results, the factor loadings ranged from 0.53 to 0.87 whereas the parallel analysis identified a single latent component accounting for 67.14% of the variance. In the present study, factor loadings were noted as above 0.40 for all items. Two factors were extracted from the factor analysis and were accountable for a total of 63.037% of the variance. Significant correlations were shown between T-BIDQ and global question as indicated by total and subscale scores of the corrected item-total correlations. These outcomes were also indicative

of a fair to excellent convergent validity and the outcomes for the validity and reliability (Cronbach's alpha, ICC and 95% confidence interval) for the translated versions of YBOCS-BDD and BIDQ were reported similar to the literature (21-27).

There are no empirically derived cut off scores for YBOCS-BDD, however, a score of 20 or above generally indicates moderate BDD (30). Moreover, a cut off score for T-BIDQ was found as 11 in our study, but only one patient scored more than 20 in T-YBOCS-BDD and 11 in T-BIDQ, so as one of the limitations of the study, the ROC-curve for both tests would not be given despite the satisfactory outcomes. Therefore, it is highly recommended that higher numbers of patients should be included in further studies, even though numbers of the groups will be adequate in each group according to the power analysis.

Study Limitations

As one of the limitations of the study, divergent validity, which was one of the methods to evaluate the factorability of the scale, was not evaluated.

Conclusion

In conclusion, the T-YBOCS-BDD and T-BIDQ resulted in high validity and reliability. Therefore, the clinicians and academicians are encouraged to perform the translated forms of these scales and questionnaires in the population who speaks the Turkish language.

It is crucial to inform the patients preoperatively in general dentistry, especially during the aesthetical operations not to perform unsatisfactory treatments due to the nature of the patients with BDD who have perceptional problems on their appearance.

Further studies in dentistry field are recommended to be performed to assess the prevalence of BDD and the clinicians should be encouraged for performing these tests in dentistry for determining the real epidemiology of BDD.

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Ethics

Ethics Committee Approval: This study was approved by the Local Ethics Committee (22.10.2019/20/375).

Informed Consent: Written informed consent was obtained from all participants after the procedures were fully explained and before their inclusion in the study, anonymity was assured.

Peer-review: Externally peer reviewed.

Authorship Contributions

Concept: T.Y., E.D.Ş., Ç.D.Ş., Design: T.Y., E.D.Ş., Ç.D.Ş., Data Collection or Processing: T.Y., E.D.Ş., M.K., G.E.Z., Analysis or Interpretation: T.Y., E.D.Ş., M.K., G.E.Z., Ç.D.Ş., Literature Search: T.Y., E.D.Ş., M.K., G.E.Z., Ç.D.Ş., Writing: T.Y., G.E.Z., M.K.

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