The Reliability and Validity Study of the Turkish Version of Yale-Brown Obsessive-compulsive Scale Modified for Body Dysmorphic Disorder for Adolescents

Adölesanlar için Geliştirilmiş Olan Yale Brown Obsesif-kompulsif Ölçeği Beden Dismorfik Bozukluğu Modifikasyonunun Türkçe Versiyonunun Geçerlilik ve Güvenirlik Çalışması

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ABSTRACT

Objective: Body dysmorphic disorder (BDD) is defined as a highly disturbing condition characterized by the patient developing an excessive anxiety and repetitive behaviors. The prevalence of BDD in the orthodontic patients is still not well known. The aim of this study was to evaluate reliability and validity study of the Turkish version of the Yale-Brown Obsessive-Compulsive Scale modified for Body Dysmorphic Disorder (TR-YBOCS-BDD) for adolescents.

Methods: This study consisted of two groups, the study group and the control group. The study group consisted of 126 patients who were admitted with aesthetic complaints (n=126). The control group consisted of 126 participants who were admitted with non-aesthetic complaints such as dental calculus, caries and pain. Turkish versions of YBOCS-BDD and Body Image Disturbance Questionnaire (T-BIDQ) were administered to 252 patients in total for reliability and validity studies.

Results: The internal consistency coefficient of the TR-YBOCS-BDD scale was 0.903. The scores of the subareas of the TR-YBOCS-BDD scale were analyzed with Principal Components Factor Analysis and it was concluded that 8 factors corresponded to 62.104% of the total variance. The test re-test analysis was carried

ÖZ

Amaç: Beden dismorfik bozukluğu (BDB), hastanın aşırı kaygı ve tekrarlayıcı davranışlar geliştirmesiyle karakterize, oldukça rahatsız edici bir durum olarak tanımlanmaktadır. Ortodontik hastalarda BDB prevalansı hala tam olarak bilinmemektedir. Bu çalışmanın amacı, Yale-Brown Obsesif-Kompulsif Ölçeği BDB modifikasyonunun adölesanlar için Türkçe versiyonunun (YBOKB-BDB) geçerlik ve güvenirlik çalışmasının değerlendirilmesidir.

Yöntemler: Bu çalışma, çalışma grubu ve kontrol grubu olmak üzere iki gruptan oluşmaktadır. Çalışma grubu estetik şikayet ile başvuran 126 hastadan oluşurken, kontrol grubu ise diş taşı, çürük veya ağrı gibi estetik olmayan şikayetlerle başvuran 126 hastadan oluşturulmuştur. Güvenilirlik ve geçerlilik çalışmaları için YBOKB-BDB ve Beden Görünüşü Rahatsızlığı Testi (BGRT) toplam 252 hastaya uygulanmıştır.

Bulgular: YBOKB-BDB'nin iç tutarlılık katsayısı 0,903'tür. YBOKB-BDB ölçek puanlarının alt alanları Temel Bileşenler Faktör Analizi ile analiz edilmiş ve 8 faktörün toplam varyansın %62,104'üne karşılık geldiği sonucuna varılmıştır. Test tekrar test analizi, YBOKB-BDB ölçeği 126 kişiye uygulanarak ve aynı test birer hafta arayla tekrar uygulanarak yapılmıştır. İlk toplam ölçek

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ABSTRACT

out by applying the TR-YBOCS-BDD scale to 126 participants and same test re-test was made at one-week interval. High positive correlation was found between the first total scale results and the total score calculated one week later (rho =0.986, p<0.001).

Conclusion: The Turkish translation of the BDD-YBOCS has content and construct validity and is also reliable method. The clinicians can apply this test to adolescents in the Turkish-speaking countries.

Keywords: Adolescent psychiatry, body dysmorphic disorder, orthodontics

ÖZ

sonuçları ile bir hafta sonra hesaplanan toplam puan arasında yüksek pozitif korelasyon bulundu (rho =0,986, p<0,001).

Sonuç: YBOKB-BDB'nin Türkçe çevirisi içerik ve yapı geçerliğine sahip olup güvenilir bir yöntemdir. Klinisyenler bu testi Türkçe konuşulan ülkelerde bulunan adölesanlarda uygulayabilirler.

Anahtar Sözcükler: Adelösan psikiyatrisi, beden dismorfik bozukluğu, ortodonti

Introduction

Body dysmorphic disorder (BDD) was first defined in 1886 as "dysmorphophobia" by a psychiatrist named Morselli (1,2). Later, in 1980, BDD was defined as "atypical somatoform disorder" in the Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV). The American Psychiatric Association classified this "problem" as "Body Dysmorphic Disorder" in the DSM-IV in 1987 (3). BDD is now included in contemporary classification systems with the DSM-V (4). BDD is a highly disturbing disorder characterized by the patient's concern about imaginary or mild physical defects perceived by the patient. Some of the common behaviors in patients with BDD are: Comparing the patient's appearance with other individuals, repeated inspection or direct examination of mirrors or other reflective surfaces for detected defects, extreme self-care (for example, hair combing, hair styling, shaving, plucking or pulling hair), camouflage (for example, repeatedly applying make-up or covering disliked areas with a hat, clothing, make-up or hair), seeking reassurance about what perceived defects look like, touch undesirable areas to check, exercising excessively or lifting weights, searching for cosmetic procedures (5). Because patients with BDD are unaware of the true nature of the problem, they often seek solutions in non-psychiatric treatments and aesthetic procedures (6,7). Patients tend to hide their disease and often refer to plastic surgeons (1,8), dentists (9) or dermatologists (10) instead of being treated.

High percentage of suicidal tendencies is found in patients with severe BDD symptoms. These rates were observed in clinics, not in the general population (11-13). The prevalence of BDD in the general population is still not well known. Previous studies reported that BDD affected only 2% of general population (1,14,15) and 12% of psychiatric patients (1,16). Major depression, social phobia, drug addiction and Obsessive-Compulsive-related disorder (OCD) are accompanying disorders found with BDD. Previous studies reported that BDD shared the basic disorder features of OCD. They were similar in terms of high comorbidity, increased family history and treatment response (4). Differential diagnosis are; concerns about normal appearance and obvious physical defects, eating disorders, other obsessive-compulsive and related disorders, illness anxiety disorder, major depressive disorder, anxiety disorders, psychotic disorders (5).

Yale-Brown Obsessive-Compulsive Scale modified for Body Dysmorphic Disorder (YBOCS-BDD) is a 12-item, semi-structured, physician-administered scale which is assessing BDD severity (17). Adapted from YBOCS which is a scale used to measure OCD severity (18). The aim of this study was to test the reliability and validity of the Turkish translation of the Yale-Brown Obsessive-Compulsive Scale modified for Body Dysmorphic Disorder (TR-YBOCS-BDD) on adolescents, which was applied to adults in the previous study (19). This test provides easier to understand the prevalence of BDD and facilitate the diagnosis in Turkey and Turkish-speaking areas. The null hypothesis is there is no differences between groups.

Methods

This study was approved by the Bezmialem Vakıf University Local Ethics Committee (decision no: 20/375, date: 22.10.2019). The necessary permissions were obtained for the scale to be adapted into Turkish. The original version of this scale was translated from English to Turkish by native English speakers. Translation was checked by an orthodontist, an oral and maxillofacial surgeon, and two psychiatrists. The meanings of the words were arranged in a way that adolescents could understand. Later, the scale was translated back into the native language by two independent translators. The English version of the scale was checked by the same board and compared with the original scale to correct any possible errors during back translation. As a result, the final version of the test was decided.

The Turkish translation of the Yale-Brown Obsessive-Compulsive Scale modified for Body Dysmorphic Disorder and Beck Depression Inventory (BDI) were applied to 252 adolescent patients. Patients aged 13-18 years were included in the study. The gender distributions between the groups were chosen very close to each other. A voluntary consent form was obtained from each patient for participating in this study. One hundred twenty six of the adolescent patients were admitted to our faculty with aesthetic expectations, the other 126 adolescent patients were admitted to the faculty with non-aesthetic complaints such as pain, calculus and caries. Participants were selected on a voluntary basis. Exclusion criteria for both groups of participants were: inability to understand the issue of scale, severe physical disorders caused by syndromes, pre-diagnosed BDD and

another psychiatric illness. TR-YBOCS-BDD was applied to the participants twice, one-week apart. In this study, the validity and reliability of the TR-YBOCS-BDD scale were compared in both control and study groups. They answered 33 questions for TR-YBOCS-BDD and 21 questions for BDI. Participants were asked to write numerically how much they participated with the questions in TR-YBOCS-BDD from 0 to 4, and from 0 to 3 with the statements in the BDI. The scales were administered directly to the patients by the researchers, over the phone, on the internet, and during a dental appointment. The content validity method was applied to the area of the items in the scale and their relationship with other items. BDI scale was used for equivalence analysis. Statistical significance was accepted as p<0.05.

Statistical Analysis

Shapiro-Wilks test (Q-Q graphs) statistics was used for evaluation of the data distribution. The two independent group comparisons were performed. In these comparisons, the independent two-sample t-test was performed for analyzing of normally distributed data, and the Mann-Whitney U test was performed for the analyzing of non-normally distributed data. Spearman correlation analysis was used to test the compatibility of the two quantitative data sets. Factor analysis was performed for the factorial structure. Principal Component Analysis was performed as factor extraction method. Additionally, factor score was determined by Bartlett test and Kaiser-Meyer-Olkin (KMO) test. Varimax rotation method was performed for factor rotation analysis. The validity analyzes for YBOCS were examined under 2 main headings: construct validity and content validity. The methods used in construct validity analysis can be defined as 4 different methods; examining the differences between subscale scores and total scale scores of the study group (group differences and construct validity analysis, examining correlations between

sub-domains, calculation of factor analysis results and calculation of internal consistency coefficient and Regarding validity. BDOC was used as an alternative form in criterion validity analysis, it was based on the concurrent validity analysis specified in the literature. The Cronbach alpha reliability coefficients were checked out for each subfield and whole scale in the internal consistency method for evaluation of the YBOCS reliability analyses. Moreover, inter-item correlation and item-total score correlation coefficient average were analyzed. Additionally, the equivalence method was performed by analyzing the correlation with the BDOCS scale. YBOCS reliability analyses were tested under 3 categories: test-retest, intra correlation coefficient (ICC), concordance correlation coefficient (CCC), Bland Altman Plot and. The R 3..6..2 program and TURCOSA (Turcosa Analytics Ltd. Co., Turkey, www.turcosa.com.tr) statistics software were used for analyzing of the data. Statistical significance was accepted as p<0.05.

Results

The findings were examined under two main headings, validity and reliability.

Content Validity

The content validity analysis of YBOCS was carried out at the following stage: The adaptation stage of the scale was adjusted in terms of cultural conformity by based on the original version. Validity was examined under 4 subgroups. As a result of their analysis, the following findings were obtained.

Calculating the Internal Consistency Coefficient (Cronbach Alpha)

The total scores of the patient group in sub-areas of the YBOCS scale and throughout the scale were found to be higher

Table 1. Examining differences between the healthy participant group and the group in terms of the YBOCS-BDD scale subscale scores and total scale scores

Scale fields	Group		p value
	Control (aesthetic concern) median (25p-75p)	Patients median (25p-75p)	
YBOCS-BDD 1	1.00 (0.00-1.00)	1.00 (1.00-2.00)	0.011
YBOCS-BDD 2 total	2.00 (0.00-7.00)	7.00 (4.00-9.25)	<0.001
YBOCS-BDD 3	0.00 (0.00-1.00)	1.00 (0.00-1.00)	0.367
YBOCS-BDD 4	0.00 (0.00-1.00)	0.00 (0.00-1.00)	0.988
YBOCS-BDD 5	0.00 (0.00-1.00)	1.00 (0.00-1.00)	0.725
YBOCS-BDD 6 total	3.00 (1.00-5.00)	7.00 (3.75-11.00)	<0.001
YBOCS-BDD 7	0.00 (0.00-1.00)	1.00 (0.00-1.00)	<0.001
YBOCS-BDD 8	0.00 (0.00-1.00)	1.00 (0.00-1.00)	0.109
YBOCS-BDD 9	0.00 (0.00-1.00)	1.00 (0.00-1.00)	0.364
YBOCS-BDD 10	0.00 (0.00-1.00)	1.00 (0.00-1.00)	0.208
YBOCS-BDD 11	1.00 (0.00-1.00)	1.00 (0.00-1.00)	0.397
YBOCS-BDD 12	0.00 (0.00-1.00)	1.00 (0.00-1.00)	<0.001
YBOCS-BDD total scale	11.00 (5.00-21.25)	10.30 (11.00-29.25)	0.006

YBOCS-BDD: Yale-Brown Obsessive-Compulsive Scale modified for Body Dysmorphic Disorder

than the scores of the healthy group (p<0.001) (Table 1). Evidence for construct validity on the scale studies is the high internal consistency coefficient (Cronbach's alpha). In this study, the internal consistency coefficient for the YBOCS scale was found to be 0.903, providing evidence for the construct validity.

The Correlation Coefficients

The correlation coefficients between the YBOCS scale subdomains of the participants in both groups and the whole scale were analyzed using the Spearman correlation coefficient. According to the analysis results, there was a correlation between the YBOCS2 and all YBOCS score of the control participants with aesthetic expectations. (rho =0.766 and p<0.001). Moreover, there was a correlation between the YBOCS6 total score scale and the total YBOCS scores of the control participants with aesthetic expectations (rho =0.733 and p<0.001). There was a correlation between YBOCS2 and total YBOCS scores of patients with unaesthetic expectations (rho =0.774 and p<0.001). Also there was a correlation between YBOCS6 total score scale and total YBOCS scores of patients with unaesthetic expectations (rho =0.812 and p<0.001). At this stage, correlation analysis between the sub-domains of the YBOCS scale was performed for both groups of participants. For control participants, there was moderate, positive and statistically significant correlation between the YBOCS2 participation domain and YBOCS6 (rho =0.472, p<0.001). Additionally, similar correlation was observed between the compact subdomain and the emotional state subdomain (rho =0.533, p<0.001).

Calculating Factor Analysis Results

The KMO was used for examination of the suitability of the sample and the adequacy of the number of samples was also controlled. With a KMO value of 0.869 sampling efficiency was found to be very good. The test results of Bartlett were found as p<0.001. The sub-areas of the scale scores were performed with the Principal Component Factor Analysis. The 8 factors corresponded to 62.104% of the total variance andan Eigen value above 1.00 emerged according to the results of the analysis. The results of the factorization of the items were determined by Varimax rotation. The 1st factor had YBOCS 2.8, the 2nd factor had YBOCS5 items

based on the results of the axis rotation analysis. YBOCS 6.12 substances were included in 3rd factor and 8th factor. Table 2 and 3 shows these results.

Regarding Validity

In the internal consistency sub-analysis of the YBOCS reliability, the average of item-total score correlation coefficients, inter-item correlation coefficients, and Cronbach Alpha method results are presented in Table 4, 5.

Reliability Analysis

Equivalence Analysis

The alternative form method was applied and the comparable form BDI scale was used. The correlation analysis was performed for the comparisons of these two scales, and a moderately significant positive correlation was found among the patient and control groups. These analyzes are shown in Table 6.

Test-retest Analysis

Another criterion used in the estimation of the reliability coefficient of the YBOCS was test-retest analysis. The YBOCS was applied to 126 participants, after a one-week break, and then applied to the same participants again. It was observed that there was a high positive correlation among the first total scale score of this scale and the total scale score one week later (rho =0.986, p<0.001). According to these results, the test was found to be reliable.

Intra Correlation Coefficient and Concordance Correlation Coefficient

The CCC between the first measurement of YBOCS and the second measurement of YBOCS was found to be 0.9913. There was significant interclass correlation coefficient results (95% confidence interval) for all factors.

Bland Altman Plot

Testing the reliability of the scale was done with Bland Altman charts. It was observed that there was no difference between the test-retested first measurement of YBOCS and the second test measurement of YBOCS.

Table 2. The Eigen values and variance percentages of the YBOCS-BDD factors

Factor	Eigen value	Percentage of variance	Cumulative percentage of variance
Factor I	8.597	26.052	26.052
Factor II	3.158	9.570	35.622
Factor III	2.414	7.314	42.935
Factor IV	1.676	5.078	48.013
Factor V	1.345	4.076	52.089
Factor VI	1.172	3.550	55.639
Factor VII	1.085	3.289	58.927
Factor VII	1.048	3.176	62.104

YBOCS-BDD: Yale-Brown Obsessive-Compulsive Scale modified for Body Dysmorphic Disorder

Table 3. Factor evaluations of the YBOCS-BDD scale items

Factor	Item numbers	Mean	Standard deviation	Corrrected item-total correlation	Cronbach's alpha if item deleted	Factor loading	ICC (95% CI)
Factor I	YBOCS-BDD 2.8	2.90	0.65	0.767	0.843	0.813	0.876 (0.85-0.90)
	YBOCS-BDD 2.6	2.90	0.66	0.692	0.853	0.778	
	YBOCS-BDD 2.9	2.97	0.61	0.638	0.860	0.748	
	YBOCS-BDD 2.7	2.88	0.71	0.664	0.857	0.706	
	YBOCS-BDD 2.10	2.93	0.63	0.581	0.867	0.667	
	YBOCS-BDD 2.5	2.88	0.68	0.635	0.861	0.620	
	YBOCS-BDD 2.4	2.94	0.62	0.622	0.862	0.568	
Factor II	YBOCS-BDD 5	2.44	0.77	0.597	0.681	0.752	0.753 (0.70-0.80)
	YBOCS-BDD 6.1	2.52	0.72	0.579	0.690	0.714	
	YBOCS-BDD 3	2.40	0.79	0.592	0.682	0.667	
	YBOCS-BDD 4	2.37	0.88	0.383	0.766	0.538	
	YBOCS-BDD 6.2	2.56	0.72	0.476	0.724	0.495	
Factor III	YBOCS-BDD 6.12	1.59	0.59	0.633	0.676	0.761	0.757 (0.71-0.80)
	YBOCS-BDD 6.13	1.58	0.61	0.583	0.692	0.747	
	YBOCS-BDD 6.11	1.58	0.60	0.576	0.695	0.680	
	YBOCS-BDD 6.10	1.56	0.63	0.490	0.726	0.611	
	YBOCS-BDD 7	1.44	0.68	0.369	0.773	0.435	
Factor IV	YBOCS-BDD 6.7	1.27	0.69	0.688	0.644	0.776	0.767 (0.71-0.81)
	YBOCS-BDD 6.9	1.36	0.63	0.535	0.729	0.728	
	YBOCS-BDD 6.6	1.24	0.71	0.552	0.721	0.693	
	YBOCS-BDD 6.8	1.31	0.67	0.503	0.745	0.547	
Factor V	YBOCS-BDD 2.2	2.21	0.61	0.663	0.643	0.755	0.754 (0.70-0.80)
	YBOCS-BDD 2.3	2.17	0.64	0.558	0.693	0.640	
	YBOCS-BDD 2.1	2.03	0.74	0.566	0.689	0.619	
	YBOCS-BDD 1	1.72	0.74	0.444	0.760	0.499	
Factor VI	YBOCS-BDD 6.4	1.02	0.67	0.583	0.531	0.769	0.703 (0.36-0.541)
	YBOCS-BDD 6.3	0.84	0.74	0.552	0.573	0.765	
	YBOCS-BDD 6.5	1.04	0.62	0.436	0.708	0.583	
Factor VII	YBOCS-BDD 9	1.55	0.95	0.510	0.547	0.739	0.673 (0.60-0.74)
	YBOCS-BDD 10	1.60	0.83	0.478	0.591	0.671	
	YBOCS-BDD 8	1.53	0.91	0.474	0.594	0.659	
Factor VII	YBOCS-BDD 12	0.85	0.80	0.452	-	0.725	0.452 (0.35-0.55)
	YBOCS-BDD 11	0.73	0.82	0.452	-	0.712	

YBOCS-BDD: Yale-Brown Obsessive-Compulsive Scale modified for Body Dysmorphic Disorder, ICC: Intra correlation coefficient, CI: Confidence interval

Table 4. Inter-item correlation analysis results for the YBOCS2 communication subfield

	YBOCS-BDD 2.1	YBOCS-BDD 2.2	YBOCS-BDD 2.3	YBOCS-BDD 2.4	YBOCS-BDD 2.5	YBOCS-BDD 2.6	YBOCS-BDD 2.7	YBOCS-BDD 2.8	YBOCS-BDD 2.9
YBOCS-BDD 2.1									
YBOCS-BDD 2.2	0.591**								
YBOCS-BDD 2.3	0.473**	0.679**							
YBOCS-BDD 2.4	0.491**	0.488**	0.551						
YBOCS-BDD 2.5	0.454**	0.454**	0.403	0.558**					
YBOCS-BDD 2.6	0.280**	0.357**	0.365	0.431**	0.531**				
YBOCS-BDD 2.7	0.346**	0.310**	0.361	0.405**	0.500**	0.560**			
YBOCS-BDD 2.8	0.391**	0.435**	0.439	0.390**	0.550**	0.633**	0.614**		
YBOCS-BDD 2.9	0.321**	0.330**	0.344	0.468**	0.351**	0.510**	0.502**	0.569**	
YBOCS-BDD 2.10	0.295**	0.336**	0.367	0.373**	0.411**	0.473**	0.375**	0.549**	0.540**

YBOCS-BDD: Yale-Brown Obsessive-Compulsive Scale modified for Body Dysmorphic Disorder; Spearman's Rho Analysis, **p<0.01.

Table 5. Inter-item correlation analysis results for the YBOCS6 communication subfield

	YBOCS-BDD 6.1	YBOCS-BDD 6.2	YBOCS-BDD 6.3	YBOCS-BDD 6.4	YBOCS-BDD 6.5	YBOCS-BDD 6.6	YBOCS-BDD 6.7	YBOCS-BDD 6.8	YBOCS-BDD 6.9	YBOCS-BDD 6.10	YBOCS-BDD 6.11
YBOCS-BDD 6.1											
YBOCS-BDD 6.2	0.517**										
YBOCS-BDD 6.3	0.358**	0.428**									
YBOCS-BDD 6.4	0.197**	0.314**	0.550**								
YBOCS-BDD 6.5	0.227**	0.298**	0.356**	0.396**							
YBOCS-BDD 6.6	0.207**	0.260**	0.379**	0.377**	0.412**						
YBOCS-BDD 6.7	0.172**	0.299**	0.299**	0.367**	0.325**	0.497**					
YBOCS-BDD 6.8	0.272**	0.324**	0.339**	0.326**	0.353**	0.385**	0.554**				
YBOCS-BDD 6.9	0.207**	0.190**	0.232**	0.238**	0.220**	0.358**	0.445**	0.440**			
YBOCS-BDD 6.10	0.215**	0.193**	0.322**	0.368**	0.237**	0.226**	0.299**	0.343**	0.448**		
YBOCS-BDD 6.11	0.062	0.168**	0.242**	0.249**	0.278**	0.269**	0.324**	0.403**	0.456**	0.489**	
YBOCS-BDD 6.12	0.157*	0.227**	0.212**	0.358**	0.272**	0.262**	0.406**	0.302**	0.380**	0.419**	0.618**

*p<0.05; **p<0.01. YBOCS-BDD: Yale-Brown Obsessive-Compulsive Scale modified for Body Dysmorphic Disorder; Spearman's Rho Analysis

Table 6. Correlation coefficients indicating the relationship between between YBOCS-BDD and BDI scale for participants and control Spearman's Rho analysis (r)

Group	YBOCS scale- BDI scale	
	rho	p
Control	0.451	<0.001*
Patients	0.602	<0.001*

YBOCS-BDD: Yale-Brown Obsessive-Compulsive Scale modified for Body Dysmorphic Disorder, BDI: Beck Depression Inventory *p<0.05.

Discussion

Adolescence (the period between the ages of 10 and 24) is a term of life specified by increased sensitivity to social life and an increased need for human relations (20). Adolescents turn to various treatment options to make better their appearance, one of which is orthodontic treatment. This situation results in increasing of the generality of BDD in orthodontic patients. The identification of BDD in orthodontic patients is very critical in terms of evaluating the treatment flow and results. The definitive diagnosis of BDD in adolescents should be made in psychology clinics, but the application of the TR-YBOCS-BDD may raise awareness in terms of providing an insight for clinicians. Previous study reported the Turkish validation of TR-YBOCS-BDD in adults, and the scale was tested in adolescents in this study, and it was aimed to better understand and guide adolescents with BDD in orthodontic treatments. The aim of this study was to investigate the prevalence of BDD in adolescents in the Turkish population with TR-YBOCS BDD and to raise awareness by changing our approach to patients with BDD symptoms.

The BDD-YBOCS psychometric properties of subjects was investigated by Philips for evaluation the reliability. Test-retest reliability (n=64) were examined. There was found that excellent inter-inter and test-retest reliability of intraclass correlation coefficients; internal consistency was strong. Of the variance 66% was determined by principal components factor analysis. The analyses of depression, social disability, and psychosocial functioning measures were resulted in a good convergent and discriminant validity. The significant decrease in average BDD-YBOCS scores with treatment indicates sensitivity to changes (21).

The diagnosis of BDD in clinical practice may be difficult. Patients with BDD are mostly preoccupied about their head and

face. For example, acne, wrinkles, scars, facial asymmetry, and disproportions are the conditions that worry patients (2,10). In addition, cheeks, teeth, lips and jaws are also concerns mentioned by these patients. The reasons why patients with BDD go to dentists are mostly; teeth whitening, jaw surgery and orthodontic treatment (22). Most of the patients with BDD undergoing dental or orthodontic treatment are dissatisfied with the treatment results and tend to visit other dentists repeatedly with similar concerns. To understand the expects of patients and psychological evaluation is a critical stage of the treatment. It allows us to make sense of the problems that may occur during the treatment process, to make more realistic treatment plans and to explain this situation to the patient (23). It has been documented that patients with BDD who are admitted to the orthodontics department have unrealistic expectations about treatment (24). Hepburn and Cunningham (25) reported that 7.5% of orthodontic patients were positive for BDD in their study of 40 adult orthodontic patients. In another study, 62 (5.2%) of 1,184 orthodontic patients were diagnosed as having BDD. Furthermore, it was reported that the rates of whitening and orthodontic treatment were nine times higher in those with BDD (24). Therefore, the clinicians must have the knowledge to clearly assess and manage patients with BDD (26). The probability of encountering patients with BDD in orthodontic practices is high. These patients should be referred to a psychiatrist for diagnosis and treatment. In order to achieve this, orthodontists should be familiar with this issue (2).

YBOCS-BDD is widely used as a gold-standard measurement of BDD symptoms (4). Researchers in various countries around the world have translated YBOCS-BDD into their own languages and performed reliability and validity tests. There were published studies on the prevalence of YBOCS-BDD between orthodontic patients. For example, in a study conducted at the Universidade Federal de São Paulo Plastic Surgery Outpatient Clinic in Brazil, YBOCS-BDD was translated into Brazilian Portuguese for the cultural adaption of the Brazilian Portuguese version of YBOCS-BDD. Thirty patients participated in the study. To analyze reliability and construct validity in patients, the final version was tested. The total Cronbach's alpha =0.918, ICC =0.934; (p<0.001) was found as a result of the study. 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). The Brazilian Portuguese version of the YBOCS-BDD was proven to be a reliable scale that demonstrated aspect, content, and construct validity (27). In another study, YBOCS-BDD translated into Persian was applied to 100 students (50 males, 50 females) selected by stratified cluster sampling from Isfahan University. The Cronbach's alpha range ranged from 0.78 for the "strength of thought control" factor to 0.93 for the "obsessive thoughts and behaviors" factor. YBOCS-BDD was found to have reliability and validity in Persian (28). This study demonstrates the psychometric investigation of the adolescent version of the TR-YBOCS-BDD in Turkish population. There are following various findings emerged as a result of this study. The results were promising (Tables 1-5).

Hepburn and Cunningham (25) reported that 7.5% of orthodontic patients were positive for BDD and they found BDD in 2.9% of the population (2). In another study, 62 (5.2%) of 1184 orthodontic patients were diagnosed as having BDD (2). Yassaei et al. (7) reported that 15 patients (5.5%) were positive. Because of the high probability of come across such patients in orthodontists' offices, it is necessary to refer these patients. Therefore physicians should be familiar with BDD (2).

The Turkish version of the scale, validated in a sample of patients (n=252), showed excellent internal consistency (Cronbach's alpha coefficient of 0.93 vs 0.80 in the original measure) and test-retest reliability (0.986 vs 0.88 in the original instrument) (17). The BDD-YBCOS can be performed for diagnosing patients who are not satisfied with their physical appearance, but do not meet diagnostic criteria for BDD. There is no definitive cut off score for YBOCS-BDD in the literature, but a score of 20 or above usually indicates moderate BDD (12). We can transfer this situation to daily clinical practice as follows: When the patient is diagnosed as having OCS, then they can be referred to a psychiatrist for the examination of BDD.

There were three main factors explaining the 60% of the total variance reported by Phillips: Factor-1 as core symptoms, Factor-2 as compulsions and Factor-3 as resistance and control of thoughts. While evaluating the validity in Turkish population, successful results were gathered with both tests. There was significant correlation, allowing to make a factor analysis. Therefore, we could evaluate the construct validity. The remarkable correlations might be performed among communication subdomain and the emotional state subdomains. These outcomes had good convergent and discriminant validity like previous studies (29). The strengths of this study were; general examination of issues and numerous aspects of reliability-validity, and the large sample size. This was also the first study to test the relationship of TR-YBOCS-BDD with adolescents in Turkish population.

Study Limitations

Relatively small sample size for analyzing of TR-YBOCS-BDD in adolescents was a limitation of the study. This test was applied to adolescents without gender discrimination. Furthermore, there are certain differences in terms of BDD rates in boys versus girls (30), and future studies should investigate predisposition of BDD according to gender. It was also important to understand that patients in this study came from patients undergoing routine dental clinical procedure and therefore might restrict the generalizability of the study. Because, all adolescents with BDD in Turkish population may not be admitted to orthodontic treatment, they may be obsessed with another part of their body. The results of this study should not be generalized to Turkish population. Divergent validity is a method to analyze the factorability of the scale. This was not performed in the study.

Conclusion

This is the first study for evaluation of the TR-YBOCS-BDD in adolescent patients. The scale has strong internal consistency, a

two-factor structure and good converent. The adolescent version of TR-YBOCS-BDD have strong psychometric properties. The research trials with adolescents are supported by the study. Thus, clinicians and academicians in Turkish-speaking populations will be able to benefit from this TR-YBOCS-BDD.

Ethics

Ethics Committee Approval: This study was approved by the Bezmialem Vakıf University Local Ethics Committee (decision no: 20/375, date: 22.10.2019).

Peer-review: Externally peer reviewed.

Authorship Contributions

Surgical and Medical Practices: E.D.Ş., S.Y., N.K., T.Y., Concept: E.D.Ş., S.Y., T.Y., G.E., Design: E.D.Ş., S.Y., T.Y., G.E., Data Collection or Processing: E.D.Ş., S.Y., T.Y., Analysis or Interpretation: E.D.Ş., S.Y., N.K., T.Y., G.E., Literature Search: E.D.Ş., S.Y., N.K., T.Y., G.E., Writing: E.D.Ş., S.Y., N.K., T.Y., G.E.

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