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Validation of the Turkish Version of the Obsessive-Compulsive Inventory-Revised (OCI-R) in Clinical and Non-Clinical Samples

Obsesif-Kompulsif Envanteri-Revize'nin (OKE-R) Türkçe Formu'nun Klinik ve Klinik Olmayan Örneklemlerde Geçerliği

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ABSTRACT

Introduction: The Obsessive-Compulsive Inventory-Revised (OCI-R) is a widely used self-report instrument developed to overcome the problems with the available instruments. The aim of this study was to assess the psychometric properties of the revised Obsessive Compulsive Inventory (OCI-R) in Turkish sample.

Methods: The psychometric properties of the Turkish version of the Obsessive-Compulsive Inventory-Revised (OCI-R) were assessed in clinical samples (n=44 for patients with obsessive-compulsive disorder (OCD), and n=44 for patients with major depression (MD) and a non-clinical student sample (n=287).

Results: The confirmatory factor analysis demonstrated that the original six-factor structure was valid in the Turkish sample. The overall and each of the subscales showed moderate to good internal consistency and convergent validity as well as test-retest reliability. However, the Cronbach's alpha was excessively low for the hoarding subscale in the OCD group. The total and subscale scores of the OCI-R satisfied at discriminating patients with OCD from both patients with MD and healthy controls, with an exception of the neutralizing subscale.

Conclusion: The Turkish version of the OCI-R did not reveal sound psychometric properties. Findings are discussed in the light of current theoretical considerations. *(Archives of Neuropsychiatry 2014; 51: 15-22)*

Key words: Obsessive-compulsive disorder, factor analysis, assessment, OCI-R

Conflict of interest: The authors reported no conflict of interest related to this article.

ÖZET

Giriş: Obsesif-Kompulsif Envanteri-Revize (OKE-R) varolan ölçme araçlarındaki sorunların üstesinden gelebilmek amacıyla geliştirilmiş yaygın olarak kullanılan bir öz değerlendirme aracıdır. Bu çalışmada, Obsesif-Kompulsif Envanteri'nin revize edilmiş formunun Türk örneklemindeki psikometrik özelliklerinin değerlendirilmesi amaçlanmıştır.

Yöntem: Obsesif-Kompulsif Envanteri-Revize'nin Türkçe formunun psikometrik özellikleri klinik örneklemlerde (obsesif-kompulsif bozukluk tanısı alan hastalarda n=44 ve major depresyon tanısı alan hastalarda n=44) ve klinik olmayan öğrenci örnekleminde (n=287) ele alınmıştır.

Bulgular: Doğrulayıcı faktör analizi sonucunda orijinal altı faktörlü yapının Türk örnekleminde geçerli olduğu bulunmuştur. Ölçeğin tümü ve alt ölçekler için orta düzeyden yükseğe doğru değişen düzeylerde iç tutarlılık, birlikte geçerlik ve test tekrar test geçerliği değerleri elde edilmiştir. İstifleme alt ölçeği için obsesif kompulsif grupta çok düşük Cronbach alfa değeri elde edilmiştir. Nötürleştirme alt ölçeği dışında toplam puanların ve alt ölçeklerin genel olarak obsesif kompulsif bozukluğu olan hastaları sağlıklı kontrollerden ve major depresyon hastalarından başarıyla ayırt edebildiği görülmüştür.

Sonuç: Obsesif-Kompulsif Envanteri-Revize'nin Türkçe formu için yeterli psikometrik özellikler saptanmamıştır. Bulgular konuya ilişkin kuramsal tartışmaların ışığında ele alınmıştır. *(Nöropsikiyatri Arşivi 2014; 51: 15-22)*

Anahtar kelimeler: Obsesif-kompulsif bozukluk, faktör analizi, değerlendirme, OKE-R

Çıkar çatışması: Yazarlar bu makale ile ilgili olarak herhangi bir çıkar çatışması bildirmemişlerdir.

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Introduction

According to the Diagnostic and Statistical Manual of Mental Disorders, 4th edition text revision (DSM-IV-TR), obsessive-compulsive disorder (OCD) is an anxiety disorder characterized by obsessions defined as intrusive, repetitive thoughts, images, or impulses; or compulsions that cause marked distress and impairment in daily functioning (1). Although OCD is conceptualized as a unitary clinical disorder in the current diagnostic approaches, heterogeneity in nature of the phenomenon is increasingly recognized (2,3,4).

Several self-report measures have been developed to sufficiently cover all types of obsessive-compulsive symptoms in accord with heterogeneous nature of the disorder (5). The Padua Inventory (6), Vancouver Obsessional Compulsive Inventory (7), Schedule of Compulsions, Obsessions, and Pathological Impulses (8), and the Obsessive-Compulsive Inventory-Revised (OCI-R) (9), which is a shortened version of the Obsessive Compulsive Inventory (10), are several of these measures developed to assess obsessions and compulsions. As seen above, various psychometric instruments have been developed; whereas the OCI-R has a number of advantages compared to previously developed measures to assess severity of obsessive-compulsive symptoms. The psychometric instrument uses a Likert-type scale to assess distress caused by symptoms. It can be readily administered in clinical and non-clinical populations and six subscales of the instrument enable a comprehensive assessment (10). The symptom categories of the measure may be more accurately compared depending on the equal number of questions in each subscale (9). It was found that the OCI-R was sensitive to changes in severity of obsessive-compulsive symptoms (11) and could discriminate patients with OCD from normal controls (9).

Sound properties of the OCI-R have been receiving an increased attention. The studies examining the factor structure of the OCI-R replicated the six-factor original structure and it was observed that the discriminant and convergent validity of the OCI-R was excellent (12,13). The psychometric properties of the translated versions (Spanish (14), German (15), French (16), Icelandic (17), Norwegian (18), and Korean) (19, 20) were examined. Results of these studies consistently supported the validity of six components of the OCI-R and reported sound psychometric properties for the scale.

Although several instruments were developed to assess obsessive-compulsive symptom have been adapted into Turkish were utilized in clinical and research purposes, the psychometric performance of the OCI-R has not been examined before. In this study, our aim was to assess the psychometric properties of the Turkish version of the OCI-R in clinical and non-clinical samples. For the purpose we conducted confirmatory factor analysis to assess the congruence of the original factor structure of the OCI-R to the current data. Besides, we assessed the associations of the scale with sub-scales of the Yale-Brown Obsessive Compulsive Scale, the Padua Inventory-Revised, and the Obsessive Beliefs Questionnaire. Miscellaneous measures of obsessive-compulsive disorder were used to make a more reliable assessment of convergent validity of the OCI-R. Finally, internal consistency and temporal stability of the instrument were evaluated.

Methods

Participants

Participants were 287 undergraduate controls, 44 adult patients with obsessive-compulsive disorder, and 44 adult patients with major depression disorder. A total of 375 subjects participated in this study. To recruit healthy controls, this study was announced to undergraduates at Ankara University, Ankara. The mean age of 287 controls was 21.81 (±2.16) years and 49% of the sample was females.

All patients were recruited from consecutive subjects seeking psychiatric care at the Psychiatric Outpatient Department of the Yüzüncü Yıl University Hospital in Van, Turkey. Patients with OCD and MD were diagnosed according to the DSM IV-TR criteria by two physicians at least five years of experience. The Structured Clinical Interview for DSM-IV was used to diagnose both MD and OCD patients. The mean age of the 44 patients with OCD was 24.23 (±6.74) years and 44 patients with MD was 29.05 (±6.74). Forty-eight percent of the patients with OCD and 71% of the patients with MD were females.

Measurements

Demographical Questionnaire

Authors developed a questionnaire form to gauge demographical characteristics of participants. The demographical questionnaire consisted of inquiries related to age, gender, educational level, educational levels of the parents, employment status, current settlement and level of income.

Obsessive-Compulsive Inventory-Revised (OCI-R)

The OCI-R (9) is an 18-item self-report questionnaire developed to assess the distress associated with obsessions and compulsions. In addition to composite scores of the OCI-R which is the sum of all items, six separate subscale scores are calculated for washing, checking, ordering, obsessing, hoarding and neutralizing symptom clusters. Items are rated on a five-point scale. The total score ranges from 0 to 72, and each subscale score ranges from 0 to 12. Foa et al. (9) reported sound psychometric properties for the OCI-R among patients with OCD, post-traumatic stress disorder, generalized social phobia and healthy controls.

Yale-Brown Obsessive Compulsive Scale (YBOCS)

The YBOCS (21) is a clinician-administered scale developed to evaluate the type and severity of obsessive-compulsive symptoms. It includes totally 19 items, but the first 10 items are used to assess severity: five for obsessions and five for compulsions. Each item is rated on a five-point Likert-type scale (0-4). The psychometric properties of the Turkish version were assessed by Tek et al. (22).

Padua Inventory-Revised (PI-R)

The Padua Inventory (PI) (6) is a 60-item self-report

questionnaire developed to assess severity of obsessive-compulsive symptoms in clinical and research settings. Vanoppen et al. (23,24) revised the instrument that the PI-R with 41-item assesses the obsessive-compulsive symptoms in five subscales: Impulses, Washing, Checking, Rumination, and Precision. The Five-factor structure was basically supported by Beşiroğlu et al. (25) who adapted both the 60-item and 41-item versions of the PI into Turkish. All subscales of the Turkish version of the PI-R discriminated OCD patients from clinical and non-clinical individuals, with an exception of impulses subscale. Beşiroğlu et al. (25) reported good psychometric properties for the total and subscales of the PI-R that inner reliabilities ranged from 0.79 to 0.95 and test-retest correlations ranged from 0.81 to 0.91. Items are rated on a five-point scale and the composite score ranges from 0 to 164.

Obsessive Beliefs Questionnaire (OBQ-44)

The instrument is a 44-item self-report scale developed to assess belief domains playing a central role in OCD (26). Three components were derived as a result of factor analysis by retaining 44 items out of 87 in the initial long version of the OBQ. Boysan et al. (27), replicated the original three-factor structure in a Turkish sample consisting of clinical patients and non-clinical controls. The Turkish version demonstrated good inner reliability and temporal stability as well as convergent validity. For each subscale, inner consistency ranged from 0.86 to 0.95 and intra-correlations ranged from 0.69 to 0.81 for the total and subscales of this measure. Items are rated on a five-point scale and the composite scores range from 0 to 220.

The Structured Clinical Interview for DSM-IV (SCID-I)

To establish the diagnosis based on the DSM-IV TR, the SCID-I was administered to each patient (28). The instrument was shown to be valid and reliable in Turkish samples (29).

Procedure

Two independent translators translated the OCI-R to Turkish. The translated versions of the scale were compared from the point of targeted translations. Finally, the translated versions were combined after having a consensus on the items.

The college student sample consisted of 287 undergraduate students who were recruited from Ankara University. The OCI-R was administered to 44 patients with OCD and 44 patients with MD after the clinicians warranted for being appropriate for the study. Inclusion criteria for this study were as follows: i) being at an age not younger than sixteen years and not older than 65 years old; ii) not been diagnosed with any comorbid axis I and II psychiatric disorders before; iii) not suffering from any chronic diseases. The patients with OCD and MD completed the pack of psychological instruments after the structured diagnostic interview. The OCI-R was administered to 54 healthy subjects at two time points in which the second application was 15 days apart from the former one.

After been given a brief information about the aims and instruments used in the research, the volunteering subjects participated in the study. Each subject participating in this study signed a written informed consent. Since four patients with OCD were younger than eighteen years old, their parents signed the written informed consents. The study was approved by the Ethics Committee of the Faculty of Medicine at Yüzüncü Yıl University.

Statistical Analysis

The analysis process started with computing item statistics. The corrected item-total correlations were obtained in order to evaluate discrimination value for each item. The validity of the original six-factor structure of the OCI-R for the Turkish version of the instrument was tested with a confirmatory factor analysis. The confirmatory factor analysis was performed by using structural equation algorithm with the Satorra-Bentler normality correction. The path and determination coefficient for each OCI-R item obtained with structural equation modeling are given in Table 2. After confirming the original factor structure for the data, we computed Pearson's correlations within subscales of the OCI-R. The Pearson's correlations of the OCI-R subscales with subscale scores of the YBOCS, PI-R, and OBQ-44 were calculated to assess the convergent validity of the instrument. The concurrent validity of the OCI-R was assessed by conducting the analysis of variance. Regarding the reliability of the Turkish version of the OCI-R, the Cronbach's alpha and 15-day test-retest correlation coefficient for each subscale was performed. SPSS version 13 and LISREL version 8.7 were utilized in the statistical analyses. The significance threshold was held at $p<0.05$.

Results

Descriptions for the demographic characteristics of the sample are presented in Table 1.

Initially, we compared the mean ages of the groups with the use of the one-way analysis of variance. F value obtained with the one-way analysis of variance was significant ($F(2.372)=50.904$; $p<0.01$). Based on the post-hoc analysis, the average age was increasing-controls, patients with OCD, and patients with MD in ascending order, respectively.

Item Discrimination

First of all, the item discrimination indexes were calculated to assess the item validity and reliability of the OCI-R. The item discrimination indices ranged from 0.40 to 0.64. The corrected item-total correlations have shown that each of the items of OCI-R revealed perfect validity and reliability. The distribution of item discrimination indices is illustrated in Figure 1.

Confirmatory Factor Analysis

We specified a six-factor model based on Foa et al. (9) in the confirmatory factor analysis. χ^2 of the model was significant ($\chi^2(120) = 266.55$, $p<0.0001$). χ^2 /df ratio was 2.23 which was less than 3. The model had a root mean square error of approximation (RMSEA) of 0.06 (90% confidence interval 0.05-0.07), a Goodness of Fix Index (GFI) of 0.91, a Comparative Fit Index (CFI) of 0.98, and a root mean square

residual (RMR) of 0.05. We also specified an alternative model consisting of a unique factor. The chi-square for one-factor structure was χ^2 (135) = 569.88 (p<0.001). The model χ^2 for the unique factor structure was significantly higher than the estimated value for the six-factor structure model. The six-factor original structure of the OCI-R was replicated for the current data by using criteria suggested by Hu and Bentler (30). Standardized factor loadings and squared multiple correlations are given in Table 2.

Pearson's correlations, means and standard deviations for the OCI-R total and subscale scores are presented in Table 3. Correlations within subscales of the OCI-R ranged from mediocre to high.

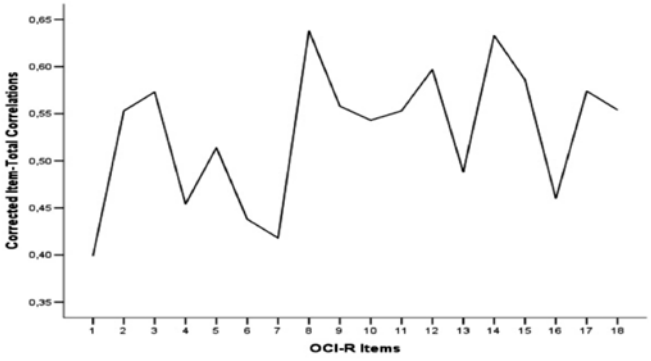

Figure 1. Discrimination indexes for the OCI-R items

Table 1. Demographic characteristics of the sample (n=375)

		n	Percentage %
Group	Controls	287	76.53
	OCD Patients	44	11.73
	MD Patients	44	11.73
Sex	Male	182	48.53
	Female	193	51.47
Education	Illiterate	8	2.13
	Primary School	15	4.00
	Secondary School	17	4.53
	High School	28	7.47
	University	307	81.87
Employment Status	Unemployed	43	11.47
	Employed	30	8.00
	Student	302	80.53
Settlement	Urban	282	75.20
	Rural	93	24.80
Income	Low	140	37.33
	Average	112	29.87
	Upper	123	32.80

Convergent Validity

For convergent validity of the instrument, associations between six categories of symptoms and other psychological variables were evaluated. Correlations of the total and subscale scores of the OCI-R with subscales of the YBOCS, PI-R, and OBQ-44 were assessed by using Pearson's correlations. As seen in Table 4, significant correlation coefficients between the OCI-R components and the YBOCS, PI-R, and OBQ-44 scores demonstrated that the Turkish version of the measure has moderate to good convergent validity.

Concurrent Validity

The differences between the groups for the composite scores of overall and six categories of symptoms were evaluated with ANOVAs that the F values obtained in analyses were all significant. Post-hoc analyses by using the Bonferonni's multiple comparison tests demonstrated that patients with OCD generally reported higher scores for total and subscales of the OCI-R than do patients with MD and normal controls. However, although patients with OCD scored higher in neutralizing symptoms than patients with MD, the difference between patients with OCD and normal controls was not significant. Findings are presented in Table 5.

Reliability

Cronbach's Alpha was calculated within the sample for overall and subscale items of the OCI-R. Findings showed that the measure has generally adequate internal consistency. However, internal reliability of the hoarding subscale was excessively low in OCD group. 15-day test-retest correlations also suggested good reliability but a modest temporal stability for neutralizing subscale. Internal and temporal reliability levels of the OCI-R are presented in Table 6.

Discussion

In the current study, our aim was to examine the psychometric properties of the Turkish version of the OCI-R in patients with OCD, patients with MD, and in healthy controls. Goodness of fit of the original six-component structure to observed data was tested by using confirmatory factor analysis. Convergent validity of the Turkish version of the OCI-R was examined by computing Pearson's correlations of subscale scores of the instrument with scores of other psychological measures. In addition, discriminant validity of the overall and subscales of the OCI-R was assessed by comparing the scores of individuals within groups. Finally, we further examined inner consistency and temporal stability of six components of the measure.

First of all, item discrimination indexes were higher than the expected level (>0.30) that individual items of the Turkish version had good validity and reliability. Confirmatory factor analysis conducted after item analyses showed that our data were fitting well to the original six-factor structure obtained based on Foa et al. (9). The ANOVA analyses demonstrated that the total and subscale scores of the OCI-R could generally discriminate patients with OCD from both patients with MD and healthy controls. Of all the subscales and total scores did

Table 2. Standardized factor loadings and squared multiple correlations from confirmatory factor analysis (n=375)

Item	Washing	Obsessing	Hoarding	Ordering	Checking	Neutralizing	R^2
5	.57						.33
11	.65						.43
17	.66						.44
6		.62					.39
12		.69					.48
18		.77					.59
1			.55				.30
7			.59				.35
13			.55				.31
3				.73			.53
9				.67			.45
15				.76			.58
2					.69		.47
8					.83		.69
14					.79		.63
4						.53	.28
10						.65	.42
16						.54	.30

Table 3. Pearson correlations, means and standard deviations (n=375)

	1	2	3	4	5	6	Mean	SD
1. Washing OCI-R	1						4.54	2.93
2. Obsessing OCI-R	.51 **	1					4.91	3.12
3. Hoarding OCI-R	.42 **	.50 **	1				4.31	2.58
4. Ordering OCI-R	.53 **	.39 **	.36 **	1			5.08	2.92
5. Checking OCI-R	.57 **	.37 **	.41 **	.60 **	1		4.99	3.16
6. Neutralizing OCI-R	.50 **	.42 **	.48 **	.53 **	.51 **	1	3.39	2.69
7. OCI-R Total	.79 **	.72 **	.69 **	.76 **	.78 **	.76 **	27.22	13.04

**:p<.01

the obsession subscale successfully discern the patients with OCD from patients with MD and normal controls. In previous studies, it was consistently found that the obsession subscale could discriminate patients with OCD from patients with other anxiety disorders (9,12). OCD is a mental diagnosis group certain with a tendency to obsessional thinking that leads to severe stress and impairment in functioning which should be well expected. The findings for other subscales of the OCI-R were in accord with the obsession subscale with an exception of the neutralizing subscale. However, although individuals who were diagnosed with OCD reported higher scores on the neutralizing subscale than do patients diagnosed with MD, the subscale could not discriminate patients with OCD from the college students. This may be because of the conceptualization of the term 'neutralizing' adopted in developing the OCI-R. From a cognitive theory perspective, neutralizing is an attempt to prevent negative consequences of intrusive thoughts. Neutralizing is proposed to be defined as a safety-seeking behavior (31). However, the items in the OCI-R developed for assessing the neutralizing behavior include only themes of counting actions. Thus, the neutralizing subscale of the OCI-R seems to have a limited utility in assessing safety-seeking behaviours in people with OCD.

The internal consistencies of the total and six-subscale of the OCI-R were adequate. The neutralizing and hoarding subscales demonstrated the lowest internal consistencies as similar results have been consistently reported in previous studies (13,20,32). However, in the current study, particularly the hoarding subscale of the OCI-R revealed excessively low internal consistency in OCD group. The compulsive hoarding is a significant predictor of poor outcomes in the treatment of OCD (33). Individuals who were more prone to hoarding reported little insight compared to non-hoarding individuals (34).

Table 4. Pearson correlations of the OCI-R subscales with the YBOCS, PI-R, and OBQ-44 (n=375)

	Washing OCI-R	Obsessing OCI-R	Hoarding OCI-R	Ordering OCI-R	Checking OCI-R	Neutralizing OCI-R	OCI-R Total
Yale-Brown Obsessive Compulsive Scale							
YBOCS Obsessions	.44 **	.41 **	.55 **	.37 **	.52 **	.36 **	.59 **
YBOCS Compulsions	.39 **	.33 **	.50 **	.34 **	.46 **	.27 *	.51 **
YBOCS Total	.42 **	.38 **	.54 **	.36 **	.51 **	.32 **	.56 **
Padua Inventory -Revised							
Impulses PI-R	.32 **	.42 **	.30 **	.32 **	.29 **	.39 **	.46 **
Washing PI-R	.71 **	.37 **	.27 **	.42 **	.49 **	.41 **	.61 **
Checking PI-R	.53 **	.36 **	.32 **	.47 **	.69 **	.38 **	.63 **
Rumination PI-R	.42 **	.62 **	.32 **	.37 **	.35 **	.32 **	.55 **
Precision PI-R	.46 **	.39 **	.29 **	.48 **	.43 **	.50 **	.57 **
Obsessive Beliefs Questionnaire							
Responsibility/ Threat Estimation	.41 **	.26 **	.28 **	.33 **	.28 **	.27 **	.41 **
Perfectionism/Certainty	.35 **	.31 **	.27 **	.40 **	.26 **	.27 **	.42 **
Importance/Control of Thoughts	.29 **	.39 **	.28 **	.25 **	.22 **	.32 **	.39 **
Obsessive Beliefs Questionnaire Total	.41 **	.37 **	.33 **	.39 **	.30 **	.34 **	.48 **

*:p<.05;**:p<.01

Table 5. ANOVA comparisons of the OCI-R subscales between patients and healthy controls (n=375)

	Group									
	Controls (n=287)		OCD Patients (n=44)		MD Patients (n=44)					
	Mean	SD	Mean	SD	Mean	SD	F(2, 372)	P	η	Post hoc Comparisons‡
Washing OCI-R	4.47	2.73	5.98	3.59	3.57	3.01	8.122	<.000	.21	OCD>C=MD
Obsessing OCI-R	4.29	2.70	7.82	3.01	6.06	3.76	32.587	<.000	.39	OCD>MD>C
Hoarding OCI-R	4.17	2.54	6.07	1.96	3.50	2.70	13.629	<.000	.26	OCD>C=MD
Ordering OCI-R	5.04	2.93	6.32	2.56	4.11	2.80	6.599	.002	.19	OCD>C=MD
Checking OCI-R	4.81	2.99	6.86	3.25	4.25	3.53	9.829	<.000	.22	OCD>C=MD
Neutralizing OCI-R	3.32	2.65	4.27	2.90	2.91	2.60	3.206	.042	.13	C=OCD>MD=C
OCI-R Total	26.10	12.46	37.32	11.50	24.40	13.90	16.547	<.000	.29	OCD>C=MD

‡Post hoc comparisons performed by using Bonferonni Multiple Comparison Test. OCD: Patients with obsessive-compulsive disorder, MD: Patients with major depression, C: Controls

Grisham et al. (35) posed that hoarding is a distinct syndrome which lies on the spectrum of OCD-related disorders. According to our findings, the hoarding scores significantly discriminated patients with OCD from other groups indicating that the hoarding symptoms appeared to be a constituent of obsessive-compulsive syndrome. However, excessively low internal consistency of this subscale seems to be that obsessive hoarders are a distinct homogeneous subgroup in OCD.

The test-retest reliability of the Turkish version of the OCI-R was satisfactory. Among the correlation coefficients demonstrating temporal stability, the test-retest correlation for the neutralizing subscale were the lowest. A possible explanation for this finding is that the test-retest reliabilities of the total and subscales of the OCI-R were computed only for the healthy controls. This procedure was adopted in order to eliminate the possible effects of medication on temporal stability of obsessive-compulsive symptoms. This was the case for healthy controls in several studies conducted before. It was found that the test-retest correlation of the neutralizing subscale was lowest among healthy individuals (9,20,32).

The convergent validity of the OCI-R subscales was good. Associations of the total and subscale scores of the Turkish version of the OCI-R with the YBOCS and PI-R subscale scores ranged from moderate to high. Particularly, the correlations for overlapping subtypes of obsessive-compulsive symptoms within the OCI-R and the PI-R such as washing and checking

Table 6. Reliability of the OCI-R subscales

	Cronbach's alphas				15-day test retest correlations
	Total (n=375)	Controls (n=287)	OCD (n=44)	MD (n=44)	(n=54)
1. Washing OCI-R	.64	.56	.86	.73	.80**
2. Obsessing OCI-R	.64	.63	.76	.79	.68**
3. Hoarding OCI-R	.57	.57	.15	.61	.72**
4. Ordering OCI-R	.75	.74	.66	.75	.64**
5. Checking OCI-R	.80	.77.	.85	.84	.81**
6. Neutralizing OCI-R	.58	.58	.56	.62	.51**
7. OCI-R Total	.89	.89	.84	.90	.74**

**:p<.01
OCD=Patients with obsessive-compulsive disorder; MD=Patients with major depression; C=Controls

were excellent. However, the relationships of the hoarding and the neutralizing subscales of the OCI-R with subscales of the OBQ-44 were slightly low. Low frequency of hoarding symptoms among patients with OCD have accelerated the controversies pertaining to weak relationships between this symptom subtype and OCD (33,35). However, we found moderate to high correlations of scores of the hoarding subscale with indicators of symptom severity in terms of the YBOCS and PI-R subscales.

The present study has several limitations. First, a sample recruited from college students as healthy controls did not sufficiently represent the non-clinical general population. In addition, various nosological classifications have been proposed in OCD depending on symptom subtypes (2,3,4), the however, sample size was not enough to make further analyses. Third, generalizibility of our data to clinical population should also be made with caution that the number of our patients was not large enough, as well. Fourth, the clinical characteristics of the patients were not recorded in the study. Besides, normal the controls were not assessed whether they have any psychiatric morbidity or not. Finally, the demographical characteristics of different groups were not matched so that possible effects of these variables could not be controlled in the study. Therefore, the group differences of the OCI-R scores might be caused by characteristics of samples. In short, the current data mostly supported the findings of previous studies. However, the Turkish version of the OCI-R has fairly sound psychometric properties when compared to the original study (9). Further studies are needed in larger clinical and non-clinical samples to address the psychometric properties of the OCI-R in Turkish sample.

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