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Interrater reliability and clinical efficacy of Children's Yale-Brown Obsessive-Compulsive Scale in an outpatient setting

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Abstract

Objective: To evaluate the interrater reliability of the Turkish version of the Children's Yale-Brown Obsessive-Compulsive Scale (CY-BOCS) and to measure the clinical efficacy using a linician-rated impression scale in a clinical outpatient setting.

Method: Data were collected from 19 nonmedicated children and adolescents (6 girls, 13 boys, mean age 14 ± 2.25 years) with obsessive-compulsive disorder (OCD). Interrater reliability was assessed by 3 raters through videotape recordings of evaluation. Correlational analyses were maintained by comparing CY-BOCS scores to self-ratings of Children's Depression Inventory (depression), 20-item Leyton Obsessional Inventory–Child Version (obsessive-compulsive symptoms), and Child Behavior Checklist (parent ratings of behavioral problems). The Clinical Global Impression for OCD was administered to measure the clinical efficacy of CY-BOCS.

Results: Internal consistency was .77 for the total 10 items. The interrater reliabilities, defined as the intraclass correlation for the compulsion subscale, the obsession subscale, and the CY-BOCS total scores were .85, .94, and .89, respectively. Although the sample size was small, CY-BOCS total score was correlated with the Clinical Global Impression score ($P < .01$) and showed a significantly higher correlation with Leyton Obsessional Inventory–Child Version scores when compared with Children's Depression Inventory and Child Behavior Checklist scores.

Conclusion: Our results indicate that the Turkish version of CY-BOCS yielded good interrater reliability and was significantly correlated with a clinician-rated global impression scale. Although the small sample size hinders a conclusion, CY-BOCS showed significant results regarding validity measures. Therefore, our results support that CY-BOCS has the potential to fulfill the need in clinical research settings.

1. Introduction

Common approaches in measuring obsessive-compulsive symptoms include various self-report inventories, clinician-rated interviews, and clinician-rated global impression scales. The self-report inventories that are commonly used for the evaluation of obsessive-compulsive disorder (OCD) severity are the Leyton Obsessional Inventory (LOI) [1] and the Maudsley Obsessive-Compulsive Inventory (MOCI) [2]. Once the diagnosis has been made, instruments such as the Yale-Brown Obsessive-Compulsive Scale (Y-BOCS) [3,4] and Children's Yale-Brown Obsessive-Compulsive Scale (CY-BOCS) [5] can be used to rate and record symptom severity. Y-BOCS has been found to be a reliable and valid measure of OCD that is sensitive to changes in functioning over time [6,7]. This scale was shown to be a reliable and valid instrument for assessing OCD severity in Turkish people [8]. The CY-BOCS has demonstrated good reliability and validity for the rating of OCD symptom severity similar to its adult counterpart, but it is not a diagnostic tool [9]. CY-BOCS has entered into the clinical and research use for children and adolescents [10-13] before the validity and reliability of the instrument were documented. Scahill et al [5] have shown that the CY-BOCS yields a reliable and valid subscale as well as total scores for obsessive-compulsive symptom severity in children and adolescents with OCD.

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Recently, McKay et al [14] studied the item structure of CY-BOCS in a clinical outpatient setting and stated that the reliance on a total score of CY-BOCS would be misleading. They suggested that CY-BOCS can be regarded as a 2-factor scale, namely, obsessions and compulsions or severity and disturbances. Moreover, Storch et al [15] examined the psychometric properties of CY-BOCS. They found good internal consistency and test-retest reliability in 4- to 18-year-old children and adolescents. Clinician-rated impairment was also well-correlated with the scale.

The Turkish translations of the 2 instruments, the 20-item LOI–Child Version (LOI-CV) and MOCI, were used for screening a Turkish subpopulation of OCD patients between the ages of 8 and 16 years [16,17]. The MOCI has been criticized, however, for being insensitive to changes in obsessive-compulsive symptom severity [6]. The LOI-CV is a 20-item self-report adapted from the adult questionnaire [18] The LOI-CV's high rate of false positives, plus its lack of applicability other than for OCD, could explain why it has had only limited use in clinical practice [19]. Furthermore, LOI-CV lacks predictive validity [18] as the cases in subclinical range on this measure do not develop the disorder [20]. In addition, both MOCI and LOI-CV have a restricted number of symptom probes, and patients may misinterpret 1 or more items. They also involve both state and trait items, which may be irrelevant to OCD [21,22]. Thus, there is a strong need to assess OCD severity in children with an internationally accepted, cross-culturally valid, and reliable clinician-rated interview for both clinical and research purposes in Turkey. This need is apparent in recent reports of drug treatment efficacy in OCD, where our instrument was used before being published [23]. The purpose of our study was to evaluate the psychometric properties of Turkish version of the CY-BOCS as a cross-cultural OCD measure in children and adolescents. Specifically, we tested the interrater reliability and the clinical efficacy of CY-BOCS using a clinician-rated impression scale in a clinical outpatient setting.

2. Material and methods

2.1. Setting and subjects

Participants were 24 nonpsychotic child and adolescent patients with an IQ of more than 70, chosen by simple randomized design from a pool of patients who have completed a standard clinical evaluation at the Medical School Foundation Clinics and received a clinical diagnosis of OCD. Six girls and 18 boys participated, whose ages were between 8 and 16 years. Five patients were excluded, and the final number of subjects were 19 (6 girls and 13 boys) with a mean age of 14 ± 2.25 years (13.82 ± 2.30 and 14.39 ± 2.28 years for boys and girls, respectively). The children and adolescents were nonmedicated and evaluated before the treatment procedure.

2.2. Measures

2.2.1. Description of the CY-BOCS

The CY-BOCS is a modified version of the Y-BOCS [3,4]. The CY-BOCS is a 10-item, clinician-rated, semi-structured instrument designed to assess the symptom severity of OCD during the individual's previous week. The overall structure, the anchor points, and the scoring of the original instrument were retained in the CY-BOCS, but the wording of the probe questions was modified to make them more developmentally appropriate for children and adolescents. CY-BOCS has 5 sections which are Instructions, Obsessions Checklist, Severity Items for Obsessions, Compulsions Checklist, and Severity Items for Compulsions. There are also items concerning insight, avoidance, indecisiveness, pathological doubting, obsessive slowness, and overvalued ideation, which are only used to obtain clinical information. The reliability and validity of these additional clinical items were not investigated in this study.

2.2.2. The Turkish translation and adaptation of CY-BOCS

Under the "instructions to the interviewer" heading, the definitions of obsessions and compulsions were carefully described, and extra time was given to the questions about the illness itself. During the translation and adaptation process, the main emphasis was given to clarify the operational definitions of terms such as "often," "sometimes," etc. Examples of numerous obsessive-compulsive behaviors in the daily routine were given under the heading of operational definitions to minimize potential misunderstandings of the severity of the disorder itself. Special emphasis was given to the use of easily understood daily language in the interview questions.

2.3. Other measures

Inventories of obsessive-compulsive symptoms such as the 20-item LOI-CV which was derived from an earlier version of the LOI [18]; the Children's Depression Inventory (CDI) for evaluating depression [24]; Child Behavior Checklist (CBCL), the parent version and the self-report version for assessment of specific behaviors and psychiatric symptoms [25]; and Clinical Global Impression Scale for OCD (CGI-OCD) [26] were used. CGI-OCD is a 7-point ordinal scale that ranks symptom severity from none to severe: "1 = normal" indicates that there are no symptoms of OCD considered appropriate, and "3 = mild " indicates that there is mild disturbance in school, social, or occupational functioning that meets *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (*DSM-IV*) criteria for OCD, whereas "7" stands for "extremely ill" conditions in OCD.

2.4. Procedure

The children were preevaluated before the CY-BOCS administration by 2 child psychiatrists, and the CGI-OCD

scores of the patients were determined independently. The clinician who administered the CGI-OCD scale to the child was not the same person who later scored the CY-BOCS. The child's assent was obtained in addition to the consent of the parent. Written and oral materials were used for diagnosis for each of the 24 patients, and the diagnoses were independently assigned on the basis of *DSM-IV* criteria by 2 psychiatrists. As a result of this procedure, 3 participants were excluded from the study, as their symptoms of OCD were not severe enough to fulfill the *DSM-IV* criteria at the time of the evaluation. Video recordings of 2 cases were excluded from the study because of technical problems during the recording process. Overall, 5 patients were excluded, and the final number of subjects were 19 (6 girls and 13 boys).

Structured interviews using the CY-BOCS were conducted and videotaped by 1 of the interviewers (1 psychologist, G.Y.; 2 psychiatrists, A.R.A. and V.T.). For the interrater agreement on CY-BOCS items, the video recordings of the interviews were scored by 2 other interviewers who were not in the interview process of the particular participant. CY-BOCS was conducted jointly with the child and the parent if the participant was younger. Older adolescents were interviewed separately. The clinician integrated additional data from the parents as needed.

Semistructured interviews concerning depression, obsessive-compulsive symptoms, and behavioral problems were administered in the study evaluation.

2.5. Statistical analyses

Internal consistency (Cronbach α) was computed to evaluate the reliability of the CY-BOCS [27]. Cronbach α is a correlation index that reflects the homogeneity of item scores with the total score.

To assess the interrater reliability, 19 interviews were videotaped by 1 interviewer and scored by 2 other interviewers. Four interviews with older adolescents included only the patient, and the rest of them included both the patient and a parent or both parents. The reliabilities of the compulsion subscale, the obsession subscale, and the CY-BOCS total score were treated as continuous variables and analyzed by intraclass correlation (ICC) that is a statistical procedure used for quantitative data.

Table 1
Means and SDs of age and the total scores for each scale (n = 19)

	Total	
	Mean	SD
Age	14.00	2.25
CY-BOCS total	21.05	7.77
Leyton total	21.75	12.51
CDI	25.75	7.33
CBCL-parent	61.27	8.51
CBCL–self-report	57.50	10.97
CGI	3.89	1.41

Table 2
Cronbach α and interitem correlations for the subscale and CY-BOCS total scores (n = 19)

Item	Interitem correlation (subscales)	Interitem correlation (CY-BOCS total)
Compulsion subscale	α = .77	
Time spent	.55	.57
Interference	.48	.59
Distress	.80	.62
Resistance	.69	.62
Control	.87	.76
Obsession subscale	α = .79	
Time spent	.71	.64
Interference	.61	.64
Distress	.73	.60
Resistance	.86	.80
Control	.68	.78
Total score	α = .77	

A κ coefficient [28] was computed for each item across all 3 raters. The κ coefficient provides an estimate of agreement for categorical ratings beyond what is expected by chance.

Clinical efficacy was measured by using CGI-OCD and CY-BOCS. We also investigated the correlations between CY-BOCS and the short form of the LOI-CV, the CBCL total *t* scores and the anxiety/depression subscale *t* scores, and with the CDI scores. The difference between these correlations was analyzed by Fisher *r* to *z* transformations; *t* scores were used in the analyses of CBCL data to permit comparison between different ages and both sexes.

3. Results

Table 1 presents the mean ages and the mean scores for boys and girls for all scales. There were no significant differences in mean scores between boys and girls in any of the scales, except that the CGI scores for boys were

Table 3
Intraclass correlations for CY-BOCS total score and subscales and κ coefficients for individual items across 3 raters (n = 19)

Item	ICC	κ
Compulsion subscale	.85	
Obsession subscale	.94	
Total score	.89	
Compulsions		
Time spent		.79
Interference		.63
Distress		.71
Resistance		.76
Control		.69
Obsessions		
Time spent		.65
Interference		.70
Distress		.73
Resistance		.74
Control		.69

For all κ, $P < .0001$.

Table 4
Fisher z tansformations comparing correlation of measures of OCD severity, depression, and behavior problems and CY-BOCS score with the correlation of Leyton total score and CY-BOCS total score (n = 19)

Measure	Correlation with CY-BOCS total score	P	Fisher z transformation	z Value	P
Leyton, total	.46	.07	0.50		
CGI	.61	.007			
CDI	−.15	.57	−0.15	2.34	.02
CBCL-parent, total	.22	.43	0.22	1.01	.16
Anxiety/depression subscale	.24	.39	0.24	.90	.18
CBCL–self-report, total	.01	.98	−0.02	1.88	.03
Anxiety/depression subscale	.16	.56	0.16	1.23	.11

significantly higher than the CGI scores of girls. CDI scores of all but 1 participant were above the cutoff score for depression (Table 1).

3.1. Reliability

3.1.1. (a) Internal consistency

Item-total correlations and Cronbach α were calculated for various permutations of the CY-BOCS. The internal consistency for the CY-BOCS total score (for items 1-10) was 0.77. Table 2 presents the correlations between the individual items and the subscale scores (Table 2).

3.1.2. (b) Interrater reliability

ICCs (Table 3) for the 3 raters were found to be .85, .93, and .89 for the compulsion subscale, obsession subscale, and the CY-BOCS total score, respectively. The mean item-by-item κ coefficient was 0.71, ranging from good to excellent agreement (range 0.63-0.79, all $P < .0001$) (Table 3).

3.2. Correlational analyses of CY-BOCS with other behavioral scales

Table 4 presents the correlations between the CY-BOCS and the other behavioral scales (Table 4).

4. Discussion

The CY-BOCS scores had the highest correlation with CGI-OCD scores. As an overall rating of impairment in OCD, CGI is a valid and reliable measure. The correlation of CY-BOCS and LOI-CV has approached significance. However, the CY-BOCS demonstrated a significant correlation with a self-report measure of obsessive-compulsive symptoms (LOI-CV) when compared with a measure of depression (CDI) and a self-report measure of behavior problems (CBCL). The reliability and validity of the Polish version of CY-BOCS were studied in children and adolescents, in which LOI-CV and CY-BOCS were also significantly correlated [29]. These findings indicate that CY-BOCS may be a reliable instrument of OCD severity in different languages and for samples of OCD patients from different cultures. Reporting the psychometric evaluation of Turkish version of CY-BOCS in English becomes a necessity considering the scarcity of reports from other cultures and the need for making comparison regarding its use in cross-cultural studies.

ICCs were excellent for the compulsion subscale, obsession subscale, and the CY-BOCS total score in our study. Moreover, the item-by-item κ coefficients indicated good agreement between the raters. These findings suggest that CY-BOCS provides the necessary means for an objective evaluation by different clinicians in terms of the severity of the obsessive-compulsive symptoms in children and adolescents.

In our study, the correlation between the CY-BOCS and CGI was higher when compared with LOI-CV. Surprisingly, most of the participants who received a diagnosis of OCD scored below the cutoff score for OCD on the LOI-CV. The interviewers also reported that the participants were having some difficulties in following and answering the items of the LOI-CV.

The Turkish version CY-BOCS has a high level of internal consistency between the 10 items and the CY-BOCS total score. Moreover, the 5 compulsion items and the 5 obsession items correlated with their respective subscales in our study. Brynska et al [27] found out that the Cronbach α coefficient for the 10 items of Polish version of CY-BOCS total score was .91. Obsession subscale was .85 and .80 for the compulsions subscale, which is slightly higher than our findings. The correlations between the 5 compulsion items and the obsession subscale score and the correlations between the 5 obsession items and the compulsion subscale score in our study suggest continuity between the 2 subscales (Table 2). Our results yielded that relatively lower correlation coefficients of interference to compulsions and time spent with obsessions were relatively lower than the other items. On the other hand, in their factor analytic study, McKay et al [14] found that the total score of CY-BOCS was not construct valid as was found for Y-BOCS. Both Scahill et al [5] and McKay et al [14] found low reliability scores for resistance items. The findings of the latter research group suggested that resistance items may require revision to reduce the amount of error variability associated with them. Further research is required to analyze the internal consistency of CY-BOCS, with specific emphasis on resistance items.

Consistent with the prominence of depressive symptoms in OCD, the CDI scores of all but 1 of the participants were above the cutoff score for depression. However, there was no significant relation between the severity of OCD symptoms and the severity of depression. This finding indicates that OCD may be comorbid with depression regardless of the severity of OCD. The severity of OCD may not necessarily be associated with the severity of depression, at least in this sample of adolescents.

The correlation of CY-BOCS total score with the CBCL-parent and CBCL–self-report scores were .22 and .01, respectively. Previous examinations that used the CBCL in children and adolescents with OCD reported consistent results with elevation of thought problem and anxious-depressed syndrome scores [11]. Hanna [11] found no significant correlation between any CBCL syndrome score and the CY-BOCS and noted that several CBCL syndrome scores differed significantly between participants with and without comorbid disruptive behavior disorders.

5. Limitations

The major limitation of the current study is its small number of participants. We attempted to minimize this particular limitation via examining audiovisual recordings by 3 investigators simultaneously. Main utilization field of this particular rating device, CY-BOCS, is the clinical assessment of disease severity and drug efficacy. Good correlations of CY-BOCS with other behavioral measures might support the previous findings that CY-BOCS is a valid measure. However, our results regarding the validity of CY-BOCS are inconclusive and need to be studied in a larger sample. In summary, despite the small number of participants, the Turkish version of CY-BOCS was demonstrated as a useful instrument in an audiovisual evaluation setting for measuring the severity of OCD in children and adolescents. The results of this study suggest that Turkish translation of CY-BOCS has the potential to fulfill the need in clinical research settings and is a clinically useful instrument to assess OCD severity in children and adolescents. In addition, CY-BOCS can be used as an accurate measure for measuring the OCD severity in cross-cultural settings.

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