Psychometric Assessment of the Yale–Brown Obsessive-Compulsive Scale—Second Edition

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ABSTRACT

Objectives: The aim was to evaluate the validity and reliability of the Persian version of the Yale–Brown Obsessive-Compulsive Scale—Second Edition.

Method: The sum of 150 patients with obsessive-compulsive disorder (OCD) was selected via convenient sampling. Data gathering was done using Yale–Brown Obsessive-Compulsive Scale—Second Edition (Y-BOCS-II), Symptom Checklist-90-Revised (SCL-90-R) and Vancouver Obsessional Compulsive Inventory (VOCI). Reliability coefficients were calculated by Cronbach's alpha and test-retest reliability. For validity assessment, concurrent criterion-related validity in correlation with VOCI and SCL-90-R, and construct validity (Confirmatory factor analysis) were executed.

Results: The results showed that the severity factors and the previous symptoms of the second edition have a satisfactory reliability. In general, in examining the previous symptoms, the Yale-Brown checklist was significantly more reliable than the present symptoms, and all factors had acceptable reliability. Also, the results indicate a high correlation between the present and the old scale. The study of past symptoms and the intensity scale without fit was necessary, but the examination of the present symptoms after the removal of the two items of counting and hoarding with factor load was acceptable and the fittings confirmed the 3-factor model.

Conclusion: The results supported satisfactory validity and reliability of translated of using Yale–Brown Obsessive-Compulsive Scale—Second Edition for research and clinical diagnostic applications.

Key words: Yale–brown obsessive-compulsive scale, Obsessive-compulsive disorder, Reliability, Validity, Assessment

INTRODUCTION

Obsessive-compulsive disorder (OCD) is defined by images, thoughts and repetitive and disturbing impulses that cause significant distress (for example, obsessions), and then actions or thoughts (for example, compulsions) with the aim of reducing distress [1]. OCD usually results in serious damage to the function at job and other functions in the society or at home. Often OCD is a chronic disorder, and complete symptom relief is rare [2]. The annual outbreak of OCD in various cultures is estimated to be 1.1% to 1.8% [3], and the prevalence of OCD in the Iranian population was 1.8% [4]. Usually the age of the onset of the disorder is before the age of 10 years and after the age of 17 years [5]. Hence, accurate diagnosis and evaluation, and then the treatment of this disorder are important.

Y-BOCS [6] is a semi-structured interview to assess the severity of obsessions and compulsions, regardless of the number and content of contemporary obsessions and compulsions. Unlike other questionnaires in this area, Y-BOCS had a high sensitivity to therapeutic variations and is widely used to assess the effectiveness of OCD's

therapeutic and psychological therapies, as the 'gold standard' assesses the severity of OCD symptoms at the end treatment is well-known [7]. Woody et al. [8] reported the good reliability of the evaluators and the Y-BOCS test-retest to assess changes in symptoms in the OCD and not to other anxiety disorders, as well as to depression. Esfahani et al. [9] evaluated the reliability and validity of the previous version of the Yale-Brown Compulsive Compulsive Scale. The internal consistency of the two parts of the sign index (SC) and the severity scale (SS) was 0.95 and 0.97, the split-half reliability for SC and SS were 0.89 and 0.9 respectively, and the test-retest reliability was 0.99. The researchers showed between SC with SCL-90-R-OCS and SS with Structured Clinical Interview for DSM-I (SCID-I) positive correlation of p<0.001 and in the Confirmatory Factor Analysis for SC and SS, respectively, were three and two factors, respectively.

On the other hand, the second edition of the Yale-Brown (Y-BOCS-II) checklist is different in some ways from the first version of this test: (1) 'Obsessive Compulsive' (Article 4) with Obsessive Spacing'; (2) all items have been placed in a 5-point Spam (0-4) and 6 Spot (0-5) Likert Spectrum, (3) the evaluation of avoidance behavior has been emphasized, and (4) Changes in content and template checklist templates have been created. The advantage of the second edition and the value of the first version of this test for the diagnosis of OCD disorder indicate the importance of evaluating the reliability and validity of the second edition in Iranian culture.

Since in Iran, the second version of this scale has not been investigated and considering the importance of this scale for evaluating patients with OCD and also for evaluating the outcome of therapeutic and non-pharmacological treatments, the purpose of this study was to investigate the reliability and validity of the Y-BOCS-II transcription version.

MATERIALS AND METHODS

The present study was descriptive-survey and cross-sectional. The statistical population of the study included all patients with OCD referring to Tehran Psychiatric Institute and psychiatric clinics. Among them, 150 people were selected. Patients referred to in the initial interview by psychiatrists were originally evaluated by Research colleagues by Structured clinical interview for DSM-5 disorders, clinician version (SCID-5-CV) for definitive diagnosis, followed by those who had inclusion criteria and they were willing to participate in the research, after expressing the secrecy principle to complete the Yale-Brown Obsessive-Compulsive Scale-Second Edition, the Psychological Disorders Symptom Checklist (SCL-90-R) and Vancouver Obsessional Compulsive Inventory (VOCI). The criteria for entering patients include the following: lack of psychiatric disorders and substance use disorders, minimum education cycle, age 18 years to 65 years.

Variables such as drug type, Severity of OCD, Time of obsess, type of obsess, socio-economic status, marital status, employment, and education are all considered as underlying variables.

The following tools were used to collect data:

- **Demographic characteristics questionnaire:** Personal information questionnaire including gender, age, education level, marital status and duration of the disease and history of the disease.

- **Yale-brown obsessive-compulsive scale-second edition:** The Yale Brown Obsessive-Compulsive Scale runs as a semi-structured interview and measures the severity and type of obsession. This scale includes the time spent, the degree of interference, the degree of discomfort, the degree of resistance and control, and observes the symptoms of obsessive-compulsive thoughts and obsessive compulsive behaviors [6]. The second edition of the Yale Brown Obsessive Compulsive Obligatory Check List (Y-BOCS-II) is different from the first version of this test: (1) 'obsessive compulsive' is replaced by 'obsessive distance'; (2) the entire item, they have been placed in a 5-point Likert scale (0-4) and 6-point (0-5), (3) the evaluation of avoidance behaviors has been emphasized, and (4) changes in the content and template checklists of the signs has been created. The results of reliability and validity of the test constructors showed that the second edition of this test is of high internal reliability (0.91) using Kuder Richardson method. The test-retest reliability was also high (0.85). The confirmatory factor analysis was not compatible with previous Y-BOCS models and Confirmatory Factor Analysis also showed a two-factor model consistent with the obsessive-compulsive intensity subscales [10]. The total score of Y-BOCS-II is the sum of the items 1 to 10, the spectrum=0 (no symptoms) to 50 (severe symptoms), while the total obsessive-compulsive subscale is respectively 1-5 and 6-10 respectively.

- **Structured clinical interview for DSM-5 disorders, clinician version (SCID-5-CV):** This tool is a semi-structured clinical and diagnostic interview developed by First et al. to evaluate clinical disorders [11].

- **Symptom checklist-90-revised (SCL-90-R):** This scale is provided by Derogatis et al., including 90 five-point questions from 0 to 4 [12]. The reliability of this questionnaire has been reported using the alpha coefficient and satisfactory rehearsal method. Regarding the validity of the questionnaire, different studies have the highest correlation for depression dimension of 0.73 and the least for fear of fears of 0.36. Anisi et al. [13] also showed the internal consistency of the Cronbach's alpha coefficient for the test sub-scales (0.75-0.92) and for the general index of the symptoms (0.98).

- **Vancouver obsessional compulsive inventory (VOCI):** This questionnaire is a self-assessment tool for measuring a wide range of obsessive-compulsive symptoms, introduced by Thordarson et al. [14], to investigate broader range of obsessions, compulsions, avoidance behaviors and personality traits related to

OCD. Questions are graded on a five-point Likert scale to enhance sensitivity to therapeutic changes. All questions refer to the patient's current concerns and behavior. This questionnaire has 55 questions and includes six sub-scales of contamination, checking, obsessive thoughts, hoarding, perfectionism/precision and doubt. This questionnaire has shown internal consistency and test-retest reliability, concurrent, diagnosis, and constructs validity [14]. Izadi et al. [15] investigated the reliability and validity of the Persian version of the Vancouver Compulsive Compensation Questionnaire on the Iranian Society in 2012, and evaluated this tool in desirable characteristics.

Convergent validity was verified by correlation of the second edition of the Yale–Brown Obsessive-Compulsive Scale with SCL-90-R and VOCI. In order to assess the reliability of the second edition, the Yale-Brown was used with Cronbach's alpha and test-retest reliability. In the test-retest method, 30% of the patients who agreed to complete the test were re-evaluated in 2 weeks later. Finally, the data will be analysed through descriptive statistics, correlation analysis by SPSS version 19 and confirmatory factor analysis by Lisrel 8.8.

RESEARCH FINDINGS

This study is a descriptive and correlational study. The data of 140 patients (35% male and 65% female) were analysed. The age range of subjects was between 20 years and 66 years, with an average of 38 years and a standard deviation of 10.89. 60.7% of the students were graduated or lower, 30.7% were college students and 8.6% higher. 29.3% of the subjects were single, 63.6% were married and 6.4% were divorced. 17.9% reported at least one chronic physical illness.

In order to assess the validity and reliability of the Yale-Brown Obsessive-Compulsive Scale-Second Edition, the first translation of this questionnaire should be provided in the first stage. For this purpose, two translators (translator 1 and 2), who were familiar with the field of psychology and test making, but have not yet seen the scale, independently translated Yale-Brown Obsessive-Compulsive Scale-Second Edition to Persian. Each translator provided a translation of the test items and a list of possible alternative translations. The translations

were then extracted by a professor of psychology fluent in English with the original version of the test of data matching and translation.

The researchers then evaluated the quantitative validity of the questionnaire quantitatively in order to examine the hypothesis that the Persian version of the second edition of the Y-BOCS for the Iranian community is a comprehensible tool. For this purpose, the original translated version was provided to five psychologists and psychiatrists to evaluate the issues (such as compatibility of the text translated with the original text, the comprehensibility of the subjects and the order of the question). To reduce and eliminate inappropriate phrases and to determine the importance of each of the expressions, the quantitative effect of the item was used. First, for each of the 15 tool items, a Likert scale of 1 to 5 was considered, with a higher score indicating the importance of the item. After completing the questionnaire by experts, the formal validity of the item was calculated using the formula's effect method. The result of the effect of the item indicated that all questions had a score equal to or greater than 1.6, so all questions were included in the Persian questionnaire.

More than half of the subjects completed the SCL-90-R-OCS and VOCI questionnaires, in addition to completing the second edition of the Y-BOCS. Again nearly 30% of the subjects completed the second edition of the Y-BOCS two weeks later.

Also, the present study evaluated the validity of the second edition of the Y-BOCS by verifying the confirmatory factor analysis using Lisrel software. Given that there is no general agreement among the structural equation modeling specialists on which of the fitness indicators provides a better estimate of the model, it is suggested to report a combination of 3 to 4 indicators. Consequently, in the present study and in line with the main validation studies of the second edition of the Y-BOCS checklist, among the absolute fitness indicators, the ratio of chi-square to degree of freedom (χ^2/df), goodness-of-fit index (GFI) and The root mean square root of the estimate of approximation (RMSEA) and the difference between the comparative and comparative fitness indicators, the Tucker-Lewis fit index (TLI), or the non-normed fit indexes fit index (NNFI), as well as the comparative fitness index (CFI), were used (Table 1).

Table 1: Fitness indices confirmatory factor analysis models

Version	χ^2	df	p	χ^2/df	GFI	CFI	NNFI	RMSEA	SRMR
Now	119.76	116	0.386	1.03	0.91	0.99	0.99	0.015	0.06
Now. modified	81.74	87	0.639	0.94	0.93	0.99	0.99	0	0.06
Past	698.85	116	0	6.02	0.63	0.63	0.57	0.192	0.12
Intensity. modified	375.22	54	0	6.94	0.88	0.88	0.86	0.207	0.09

In order to perform a factor analysis, it is necessary to ensure that the data is normal before any work. To do this, we examined the skewness and elongation of the items, none of which had more than 2 skewings and no

more than 3 elongations. Therefore, all items were normal and entered into analysis.

The results of the confirmatory factor analysis by Lisrel software on the second edition of the Y-BOCS checklist showed that, although the 3-factor fitness indicators of the main makers in the study of symptoms are confirmed in the present but the two items of custody and storage were not t meaningful. By eliminating these two items, in examining the signs of the present, all items have an acceptable gain and fittings confirming the 3-factor model. However, the study of the past symptoms of the second edition of the Y-BOCS checklist revealed a lack of confirmation of the 3-factor model. The severity scale, which was derived from 14 Likert questions, also lacked fitness even by deleting 2 items 12 and 14. Figure 1 shows information on the factor load; the present symptom model now contains the Y-BOCS.
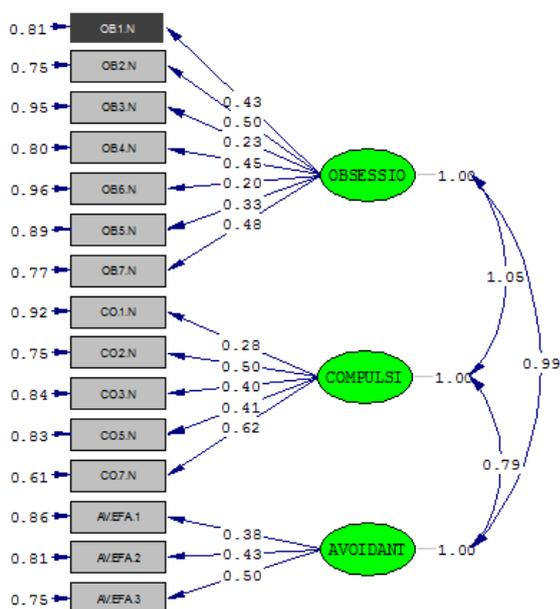

Figure 1: Factor loads and measurement errors new model 3 factors current symptoms Y-BOCS-II (OB: obsession (1. infection, 2. aggression, 3. religious, 4. sexuality, 5. symmetry, 6. hoarding and 7. other obsessions); CO: compulsion (1. washing, 2. checking, 3. ritual, 4. counting, 5. order, 6. hoarding and 7. other compulsions); AVOID: in three categories derived from exploratory factor analysis)

Based on the results of Figure 1, the path coefficients were between 0.20 and 0.62 and with a mean of 0.41. The highest path coefficient (0.62) belongs to the subscale of the others compulsions and the lowest path coefficient (0.20) belongs to the hoarding subscale. The results of Table 2 show, the average item load in the agents is

between 0.37 and 0.44, which indicates the appropriate level of explanation for the obvious variables on the latent variables or the same factors. The intrinsic reliability of the checklist is poor, and only the general scale of the symptoms of the second edition of the Y-BOCS is acceptable. In examining the previous symptoms, the Y-BOCS checklist was significantly more reliable than the present symptoms, and all factors had acceptable reliability. The severity factors also showed good reliability.

Table 2: Internal reliability, mean of item load, and internal correlation

	Scale	Total Items in Scale	Means of load items	Means of Inter-correlations	Standard of Cronbach's alpha
	Obsession	7	0.37	0.21	0.65
	Compulsion	5	0.44	0.33	0.71
	Avoidant	3	0.43	0.3	0.56
NOW	Total	15	0.41	0.27	0.84
	Obsession	7	0.6	0.3	0.75
	Compulsion	5	0.7	0.42	0.78
	Avoidant	3	0.74	0.49	0.74
PAST	Total	15	0.66	0.34	0.88
	Intensity	12	0.73	0.46	0.91

Table 3 examines the correlation of factors in the study of symptoms of the present and the past. As the results show, the correlation between the factors in the present and the past, and the factors of each version have a positive and strong correlation at a significant level of more than 0.01. To verify the signs' stability, the second edition of the Y-BOCS has been used test-retest method. To this end, 36 participants were interviewed again using a Y-BOCS on a 2-week interval. The Pearson correlation coefficient between the scores from the two runs in the version was 0.96 in all three factors, and in the past, for obsessions, compulsions, and avoidances were 0.95, 0.94 and 0.94 respectively, all of which had a significant level greater than 0.01. The correlation between the implementation of the severity scale also showed a correlation of 0.43 and a significance level of more than 0.01. Therefore, the results show a high correlation between the two tests and the result of the reliable and reliable retest reliability of the present and past versions and the intensity scale (Table 4).

Table 3: Correlation between factors the Y-BOCS-II

	Scale	M	SD	Skewness	Kurtosis	1	2	3	4	5	6
NOW	Obsession	10.96	5.11	0.4	0.19	1					
	Compulsion	9.5	4.38	0	-0.32	0.77**	1				
	Avoidant	4.24	2.53	-0.02	-0.95	0.64**	0.54**	1			

PAST	**Obsession**	10.99	5.84	0.23	-0.58	0.81**	0.71**	0.50**	1	
	Compulsion	9.31	5.1	0.06	-0.84	0.66**	0.86**	0.45**	0.79**	1
	Avoidant	4.17	2.86	0	-1.24	0.55**	0.57**	0.80**	0.56**	0.67**	1
	Intensity	33.36	12.53	0.27	-0.8	0.61**	0.55**	0.35**	0.66**	0.63**	0.42**

Table 4: Correlation between the first and second implementation of the factors of the Y-BOCS-II

Scale	Correlation between Run 1 and 2	Correlation between Run 1 and 2
	Now	**Past**
Obsession	0.96**	0.95**
Compulsion	0.96**	0.94**
Avoidant	0.96**	0.94**
Intensity	0.43	-

In order to investigate the convergent validity of the Y-BOCS second edition checklist was investigated with the Persian version of Vancouver Obsessional Compulsive Inventory (VOCI) (Table 5) and the Symptom Checklist-90-Revised (SCL-90-R) (Table 6). As the results showed, there was a strong correlation between the second edition of the Y-BOCS checklist with VOCI and SCL-90-R. All of the relationships had a significant level of greater than 0.01 and only one factor was the avoidance factor in the signs of the Y-BOCS and the Hoarding factor in the VOCI (0.17) and the significance level was 0.04.

Table 5: Correlation between the Y-BOCS-II scale factors with VOCI

	Scale	Contamination	Checking	Obsessions	Hoarding	Just Right	Indecisiveness
NOW	**Obsession**	0.53**	0.66**	0.76**	0.34**	0.70**	0.55**
	Compulsion	0.48**	0.63**	0.66**	0.41**	0.70**	0.53**
	Avoidant	0.49**	0.52**	0.55**	0.17*	0.51**	0.33**
PAST	**Obsession**	0.32**	0.55**	0.51**	0.37**	0.60**	0.37**
	Compulsion	0.35**	0.60**	0.55**	0.42**	0.62**	0.50**
	Avoidant	0.31**	0.47**	0.50**	0.34**	0.53**	0.43**
	Intensity	0.46**	0.62**	0.57**	0.35**	0.68**	0.56**

Table 6: Correlation between the factors of the Y-BOCS-II scale factors with the SCL-90-R

	Scale	Hostility	Anxiety	Obsessive-Compulsive	Interpersonal Sensitivity	Somatization	Psychoticism	Paranoid Ideation	Depression	Phobic Anxiety
NOW	**Obsession**	0.58**	0.76**	0.68**	0.64**	0.76**	0.71**	0.58**	0.62**	0.72**
	Compulsion	0.38**	0.52**	0.61**	0.52**	0.52**	0.57**	0.53**	0.53**	0.55**
	Avoidant	0.44**	0.52**	0.48**	0.48**	0.51**	0.43**	0.50**	0.42**	0.47**
PAST	**Obsession**	0.42**	0.54**	0.52**	0.39**	0.57**	0.47**	0.27**	0.47**	0.61**
	Compulsion	0.30**	0.44**	0.54**	0.42**	0.40**	0.46**	0.35**	0.48**	0.53**
	Avoidant	0.28**	0.40**	0.44**	0.38**	0.37**	0.34**	0.31**	0.40**	0.42**
	Intensity	0.51**	0.57**	0.62**	0.36**	0.55**	0.57**	0.31**	0.60**	0.63**

DISCUSSION

In the study of internal factors, the results showed that the severity factors and the previous symptoms of the second edition have a satisfactory reliability. In general, in examining the previous symptoms, the Yale-Brown checklist was significantly more reliable than the present symptoms, and all factors had acceptable reliability. Also, the results indicate a high correlation between the present and the old scale. The study of past symptoms and the intensity scale without fit was necessary, but the examination of the present symptoms after the removal of the two items of counting and hoarding with factor load was acceptable and the fittings confirmed the 3-factor model.

Research by Storch et al. [10] referred to the findings of this study. In general, the dimensions of Y-BOCS-II-SC have a high internal stability and an appropriate stability rate within a short time. The results of reliability of the test constructors showed that the second edition of this test is of high internal reliability (0.91) using Kuder Richardson method. The confirmatory factor analysis was not compatible with previous Y-BOCS models and Confirmatory Factor Analysis also showed a two-factor model consistent with obsessive-compulsive intensity subscales.

CONCLUSION

Among the limitations of this study are the following: One of the limitations of the present study was the availability of sampling method and that it was carried out in a specific population of patients with obsessive-compulsive disorder, thus generalizing the results to other geographical areas and contexts should be treated with caution. On the other hand, considering that the patients were reassessed two weeks after the first evaluation, the longer term reliability of the questionnaire is unclear and it is suggested that further studies be evaluated over time in most patients. In sum, the results of this early study in Iranian society indicate the validity and reliability of the present scale, and clinical experts and therapists can use this scale to evaluate clinical outcomes, as well as clinical, therapeutic and research work.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this manuscript.

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