

The Examination of the Psychometric Properties of the Turkish Form of the Penn Inventory of Scrupulosity



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SUMMARY

Objective: The aim of the present study was to adapt the Penn Inventory of Scrupulosity (PIOS), which was developed by Abramowitz and his colleagues (2002), for Turkish intervention and to evaluate its psychometric properties on a cohort of students a cohort of nonclinical university students.

Method: The sample of the present study consisted of 444 undergraduate university students between ages of 18 and 25. All participants were asked to complete a battery of self-report measures including the PIOS, Beck Depression Inventory, Beck Anxiety Inventory, Clark-Beck Obsessive Compulsive Inventory, and Penn State Worry Inventory. Following a period of approximately 4 weeks, a sub-sample of the participants was asked to complete the questionnaires for a second time.

Results: Consistent with the findings of the original study (Abramowitz et al. 2002), explanatory and confirmatory factor analyses supported the two-dimensional structure of the Turkish version of the PIOS. However, distribution of the items on the two factors showed some cultural differences that might be specific to the Turkish culture. The results revealed acceptable test-retest and internal consistency coefficients as well as good construct, convergent, discriminant, and criterion validity information for the Turkish version of the PIOS. These findings can be used in the Turkish culture to evaluate individual differences in terms of scrupulosity symptoms.

Conclusion: The results indicated good reliability and validity information for the Turkish version of the PIOS, which supports the cross-cultural nature of the scale.

Keywords: Religious obsessions, obsessive compulsive disorder, validity, reliability

Obsessive-Compulsive Disorder (OCD) is a disorder characterized by obsessions comprising involuntary and repetitive thoughts, images, or impulses that suddenly pop into an individual's mind and cause significant distress and compulsions. Compulsions are repetitive behaviors or mental acts that are aimed at reducing the anxiety caused by obsession (DSM-5 American Psychiatric Association (APA) 2013). The research indicates that OCD has a heterogeneous symptom profile and the content of the obsessions can include the themes of dirtiness/contamination, sexuality, morality, religion, doubt,

harm, aggression, victim of harm, and symmetry (Greenberg and Huppert 2010, McKay et al. 2004).

Scrupulosity, which is one of the symptom types of OCD, consists of persistent doubts in important issues related to an individual's faith including whether he/she confessed his/her sins, sanctified himself/herself entirely from his/her sins, performed a religious prayer properly, and/or had complete faith in God. These obsessions can be also experienced as the involuntary and sudden emergence of sinful thoughts, intrusive swear words against God, blasphemous sexual thoughts, or

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images of sacred figures in mind. Scrupulous individuals may perform repetitive and ritualistic compulsions in order to reduce the anxiety arising from obsessions. These compulsions may include excessive praying, repeating specific religious words in a certain number of repetitions, continuous confession of sins, and reassurance seeking from religious figures about whether or not they have sinned. They may also exhibit an extreme sensitivity and a rigid attitude toward religious issues including breaking the moral rules, a strict adherence to religious rules, and being sufficiently faithful (Abramowitz 2008, Abramowitz and Jacoby 2014). These individuals complain about the inability to live according to their faith due to their intense doubts and worries on religious and moral issues or intense feelings of anxiety and guilt caused by the unwanted intrusive thoughts, images, and impulses related to having done something contrary to their beliefs (Abramowitz et al. 2004, Tek and Ulug 2001).

Scrupulosity is one of the most common symptoms of OCD. Studies conducted in Western countries have revealed that scrupulosity is observed between 10.0% and 33.0% of patients diagnosed with OCD (Eisen et al. 1999, Mataix-Cols et al. 2002). However, it has been suggested that, because of the influence of cultural values, this rate can vary across different cultures (Besiroglu et al. 2014, Mahgoub and Abdel-Hafeiz 1991, Okasha et al. 1994). It was reported that the patients with scrupulosity had lower insights compared to those of patients with other OCD symptoms, and they exhibited greater perceptual distortion and magical thinking (Tolin et al. 2001). Similarly, Nelson et al. (2006) found that scrupulosity was related to obsessive beliefs including over-importance of controlling unwanted thoughts, perfectionism, and inflated responsibility. Additionally, it was reported that individuals with scrupulosity were more resistant to OCD treatments (Alonso et al. 2001, Egrilmez et al. 1997, Ferrano et al. 2006). Also, a positive association was shown between increased scrupulosity and OCD symptoms (Inozu et al. 2012a, 2012b, Tek and Ulug 2001).

It is remarkable that the number of studies published on scrupulosity is limited in Turkey. There is a serious lack of information on the differentiation of scrupulosity in countries with different religious beliefs and cultures. In a cross-cultural study including Turkey, Inozu et al. (2012a) found that the frequency and content of the scrupulosity symptoms differed between the Muslim Turkish and the Christian Canadian samples. The authors reported that, while there was no significant difference between the two cultures regarding the Fear of Sin symptoms, Fear of God symptoms were significantly higher in the highly religious Muslim group compared to those of the highly religious Christian participants. Furthermore, the results have indicated that the intensity of scrupulosity increased as the religiousness levels of the individuals increased. In a similar study, Inozu et al. (2012b) found that highly

religious Muslim participants reported a significantly higher degree of compulsive symptoms compared to highly religious Christians. Besiroglu et al. (2014) examined the cognitive factors related to scrupulosity and indicated that the intensity of scrupulosity increased as the intensity of obsessive beliefs increased. It has been stated that, in order to carry out similar studies that will allow developing a better understanding of scrupulosity, it is important to develop reliable and valid questionnaires (Abramowitz et al. 2002).

In the related literature, the most commonly used measure of scrupulosity, that was psychometrically validated in different samples, is the Penn Inventory of Scrupulosity (PIOS) (Abramowitz et al. 2002). The original version of the PIOS was developed for assessing scrupulosity in a nonclinical university student sample. It was found that the 19-item PIOS consisted of two subscales. One of the sub-scales was Fear of Sin and the other was Fear of God. The internal consistency coefficients were found as 0.93 for the Total Score, 0.88 for the Fear of God, and 0.90 for the Fear of Sin subscales. Additionally, discriminant and convergent validities of the scale were at acceptable levels (Abramowitz et al. 2002). Then, the factor structure of the scale was tested in a different non-clinical sample by Olatunji et al (2007). The results supported the two-factor structure of the scale; however, the number of the items was reduced to 15. It was stated that the revised version of the scale had very high validity and reliability values and showed a 0.99 correlation with the original version. Shapiro et al. (2013) evaluated the psychometric properties of the 15-item revised version in a clinical sample consisting of 417 patients diagnosed with OCD. The analyses supported the two-factor structure of the scale and validity/reliability values were at acceptable levels. In another study, Huppert and Fradkin (2016) examined the psychometric properties of the 19-item original version of the scale using the data collected from patients diagnosed with OCD. Consistent with the previous studies, this study also reported that the scale had two factors consisting of Fear of God and Fear of Sin. However, it was reported that there were some differences from the original scale (Abramowitz et al. 2002) in terms of item distribution and the number of items. Based on these studies, it was stated that PIOS was a very strong measure of scrupulosity that can be used in both normal and clinical samples.

The scale was adapted to Turkish by Altun (2009) and the 19-items original version was used with the same items loaded on the two factors. Its validity and reliability values were examined. The data obtained from Canadian and Turkish samples were compared using Target Rotation Analysis. It was demonstrated that item distribution of conformity index, which constitutes the factors, was congruent in the two cultures. Therefore, the 19-item original version was used in the Turkish sample without any changes. In other studies

using the scale (e.g., Inozu et al. 2012a, Besiroglu et al. 2014), validity and reliability values obtained from this study were used. However, as explained above, the number of items was reduced in the subsequent studies that examined psychometric properties of this scale (e.g., Huppert and Fradkin 2016, Shapiro et al. 2013), and the results revealed differences in the item distributions that form the factors. Therefore, the need of reexamination of the psychometric properties of the Turkish version had emerged. In line with this requirement, the aim of this study was to re-examine the psychometric properties of Turkish version of the PIOS (Abramowitz et al. 2002) using advanced and additional analyses. Accordingly, reliability properties of the PIOS were evaluated using internal consistency and test-retest reliability values while validity properties were evaluated using construct validity, convergent validity, discriminant validity, and predictive validity values. In spite of the increase in the studies on scrupulosity (e.g., Pirutinsky et al. 2015, Rasmussen et al. 2016) it is a subject still waiting to be studied and understood in Turkey. The adaptation of the scale into Turkish will provide an opportunity to assess scrupulosity in cultures with different religious beliefs. Therefore, studying the psychometric properties of PIOS in Turkey will significantly contribute both to the national and international literature.

METHOD

Participants

Four hundred forty four college students in different departments of Middle East Technical University participated in the present study. Two hundred forty one of them (54.3 %) were female and the mean age was 21.90 (SD = 0.80).

Instruments

Beck Depression Inventory (BDI): The BDI is a 21-item self-report measure of cognitive, emotional, and somatic symptoms of depression, each of which was rated on a 4-point scale. The higher scores indicate the increase in severity of depression. The first version of the scale was developed by Beck (1961) and then, revised in 1978 (Beck et al.). The revised form was adapted to Turkish by Hisli (1988, 1989). In these studies, the psychometric properties of Turkish version of the scale were found to be comparable with the original form.

Beck Anxiety Inventory (BAI): The BAI is a 21-item Likert-type scale that assesses general symptoms of anxiety (Beck et al. 1988). High scores point to a rise in anxiety symptoms. The adaptation study of the scale to Turkish was conducted by Ulusoy et al. (1998). The reliability and validity analyses showed that psychometric properties of the Turkish form were as satisfactory as the original version of the BAI.

Clark-Beck Obsessive Compulsive Inventory (CBOCI): The CBOCI is a 25-item Likert-type scale that assesses obsessive-compulsive symptoms (Clark et al. 2005). This inventory consists of two subscales including obsession and compulsion. Obsession subscale includes 14 items that assess frequency, distress, uncontrollability, salience, responsibility, insight of obsessions, and control efforts over them. The compulsion subscale consisted of 11 items assessing frequency, precision, discomfort, and avoidance of compulsions. The study of reliability and validity of the Turkish form was conducted by Besiroglu et al. (2007). Reliability and validity values derived from OCD-diagnosed sample showed that the psychometric properties of Turkish form of CBOCI was comparable with the original version.

Penn Inventory of Scrupulosity (PIOS): The PIOS is a 19-item self-report measure developed to assess religious obsessions and compulsions (Abramowitz et al. 2002). It consists of two subscales: one measuring the fears of having poor relationship with God and punishment from God (Fear of God), and the other measuring the fears of having committed a religious or moral sin (Fear of Sin). Fear of sin sub-scale assesses concerns about having a poor relationship with God, being a bad person, and disobeying the commandments of religion (Abramowitz 2001). The scale has adequate convergent and divergent validity values. This scale was adapted to Turkish by Altın (2009). The analyses conducted using same factor structure and item distribution of the original form indicated that Turkish form of scale had acceptable psychometric properties.

Penn State Worry Questionnaire (PSWQ): This questionnaire was composed of 16 items and aimed to measure tendency to worry (Meyer et al. 1990). The studies that were conducted with both clinical and non-clinical samples indicated that internal consistency, test-retest reliability, convergent, and divergent validity of PSWQ were quite strong (Brown et al. 1992, Davey 1993). The Turkish adaptation of the scale was performed by Yılmaz et al. (2008). The results indicated that the Turkish version of the scale had comparable reliability and validity values with the original questionnaire

Procedure

After receiving permission from the Ethical Committee of Middle East Technical University, a set of questionnaires introduced above were administered to the students who volunteered to participate in the study. The scales were presented in a randomized sequence in order to eliminate the errors related to the influence of ordering. The scales were applied in the class setting and each administration took approximately 40-45 minutes. Following a period of approximately 4 weeks, 167 randomly selected the participants (54.8% Female) were asked to complete the questionnaires for the second time.

RESULTS

Validity

Construct Validity: The original version of the PIOS consists of 19 items and 2 subscales. The Fear of Sin and Fear of God subscales are composed of 12 and 7 items, respectively (Abramowitz et al. 2002). First, a confirmatory factor analysis (CFA) using AMOS (Analysis of Moment Structures) program was conducted on the 19-items of the Turkish version of the PIOS using priori loaded items onto the two subscales of the original form. The results revealed that the fit of this model involved the same 19 manifest indicators of the original form was not at an acceptable level ($X^2/df = 6.56$, AGFI = 0.73, GFI = 0.78, CFI = 0.87, NFI = 0.85, RMSEA = 1.12, $p < .001$). As mentioned before, religious obsessions can vary across different cultures. By considering this information and the results of the CFA, it was decided to re-examine the unique factor structure of the Turkish version of the PIOS. Accordingly, exploratory factor analysis was firstly conducted. Then, the structural equation modeling (AMOS) was used in order to verify the obtained factor structure.

Exploratory factor analysis: To assess the construct validity of the PIOS, a Principal Component Analysis with direct oblimin rotation was conducted. The Kaiser-Meyer Olkin (KMO) index, a measure of sampling adequacy index for assessing suitability of the data collected by using PIOS to continue with exploratory factor analysis, was found as 0.96. The Barlett's chi-square index was found as 6363.06 ($p < .001$). These values were evidence that data had a perfect measurement quality to continue with factorial analysis. Consistent with the two-factor structure of the original form, only two factors with eigenvalues greater than 1 were identified. This two-factor solution accounted for 63.0% of the cumulative variance. Similarly, scree-plot criteria supported that the measure's structure was best described as having two factors.

According to analyses, 8 PIOS items (2, 4, 5, 6, 9, 13, 17, and 19) were loaded onto the Fear of God factor and 9 PIOS items (1, 3, 7, 8, 11, 12, 14, 16, and 18) were loaded onto the Fear of Sin factor, with factor I accounting for 54.0% and factor II for 8.0% of the cumulative variance. However, in consistent with the original form, items 4, 6, 10, and 15

loaded on the different factor. As a different from the original form of the scale, item 4 (I feel urges to confess sins over and over again) with a standardized loading of 0.86, and item 6 (I worry I must act morally at all times or I will be punished) with a standardized loading of 0.78 loaded onto the Fear of God factor instead of loading onto the Fear of Sin factor. Furthermore, it was found that their standardized loadings were lower than 0.10 on the Fear of Sin subscale. As a result, considering both content of the items and statistical results, it was decided that item 4 and 6 should load onto the Fear of God subscale as different from the original form.

Another difference from the original form (Abramowitz et al. 2002) was that item 10 and 15 loaded too evenly on both factors (factor loading < 0.10 difference). The results of the Principal Component Analysis indicated that standardized factor loadings of item 10 (I fear I have acted inappropriately without realizing it) were 0.44 and 0.37 on the Fear of God and Fear of Sin subscales, respectively. Similarly, a factor loading of item 15 (I worry I will never have a good relationship with God) was 0.47 on the Fear of God and 0.31 on the Fear of Sin. In parallel with these findings, factor structure of the PIOS was tested using a sample composed of university students from USA (Olatunji et al. 2007). It was reported that items 2, 6, 10, and 15 had similar factor loadings on both of the subscales. Therefore, the authors decided to exclude these four items from the scale. Consistent with the study of Olatunji et al. (2007), it was decided to remove items 10 and 15 from the scale by considering the results of confirmatory factor analysis given below.

Validating Factor Structure of PIOS: A CFA was contacted in order to validate item distribution of the Turkish form of the PIOS using AMOS (Analysis of Moment Structures), and three competing models of interest were estimated. First, as indicated by the exploratory factor analysis, item 4 and 6 were included to Fear of God subscale. Then, before item 10 and 15 were removed from scale, confirmatory factor analysis was conducted on the 19 items of the PIOS to test two-factor model. Subsequently, items 10 and 15 were removed and confirmatory factor analyses were conducted for both unifactorial model and two-factor model, separately. As it is seen in Table 1, the two-factor model of the shortened PIOS

Table 1. Fit indices of models related PIOS's factor structure.

	X^2	sd	X^2/sd	p	AGFI	GFI	CFI	NFI	RMSEA
Model 1	990.5	151	6.56	0.00	0.73	0.78	0.87	0.85	0.11
Model 2	1160.5	119	9.75	0.00	0.58	0.68	0.82	0.80	0.14
Model 3	542.1	118	4.59	0.00	0.83	0.87	0.93	0.91	0.09
Model 4	423.9	116	3.65	0.00	0.86	0.90	0.95	0.93	0.07

Notes: Model 1: The model for two-factor structure without removing item 10 and 15. Model 2: The model for one-factor structure after removing item 10 and 15. Model 3: The model for two-factor structure after removing item 10 and 15. Model 4: After corrections have been made on Model 3.

AGFI: Adjusted Goodness of Fit Index, GFI: Goodness of Fit Index, CFI: Comparative Fit Index, NFI: Normed Fit Index, RMSEA: Root Mean Square Residual

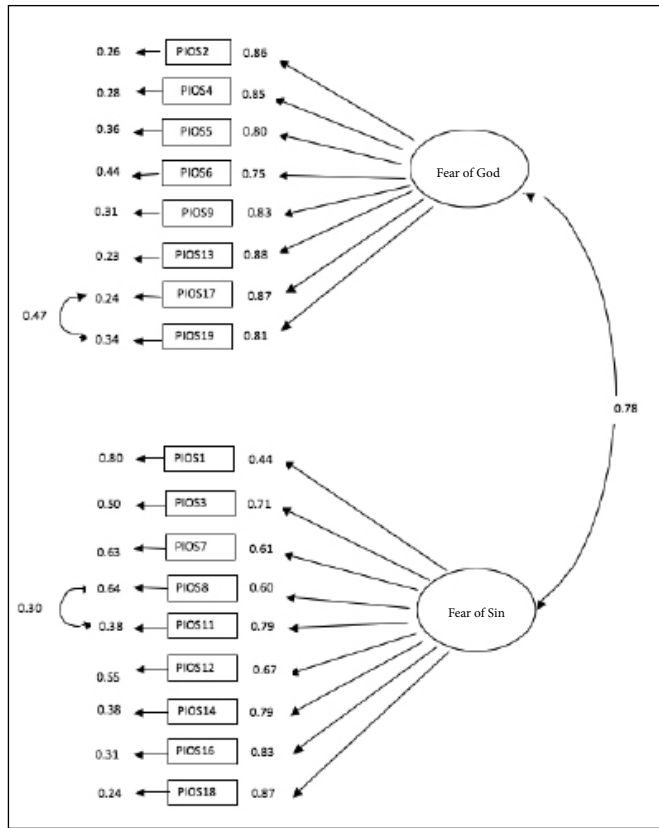


Figure 1. Standardized values of two factor measurement model of the PIOS

(without items 10 and 15, Model 3) provided the most suitable fit to the data ($X^2/df = 4.59$, AGFI = 0.83, GFI = 0.87, CFI = 0.93, NFI = 0.91, RMSEA = 0.090, $p < .001$) for the factor structure and item distribution in the Turkish culture. In addition, examination of fit indices for the other models revealed that their absolute fit were not satisfactory. Finally, some modifications were made for Model 3 by using CFA modification indices. The analysis suggested significant error covariance (modification index $X^2 = 34.01$) between item

17 (I worry that God is upset with) and 19 (I am afraid my thoughts are unacceptable to God). Thus, the model was re-specified allowing the error covariance between item 17 and 18 to be freely estimated. This re-specification significantly improved the fit of the measurement model. Another proposed modification was to allow error covariance between item 8 (Immoral thoughts come into my head and I can't get rid of them) and item 11 (I must try hard to avoid having certain immoral thoughts) in the Fear of Sin subscale (modification index $X^2 = 34.01$). After two modifications, two-factor structure of PIOS demonstrated a good to excellent fit to the data (Model 4) ($X^2/df = 3.65$, AGFI = 0.86, GFI = 0.90, CFI = 0.95, NFI = 0.93, RMSEA = 0.077, $p < .001$).

Convergent and Divergent Validity. To assess the convergent and divergent validity of the PIOS, correlation coefficients between variables were used. When related correlation coefficients were examined, it was observed that the PIOS total and subscale scores were significantly correlated with the CBOCI total and subscale scores that assess obsessive-compulsive symptom severity (correlation coefficients ranged between $r = 0.23$ and $r = 0.43$, $p < .001$). Furthermore, the PIOS Fear of Sin subscale was found to be associated with depression (BDI), anxiety (BAI), and worry (PSWQ) questionnaires ($r_s = 0.22, 0.33, 0.29$, respectively). These findings supported the convergent validity of the PIOS.

On the other hand, in order to assess the divergent validity of the PIOS, its association with the PSWQ and CBOCI were examined. As it is seen in Table 2, significant correlations were found between the PIOS and the PSWQ ($r = 0.18$) and CBOCI ($r = 0.36$). To determine whether its correlation with the CBOCI was significantly stronger than its correlation with the PSWQ, a Z-test was conducted. The results indicated that the PIOS showed a significantly stronger association with the CBOCI scores than the PSWQ scores ($n =$

Table 2. Correlation coefficients between PIOS and PSWQ, BDI, BAI, CBOCI

	PIOS Total	Fear of God	Fear of Sin	PSWQ	BDI	BAI	CBOCI Total	CBOCI Obs.	CBOCI Comp.
PIOS Total		0.94**	0.90**	0.18*	0.23**	0.18**	0.35**	0.36**	0.31**
Fear of God			0.71**	0.13	0.12*	0.07	0.23**	0.26**	0.25**
Fear of Sin				0.22**	0.33**	0.29**	0.43**	0.42**	0.33**
PSWQ					0.45**	0.42**	0.45**	0.45**	0.37**
BDI						0.54**	0.56**	0.58**	0.51**
BAI							0.38**	0.40**	0.36**
CBOCI Total								0.94**	0.73**
CBOCI Obs.									0.91**
CBOCI Comp.									

* $p < 0.05$, ** $p < 0.01$

Note. PIOS Total: The Penn Inventory of Scrupulosity Total Score; Fear of God: Fear of God Subscale of The Penn Inventory of Scrupulosity; Fear of Sin: Fear of Sin Subscale of the Penn Inventory of Scrupulosity; PSWQ: Penn State Worry Questionnaire Total Score; BDI: Beck Depression Inventory Total Score; BAI: Beck Anxiety Inventory Total Score; CBOCI Total: Clark-Beck Obsessive Compulsive Inventory Total Score; CBOCI Obs: Clark-Beck Obsessive Compulsive Inventory-Obsession Subscale; CBOCI Comp: Clark-Beck Obsessive Compulsive Inventory Compulsive Subscale

Table 3. Associations of the Fear of God and Fear of Sin subscales with the CBOCI Obsession and Compulsion subscale scores**The results of the CBOCI- Obsession subscale**

Analysis steps	Variables	R	R ²	ΔR ²	F	β	t
1		0.20	0.04	0.03	4.58**		
	Gender					0.72	1.13
	Age					0.08	0.51
	SED					-1.89	-2.34*
	Current Mental Status					4.79	3.16*
2		0.63	0.39	0.39	40.24**		
	BDI					0.34	8.01**
	BAI					0.10	3.12*
	PSWQ					0.17	6.01**
3		0.68	0.46	0.45	39.44**		
	PIOS-Fear of God					-0.01	4.45**
	PIOS-Fear of Sin					0.28	4.90**

The results of the CBOCI- Compulsion subscale

Analysis steps	Variables	R	R ²	ΔR ²	F	β	t
1		0.20	0.04	0.03	4.55**		
	Gender					1.07	1.94*
	Age					0.15	1.16
	SES					-1.87	-2.66*
	Current Psychiatric Status					2.69	2.04
2		0.59	0.34	0.33	31.53**		
	BDI					0.21	5.32**
	BAI					0.12	4.48**
	PSWQ					0.14	5.61**
3		0.62	0.39	0.37	29.19**		
	PIOS-Fear of God					0.13	3.27**
	PIOS-Fear of Sin					0.03	0.66*

*p < 0.05, **p < 0.01

Note. PIOS-Fear of God: Fear of God Subscale of The Penn Inventory of Scrupulosity; PIOS-Fear of Sin: Fear of Sin Subscale of the Penn Inventory of Scrupulosity; PSWQ: Penn State Worry Questionnaire Total Score; BDI: Beck Depression Inventory Total Score; BAI: Beck Anxiety Inventory Total Score; CBOCI: Clark-Beck Obsessive Compulsive Inventory

444, $z = -3.80$, $p < 0.001$). The PIOS was associated with two different scales that measure different constructs, confirming the divergent validity of this measure.

Predictive Validity: Predictive validity of the scale was assessed by using the CBOCI that measures symptoms of obsession and compulsion. A hierarchical regression analyses was conducted to examine whether the Fear of God and Fear of Sin subscale scores predicted the changes in the CBOCI obsession and compulsion subscale scores.

First, the CBOCI obsession subscale scores were entered the analysis as an outcome variable. As predictive variables, demographic variables (age, gender, socioeconomic status (SES),

and current mental status) were the first variables entered into the equation, general symptom measures of the BDI, BAI, and PSWQ were entered into the analysis at the second step. At the last step, two subscales of the PIOS were entered. The results revealed that age, gender, SES, and current mental status explained 0.04% of the total variance in the CBOCI obsession subscale scores. The addition of the BDI, BAI, and PSWQ scores in the second step explained 39.0% of the total variance. On the last step, the addition of the PIOS subscales increased the explained variance to 46.0%. Consequently, statistical model showed that after controlling for the effects of other variables, the Fear of God ($\beta = -0.01$, $t(444) = 4.45$, $p < 0.001$) and Fear of Sin subscales ($\beta = 0.28$, $t(444) = 4.90$,

$p < 0.001$) still significantly predicted the CBOCI Obsession subscale scores on the last step (see in Table 3).

In the analysis that CBOCI compulsion subscale scores were used as a dependent variable, demographic variables explained 0.04% of the total variance. With the addition of the BDI, BAI, and PSWQ score, the explained variance was 34.0%. When the Fear of God and Fear of Sin subscales were entered into the equation, 39.0% of the total variance was explained. Consistent with the previous analysis, the regression model indicated that the Fear of God ($\beta = 0.13$, $t(429) = 3.27$, $p < 0.001$) and Fear of Sin ($\beta = 0.03$, $t(429) = 0.66$, $p < 0.05$) subscales still significantly predicted the CBOCI compulsion subscale when the effect of all variables were controlled (As seen in Table 3).

Reliability

Internal consistency coefficients were 0.95 for the PIOS total score, 0.95 for the Fear of God, and 0.90 for the Fear of Sin subscale scores. Test-retest reliability values were found as 0.84, 0.87 and 0.73, respectively. Item total correlations of the PIOS ranged between 0.41- 0.85 for the total scale, 0.79 - 0.90 for the Fear of God subscale, and 0.48 - 0.84 for the Fear of Sin subscale. As can be seen from values stated above, internal consistency and test-retest reliability of the PIOS were statistically significant (Nunnally 1978). Also, split-half reliability of the PIOS was found as 0.94.

DISCUSSION

Consistent with the original (Abramowitz et al. 2002) and previous studies (Huppert and Fradkin 2016, Olatunji et al. 2007, Shapiro et al. 2013), the present study showed that the two-factor structure of the Turkish version of PIOS was suitable for Turkey. However, different from the original scale, it was shown that the 17-item PIOS (but not the 19-item PIOS) had stronger psychometric properties. Furthermore, different from the original scale, item 4 (I feel urges to confess sins over and over again) and item 6 (I worry I must act morally at all times or I will be punished) were loaded on the Fear of God subscale instead of Fear of Sin subscale. This result seems to be consistent with the basic doctrines of the Islam that frequently emphasizes the God's merciful and forgiving characteristics, besides His punitive characteristics, and Fear of God being one of the main elements of being faithful to God (Ghassemzadeh et al. 2002).

In this study, it was shown that convergent and divergent validities of PIOS were also high. The results are consistent with the approach suggesting that scrupulosity is a dimension of OCD (Greenberg and Huppert 2010, Nelson et al. 2006, Tolin et al. 2001, Witzig and Pollard 2013). The results are also parallel with the previous findings indicating

that scrupulosity is related with the depression and anxiety symptoms (Olatunji et al. 2007, Witzig and Pollard 2013). Our results indicate significant positive association with the intensity of both obsessive and compulsive symptoms and were consistent with the findings obtained from non-clinical samples (Abramowitz et al. 2002, Olatunji et al. 2007). However, our findings were partially inconsistent with those obtained from clinical samples, which indicates that the total PIOS scores were in a significant relation only with the intensity of obsession (Nelson et al. 2006). The analyses indicating that predictive validity of PIOS was at sufficient levels supported the fact that scrupulosity was related not only with the intensity of obsessive symptoms but also with the compulsive symptoms. Therefore, it is important to examine the relationship between religious worships and concerns with OCD symptomatology in clinical sample diagnosed with OCD.

In conclusion, psychometric properties of PIOS that assess the scrupulosity, which is a dimension of OCD, was re-examined and demonstrated that the Turkish version of the scale was comparable to the original version in terms of validity and reliability. It was also found that, consistent with the original version, the two-factor structure of the scale was suitable for Turkey. However, there were some cultural differences in the items loaded on the factors and the scale can be used as a valid and reliable measure in Turkey.

One of the limitations of the present study is that the sample consisted of participants with a high level of education between ages of 18 and 25. This is an important limitation in terms of generalizability of the study results. Although the related literature indicates that the studies on OCD were mainly conducted in non-clinical university samples (e.g., Abramowitz et al. 2002), it is believed that, due to the phenomenon studied in the present study being clinical, using a non-clinical sample is an important limitation.

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REFERENCES

- Abramowitz JS (2001) Treatment of Scrupulous obsessions and compulsions using exposure and response prevention: A case report. *Cogn Behav Pract* 8:79-85.
- Abramowitz JS (2008) Scrupulosity Clinical handbook of obsessive-compulsive disorder and related problems. Baltimore: Johns Hopkins University Press. s.156-72.
- Abramowitz JS, Deacon BJ, Woods CM et al (2004) Association between Protestant religiosity and obsessive-compulsive symptoms and cognitions. *Depress Anxiety*, 20:70-6.
- Abramowitz JS, Huppert JD, Cohen AB et al (2002) Religious obsessions and compulsions in a non-clinical sample: the Penn Inventory of Scrupulosity (PIOS). *Behav Res Ther* 40:825-38.
- Abramowitz JS, Jacoby RJ (2014) Scrupulosity: A cognitive-behavioural analysis and implications for treatment. *J Obsessive Compuls Relat Disord*, 3:140-9.

- Alonso P, Menchon JM, Pifarre J et al (2001) Long-term follow-up and predictors of clinical outcome in obsessive-compulsive patients treated with serotonin reuptake inhibitors and behaviour therapy. *J Clin Psychol* 62:535-40.
- Altın M (2009) A cross-cultural investigation of obsessive compulsive disorder symptomatology: The role of religiosity and religious affiliation, Unpublished PhD Thesis, Middle East Technical University, Institute of Social Science.
- American Psychiatric Association (2013) Diagnostic and statistical manual of mental disorders (DSM-5). Washington DC: Author, s. 237-42.
- Beck AT, Epstein N, Brown G et al (1988) An inventory for measuring clinical anxiety: Psychometric properties. *J Consult Clin Psychol* 56:893-7.
- Beck AT, Ward CH, Mendelson M et al (1961) An inventory for measuring depression. *Arch Gen Psychiatry* 6:861-5.
- Beck AT, Ward CH, Mendelson M et al (1978) Beck Depression Inventory. *Arch Gen Psychiatry* 4:561-71.
- Besiroglu L, Karaca S, Keskin İ (2014) Scrupulosity and Obsessive Compulsive Disorder: The Cognitive Perspective in Islamic Sources. *J Relig Health* 53:3-12.
- Besiroglu L, Yücel MY, Boysan M et al (2007) The psychometric properties of the Clark-Beck Obsessive-Compulsive Inventory in a Turkish population. *Anadolu Psikiyatrı* 8:197-205.
- Brown TA, Antony MM, Barlow DH (1992) Psychometric properties of the Penn State Worry Questionnaire in a clinical anxiety disorders sample. *Behav Res and Ther* 30, 33-37.
- Clark D, Antony MM, Beck AT et al (2005) Screening for obsessive and compulsive symptoms: validation of the Clark-Beck Obsessive Compulsive Inventory. *Psychol Assess* 17:132-43.
- Dag İ (1991) Belirti tarama listesi (SCL-90-R)'nin üniversite öğrencileri için güvenilirliği ve geçerliği. *Türk Psikiyatri Derg* 2:5-12.
- Davey GC (1993) A comparison of three worry questionnaires. *Behav Res and Ther* 31:51-6.
- Egrilmez A, Gülsere L, Gülsere S et al (1997) Phenomenology of obsessions in a Turkish series of OCD patients. *Psychopathology* 30:106-10.
- Eisen JL, Goodman WK, Keller MB et al (1999) Patterns of remission and relapse in obsessive compulsive disorder: A 2 year prospective study. *J Clin Psychiatr* 60:346-51.
- Ferrao YA, Shavitt RG, Bedin NR et al (2006) Clinical features associated to refractory obsessive compulsive disorder. *J Affect Disord* 94:199-209.
- Ghassemzadeh H, Mojtahai R, Khamseh A et al (2002) Symptoms of obsessive-compulsive disorder in a sample of Iranian patients. *Int J Soc Psychiatry* 48, 20-28.
- Greenberg D and Huppert JD (2010) Scrupulosity: A unique subtype of obsessive-compulsive disorder. *Curr Psychiatry Rep* 12:282-9.
- Hisli N (1988) Beck Depresyon Envanteri'nin geçerliği üzerine bir çalışma. *Psikoloji Derg* 6:118-22.
- Hisli N (1989) Beck Depresyon Envanteri'nin üniversite öğrencileri için geçerliği, güvenilirliği. *Psikoloji Derg* 7:3-13
- Huppert JD, Fradkin I (2016) Validation of Penn Inventory of Scrupulosity (PIOS) in scrupulous and nonscrupulous patients: Revision of factor structure and psychometrics. *Psychol Assess* 48:639-51.
- Inozu M, Clark D, Karanci A (2012a) Scrupulosity in Islam: A comparison of highly religious Turkish and Canadian Samples. *Behav Ther* 43:190-202.
- Inozu M, Karanci A, Clark D (2012b) Why are religious individuals more obsessional? The role of mental control beliefs and guilt in Muslims and Christians. *J Behav Ther Exp Psychiatry* 43:959-66.
- Mahgoub OM, Abdel-Hafeiz HB (1991) Pattern of obsessive compulsive disorder in Eastern Saudi Arabia. *Br J Clin Psychol* 158:840-2.
- Mataix-Cols D, Marks IM, Greist JH et al (2002) Obsessive compulsive symptom dimensions as predictors of compliance with and response to behaviour therapy: Results from a controlled trial. *Psychother and Psychosom* 71:255-62.
- McKay D, Abramowitz JS, Calamari JE et al (2004) A critical evaluation of obsessive-compulsive disorder subtypes: Symptoms versus mechanisms. *Clin Psychol Rev* 24:283-313.
- Meyer TJ, Miller ML, Metzger RL et al (1990) Development and validation of the Penn State Worry Questionnaire. *Behav Res and Ther* 28:487-95.
- Nelson E, Abramowitz J, Whiteside SP et al (2006) Scrupulosity in patients with obsessive compulsive disorder: Relationship to clinical and cognitive phenomena. *J Anxiety Disord* 20:1071-86.
- Okasha A, Saad A, Khalil A et al (1994) Phenomenology of obsessive compulsive disorder: A transcultural study. *Comp Psychiatry* 35:191-7.
- Olatunji BO, Abramowitz JS, Williams NL et al (2007) Scrupulosity and obsessive-compulsive symptoms confirmatory factor analysis and validity of the Penn Inventory of Scrupulosity. *J Anxiety Disord* 21:771-87.
- Pirutinsky S, Siev J, Rosmarin DH (2015) Scrupulosity and implicit and explicit beliefs about God. *J Obsessive Compuls Relat Disord* 6:33-8.
- Rasmussen J, Siev J, Abramovitch A et al (2016) Scrupulosity and contamination OCD are not associated with deficits in response inhibition. *J Behav Ther Exp Psychiatry* 50:120-6.
- Shapiro LJ, Krompinger JW, Girona CM et al (2013) Development of a scrupulosity severity scale using the Pennsylvania Inventory of Scrupulosity-Revised. *J Obsessive Compuls Relat Disord* 2:420-4.
- Tek U, Ulug B (2001) Religiosity and religious obsessions in obsessive compulsive disorders. *Psychiatry Res* 104:99-108.
- Tolin D, Abramowitz J, Kozak M et al (2001) Fixity of belief, perceptual aberration and magical ideation in obsessive-compulsive disorder. *J Anxiety Disord* 15:501-10.
- Ulusoy M, Sahin N, Erkmen H (1998) Turkish version of the Beck Anxiety Inventory: Psychometric properties. *J Cogn Psychother* 12:163-72.
- Witzing TF, Pollard CA (2013) Obsessional beliefs, religious beliefs, and scrupulosity among fundamental Protestant Christians. *J Obsessive Compuls Relat Disord* 2:331-7.
- Yilmaz AE, Gencoz T, Wells A (2008) Psychometric characteristics of the Penn State Worry Questionnaire and Metacognitions Questionnaire-30 and metacognitive predictors of worry and obsessive-compulsive symptoms in a Turkish sample. *Clin Psychol Psychother* 15:424-39.