

The Assessment of Obsessive-Compulsive Symptoms: Reliability and Validity of the Padua Inventory in Turkish Population

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SUMMARY

Objective: We examined the reliability and validity of the 60-and 41-item versions of the Padua Inventory (PI and PI-R) which were developed to assess the frequency and severity of obsessive-compulsive symptoms, in a Turkish population.

Method: The sample consisted of 43 OCD patients, 30 non-OCD patients with other anxiety disorders, 30 nonobsessional depressed patients, 76 healthy adults, and 181 undergraduate students. We investigated internal consistency, test-retest reliability, and factor structure, concurrent and discriminant validity.

Results: Psychometric analyses showed that both the original PI and PI-R had a high internal consistency and test-retest reliability. While principal factor analysis of the 41 items revealed six factors that are consistent with the PI-R, the factor structure of the original scale was not confirmed. All the subscales and total scores for both instruments were significantly correlated with the Yale-Brown scores except for the impulses subscale. There were significant differences between OCD patients and nonclinical samples in all total and subscale scores for both instruments. OCD patients scored significantly higher on the total, contamination/washing and checking subscales for both instruments than nonobsessional anxious, and depressed patients. While OCD patients scored significantly higher on the PI-R rumination scale than nonobsessional anxious patients, their PI impaired control subscale score was not different from that of the other clinical groups.

Conclusions: The Turkish version of the PI has appropriate reliability and validity for assessing the frequency and severity of obsessive-compulsive symptoms.

Key Words: Obsessive-compulsive disorder, validity, reliability, obsession, compulsion

INTRODUCTION

Obsessive-compulsive disorder (OCD) is characterized by disturbing, ego-dystonic and persistent thoughts which cause marked anxiety and significant impairment in social and academic functioning of the patients and repetitive motor and mental acts that are performed to reduce anxiety (American Psychiatric Association 1994). Although intrusive, unwanted and ego-dystonic thoughts, imaginations or impulses are prevalent in normal population, they are experienced as occurring shorter lasting, less frequently, less discomforting, less ego-dystonic and eliciting less resistance to neutralize, compared to clinical obsessions (Insel 1990).

At present, there are various instruments developed to assess the content and severity of obsessive-compulsive symptoms both in clinical and non-clinical studies. The Yale-Brown Obsession Compulsion Scale (YBOCS) is the most commonly used instrument and considered as the “golden standard” for measuring OC symptoms (Goodman et al. 1989, Steketee 1994). It is very sensitive in evaluation of treatment response (Taylor 1995). However, as it is administered by the trained interviewer, it is not suitable for non-clinical populations. All other scales other than the YBOCS depend upon self-reported information. Some of common examples are the Leyton Obsessional Inventory (LOI) (Cooper 1970), the Maudsley Obsessional-Compulsive Inventory (MOCI) (Hodgson and Rachman 1977), the Padua Inventory (PI) (Sanavio 1988) and the Obsessive-Compulsive Inventory (OCI) (Foa et al. 1998).

Among these self-report instruments, only the MOCI was adapted to Turkish population (Erol and Savaşır 1988). Nonetheless, some limitations of MOCI were defined as some items that do not directly assess OC symptoms, inability to assess the severity with responses like yes or no and attribute excessive importance to cleaning/control compulsions (Taylor 1955). Eventually, need for reviewing MOCI was born (Thordarson et al. 2004).

The psychometric properties of the PI which was developed by Sanavio were tested in various studies including Italy (Sanavio 1988), Dutch (Van Oppen 1992), United States (Sternberger and Burns 1990), Australia (Hafner 1988), Korea (Min 1999), England (Macdonald and de Silva 1999), Spain (Mataix-Cols 2002) and Iran (Goodarzi and Firoozabadi 2005). Also, Van Oppen et al. (2002) and Burns et al. (1996) proposed 41-and 39-item revised versions of the inventory, respectively. Both of these versions were constituted by eliminating the items that are not attributed to any psychopathological symptom for OCD and are highly correlated with Penn State Worry Inventory measuring worry. For this reason, both revised scales are more specific to OCD than original scale.

The PI provides general information about the severity of OCD and helps to determine prominent symptoms. The PI does not just measure overt compulsive behaviors (e.g., cleaning, washing, checking gas taps), but also has items for covert phenomena. As it is a self-report scale, it may be used in non-clinical populations. Moreover, severity of symptoms which are phenomenologically discriminated may be determined separately. Among all self-report scales, it is the most commonly used instrument in OCD studies (Steketee 1994).

The PI includes 60 items, and these items had been chosen from 200 different symptoms which were defined by patients with OCD diagnosis. Each item includes five choices and only one of them may be chosen. Each answer matches with a point between 0-4 (0=not at all, 1=a little, 2=quite a lot, 3=a lot, 4=very much). The score "0" indicates that the individual never experiences the symptom or is not disturbed by symptom and "4" indicates that the individual continuously experiences it or is excessively disturbed by it.

The four factors of the PI were extracted using a factor analysis method (Sanavio 1980, Mataix-Cols 2002, Goodarzi and Firoozabadi 2005). Van Oppen et al. found a five factor structure for revised version. Its factorial structure is broadly corresponds to the four factors in the original scale.

Subscale I, Impaired control over mental activities;

This subscale is related with reduced capacity for removing undesirable thoughts, difficulty in making simple decisions and doubts, uncertainty concerning one's responsibility in the case of incidents, rumination over unlikely hazards, etc. It consists of 17 items, and total score varies between 0-68. Ten items in this subscale loaded on same factor in the revised version of Van Oppen, and it was named as "rumination" subscale in his short form.

Subscale II, Becoming contaminated

This subscale is about stereotyped cleaning activity, severe preoccupation with dirt, unrealistic fear of contamination, etc. It consists of 11 items and total score varies between 0-44. Ten of these 11 items were also loaded on a factor, and it was termed as "washing" subscale by Van Oppen.

Subscale 3, Checking;

It is related with checking behaviors, for example checking doors, gas and water taps, letters, money, numbers, etc., over and over again. Scored between 0 and 32. All of 8 items in the original form for this subscale are identical with short form, and it was termed as "checking" subscale by Van Oppen.

Subscale 4, Urges and worries of losing control over motor behaviour (hereinafter denoted as 'urges and worries')

This subscale was interpreted as covering items relating to urges and worries of loss of control of motor behaviors, and thus included urges of violence against animals or things, impulses to kill oneself or others without reason, fear of losing control over antisocial or sexual impulses, etc. Urges and worries subscale includes 7 items and total score varies between 0-28. Van Oppen defined 7 items in his short form and named them as impulses subscale. Four of them are similar with original form and others are not. Moreover, Van Oppen et al. extracted a additional factor including

TABLE 1. Demographic characteristics of the sample*

	OCD		Anxiety		Depression		Healthy Adult		Student		
	n	%	n	%	n	%	n	%	n	%	
Gender											
Female	23	53.5	14	46.7	15	50.0	37	48.7	91	50.3	$\chi^2= .40$, df=4, $p>0.05$
Male	20	46.5	16	53.3	15	50.0	39	51.3	90	49.7	
Marital Status**											
Single	11	26.2	16	37.2	12	40	20	26.3	174	96.1	-
Married	28	66.7	27	62.8	18	60	50	65.8	2	1.1	
Marital loss	-	-	-	-	-	-	2	2.6	-	-	
Education**											
Primary School	10	23.3	6	20.0	7	23.3	6	7.9	-	-	-
Secondary School	4	9.3	3	10.0	8	20.0	12	15.8	-	-	
High School	16	37.2	14	46.7	6	26.7	19	25.0	-	-	
University and over	13	30.2	7	23.3	9	30.0	38	50.0	181	100	
Age, Mean											
(SD)	29.0 (8.3)		30.1 (10.0)		25.8 (7.9)		33.7 (8.8)		21.5 (3.0)		df=4, $p<0.005^{\dagger}$

* Percentages may not sum to 100 because of missing data.

** As majority of expected counts was below 2, analyses were not performed.

$\dagger$: ANOVA

six items that were named as “precision”

The Padua Inventory (PI) gives a total score that varies from 0 to 240 (0-164 for short form) indicating the degree of disturbance as a consequence of obsessive-compulsive symptoms and 4 scores referring to the subscales.

Several studies have found the PI total scale and its subscales to have high internal consistency (Cronbach’s coefficients>0.80), with exception of the “urges and worries” subscale, which has varied considerably in its internal consistency (Sanavio 1980, Sternberger and Burns 1990, Kyrios et al. 1996, Macdonald and de Silva 1999, Goodarzi and Firoozabadi, 2005). Test-retest reliability of the scale was found to be high ($r=0.79-0.83$). Original scale was found to be a valid instrument for differentiating neurotic and nonclinical subjects from

OCD patients and showed significant correlations with other scales like MOCI or LOI evaluating OC symptoms (Sanavio 1980, Sternberger and Burns 1990, Van Oppen 1992). Moreover, 41-item version of Van Oppen et al. (1992) and 39-item version of Burns et al. (1996) were found to have high validity and reliability (Padua Inventory Washington State University Revision).

Adapting this scale to Turkish population will not only provide an important support to clinical and non-clinical studies about OCD in our country, but also help to compare results from different countries. Moreover, it is considered that an opportunity may emerge to develop new instruments for OCD. For this purpose, we aimed to evaluate validity and reliability of 60-item original and 41-item revised versions (Van Oppen et al. 1992) of Padua Inventory.

TABLE 2. PI short form, factorial structure and factor loads.

	Loading
I. Rumination	
31. I invent doubts and problems about most of the things I do..	.770
26. I find it difficult to make decisions, even about unimportant matters.	.729
32. When I start thinking of certain things, I become obsessed with them.	.716
36. I imagine catastrophic consequences as a result of absent-mindedness or minor errors which I make	.712
28. I have the impression that I will never be able to explain things clearly, especially when talking about important matters that involve me.	.705
29. After doing something carefully, I still have the impression I have either done it badly or not finished it.	.691
35. My brain constantly goes its own way, and I find it difficult to attend to what is happening round me	.639
33. Unpleasant thoughts come into my mind against my will and I cannot get rid of them.	.624
44. When a thought or doubt comes into my mind, I have to examine it from all points of view and cannot stop until I have done so.	.577
45. In certain situations, I am afraid of losing my self-control and doing embarrassing things.	.572*
11. When doubts and worries come to my mind, I cannot rest until I have talked them over with a reassuring person.	.411
II. Cleaning	
4. I find it difficult to touch garbage or dirty things.	.713
5. I avoid using public toilets because I am afraid of disease and contamination.	.710
2. I thin□	.695
3. I find it difficult to touch an object when I know it has been touched by strangers or by certain people.	.667
7. I wash my hands more often and longer than necessary.	.645
6. I avoid using public telephones because I am afraid of contagion and disease.	.642
9. If I touch something I think is "contaminated," I immediately have to wash or clean myself.	.613
8. I sometimes have to wash or clean myself simply because I think I may be dirty or "contaminated."	.568
1. I feel my hands are dirty when I touch money.	.555
10. If an animal touches me, I feel dirty and immediately have to wash myself or change my clothing.	.532
III. Control	
19. I tend to keep on checking things more often than necessary	.705
20. I check and recheck gas and water taps and light switches after turning them off	.697
23. I keep on going back to see that matches, cigarettes, etc. are properly extinguished.	.678
25. I check letters carefully many times before posting them.	.666
22. I keep on checking forms, documents, checks, etc. in detail to make sure I have filled them in correctly.	.665
21. I return home to check doors, windows, drawers, etc., to make sure they are properly shut	.656
18. I have to do things several times before I think they are properly done.	.655
24. When I handle money, I count and recount it several times.	.572
IV. Impulses	
49. While driving, I sometimes feel an impulse to drive the car into someone or something.	.747
47. When I see a train approaching, I sometimes think I could throw myself under its wheels.	.621
50. Seeing weapons excites me and makes me think violent thoughts.	.550
53. I sometimes feel the need to break or damage things for no reason	.514
51. I get upset and worried at the sight of knives, daggers, and other pointed objects.	.508
46. When I look down from a bridge or a very high window, I feel an impulse to throw myself into space.	.483
V. Precision (Counting)**	
40. I sometimes start counting objects for no reason.	.755
41. I feel I have to remember completely unimportant numbers.	.751
17. I feel I have to repeat certain numbers for no reason.	.709
V. Precision (Repeating)**	
16. Before going to bed, I have to hang up or fold my clothes in a special way	.734
15. Before going to sleep, I have to do certain things in a certain order.	.679
14. I feel obliged to follow a particular order in dressing, undressing, and washing myself	.652

* This item loaded on Impulses subscale in revised form.

**These two factorial structures loaded on Precision subscale in revised form.

METHOD

Sample

Our sample consisted of 43 patients with OCD,

30 nonOCD patients with other anxiety disorders, 30 nonobsessional depressed patients, 76 adults without any psychiatric and serious medical dis-

TABLE 3. Correlation matrix based on the OCD group and combined nonclinical samples in the validation study. *

	1/1 ^{PI-R}	2/2 ^{PI-R}	3/3 ^{PI-R}	4/4 ^{PI-R}	5 ^{PI-R}	6/6 ^{PI-R}	7	8	9	10	11
1. Impaired control/ 1.PI-R Rumination	—	<u>.63^c</u>	<u>.70^c</u>	<u>.62^c</u>		<u>.93^c</u>	<u>.53^c/.50^c</u>	<u>.47^c/.46^c</u>	-	-	-
2. Contamination / 2.PI-R Washing	.75 ^c	—	<u>.62^c</u>	<u>.34^c</u>		<u>.77^c</u>	<u>.45^c/.43^c</u>	<u>.31^c/.29^c</u>	-	-	-
3.Checking/ 3. PI-R Control	.73 ^c	.58 ^c	—	<u>.35^c</u>		<u>.81^c</u>	<u>.41^c/.41^c</u>	<u>.26^b/.26^c</u>	-	-	-
4.Impulses / 4 PI-R Impulses	.63 ^c	.46 ^c	.44 ^c	—		<u>.68^c</u>	<u>.51^c/.51^c</u>	<u>.54^c/.33^c</u>	-	-	-
5. PI-R Precision					—		<u>.41^c</u>	<u>.27^c</u>			
6. PADUA total/ 6. PI-R Total	.90 ^c	.82 ^c	.81 ^c	.70 ^c		—	<u>.59^c/.51^c</u>	<u>.48^c/.40^c</u>	-	-	-
7. BAI	<u>.48^c/.30^b</u>	<u>.52^c/.48^c</u>	<u>.22/.22</u>	<u>.43^b/.37^b</u>	<u>.42^c</u>	<u>.45^c/.37^b</u>	—	<u>.55^c</u>	-	-	-
8. BDI	<u>.65^c/.58^c</u>	<u>.55^c/.55^c</u>	<u>.54^c/.54^c</u>	<u>.62^c/.55^c</u>	<u>.61^c</u>	<u>.71^c/.65^c</u>	.52 ^c	—	-	-	-
9. YB-Obsession	<u>.42^c/.43^c</u>	<u>.39^b/.38^b</u>	<u>.44^c/.44^c</u>	<u>.01/.06</u>	.34 ^b	<u>.35^b/.38^b</u>	.18	.33 ^b	—	-	-
10. YB-Compulsion	<u>.44^c/.48^c</u>	<u>.46^c/.44^c</u>	<u>.42^c/.42^c</u>	<u>.09/.13</u>	.37 ^b	<u>.41^c/.50^c</u>	.02	.30 ^b	.70 ^c	—	-
11. YB-Total	<u>.46^c/.50^c</u>	<u>.40^c/.41^c</u>	<u>.46^c/.46^c</u>	<u>.05/.10</u>	.35 ^b	<u>.42^c/.48^c</u>	.10	.34 ^b	.91 ^c	.93 ^c	—

* : Underlined values at the right upper part of the table are correlation coefficients which belong to control group (students and adult group together, n=257) and the others are valid for patients with OCD. Bold values at right of the slashes belong to PI revised version (PI-R),

^b : p< 0.05; ^c : p< 0.001.

order and 181 undergraduate students. All the patients were individuals who consecutively admitted to Psychiatric Outpatient Clinic of the University Hospital between March-December 2004. The patients were included if they had no history of any neurological disorder, head trauma, mental retardation, any psychotic disorder, bipolar disorder and alcohol/substance dependence, a serious concomitant medical disorder (e.g., cancer, renal failure, diabetes mellitus, heart failure, epilepsy, asthma). Patients aged 18 to 60 years who met the criteria of the DSM-IV for the relevant diagnosis, and all of them were literate.

The comorbid diagnostic composition of the OCD sample consisted of major depression (35%, n=15) and another anxiety disorder (30%, n=13). Panic disorder (47%, n=14) and generalized anxiety disorder (60%, n=18) were the diagnoses established in the anxious group. Seven percents of them (n=2) had two comorbid disorders accompanying OCD. In the depressed group all had major depressive disorder.

Adult control group included 76 individuals without any psychiatric or medical disorder who were drawn from university staff or relatives of the patients. Other control group consists of un-

dergraduate students in the Medical and Science-Literature Faculties. Students who reported they received psychiatric or psychological treatment (n=9) and had significant medical illness for which receiving health care is necessary (n=8) were excluded. Twenty one students who had important deficiencies in questionnaire battery were not included in the study. Eventually, 181 students were included. Sociodemographic characteristics of the sample are seen in Table 1.

MATERIALS

Padua Inventory

Structured Clinical Interview Instrument for DSM-IV Axis-I Disorders (SCID-I/CV);

It is a semi-structured clinical interview instrument in order to evaluate DSM-IV Axis-I psychiatric disorders which is administered by the interviewer (First et al. 1997).

Yale-Brown Obsession Compulsion Scale (YBOCS);

It was developed by Goodman et al (1989) in order to evaluate type and severity of obsessive-compulsive symptoms. It includes totally 19 items,

TABLE 4. Mean values of all sampling in PI and other scales*

	OCD		Anxiety		Depression		Healthy Adult- Student (n=257)		Kruskal Wallis** χ^2 (df=4)
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Impaired control/ PI-R Rumination	38.0/ 24.6	16.8/ 10.5	27.7/ 17.0	16.5/ 9.6	28.0/ 17.2	16.8/ 11.1	17.4/ 11.4	11.9/ 7.7	71.5/ 71.6
Contamination / PI-R Washing	19.2/ 17.1	11.2/ 10.8	11.4/ 10.0	5.8/ 5.3	10.8/ 9.7	6.5/ 6.2	13.1/ 12.2	8.2/ 7.6	23.4/ 22.9
Checking/ PI-R Control	16.4/ 16.3	8.3/ 8.6	10.3/ 10.3	6.3/ 6.3	11.1/ 11.1	7.0/ 7.0	9.7/ 9.7	6.9/ 6.9	30.7/ 30.7
Impulses / PI-R Impulses	4.7/ 9.1	4.5/ 6.8	4.3/ 8.2	3.9/ 6.9	3.2/ 7.2	2.9/ 6.0	2.7/ 5.2	2.5/ 4.6	18.7/ 33.4
PI-R Precision	-8.0	-6.9	-3.6	-3.0	-4.4	-3.4	-4.2	-3.9	/19.1
PADUA total/ PI-R Total	103.4/ 66.2	50.9/ 31.6	63.6.3/ 43.2	31.0/ 20.3	61.0/ 45.1	29.4/ 24.9	56.7/ 37.7	33.8/ 21.7	49.4/ 44.7
YB-Obsession	12.3	3.8	-	-	-	-	-	-	
YB-Compulsion	11.5	4.3	-	-	-	-	-	-	
YB-Total	23.9	7.5	-	-	-	-	-	-	

*Bold values at right of the slashes belong to PI Short Form (SF).

** For all variables $p < 0.001$

but 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) by clinician. The psychometric properties of the Turkish version were tested by Karamustafahoğlu et al (1993) and Tek et al (1995).

Beck Depression Inventory (BDI);

It was developed by Beck et al (1961) to assess the severity of depressive symptoms. It is a self-report scale which includes 21 questions. Turkish adaptation was performed by Hisli (1988).

Beck Anxiety Inventory (BAI);

BAI is a self-report instrument developed by Beck et al (1988) to assess the severity of anxiety symptoms. It includes 21 questions. Total score vary between 0-63. The Turkish adaptation was performed by Ulusoy et al (1998).

Procedure

Two independent translators translated PI to

Turkish. Translated versions were given to 10 separate individuals to report any problems if they had in understanding the PI items. Then, the translators compared the translations from the point of targeted expressions. Finally, two translation versions were combined. Thirty five OCD patients and 162 students completed the PI a second time after 7-15 days.

Statistical Analyses

Sociodemographic characteristics were compared through Chi-square test and variance analysis. Internal consistency was assessed with Cronbach's α statistics. Test-retest reliability and correlations between PI and other scales were assessed with two-tailed Pearson correlation analyses. As group variances were not homogenous other than control subscale, statistical differences between groups in total and subscale scores of original and revised form were assessed with one-way Kruskal-Wallis variance analysis. As medians for all variables in both forms were significantly different ($p < 0.001$),

TABLE 5. Inter groups comparison between PI and other scales with Mann-Whitney U test*

	OCD-Anxiety	OCD-Depression	OCD-Control (Healthy Adult-student)
Impaired control/ PI-R Rumination	- / +	- / -	+ / +
Contamination / PI-R Washing	+ / +	+ / +	+ / +
Checking/ PI-R Control	+ / +	+ / +	+ / +
Impulses / PI-R Impulses	- / -	- / -	+ / +
PI-R Precision	/ +	/ -	/ +
PADUA total/ PI-R Total	+ / +	+ / +	+ / +

*Bold values at right of the slashes belong to PI Short Form (SF).

(+): $p < 0.008$, (-) : $p > 0.008$

Mann-Whitney U test was used as a post-hoc comparison method. As there were totally six binary comparisons, significant level was accepted as $0.05/6=0.008$. Factorial structure of the scale was examined by an exploratory factor analysis (Principal Components Analysis) followed by Varimax rotation. In order to reach adequate sample size required for factor analysis, all of the groups were combined. Factors with eigenvalues greater than one were examined and items with factor loadings of greater than 0.40 were included because the same value as used in Sanavio's (1980) study. All of these statistical procedures were repeated for revised version by extracting data of 41 items from 60 item of original form.

RESULTS

Sociodemographic characteristics of the sample were presented in Table 1. While there was no significant difference between the groups for gender, statistical significance could not be analyzed for marital status and educational level because most of expected counts were below 2. Groups were found to be different for age in one-way ANOVA ($df=4$, $p<0.005$). Post-hoc Tukey method revealed that while mean age of student group was significantly lower than all other groups, mean age of adult group was significantly higher than all groups except for anxiety group. There was no significant difference between clinical groups (post-hoc comparisons were not shown).

Validity

Factorial Structure

Factorial structure of the scale was separately tested for both original form and revised version including 41 items. We found that items loaded on ten factors with eigenvalues >1 and accounted for 36% of the variance when a principal components analysis with varimax rotation was conducted. When confirmatory factor analysis with a four factor solution was allowed, only items loaded on "becoming contaminated" subscale corresponded exactly to the items loading on same subscale in original instrument (the results were not presented). As a result, it was considered that four factorial structure of original form was not confirmed.

The same methods were applied to revised form, and we found that items loaded on six factors accounted for 62.1% of the total variance. Item 45 that loaded on Van Oppen's "impulses" factor loaded on our "rumination" factor. Six items that loaded on "precision" factor in Van Oppen's revised version loaded on two separate factors which included three questions each. These factorial structures were initially named as "counting" and "repeating". All of the other items entirely matched Van Oppen's factors (Table 2).

Criterion-Related Validity: Concurrent Validity

Correlation coefficients between original and

TABLE 6. Cronbach α coefficients of total PI and subscales according to groups and test-retest analyses of points obtained in two different time periods.

	Cronbach α						Test-retest analysis $r^{\dagger} =$
	Total						
	OCD ($n=43$)	Clinical Sample* ($n=104$)	Healthy Adult-Student ($n=257$)	Male ($n=180$)	Female ($n=180$)	Total ($n=360$)	Total ($n=190$)
Impaired control/ PI-R Rumination	.93	.93	.92	.94	.92	.95/. 92**	.89/. 86**
Contamination / PI-R Washing	.92	.89	.88	.85	.91	.89/. 88**	.90/. 90**
Checking/ PI-R Control	.90	.90	.91	.90	.91	.91/. 91**	.90/. 90**
Impulses / PI-R Impulses	.77	.75	.71	.73	.73	.73/. 79**	.82/. 81**
PI-R Precision						.80**	.89**
PADUA total/ PI-R Total	.96	.96	.96	.96	.96	.96/. 95**	.92/. 91**

* OCD, together with anxiety and depression groups

** Bold values at right of the slashes belong to PI Short Form (SF).

$\dagger$: For all variables $p < 0.001$

revised form of the PI and other scales in OCD group and controls (healthy adults and students) were listed in Table 3. Total and all subscale scores in both original and short forms were significantly related with BAI and BDI in controls. In OCD group, all correlations with the total and subscale scores in both original and short forms were significant except for the correlations of impulses subscale with YBOCS obsession, compulsion and total scores. Correlation coefficients between total scores of original and short forms and YBOCS total score were found as 0.41 and 0.48, respectively ($p < 0.001$).

As correlation level was higher in BDI than YBOCS in OCD group, partial correlation analyses between YBOCS and PI were performed to exclude the effect of depressive symptoms. Results remained as statistically significant ($p < 0.05$) except for correlations of impaired control scores of the PI original form with YBOCS obsession scores and total scores and

Group Comparisons

Mean and standard deviation scores of all study population for PI (original and short forms) and

other scales were shown in Table 4. Significant differences between OCD group and controls with Mann-Whitney U test were presented as positive (+) and others were presented as negative (-) in Table 5 (z values were not shown). All of the total and subscale score of both original and short forms were found to be valid in distinguishing patients with OCD from healthy individuals. Total, contamination and checking subscale scores of OCD patients were significantly higher than the patients with depression and anxiety groups in both original and short forms. While impaired control subscale scores were not different in OCD patients than depression and anxiety groups for original form, the difference for rumination subscale in short form reached statistical significance between OCD and anxiety groups ($z = -2.94$, $p < 0.008$). The difference between OCD and depression groups was found to be just at the limit ($z = -2.63$, $p = 0.008$) for this subscale. There was no significant difference between OCD group and other clinical groups for impulses subscales. While the precision scores of OCD group were significantly higher than depressive patients, but were not different than anxiety group.

Reliability

Internal Consistency

Table 6 presents Cronbach's α coefficients which represented internal consistency of total scale and subscales. They were calculated as 0.96 and 0.95 for original and short forms, respectively. While the lowest internal consistency coefficients were found in the impulses, subscale, for the total and other subscales, they found to be considerably high. The lowest coefficient was 0.79 and even this level was considered satisfactory.

Test-retest Reliability

After deletion of missing data, the final sample for the test-retest reliability consisted of 190 subjects. While the test-retest correlations ranged 0.59-0.84 ($p < 0.001$) for all items were obtained, correlations for total and subscale scores were seen in Table 6. There were significantly high correlation coefficients in all domains for both original and short forms ($r = 0.81-0.92$, $p < 0.001$).

DISCUSSION

In this study validity and reliability of two versions of the PI, one is the original and the other is the shortened version revised by Van Oppen et al. were tested. When factorial structures were examined, factorial structure of the short form was found to be similar without any need for confirmation analyses, but factorial structure of the original form could not be confirmed. As Cronbach α coefficients were found to be high in all subscales, internal consistency of Turkish adaptation of PI was considered to be satisfactory and as high as the original form. Test-retest reliability of the scale was found to be high as well. It is concluded that the scale in all aspects can differentiate between OCD patients and healthy controls

When factorial structure of revised form of Turkish PI was examined, a six factorial structure was emerged. The four subscales were exactly replicated Van Oppen's factors except for one item (Item 45). Precision subscale of PI short form was found to be divided into two factorial structures which included three questions each. The items loaded on a factor which were named as repetitive behaviors by us also had load on another 39 item version revised by Burns et al (1996). The similarity of the factor structure in our Turkish sample with Van Oppen's short form might be considered

as an important indicator of structural validity.

Inability to confirm the factorial structure of the original form might be due to various reasons. First, as the number of subjects should be 5-10 times greater than the number of items to obtain reasonable results in factor analyses, we included whole sample to test the factorial structure of 60 item original form. However, clinical groups were not included in original studies for original form. (Sanavio 1988). Analyses were performed in a similar group like ours in original study of short form. Second, as mentioned earlier, some items which were present in original form were excluded as they were not specific to OCD, did not have any psychopathologic meaning or were related with worries, and consequently two revised version were developed (Van Oppen et al. 1992, Burns et al. 1996). We concluded that these items might have influence on factorial structure of original form.

Both versions of the PI were found to be highly correlated with BAI and BDI in OCD patients and controls (Table 5). The impulses subscale and YBOCS scores were not correlated in OCD patients for both forms. It is conceivable that in this subscale items which were attributed to impulses might not be taken into account in severity evaluation with the YBOCS by the clinician. It was noticed that in the correlations for OCD group between the PI and BDI was higher than the relationship with YBOCS. It might be attributed to presence of comorbid major depression in nearly 35% of patients in OCD group. It was found that the all statistical significances continued for PI-R when we examined the partial Pearson correlations between scores on the YBOCS and PI-R after controlling for the BDI score to remove any contribution of depressive symptoms to the correlational results. However, the PI total score and impaired control subscale in original form did not continue to have a statistical significance for the correlation with the YBOCS obsession score. The correlation coefficients with the YBOCS were lower than those using other scale evaluating obsessive-compulsive symptoms in the original studies (i.e., MOCI, LOI) (Sanavio 1980, Sternberger and Burns 1990, Van Oppen 1992). This may be predicted. Self rated scales measure the severity of OC symptoms in terms of their frequency or assess the severity of symptoms with a dichotomous response format (as in MOCI). In contrast,

YBOCS is not only interested with frequency of symptoms, but their influence on daily life or resistance against them as well. As a consequence, relatively low relationship level between PI and an interviewer-rated scale compared with a self-report scale might be understood.

When correlations between original and short forms of PI with BAI and BDI were evaluated (both sides of slashes in Table 3), the level of correlations was relatively lower in short form compared to original form in both OCD group and controls. It was seen that the correlation coefficients between all PI scales and severity of illness depicted at the right of the slashes were slightly higher than those at the left of the slashes in OCD group. It may be concluded that short form is more specific for OCD in terms of concurrent validity. Moreover, while statistical significance was remained essentially unchanged with partial correlation analyses excluding the influence of BDI in the short form, it did not continue in original form.

In this study the scale was found to be able to discriminate OCD patients from healthy controls. But when compared with other clinical groups, especially original form had some limitations. Subscales which were related with impulses were found to be inadequate in distinguishing OCD patients from other clinical groups in both versions. While impaired control subscale in original form can not differentiate between OCD and other clinical groups, this subscale in short form is more likely to discriminate ($z=-2.63$, $p=0.008$). A 35% rate of comorbid depression in the OCD group might be thought to be responsible for not allowing a statistical significance. As a result, it may be concluded that the discriminating validity of short form is higher generally; its discriminating ability is more prominent in anxiety group compared to depression group. Similarly, Van Oppen et al. (1992) showed that the PI-R can differentiate between OCD patients and social phobia or panic disorder patients.

The results about internal consistency of the scale are closely similar to those of other findings from various countries (Sanavio 1980, Sternberger and Burns 1990, Van Oppen 1992, Kyrios et al. 1996, Goodarzi and Firoozabadi 2005). The lowest levels were appeared in impulses subscale like other studies, but even this level may be accepted as high.

Generally, it might be presumed that reliability of both forms are considerably high. It was possible to conclude that factorial structure of short form was more specific to OCD and more likely to discriminate the patients with OCD from other clinical groups. The original PI has been criticized because of containing some items which were not specific to OCD, but exclusion of items which showed high correlation with Penn State Worry Inventory decreased these objections. Also, validity results of short form were more positive than original form. Nonetheless, there are some other limitations of the PI. It does not evaluate some symptoms as hoarding obsessions and compulsions and does not take into account some other aspects related with severity of illness like functionality or resistance to symptoms which might be evaluated via YBOCS. But there is not any self-report scale which takes all of these aspects into consideration. In YBOCS which is considered as golden standard severity and distribution of symptoms can only be evaluated separately. Moreover, symptoms like doubt obsessions do not take place in YBOCS. In our opinion measurement of severity and determination of distribution of symptoms in a single form for a self-report scale is not so easy and will probably have some kind of limitations. In that manner, presentation of an internationally accepted scale can be used in clinical and non clinical studies will constitute an important step. Comparison of data from future PI studies with other international reports will provide an opportunity in terms of cross-cultural designs. Also, development of new scales about OCD in our country may be possible.

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