Original Article

Factor structure, validity and reliability of PROCSI; A questionnaire to measure relationship obsessive compulsive disorder

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Abstract

Introduction: The purpose of the present study was to evaluate the factor structure, validity and reliability of the Partner-Related Obsessive-Compulsive Symptoms Inventory (PROCSI) in university students of Tehran.

Materials and Methods: The present study included 459 married students who were selected through convenient sampling method from Tehran universities, such as Shahid Beheshti, Tehran, Shahed, Tarbiat Modares, Allameh Tabatabai, Amirkabir, Sharif and Kharazmi in the academic year of 2018-2019. This research was conducted in two steps. Firstly, after completing the translation steps, the final questionnaire was prepared. In the second stage, the PROCSI was implemented on students, along with Depression, Anxiety and Stress Scales (DASS), Dyadic Adjustment Scale (DAS), Relationship Beliefs inventory (RBI) and Obsessive Compulsive Inventory- Revised (OCI-R) scales. Data analyzed using descriptive statistics, Pearson correlation, Cronbach alpha coefficients, and the confirmatory factor analysis. The convergent and divergent validity were used based on the correlation of PROCSI with DAS, DASS, OCI-R, and RBI. The mentioned analyzes were performed based on SPSS 21 and Lisrel 8.80.

Results: The internal consistency of PROCSI was in the range of 0.42 to 0.82. The confirmatory factor analysis of PROCSI showed that six factors of it have an appropriate fitness.

Conclusion: It seems that it seems that the PROCSI has good validity and reliability to use in Iranian couples.

Keywords: Factor analysis, Partner-related obsessive-compulsive symptoms inventory, Relational obsessive compulsive disorder

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Introduction

Obsessive-Compulsive Disorder (OCD) is a debilitating disease that is composed of obsessions and compulsive behaviors. Obsessions refer to the thoughts, feelings, or senses that unwittingly and repeatedly enter the mind of the patient and compulsive behaviors refer to repetitive behaviors that usually occur in response to obsessions and reduce the anxiety resulting from them (1). The prevalence rate of OCD is equal in both genders and usually begins early in adulthood and sometimes in childhood. Epidemiological studies indicate an outbreak of 1 to 3% of OCD in the general population (2,3). This rate is 1.8% for Iranian population and is estimated at 6% in psychiatric clinics (4).

Previous studies show that patients with OCD often show disturbed communication function compared to normal populations. For example, reducing the probability of marriage and increasing the likelihood of distress in marital life are their problems (5-7). The distress caused by ritual behaviors (such as frequent checking, or extreme washing) and anger caused by the pressure to perform ritual behaviors may increase communication conflicts (8,9).

Doron et al. argued that when the obsessive behaviors focus on the relationship, their destructive effects are more presented on couples' intimate communication. In this regard, they proposed a new theme for OCD called Relational Obsessive Compulsive Disorder (ROCD). The relationship obsessions are often seen in the form of thoughts (e.g., "is our relationship correct?") and images related to the relationship with the spouse. Of course, they may also be seen in the form of an impulsion (such as the desire to leave a spouse (10).

The symptoms of ROCD may have a significant impact on marital satisfaction. Frequent doubt about the spouse or the relationship with him/her can lead to severe damage to the core of marital relationship and directly affect its durability. On the contrary, the spouse's positive perception or the relationship with him/her plays a role in the sustainability of an intimate and successful relationship (11,12).

The development of the measurement and diagnosis of OCD remains an important area to focus on research and clinical activities (13,14). The incompatibility of obsessive-compulsive symptoms, high comorbidity of obsession with emotional disorders, high rates of suicide in OCD, and the tendency to conceal symptoms, are the barriers to early diagnosis of OCD and participation in treatment. Of course, one of the problems in the field of evaluation and diagnosis of OCD is the variety of diagnostic tools and validated standardized scales that the complexity of the symptoms is the cause of this diversity. So, it can be said that the assessment and diagnosis of OCD are critical (15).

So far, many tools have been designed to diagnose OCD. Among these tools, we can mention the Yale-Brown Obsessive-Compulsive Scale-II (Y-BOCS), Obsessive Belief Questionnaire (OBQ), Vancouver Obsessional Compulsive Inventory (VOCI), Obsessive-Compulsive Inventory-Revised (OCI-R), etc. In conjunction with ROCD, similar to other themes of OCD, it was necessary to design a tool for measuring and assessing it (16).

In this regard, Doron et al. designed a tool for measuring ROCD, which measures the spouse's symptoms in a range of mild to severe. The Partner-Related Obsessive-Compulsive Symptoms Inventory (PROCSI) is a 24-item self-report scale designed to measure obsessions (such as mental doubts) and neutral behaviors (such as checking) related to the perceived defect of the spouse and measures the severity of the symptoms focused on the spouse in six domains. These six areas are physical appearance, sociability, morality, emotional stability, intelligence, and competence. In the study by Doron et al. PROCSI showed proper internal consistency. The correlation between the subscales of PROCSI was in the range of 0.77 to 0.87, all of which were significant (16). Regarding the validity of PROCSI, its subscales showed a good correlation with the subscales of OCI-R and OBQ, which were significant in the range of 0.17 to 0.44. Also, the correlation of its subscales with the subscales of Depression, Anxiety, Stress Scale (DASS), the anxiety and avoidance subscales of Experiences in Close Relationships scale (ECR), and the subscales of Relationship Assessment Scale (RAS) was

found to be significant in the range of 0.26 to 0.47, 0.23 to 0.45 and –0.24 to –0.42, respectively. On the other hand, the confirmatory factor analysis results indicated that the six factors fit as appropriate. In this regard, good fitness indicators such as CFI (0.93) and RMSEA (0.068) were obtained at an appropriate level. Also, the total and subscales scores of PROCSI showed excellent internal consistency. So far, in Iran, no study has been conducted to investigate the psychometric properties of PROCSI, as one of the evaluation tools of ROCD. A comprehensive assessment of the continuity and severity of OCD is the most crucial step in the clinical field and research (9). Considering the importance to assess ROCD due to the gap in the study of the psychometric properties of PROCSI in Iran, the present study aimed to investigate the psychometric properties of the PROCSI.

Materials and Methods

The statistical community of this study consisted of all married students studying in Tehran universities in the academic year of 2018-2019. The cases were selected using the convenient sampling method from Tehran, Shahid Beheshti, Shahed, Tarbiat Modares, Allame Tabatabai, Amir Kabir, Sharif, and Kharazmi universities. Given that in factor analysis studies should be considered at least ten cases for each item (17), according to 28 items of PROCSI, at least 280 participants were required. To further refine the factor analysis results, more participants were used and considered the deletion of incomplete questionnaires; finally, 459 participants were selected.

Research instrument

A) PROCSI: Information about PROCSI is provided in the introduction (16).

B) Obsessive-Compulsive Inventory-Revised (OCI-R): This scale is a revised version of the Obsessive-Compulsive Inventory (OCI) and consists of 6 subscales and 18 items graded based on a 5-degree scale (from 0 to 4). The subscales of OCI-R are washing, obsession, hoarding, ordering, checking, and undoing. The OCI-R has appropriate internal consistency and test-retest reliability (18-22). Early evidence

suggests the sensitivity of OCI-R to treatment, but it seems that more evidence is needed in this regard (23). Also, it seems that OCI-R is suitable for diagnostic screening, and scores of 21 or higher can show OCD. In Iran, Mohammadi et al. (24) studied the reliability of the OCI-R. Their findings showed suitable internal consistency calculated with the Cronbach's alpha coefficient (ranging from 0.51 to 0.72). Also, the six-factor structure obtained in the original research was confirmed by confirmatory factor analysis. The results of their study showed that there were significant correlations between subscales of OCI-R ($P<0.01$), but their amount was not too high (correlations were in the range of 0.26 to 0.80).

C) Depression, Anxiety, and Stress Scale (DASS): This scale consists of 21 phrases related to symptoms of negative emotions (e.g., depression, anxiety, and stress). Lovibond and Lovibond (25) reported that the internal consistency coefficients (Cronbach's alpha) of the three subscales of depression, anxiety, and stress were 0.91, 0.81 0.89, respectively. Also, their results showed that the three-factor models could be better suited to the data. The results of a study by Brown et al. (26) showed that the internal consistency coefficients of the three subscales of depression, anxiety, and stress were 0.96, 0.89, and 0.93, respectively. The test-retest coefficients of three subscales of depression, anxiety, and stress reported 0.71, 0.79, and 0.82, respectively. In that study, the three-factor structure of DASS was confirmed using exploratory factor analysis. In Iran, Asghari Moghadam et al. confirmed three-factor structure of DASS. The reliability was confirmed by examining the internal consistency coefficients (Cronbach's alpha higher than 0.70 in all subscales) and test-retest coefficients (for depression scale: 0.84, for the anxiety scale: 0.89, and the stress scale: 0.91). Also, the construct validity of two scales of depression and anxiety was confirmed by using the correlation coefficient between the scores of the two scales with the scores of the Beck Depression Inventory (BDI) and the Four Systems Anxiety Questionnaire (FSAQ) (27). In this regard, the correlations were in the range of

0.42 to 0.90, which were significant at the level of *P*<0.001. The concurrent validity of the depression, anxiety, and stress scales was confirmed by comparing the scores of a sub-sample taken from the general population (315 cases) with a peer group of patients with psychological disorders (130 individuals).

D) Dyadic Adjustment Scale (DAS): This questionnaire is a 32-item tool for assessing the marital relationship quality in terms of the husband and wife or two people who live together. It measures four dimensions: dyadic consensus, dyadic satisfaction, dyadic cohesion, and affectional expression. The total score ranged 0 to 151. The higher scores indicate a better relationship. The total score of DAS with Cronbach's alpha of 0.96 has a significant internal consistency. The internal consistency of the subscales is between good to excellent: dyadic satisfaction= 0.94, dyadic cohesion= 0.81, dyadic consensus= 0.90, and affectional expression= 0.73 (22,28). Sharply and Cross reported that the reliability of DAS was 0.96 (29). In another study carried out by Spanier and Thompson (30), the Cronbach's alpha coefficient was 0.91. In Iran, in the study of Molazadeh, the reliability coefficient and Cronbach's alpha were 0.86 and 0.89. Using the concurrent implementation of DAS and Lock-Wallace Marital Adjustment Test (LWMAT), the validity coefficient for 76 couples with similar couples obtained 0.90 (*P*<0.01) (31).

E) Relationship Beliefs Inventory (RBI): This scale was develped to measure the relationship beliefs in marital life and has five subscales that measure five ineffective relationship beliefs. These beliefs include "disagreement is destructive," "partner cannot change," "mind reading is expected," "the sexes are different," and "sexual perfectionism." Eidelson and Epstein (32) reported Cronbach's alpha coefficient of five subsamples of RBI ranging from 0.72 to 0.81. The reliability of RBI through test-retest obtained 0.81. The Persian version of RBI is provided by Mazaheri and Pour Etemad. In their study, the Cronbach's alpha of RBI was obtained 0.75 (33). Dehshiri reported its Cronbach alpha equal to 0.88 (34).

The method of research included two steps. In the first stage, three psychologists (Ph.D. in psychology) translated the test. Then, the translations were compared and adapted. After the necessary amendments, the final version was prepared and translated by an English specialist (MS. in English translation). The above translation was compared with the original questionnaire. Then, the problems of the final questionnaire were resolved. In the second stage, the prepared questionnaire (PROCSI) was carried out on a few married students to understand the meaning of the phrases and then, along with DAS, DASS, OCI-R, and RBI, was implemented on a large sample.

Data analyzed using descriptive statistics, Pearson correlation, Cronbach alpha coefficients, and the confirmatory factor analysis. The convergent and divergent validity were used based on the correlation of PROCSI with DAS, DASS, OCI-R, and RBI. The mentioned analyzes were performed based on SPSS 21 and Lisrel 8.80.

Results

In this study, 36 men (29.6%) and 323 women (70.4%) participated. Most of them had no child (67.5%), 17% had one child, 9.4% had two children, and 6.1% had more than two children. In term of educational course, 51.4%, 21.8%, 14.6%, 8.1%, 1.5%, and 0.9% were studying in the humanities, technical engineering, basic sciences, medicine and paramedicine, arts, and agriculture.

Most of the students were studying at the master degree (42.9%). Also, 31.2% of them were studying at the undergraduate degree, 23.3% in Ph.D., and 1.3% in MD. Furthermore, many students were not employed (60.1%).

In term of psychological status, 71.9% of them did not have a history of referring to a psychologist. They aged 18-50 years (23.58 ± 7.9 year).

The marriage duration ranged between 6 months and 39 years.

Tables 1 and 2 indicated inter-correlation between the subscales and total scores of PROCSI and test-retest correlation of PROCSI.

Table 1. Inter-correlation between the subscales and total scores of PROCSI

	Physical appearance	Sociability	Morality	Emotional stability	Intelligence	Competence	Total
Physical appearance	1	0.48**	0.51**	0.60**	0.52**	0.40**	0.72**
Sociability		1	0.58**	0.57**	0.55**	0.53**	0.79**
Morality			1	0.65**	0.53**	0.47**	0.79**
Emotional stability				1	0.59**	0.50**	0.82**
Intelligence					1	0.57**	0.80**
Competence						1	0.76**
Total							1

**Correlation is significant at the 0.01 level (2-tailed)

The presented results in Table 1 showed that all correlations between "physical appearance", "sociability", "morality," "emotional stability", "intelligence", "competence" and the total score of PROCSI are positive and significant (*P*<0.01). The presented results in Table 2 showed that all test-retest correlations of the subscales and total score of PROCSI are positive and significant (*P*<0.01). Also, the Cronbach alpha of the "physical appearance","sociability", "morality", "emotional stability", "intelligence" and "competence" were 0.76, 0.62, 0.71, 0.71, 0.69, and 0.67, respectively, and the Cronbach alpha of the total scale was 0.90. Thus, according to the obtained alpha and the presented results in Tables 1 and 2, we can say

that PROCSI has suitable reliability in the sample of Iranian couples. Findings of the convergent and divergent validity (Table 3) showed that the subscales and the total score of PROCSI have a negative and significant correlation with all subscales and the total score of DAS (*P*<0.01), and this is an indicator of the suitable divergent validity of PROCSI.

Also, the subscales and the total score of PROCSI have a positive and significant correlation with all subscales and the total score of DASS (*P*<0.01) and have a positive and significant correlation with many subscales and total score of RBI as well as OCI-R (*P*<0.01 and *P*<0.05) that indicate the appropriateness of the convergent validity of PROCSI.

Table 2. Test-retest correlation of PROCSI

	Test-retest correlation
Physical appearance	0.64**
Sociability	0.84**
Morality	0.67**
Emotional stability	0.77**
Intelligence	0.57**
Competence	0.84**
Total	0.82**

**Correlation is significant at the 0.01 level (2-tailed).

Table 3. The results of correlation of PROCSI with DAS, DASS, OCI-R, and RBI

		Physical appearance	Sociability	Morality	Emotional stability	Intelligence	Competence	Total
DAS	Satisfaction	-0.55**	-0.51**	-0.58**	-0.61**	-0.45**	-0.32**	-0.63**
	Cohesion	-0.45**	-0.38**	-0.44**	-0.35**	-0.34**	-0.38**	-0.50**
	Consensus	-0.36**	-0.46**	-0.46**	-0.48**	-0.35**	-0.40**	-0.54**
	Affection expression	-0.42**	-0.37**	-0.36**	-0.41**	-0.31**	-0.31**	-0.46**
	Total	-0.51**	-0.53**	-0.56**	-0.57**	-0.44**	-0.43**	-0.64**

DASS	Depression	0.27*	0.27*	0.34**	0.40**	0.26*	0.28*	0.38**
	Anxiety	0.36**	0.34**	0.53**	0.51**	0.32**	0.26**	0.47**
	Stress	0.31**	0.40**	0.47**	0.46**	0.33**	0.28**	0.47**
	Total	0.35**	0.38**	0.50**	0.51**	0.34**	0.31**	0.50**
OCI-R	OCI-R	0.25*	0.20	0.20	0.23*	0.26*	0.20	0.27*
RBI	Disagreement is destructive	0.48**	0.34**	0.43**	0.54**	0.11	0.28*	0.46**
	Mindreading is expected	0.24*	0.34**	0.34**	0.42**	0.25*	0.22*	0.39**
	Partners cannot change	0.12	0.13	0.23**	0.16	0.012	0.012	0.13
	Sexual perfectionism	0.13	0.036	0.047	0.25*	0.19	0.018	0.12
	Sexes are different	0.22	0.18	0.22*	0.17	0.12	0.086	0.21
	Total	0.31**	0.32**	0.40**	0.36**	0.09	0.22	0.37**

** $P<0.01$

Figure 1. The diagram of confirmatory factor analysis of PROCSI

Chi-Square=1646.63, df=237, P-value=0.00000, RMSEA=0.114
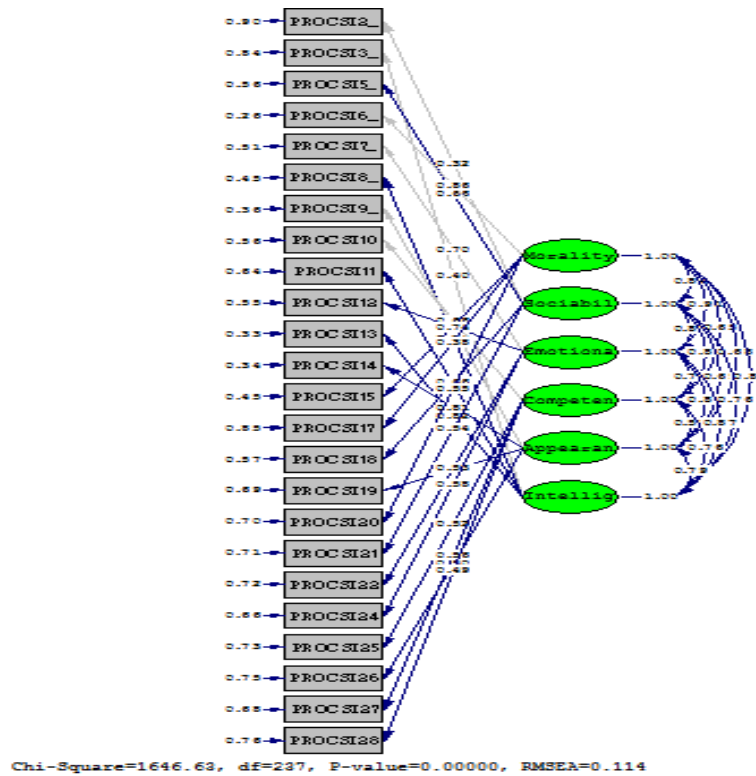
In Figure 1, the diagram of the confirmatory factor analysis of PROCSI is presented. Also, the fitness indicators of the confirmatory factor analysis of PROCSI are presented in Table 4. As can be seen in this table, in general, the fitness indicators show the good fitness of the factors of PROCSI. Of course, the results of the division of x2 on the DF were not obtained in the normal range, which is predictable due to the high sample size (35). Table 5 shows the results of the factor loads extracted from the confirmatory factor analysis of PROCSI. The Composite Reliability (CR) and the Averaged Variance Extracted (AVE) are approximately in the normal range (36). Thus, it can be said that PROCSI has good structural validity. Therefore,

based on what is shown in Tables 3-5, it can be said that PROCSI has an appropriate validity in the sample of Iranian couples.

Table 4. The results of the indicators of good fitness of PROCSI

Indicators of good fitness	Amount
X^2/df	6.94
NFI	0.91
GFI	0.77
AGFI	0.71
CFI	0.93
IFI	0.93
RFI	0.90
RMSEA	0.11

Table 5. The results of standard and non-standard factor loads of PROCSI

Factors		Item	B	β	T	CR	AVE
Factor 1 Morality	6	I am constantly bothered by doubts about my partner's morality level	0.19	0.86	8.61	0.73	0.43
	15	The thought that my partner is not a "good and moral" person bothers me on a daily basis	0.25	0.74	12.43		
	17	I keep looking for evidence that my partner is moral enough	1.06	0.38	14.77		
	20	I'm constantly examining my partner's morality level	0.64	0.54	14.22		
Factor 2 Sociability	2	I repeatedly evaluate my partner's social functioning	1.03	0.32	14.80	0.63	0.32
	5	I am troubled by thoughts about my partner's social skills	0.60	0.66	12.39		
	18	Thoughts about my partner's poor functioning in social situations bother me on a daily basis	0.29	0.66	12.50		
	21	I keep trying to compensate for my partner's social deficiencies	0.93	0.54	13.84		
Factor 3 Emotional stability	7	I find it hard to dismiss the thought that my partner is mentally unbalanced	0.35	0.70	12.91		0.39
	12	I find it difficult to control my tendency to compare my partner's emotional responses to those of other men/women	0.48	0.67	13.28	0.71	
	22	I am bothered by doubts about my partner's emotional stability	0.54	0.58	14.38		
	24	I keep examining whether my partner acts in a strange manner	0.53	0.52	14.09		
Factor 4 Competence	10	I keep comparing my partner's ability to "achieve something" in life to that of other men/women	0.56	0.66	11.60		0.5
	25	I am extremely preoccupied with assessing my partner's ability to "make something of himself/herself"	0.91	0.50	13.58	0.61	
	27	When I think of my partner I wonder whether he/she is the sort of person who can succeed in the modern world	0.72	0.49	13.11		
	28	I keep looking for evidence of my partner's occupational success	1.21	0.49	13.79		
Factor 5 Physical appearance	9	When I am with my partner I find it hard to ignore her physical flaws	0.25	0.80	10.28		0.46
	14	I am constantly bothered by thoughts regarding the flaws in my partner's physical appearance	0.17	0.81	9.90	0.76	
	19	Every time I'm reminded of my partner I think	0.24	0.55	14.00		

	26	about the flaw in his/her appearance I feel an uncontrollable urge to compare my partner's physical flaws with those of other men/women	0.32	0.49	14.28	
Factor 6 Intelligence	3	I am constantly questioning whether my partner is deep and intelligent enough	1.20	0.40	14.72	0.5
	8	I often seek reassurance (from friends, family, etc.) about whether my partner is smart enough	0.29	0.74	12.32	
	11	I can't stop comparing my partner's intelligence level to that of other men/women	0.68	0.60	13.89	0.74
	13	The thought that my partner is not intelligent enough bothers me greatly	0.22	0.82	10.23	

Discussion

The present study was conducted to determine the validity and reliability of PROCSI in a sample of married students in Tehran universities. In general, the results of the internal correlation of PROCSI are consistent with previous studies. In general, the reliability results in ways like Cronbach's alpha, internal consistency, and the test-retest of the PROCSI are consistent with Doron et al. (16).

In the present study, DAS, DASS, OCI-R, and RBI were used to assess the convergent and divergent validity of PROCSI. The results of the present study, are concordant with Doron et al. studies (16,37,38). They showed that there is a positive and significant correlation between PROCSI and OCI-R. As Doron et al. (37) indicated, obsessions and compulsive behaviors associated with ROCD, similar to OCD, lead to distress and often affect social function, occupation, and other life areas. Mental engagements about relationships are often ego-dystonic, in the sense that they contradict the perception that a person has about the relationship with a spouse or that they may contradict an individual's internal values. These mental conflicts are perceived as unacceptable and unwanted, and often, a person feels guilty and embarrassed due to their occurrence and content (37).

Regarding previous studies, when OCD focuses on the relationship, it has a more devastating effect on the intimate relationships of couples (16). Also, previous studies indicate that OCD harms relationship function (39), and these effects lead to increased severity of OCD symptoms. For example, the pressure that individuals with OCD put on their spouse to behave by their obsessions is one factor of relationship tensions and conflicts and affects the relationship's quality (40). Accordingly, the spouse's compliance with OCD symptoms (such as participation in obsessive rituals or avoidance of anxiety situations) is associated with the aggravation of symptoms, poor treatment outcomes, and loss of life satisfaction with individuals with OCD (41). Therefore, it can be expected that a negative and significant correlation between the subscales and the total score of PROCSI with the subscales and the total score of DAS would have existed.

Our results also showed a positive and significant relationship between PROCSI and DASS, which is consistent with previous studies (16,38). In this regard, it can be concluded that as many OCD patients simultaneously experience other psychiatric disorders such as anxiety and depression (42), in OCD with relationship theme, the patient is also afflicted with other psychiatric disorders such as depression and anxiety (37).

Also, in the present study, there was a positive and significant correlation between PROCSI and RBI. In this regard, Doron et al. found that people with ROCD acquired high scores in relationship maladaptive beliefs. As a result, it can be suggested that relationship maladaptive beliefs have a prominent role in the formation and continuation of ROCD (38).

In the present research, the confirmatory factor analysis of PROCSI showed that six factors of it have an appropriate fitness in line with the results of Doron et al. study. It seems that the similarity of participants (students) and the sample size are likely reasons to match the

results of the present study with the results of Doron et al. study (16).

The use of some universities in Tehran, instead of all universities in Tehran, whether public or private, is one of the limitations. Also, the lack of diversity in the sample population (using only student samples) and the convenient sampling method are the other limitations. In this respect, the random or cluster sampling method makes a more precise selection of cases, and a better generalization. Also, the lack of use of the clinical sample of ROCD and comparing these patients with healthy individuals is one of the other limitations.

Conclusion

Based on the findings, it seems that the PROCSI has good validity and reliability to use in Iranian couples.

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