ORIGINAL ARTICLE

The psychometric properties of the Persian version of Interpersonal Sensitivity Measure

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Background: Investigating the psychometric properties of existing psychometric scales in societies with differing dynamics can help with their external validity. This research specifically aimed at standardization and validation of Interpersonal Sensitivity Measure (IPSM) scale in Iran. **Materials and Methods:** Persian version of the IPSM was produced through forward translation, reconciliation, and back translation. A total of 357, nonclinical students were selected through multistage sampling method and completed a set of questionnaires including IPSM. Internal consistency, convergent validity, divergent validity, and test-retest reliability of the Persian version of the IPSM were analyzed. To assess the construct validity, confirmatory factor analysis (CFA) was performed. **Results:** Total IPSM, as well as all subscales showed satisfactory internal consistency (Cronbach's α =0.86 and 0.51–0.71, respectively). Test-retest reliability at a 2-week interval was significant, with intraclass correlation coefficient ranging between 0.73 and 0.92. In terms of convergent validity, IPSM showed the significant positive correlation with self-report measures of depression, social anxiety, and anxious attachment style. IPSM showed negative correlation with Social Desirability Scale and secure (C subscale of avoidant attachment style [AAS]) and dependent (D subscale of AAS), thus demonstrated divergent validity with these constructs. According to the CFA, the responses of the sample in this study were fitted to the original five-factor structure. **Conclusion:** The IPSM showed good validity and reliability and could be useful in assessing interpersonal sensitivity in Iranian population.

Key words: Attachment styles, interpersonal sensitivity, psychometric properties, social anxiety

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INTRODUCTION

Boyce and Parker developed the Interpersonal Sensitivity Measure (IPSM), a self-report scale, to measure the construct of interpersonal sensitivity which they defined as "undue and excessive awareness of and sensitivity to the behavior and feelings of others." They proposed interpersonal sensitivity as a risk factor for depression.[1] This construct has also been defined as "sensitivity to social feedback, vigilance to others' reactions, piled up concern toward others' behavior and thoughts and fear of others' perceived or actual criticism."[2] Interpersonal sensitivity is characterized by a sense of personal inadequacy and recurring misunderstanding of others' interpersonal behavior, nonassertive behavior, and avoiding interpersonal relations.[1,3]

The authors considered the construct to consist of five subcategories, that is, interpersonal awareness, the need for approval, separation anxiety, fragile inner self, and timidity. Interpersonal awareness refers to the ways people evaluate interpersonal actions and reactions and assign them meanings. Those with high scores on this subscale are conscious of the effect they have on others and are very much alarmed and intense in social interactions. Need for approval subcategory speaks of how much an individual is willing to sacrifice their own needs and prioritize others' views to avoid being humiliated or cast out and keep others content. Separation anxiety measures the anxiety one experiences when separating a significant other. Timidity indicates

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a total lack of assertiveness. And finally, fragile inner self-watches over one's fear of being humiliated or rejected. Those who score high in this subscale are of fragile self-esteem, which needs to be reinforced by the constant approval of others.[1]

Although the devisors of IPMS described it as a measure of "Interpersonal Sensitivity Scale," "sensitivity to interpersonal rejection" seems to be a better title. This title could sort out the difficulties arising from the similarities to the concept of interpersonally aware/sensitive individuals and offers a better, more wholesome definition of fear and difficulties associated with interpersonal rejection.[4]

Prospective studies of IPSM predictive power have indicated the formation of the initial stages of depression, depression relapse 6 months after childbirth, and depression symptoms' remaining in hospitalized patients.[5] Research indicates that this construct is not only related to depression but also with differing mental health problems as specific anxiety disorders, and early parental environment,[6] social anxiety,[4,7] bulimic symptomatology,[8] attenuated positive psychotic symptoms, avoidant coping, and negative emotional states in the prodromal phase of psychosis.[9]

A major proportion of studies on the relationship between interpersonal sensitivity and vulnerability to psychological difficulties have been carried out in societies with individualistic cultures where interpersonal understanding and relations can differ from other societies.[10] Investigating the psychometric values of this scale in societies with differing dynamics can help with its external validity. The validity of psychometrics characteristics of IPSM has been investigated and approved in India,[11] Italy,[12] Korea,[10] and Turkey[13] although in the recent study, the structure of five factors in IPSM was not confirmed, and a three-factor structure was suggested. Despite the importance of interpersonal sensitivity construct in research and clinical treatment, IPSM rarely used or fully investigated in Iran. In one pilot study, Cronbach alpha has been reported 0.81.[14]

This research aimed at specifically standardization and validation of interpersonal sensitivity scale in Iran.

MATERIALS AND METHODS

Sample

In this psychometric study, a total of 380 nonclinical students of Isfahan University of Medical Sciences were recruited through multistage sampling method to participate in this study, considering the gender, faculty, and major. They were all undergraduates, aged between 18 and 40, having sufficient knowledge of the Persian language and consent to complete the questionnaires. All individuals were scheduled for a gathering of demographic information, and completion of a package of self-report measures. Among all the candidates recruited for the study, 357 were completed and returned the questionnaires.

Measures

Persian version of the Interpersonal Sensitivity Measure

The IPSM was developed by Boyce and Parker to assess excessive individuals' sensitivity to interpersonal behavior of others, to social feedback and negative evaluation by others. The 36 items of the IPSM are completed on a four-point likert-type scale with a higher total score reflecting greater interpersonal sensitivity. The psychometric properties of the scale were supported in initial studies.[1] The authors reported internal consistency estimates of 0.86 and 0.85 for the total score in samples depressed patients and nonclinical students, respectively. Test-retest reliability of the scale in the student sample over a 6-week period was 0.70. The convergent and divergent validity of IPSM was assessed through concurrent administration of the scale with a measure of neuroticism, a measure of self-esteem, and a measure of emotional arousability which yielded correlations of 0.56, 0.39, and 0.11, respectively. Of the five IPSM subscales, that is, interpersonal awareness, separation anxiety, timidity, and fragile inner self, the internal consistency estimates of four scales were comparable to those reported for the total score. Six-week retest reliability for the need for approval was 0.55. Alpha coefficient in patient sample and student sample were 0.57 and 0.55, respectively.

The comparability of IPSM and the original IPSM has been validated by precise translation and back-translation procedures. The IPSM was first translated into Persian independently by three PhD candidates of clinical psychology. Then, the Persian IPSM was back-translated by a person bilingual in Persian and English to validate the translation, and the back-translated version was reviewed by another bilingual person. The final version of Persian IPSM was also compared to the original version by a bilingual clinical psychologist.

Beck Depression Inventory II

It is the revised version of Beck Depression Inventory (BDI) that was devised to measure the severity of depression.[15] Similar to its original version,[16] this questionnaire consists of 21 items which are scored 0 through 3 by the patients. Beck *et al*., reported that the psychometric properties of the BDI-II are quite sound. Coefficient alpha estimates for the BDI-II with outpatients and nonclinical sample was 0.92 and 0.093, respectively. The test-retest reliability coefficient across the period of a week was quite high at 0.93.[15]

Fata *et al*. investigated the scale in Iran and reported the alpha coefficient as 0.91, split half correlation coefficient as 0.89 and test-retest coefficient as 0.94 for a week interval.[17]

Leibowitz Self-report Social Anxiety Scale

It is the most widely used social anxiety scale with two planes of clinician and self-report. Including 24 items, it is designed in a way that embraces a wide proportion of two areas of functional and social interaction in people diagnosed with social fear and anxiety.[18] Numerous studies endorse the reliability and validity of this scale.[19] The self-report version is also as valid almost equal to the clinician form.[20] Atrifard *et al*. also has investigated the characteristics of the self-report version and has approved its being used in the context of Iran. The test-retest validity of the scale and its subscales ranges from 0.76 to 0.84. They have, as well, reported the Cronbach's alpha coefficient ranging from 0.73 to 0.93.[21]

Collins and read Adult Attachment Scale (1990)

It is an 18-item self-report scale that measures the skill of initiating a relation and forming attachment in close relationships and is of three subcategories: (1) dependence (D): It measures the amount of trust and dependence one feels toward others and their availability in times of need (almost an opposite to avoiding attachment); (2) closeness (C): This subscale measures the amount of comfort associated with intimacy and emotional closeness (in accordance with secure attachment style); (3) anxiety (A): It measures the fear of having relations (in accordance with anxious-ambivalent attachment style).[22] In the context of Iran, Pakdaman implemented the questionnaire with a month interval and reported a reliability of 0.95.[23]

Social Desirability Scale

This questionnaire was devised by Crowne and Marlowe[24] to investigate the level of social acceptability. It is of 33 statements, and the respondents offer their opinion through marking them as correct or incorrect. In the context of Iran, Karami calculated the scale's reliability using Cronbach alpha as 0.61 and 0.88, respectively.[25]

Statistical analysis

Data were analyzed using the Statistical Package for the Social Sciences Statistics v. 22.0 (IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp, Chicago, USA, 2013). First, descriptive statistics for the study sample were calculated. Then, internal consistency, convergent validity, divergent validity and test-retest reliability of the Persian version of the IPSM were analyzed. Internal consistency was estimated using Cronbach's alpha. To investigate convergent and divergent validity, we used Spearman's rank-order correlation coefficient (r) to examine the correlation between interpersonal sensitivity and theoretically related and less related measures. Correlation coefficients between 0.1–0.3, 0.3–0.5 and 0.5–1.0 (plus or minus) regarded as weak, moderate, and strong correlation, respectively. Test-retest reliability was assessed by examining the intraclass correlation coefficient (ICC) where 0–0.2 indicates poor agreement: 0.3–0.4 indicates fair agreement; 0.5–0.6 indicates moderate agreement; 0.7–0.8 indicates strong agreement; and >0.8 indicates almost perfect agreement. The significance level was set at 0.05, and all reported significance values were two-tailed. In all tests, $P \leq 0.05$ was considered statistically significant.

Finally, to assess the construct validity, confirmatory factor analysis (CFA) was performed using AMOS 22. The Chi-square test of covariance equivalence and three additional indicators of fit, including the Tucker–Lewis index (TLI), the comparative fit index (CFI), and the root mean square error of approximation (RMSEA) used to determine the fit of the subscales structure obtained by Boyce and Parker. RMSEA value of 0 indicates perfect fit and values <0.08 considered as good fit.[26]

RESULTS

Description of the sample

First, descriptive statistics for continuous and categorical variables were calculated [Table 1]. Participants were

Table 1: Demographic characteristics of the sample

	n (%)
Sex	
Male	87 (24.37)
Female	270 (75.63)
Marital status	
Single	60 (16.81)
Married	297 (83.19)
Course	
Public health	85 (23.81)
Medicine	84 (23.53)
Health information technology	20 (5.60)
Midwifery	13 (3.64)
Labor therapy	19 (5.32)
Emergency medicine	14 (3.92)
Speech therapy	14 (3.92)
Nursing	22 (6.16)
Radiology	25 (7.00)
Nutrition	22 (6.16)
Pharmacy	1 (0.28)
Environmental health	38 (10.64)
Educational level	
B.Sc.	271 (75.91)
MD	86 (24.09)
Age	
Mean (SD)	22.05 (3.11)

SD = Standard deviation

mostly female (75.63%), bachelor student (75.91), and their mean (standard deviation) age was 22.05 (3.11) years.

Internal consistency

As can be seen in Table 2, the internal consistency of the total IPMS score and each of the five subscales were calculated. The results showed that the total IPSM score demonstrated excellent internal consistency with a Cronbach's alpha of 0.86. For the subscales, it showed moderate to good consistency with Cronbach's alpha fell within the range of 0.51–0.71.

Intercorrelation among Interpersonal Sensitivity Measure subscales

Correlations among the IPSM subscales are shown in Table 3. As expected, all were high, with the exception of the correlation between need for approval and fragile inner-self subscales ($P = 0.957$). The significant correlation between the subscale scores ranged from 0.161 to 0.508 ($P < 0.001$). Correlations between the IPSM total score and the subscales were significant ($P < 0.001$) and ranged from 0.495 to 0.806.

Table 2: Internal consistency (Cronbach's alpha coefficients) for the 36-item Interpersonal Sensitivity Measure score and 5 subscales

	Number of items	Cronbach's alpha
IPSM total	36	0.86
Interpersonal awareness	7	0.70
Need for approval	8	0.51
Separation anxiety	8	0.58
Timidity	8	0.58
Fragile inner-self	5	0.70

IPSM = Interpersonal Sensitivity Measure

Convergent and divergent validity of the Interpersonal Sensitivity Measure

The convergent validity of the IPSM was investigated by examining the relationship between IPSM total scores and scores on self-report measures of depression, social anxiety and anxious-ambivalent attachment style applying Pearson product – moment correlations [Table 4]. For the comparison of the magnitude of correlation coefficients, *Z*-tests of dependent correlation differences were calculated.[27]

The results demonstrated the expected relationship between the IPSM and BDI, Liebowitz Social Anxiety Scale and anxiety subscale of AAS. Moderate positive correlations were found between the IPSM and these three scores ($P < 001$).

To evaluate the divergent validity of IPSM, we examined the association between the IPSM and three theoretically less related constructs, including Social Desirability Scale (SDS) and secure (closeness subscale of avoidant attachment style [AAS]) and dependent (D subscale of AAS) [Table 4]. As expected, we found negative correlations between IPSM and these three scales ($P < 0.05$).

Test-retest reliability

Thirty randomly selected participants were asked to complete the IPSM 2 weeks after the first measurement. Test-retest reliability for IPSM total and all the subscales were determined by evaluating test-retest correlation. All ICC between first and second measurement scores were significant ($P < 0.001$), with coefficients, r ranging from 0.73 to 0.92 [Table 5].

Table 3: Correlations among the 36-item Interpersonal Sensitivity Measure subscales

	Interpersonal awareness	Need for approval	Separation anxiety	Timidity	Fragile inner-self
Interpersonal awareness					
r[+]	1				
P					
Need for approval					
r	0.313**	1			
P	<0.001				
Separation anxiety					
r	0.557**	0.161**	1		
P	<0.001	0.002			
Timidity					
r	0.503**	0.378**	0.442**	1	
P	<0.001	<0.001	<0.001		
Fragile inner self					
r	0.469**	−0.003	0.508**	0.430**	1
P	<0.001	0.957	<0.001	<0.001	
IPSM total					
r	0.806**	0.495**	0.788**	0.776**	0.598**
P	<0.001	<0.001	<0.001	<0.001	<0.001

[+]Pearson correlation coefficient. IPSM = Interpersonal Sensitivity Measure, *Correlation is significant at 0.05 level, **Correlation is significant at 0.01 level

Table 4: Convergent and divergent validity of the Interpersonal Sensitivity Measure

	BDI	LSAS	Anxiety	Closeness	Dependence	Social desirability
IPSM total						
r	0.373**	0.333**	0.372**	−0.243**	−0.175**	−0.119*
P	<0.001	<0.001	<0.001	<0.001	0.001	0.028

*Correlation is significant at 0.05 level, **Correlation is significant at 0.01 level. BDI = Beck Depression Inventory; LSAS = Liebowitz Social Anxiety Scale; IPSM = Interpersonal Sensitivity Measure

Table 5: Means (standard deviations) and test-retest reliability of the Interpersonal Sensitivity Measure and its subscales

	Time 1	Time 2	ICC	*P*
Interpersonal awareness	18.17 (30.75)	20.07 (4.37)	0.89	<0.001
Need for approval	25.23 (3.22)	220.80 (30.70)	0.86	<0.001
Separation anxiety	170.50 (30.82)	19.30 (30.82)	0.88	<0.001
Timidity	20.57 (30.59)	170.90 (30.57)	0.73	<0.001
Fragile inner self	80.83 (20.53)	10.50 (3.27)	0.89	<0.001
IPSM total	90.40 (10.77)	90.57 (12.28)	0.92	<0.001

IPSM = Interpersonal Sensitivity Measure; ICC = Intraclass correlation coefficient

Factor analysis

To assess the construct validity of IPSM and determine the fit of the factor and subscales structure obtained by Boyce and Parker, CFA was performed. The responses of the sample in this study were fitted to the original five-factor structure using AMOS 22.0. (IBM SPSS AMOS for Windows, Version 22.0. Armonk, NY: IBM Corp, Chicago, USA, 2013). The Chi-square test of covariance equivalence was significant ($\chi^2 = 11520.537$, $P < 0.001$), indicating a poor fit of the data to the original model. As this test is very sensitive to sample size and could overestimate the lack of model fit, we selected three additional indicators of fit, based on Bollen, and Hu and Bentler: The TLI, the CFI, and the RMSEA.[26,28] The results (TLI = 0.789, CFI = 0.809 and RMSEA = 0.053) indicated a reasonable good fit.[26]

DISCUSSION

The results of the study provide evidence for the validity, internal consistency and test-retest reliability of the Persian version of IPSM in a nonclinical population of students. After preparing the Persian version of the measure, its internal consistency was assessed. All internal consistency alpha indices were adequate and incomparable to those reported by Boyce and Parker.[1] As these authors noted, the subscales had lower and less satisfactory internal consistencies because of their fewer items. Correlations among the five IPSM subscales were also quite similar to those obtained by Boyce and Parker.

Test-retest reliability assessment on thirty randomly selected participants over a 2-week period yielded significant ICC of 0.81 for the full-scale and between 0.58 and 0.77 for the subscales.

Evidence for the convergent validity of the IPSM was obtained from significant correlations with measures of constructs related to interpersonal rejection sensitivity. These included depression, social anxiety, and anxious attachment style.[1,4,7,11]

The correlation between interpersonal sensitivity score and depression symptoms confirmed the theoretical construct proposed by Boyce and Parker.[1] Furthermore, the correlation between IPMS score and social anxiety support previous researches demonstrating the relation between interpersonal rejection sensitivity and social anxiety disorder.[4,7,11,29] Although such constructs measures and IPSM was shown to have significant positive correlations, they were moderate at best with coefficients r falling in a range between 0.29 and 0.40 ($P < 0.001$), thus supporting convergence but not collinearity.

The divergence between IPSM and SDS and nonanxious insecure attachment style was assumed based on previous research[4,10] that these constructs were distinct from social and interpersonal sensitivity. Thus, by demonstrating negative correlations between IPSM, SDS and Closeness and Dependence subscales of AAS, it was confirmed that the IPSM is measuring a distinct construct.

The results of the CFA supported the application of the five-factor structure reported by original authors[1] in an Iranian sample. Despite reaching reasonable good fit indices, some suggest more stringent criteria and higher cutoff points for the fit indices.[26] It is important to note that this study has some limitations. First, the validation analyses would have benefited from the inclusion of more measures addressing the influence of method variance. All measures included in this study were self-report instruments. Thus, correlations may have been inflated by common method variance. Second, a larger sample size would have increased the power of the factor-analytic investigation. There were approximately ten participants in the current study per one variable that is in accordance with the common guideline for factor analyses[30] but a higher ratio could have increased the power. Third, the study sample was limited to participants with certain demographic characteristics: They were all university students and were mostly single and female. This may

lead to a problem of generalizing the results to the general population. Fourth, the result of the factor analysis failed to reach the excellent goodness of fit.

Despite these limitations, the project has a number of achievements:

First, in our dataset all five components of IPSM proposed by Boyce and Parker[1] were found to be reliable and valid. This provides further support for Boyce and Parker definition of interpersonal sensitivity and suggests that each component of the model is important in defining and measuring it. Second, the correlation between interpersonal sensitivity score and depressive symptoms confirmed the original Boyce and Parker theoretical construct. Third, the correlation between IPMS score and social anxiety support previous researches[4,7,11,29] demonstrated the relation between interpersonal rejection sensitivity and social anxiety disorder.

CONCLUSIONS

The Persian version of IPSM showed good and reliable validity to measure interpersonal sensitivity in Iranian population. Furthermore, the study supplements the literature on the cross-cultural validity of this measure,[1,10-13] thus providing more support for the generalizability of the relation of interpersonal sensitivity and some previously studied psychopathologies.

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Conflicts of interest
There are no conflicts of interest.

AUTHORS' CONTRIBUTION

- YM contributed in the conception of the work, conducting the study, revising the draft, approval of the final version of the manuscript, and agreed for all aspects of the work
- BM contributed in the conception of the work, revising the draft, doing statistical analyses, approval of the final version of the manuscript, and agreed for all aspects of the work
- FFL contributed in the conception of the work, revising the draft, approval of the final version of the manuscript, and agreed for all aspects of the work
- MD contributed in the conception of the work, revising the draft, approval of the final version of the manuscript, and agreed for all aspects of the work
- MAV contributed in the conception of the work, conducting the study, drafting and revising the draft, approval of the final version of the manuscript, and agreed for all aspects of the work.

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