



Psychometric Properties of the Persian Version of Personality Inventory for DSM-5 (PID-5) in Psychiatric Patients

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Abstract

Background: The fundamental problems with the personality disorders diagnostic system in DSM-IV led to the revision of the DSM approach and proposition of a dimensional model for DSM-5. The DSM-5 Personality and personality disorders workgroup developed the personality inventory for DSM-5 (PID-5) to assess the pathological personality traits within this new model.

Objectives: The purpose of this study was to investigate the psychometric properties of PID-5 in psychiatric patients.

Methods: In a cross-sectional study, the Persian translation of the PID-5 was administered to 400 psychiatric patients admitted to the Roozbeh Hospital. After data collection, the reliability of the inventory was investigated using internal consistency and test-retest methods. In addition, confirmatory factor analysis and convergent validity methods were used to evaluate the validity of the scale.

Results: Adequate internal consistency coefficients were obtained for domains and facets. In addition, the test-retest coefficients (up to 0.70) suggested scale stability. Confirmatory factor analysis supported the original five-factor model of the inventory. The convergent validity of the inventory with the TCI-R scale was appropriate.

Conclusions: The results of the study supported the psychometric properties of the Persian version of PID-5 in psychiatric populations.

Keywords: Dimensional, DSM-5, Personality Disorder, Personality Inventory, Reliability, Validity

1. Background

The diagnostic system of personality disorders in DSM-IV-TR has undergone major changes. These changes have been made in response to significant limitations of the categorical approach, including the high levels of diagnostic comorbidity heterogeneity within diagnostic categories, arbitrary diagnostic thresholds (1-5), temporal instability, and limited validity and clinical utility (6). In addition to these limitations, there was a substantial agreement among leading experts in pre-DSM-5 personality disorder PD meetings on the fact that DSM-5 should include a dimensional system for diagnosing personality pathology (7). Thus, 18 alternative dimensional models were proposed (8). Widiger and Simonsen (8) believed that most of these alternative models could be integrated within a common hierarchical structure. Therefore, by reviewing the existing models, the personality and personality disorders work group for DSM-5 proposed a hybrid dimensional-categorical model that was finally placed in Section III of

DSM-5 for further study. Personality disorders in the alternative DSM-5 model are diagnosed based on impairments in personality functioning (self and interpersonal), as well as 25 pathological personality traits. This model also includes a diagnosis of personality disorder-trait specified (PD-TS) that could be made when the criteria for a specific personality disorder are not fully met (9).

Krueger et al. (10) started with an initial list of 37 specific personality trait facets and six broad domains that were derived from literature reviews and workgroup discussions. Self-report items were then created to assess these 37 traits. Data were collected and analyzed, resulting in the initial 37 facets reducing to 25 facets. In addition, six broad domains were investigated using factor analysis, and five higher-order factors were obtained. Thus, 25 traits were organized into five domains: Negative affectivity, detachment, antagonism, disinhibition, and psychoticism. The personality and personality disorders work group proposed PID-5 for evaluating these traits.

Since the publication of PID-5, a considerable number

of studies have investigated its reliability and validity. For example, in an Italian sample, Fossati et al. (7) supported the factor structure of PID-5 and its ability to recover DSM-IV personality disorders. Roskam et al. (11) corroborated the five-factor and hierarchical structure of the French version of PID-5. Furthermore, in a clinical sample, a study (3) reported adequate internal consistency and good convergence between PID-5 and several self-report scales. Zimmermann et al. (12) replicated the PID-5 higher-order domain structure and convergent associations between the DSM-5 trait domains and the five-factor model in a sample of German students and psychiatric inpatients. Bastiaens et al. (13) confirmed the original five-factor structure of PID-5 and showed that the Flemish version had convergent and discriminant validity in clinical samples. Gutierrez et al. (14) showed that in the Spanish version of PID-5, facet scales had good internal consistency and were unidimensional under exploratory and confirmatory approaches. In Iranian samples, Soraya et al. (15) demonstrated that the Persian version of PID-5 has acceptable construct validity. Kamalzadeh et al. (16) and Amini et al. (17) also showed that PID-5 has good reliability and internal consistency.

2. Objectives

There are limited studies that have investigated the psychometric properties of PID-5 in other linguistic or cultural contexts, especially in clinical samples. Therefore, the first objective of this study was to assess the reliability of the Iranian version of the PID-5 self-report form using internal consistency and test-retest methods. The second objective was to investigate the factor structure of Iranian PID-5 in a psychiatric patient sample. The third objective was to examine the associations between PID-5 domains and TCI-R domains. Finally, we aimed to explore the differences in the PID-5 domain scores according to gender.

3. Methods

3.1. Participants

This study had a cross-sectional design. From all patients admitted to the Roozbeh Psychiatric Hospital from October 2016 to April 2017, 400 patients were selected by convenience sampling. Although there is no general agreement on the sample size required for factor analysis and structural models, many researchers admit the minimum sample size of 200 (18). The inclusion criteria were at least 18 years of age, reading and writing ability, and consent for participation in the study. The exclusion criteria were the presence of cognitive disorders, severe psychiatry disorders as psychotic or manic, and the presence of physical

disorders that impaired a person's mental status. Patients with these disorders were identified based on their medical files and excluded from the study.

The researcher was referred to the hospital clinic every day. After explaining the study purpose to each patient and assuring the confidentiality of information, she asked for participation in the study. Finally, 470 patients with different diagnoses (most commonly, mood and anxiety disorders) agreed to take part in this research.

They completed the PID-5 while waiting for their appointments. Of them, 400 participants returned questionnaires without missing data, but 70 participants were removed due to invalid data or failure to meet the criteria. Among them, 144 agreed to complete the temperament and character inventory-revised (TCI-R). In addition, 50 participants were randomly selected to complete the PID-5 after four weeks again to assess the test-retest reliability.

This research was confirmed by code IR.TUMS.MEDICINE.REC.1396.3962 in the Ethics Committee of Tehran University of Medical Sciences.

3.2. Measures

Personality Inventory for DSM-5 (PID-5). The PID-5 is a 220-item questionnaire that assesses 25 primary facet scales organized in negative affectivity, detachment, antagonism, disinhibition, and psychoticism domains. In this questionnaire, responses are scored on a 4-point Likert-type scale ranging from 0 to 3. Krueger et al. (10) reported the internal consistency of the domains ranging from 0.73 to 0.95 with an average of 0.86. For the Persian version, Amini et al. (17) obtained alpha coefficients ranging from 0.71 to 0.84 for domains and 0.50 to 0.82 for facets. Kamalzadeh et al. (16) reported the internal consistency of the facets ranging from 0.46 to 0.94.

After obtaining official permission from the American Psychiatric Association (APA), the author translated the PID-5 into Persian. Then, after correction, this version was back-translated into English by a bilingual translator. Finally, the translated version was compared with the original version, and discrepancies were resolved.

Temperament and character inventory-revised (TCI-R). The TCI-R is a 240-item inventory that includes two parts of temperament (novelty seeking, reward dependence, harm avoidance, and persistence dimensions) and character (self-directedness, cooperativeness, and self-transcendence dimensions). This questionnaire is scored on a 5-point Likert scale ranging from 0 to 5. In this study, we used a short form of TCI: TCI-140. Vepesa et al. (19) reported good internal consistency of the scales: HA = 0.84, RD = 0.70, SD = 0.86, C = 0.75, ST = 0.83, and NS = 0.60, with Cronbach's alpha coefficients ranging from 0.14 to

0.79 for facets. Hajirezaei et al. (20) validated TCI-140 on psychiatric patients and reported acceptable internal consistency, convergent validity, and predictive validity.

3.3. Statistical Analysis

To evaluate the internal consistency of the PID-5, Cronbach's alpha coefficient was calculated. We computed correlations between the test and retest scores to assess the temporal consistency of the PID-5. To evaluate the factor structure, we conducted confirmatory factor analysis (CFA). The fit of the model was assessed using three common fit indices: Comparative fit index (CFI), Tucker Lewis index (TLI), and root mean square error of approximation (RMSEA). To test the convergent validity, we investigated correlations between the PID-5 domains and TCI-R domains. The independent t-test was used to examine the higher-order domain score differences according to gender.

4. Results

The demographic information of the participants is shown in Table 1.

Table 1. Demographic Information

Categories	Frequency (%)
Gender	
Male	155 (38.8)
Female	245 (61.2)
Age	
18 - 30	235 (58.8)
31 - 40	107 (26.8)
41 - 50	43 (10.8)
51 - 60	12 (3)
61 - 70	3 (0.8)
Marital status	
Single	228 (57)
Married	165 (41.25)
Divorced	7 (1.75)

Finally, 400 patients were evaluated in this study. Of them, 245 were females, and 155 were males. They ranged in age from 18 to 63 years and were predominantly single (57%).

Acceptable internal consistency reliability was obtained for the PID-5 domains and facets. The mean, standard deviation, alpha values, and retest coefficients of PID-5 are shown in Table 2. Cronbach's alpha ranged from 0.89

to 0.96 for domains and 0.42 to 0.94, with a median value of 0.79, for facets.

Table 2. Descriptive Statistics and Reliability Coefficients of PID-5 Domains and Facets

	Mean \pm SD	α	Retest Coefficients
Negative affectivity	1.55 \pm 0.54	0.88	0.91
Detachment	1.17 \pm 0.57	0.91	0.89
Antagonism	0.85 \pm 0.43	0.84	0.89
Disinhibition	1.27 \pm 0.56	0.90	0.94
Psychoticism	0.87 \pm 0.56	0.94	0.96
Anhedonia	1.36 \pm 0.7	0.83	0.91
Anxiousness	1.7 \pm 0.73	0.88	0.90
Attention seeking	1.74 \pm 0.75	0.91	0.91
Callousness	0.47 \pm 0.4	0.77	0.91
Deceitfulness	0.69 \pm 0.54	0.81	0.93
Depressivity	1.19 \pm 0.74	0.91	0.94
Distractibility	1.52 \pm 0.77	0.9	0.90
Eccentricity	1.01 \pm 0.77	0.94	0.95
Emotional lability	1.58 \pm 0.69	0.82	0.84
Grandiosity	1.26 \pm 0.53	0.58	0.79
Hostility	1.41 \pm 0.62	0.82	0.86
Impulsivity	1.33 \pm 0.78	0.86	0.91
Intimacy avoidance	0.82 \pm 0.72	0.81	0.89
Irresponsibility	0.97 \pm 0.52	0.63	0.89
Manipulativeness	0.59 \pm 0.56	0.7	0.78
Perceptual dysregulation	0.86 \pm 0.56	0.82	0.93
Perseveration	1.35 \pm 0.6	0.79	0.85
Restricted affectivity	1.29 \pm 0.59	0.71	0.76
Rigid perfectionism	1.58 \pm 0.61	0.81	0.89
Risk-taking	1 \pm 0.65	0.89	0.95
Separation Insecurity	1.36 \pm 0.69	0.77	0.9
Submissiveness	1.63 \pm 0.67	0.75	0.86
Suspiciousness	1.36 \pm 0.45	0.42	0.76
Unusual Beliefs and Perceptions	0.75 \pm 0.58	0.75	0.91
Withdrawal	1.33 \pm 0.65	0.87	0.89

As presented in Table 2, all domain and facet scales demonstrated retest coefficients greater than 0.76.

For the higher-order domain scales, the fit indices indicated that the fit of the five-factor model was nearly acceptable ($df = 5$, $\chi^2 = 87.88$, CFI = 0.91, TLI = 0.82, RMSEA = 0.2). Based on modification indices (error covariance), the model showed an adequate fit (Table 3). Standardized regression coefficients equaled 0.84 for negative affectivity,

0.62 for detachment, 0.54 for antagonism, 0.84 for disinhibition, and 0.85 for psychoticism. These results show that the model had an acceptable fit.

The convergent validity was examined by the associations between PID-5 and TCI-R domain scores, the results of which are shown in [Table 4](#).

Negative affectivity was correlated highly with harm avoidance and self-directedness. Detachment was highly associated with harm avoidance and moderately with other domains, except for novelty-seeking. Antagonism was correlated significantly with all TCI-R domains, except for reward dependence and persistence. Disinhibition was correlated substantially with the domains of TCI-R, Except for reward dependence and self-transcendence. Psychoticism was significantly associated with novelty-seeking, self-directedness, cooperativeness, and self-transcendence. Regarding the correlation coefficients between the two questionnaires, it seemed that the questionnaire had good validity.

To compare the scores of males and females in the PID-5 domains, the independent *t*-test was used. The results are presented in [Table 5](#).

Females scored significantly higher than males in negative affectivity, whereas males exhibited significantly higher scores on antagonism and psychoticism than females. Gender showed no significant differences in detachment and disinhibition.

5. Discussion

The present study investigated the psychometric properties of the Persian version of PID-5 in a clinical sample. One of the goals of this study was to assess the reliability of the PID-5. Cronbach's alpha and test-retest were used for this purpose. All PID-5 domain and facet scales demonstrated adequate internal consistency, with exception of the facet of suspiciousness that showed alpha values lower than 0.50. Previous studies ([14](#), [16](#), [17](#), [21](#), [22](#)) have reported this facet to be more unreliable than other facets. This may be due to the small number of items in this facet. Consistent with previous findings ([7](#), [10](#), [12](#), [16](#), [23](#), [24](#)), eccentricity was the facet with the highest alpha values, and the lowest alpha value was observed for the facet of suspiciousness.

In line with Dhillon and Bagby ([25](#)), Wright et al. ([26](#)), and Kamalzadeh et al. ([16](#)) findings, in our study, the retest coefficients at four weeks suggested that all PID-5 domain and facet scales were stable over time. Also, in test-retest reliability, like internal consistency, eccentricity showed the highest retest coefficient, and suspiciousness had the lowest retest coefficient.

To assess the validity of the PID-5, the factor structure and convergent validity were evaluated. Confirmatory

factor analysis (using the five domains) indicated a good model fit. In this regard, CFI and TLI with values above 0.95 refer to a good model fit ([27](#)), and RMSEA with values below 0.10 refer to an acceptable model fit. In this study, CFI and TLI values were greater than 0.95, and RMSEA was 0.4. Therefore, the results of CFA supported the original structure of PID-5 as reported by Krueger et al. ([10](#)). The theoretical model with error covariance between the domains showed good fit indices and standardized regression coefficients were adequate. The five-factor structure of the PID-5 has been confirmed in different studies ([7](#), [11](#), [12](#), [23](#), [28](#)).

Our study is the first to examine the association between PID-5 domains and TCI-R domains. The results demonstrate that negative affectivity was positively related to harm avoidance and reward dependence. Detachment had a positive relationship with harm avoidance and a negative relationship with reward dependence. The person who obtains high scorers on harm avoidance is pessimistic, fearful, shy, and fatigable. Detachment is related to characteristics such as sentimental, open, warm, and sympathetic ([29](#)). Also, antagonism was correlated positively with novelty-seeking and self-transcendence and negatively with harm avoidance. As novelty-seeking is the tendency to exploratory, impulsive, and extravagant activities ([29](#)), the positive relationships of antagonism, disinhibition, and psychoticism with novelty-seeking are defensible. As the five domains of PID-5 measure the maladaptive personality traits, there is a negative relationship between the five domains and persistence, self-directedness, cooperativeness, and self-transcendence. Associations between PID-5 domains and TCI-R domains support the convergent validity of the scale.

Concerning the differences in the PID-5 domain scores according to gender, the results showed that gender had a significant effect on three dimensions of PID-5. Specifically, negative affectivity scores were higher in women whereas men exhibited higher scores on antagonism and psychoticism. Detachment and disinhibition did not differ between the two groups. Bastiaens et al. ([13](#)) reported that females scored significantly higher than males on negative affectivity and disinhibition although antagonism is significantly higher in men. No significant gender differences were found for detachment and psychoticism. Concerning these results, earlier findings reported that women were more anxious than men, on average, and several epidemiological studies have reported a greater prevalence of anxiety disorders among women ([30](#), [31](#)). Also, the findings on gender differences in agreeableness ([32](#)) showed females to be more agreeable than men.

The findings demonstrated that the Persian version of PID-5 had good reliability and validity in clinical samples, and it can be used as a new tool for diagnosing and re-

Table 3. Fit Indices for the PID-5 Domains

Fit Indices	df	χ^2	CFI	TLI	RMSEA
Value	2	3.27	0.99	0.99	0.04

Table 4. Correlations Between PID-5 and TCI-R Domain Scores

	Negative Affectivity	Detachment	Antagonism	Disinhibition	Psychoticism
Novelty-seeking	0.15	-0.14	0.29 ^a	0.42 ^a	0.25 ^a
Harm avoidance	0.5 ^a	0.53 ^a	-0.19 ^b	0.38 ^a	0.16
Reward dependence	0.28 ^a	-0.48 ^a	0.1	0.1	-0.02
Persistence	-0.21 ^a	-0.31 ^a	0.06	-0.36 ^a	0.02
Self-directedness	-0.6 ^a	-0.46 ^a	-0.16 ^b	-0.65 ^a	-0.47 ^a
Cooperativeness	-0.18 ^b	-0.3 ^a	-0.37 ^a	-0.36 ^a	-0.31 ^a
Self-transcendence	-0.07	-0.25 ^a	0.19 ^b	-0.004	0.22 ^a

^aCorrelation is significant at the 0.01 level.

^bCorrelation is significant at the 0.05 level.

Table 5. Independent *t*-test to Compare the Scores of Males and Females

Domain	Male, Mean \pm SD	Female, Mean \pm SD	t	Sig.
Negative affectivity	1.45 \pm 0.56	1.61 \pm 0.53	-2.94	0.003
Detachment	1.19 \pm 0.62	1.16 \pm 0.54	0.47	0.63
Antagonism	0.93 \pm 0.45	0.79 \pm 0.40	3.23	0.001
Disinhibition	1.32 \pm 0.59	1.24 \pm 0.54	1.25	0.21
Psychoticism	0.97 \pm 0.59	0.81 \pm 0.53	2.78	0.006

searching personality disorders based on the dimensional model.

5.1. Limitations

The study had several limitations. First, sampling from one hospital limited the generalizability of our findings. Second, the sample included all psychiatric disorders, and personality disorders were not considered separately. Future research should replicate findings in extensive samples and especially focus on patients with personality disorders. Finally, because of the limited sample size, our factor analysis was performed on the PID-5 higher-order domains. Future research can examine factor structures based on facets and items.

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Footnotes

Authors' Contribution: Study concept and design: Abolfazl Mohammadi and Zahra Shojaei. Acquisition of data: Zahra Shojaei. Analysis and interpretation of data: zahra shojaei and mohamad zarei. Drafting of the manuscript: Zahra Shojaei and mohamad zarei. Critical revision of the manuscript for important intellectual content: Abolfazl Mohammadi. Statistical analysis: Zahra Shojaei and mohamad zarei. Study supervision: Abolfazl Mohammadi.

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