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A Meta-Analysis of the Structural Validity of Original and Brief Versions of the Personality Inventory for DSM-5 in Iran

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Abstract

Objective: The Personality Inventory for DSM-5 (PID-5) is a widely used scale to evaluate the dimensional constructs of two trait models proposed by the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) and the International Classification of Diseases (ICD-11). The present meta-analysis first aimed to examine the factor structure, reliability, and congruence coefficients of the Persian version of the PID-5 to assess both trait models. The second aim was to evaluate the factor structure and reliability of the Persian version of the Personality Inventory for DSM-5-Brief Form (PID-5-BF).
Method: A systematic search was conducted in PubMed, Magiran, and SID to find records in English and Farsi from January 2013 to December 2023. According to the PRISMA, data from nine medium- to high-quality reports including 7,608 participants were analyzed using the random-effects method. Quality of studies, heterogeneity, and publication bias were reported.
Results: The five-factor structure of the PID-5 to measure both trait models was supported by the pooled estimates of factor loadings. The alpha coefficient median for the DSM-5 model was 0.83 (range: 0.82-0.90), and the congruence coefficient median was .91 (range: 0.80-0.97). The ICD-11 alpha median was .78 (range: 0.68-0.91), and congruency median was 0.90 (range: 0.71-0.96). The factor loadings for negative affectivity, detachment, antagonism, disinhibition, and psychoticism on the PID-5-BF were 0.44-0.69, 0.38-0.67, 0.46-0.72, 0.42-0.70, and 0.44-0.76, respectively, and the alpha median was 0.73 (range: 0.65-0.76).
Conclusion: Since both the original and brief versions of the PID-5 are valid and strongly similar to international structures, the clinical and research applications of these questionnaires are recommended to mental health professionals in Iran.

Key words: *Meta-Analysis; Personality Assessment; Personality Disorders; Psychometrics; Validity and Reliability*

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The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) and the International Classification of Diseases (ICD-11) are pivotal frameworks in the diagnosis of personality pathology to provide standardized criteria and definitions for diagnosing different disorders, allowing clinicians to communicate effectively and consistently (1). Both systems historically and clinically contribute to the dimensional assessment of personality by expanding measurement approaches, bipolar measurement of the normal-abnormal spectrum of personality, improving clinical utility, cross-cultural universality, and de-stigmatizing as a result of categorical diagnosis (2).

Recently, the DSM-5 and ICD-11 have provided two transdiagnostic frameworks that work in relative parallel for diagnosing personality pathology using a dimensional approach (3, 4). Both models assess personality dysfunction (i.e., severity of personality pathology) and maladaptive traits (i.e., type of personality disorder) (5, 6). The trait model by the DSM-5 introduced 25 maladaptive facets/traits used to evaluate five personality constructs including antagonism, psychoticism, disinhibition, detachment, and negative affectivity (7). The proposed structure closely resembles the trait model by the ICD-11, comprising five maladaptive domains: dissociality, anankastia, disinhibition, detachment, and negative affectivity (8, 9). Both assess personality pathology dimensionally, overcoming limitations of the categorical approach such as high comorbidity and low specificity by moving away from a binary (present or absent) approach to diagnosis and instead measuring mental health on a spectrum (10, 11). This allows for a more nuanced understanding of individual experiences and can help to reduce the overlap between diagnoses.

However, the personality models of the DSM-5 and ICD-11 differ in a few ways despite their many similarities (6). In more detail, psychoticism and anankastia are completely independent domains that differentiate the trait models (9). This issue may affect the diagnosis of the type of personality pathology because the DSM-5 psychoticism is used to diagnose a schizotypal personality disorder, while the ICD-11 anankastia is a necessary construct to diagnose obsessive-compulsive personality disorder. Other differences include the use of a severity level and a borderline pattern qualifier in the ICD-11 model (12). Therefore, a comparative analysis of the DSM-5 and ICD-11 frameworks is necessary to understand their similarities and differences, which can help evaluate the reliability and validity, improve diagnostic accuracy, enhance treatment approaches, improve cross-cultural understanding, promote research and development, and facilitate international collaboration (12).

The constructs of both the trait models by the DSM-5 and ICD-11 can be conceptualized as higher-order elements of personality in a hierarchical-dimensional structure that may be assessed by some self-administered inventories (6, 13, 14). Self-report scales that are used to evaluate the constructs of the trait model by the ICD-11 include the 60-item Personality Inventory for ICD-11 (15), the 121-item Five-Factor Personality Inventory for ICD-11 (16), and the 40-item measure for the Personality Assessment Schedule (17). Various validation studies have confirmed the psychometric properties of all these measures (15-17). The elements of the DSM-5 model, however, are mainly assessed by different versions of the Personality Inventory for DSM-5 (PID-5), including the original (220 items), short (PID-5-SF: one hundred items), and brief (PID-5-BF: twenty-five items) versions (7, 18, 19). The PID-5 versions are the most widely used scales to evaluate the DSM-5 model because they measure both 25 maladaptive traits and five higher-order domains. Their psychometric properties are also confirmed across cultures, which is effective in the generalizability of findings in the international context (20-23). Recently, some studies tried to use the PID-5 to harmonize the constructs of these trait models (8, 24). Other studies developed shorter scales adapted from the PID-5 to assess the constructs of both the DSM-5 and ICD-11 models (25, 26). These measures are favored because of their rapid and simultaneous screening of two new model constructs, cost-effectiveness, and good psychometric properties. Therefore, the PID-5 versions are widely used scales for evaluating the constructs of both models.

In the last decade, many studies aimed to validate the PID-5 in different regions of the world such as the United States (27), Canada (28), Germany, Austria, Switzerland (29), France, Belgium, Switzerland (30), Norway (31), Denmark (32), Spain (33), Portugal (34), Italy (35), Hungary (36), Romania (37), Brazil (38), China (39), Indonesia (40), Bahrain, Kuwait, Qatar (41), the United Arab Emirates (42), and Iran (43, 44). These studies mostly supported the validity of the PID-5 across cultures. The regional studies are crucial for validating the PID-5 across various cultures, as they allow researchers to assess the instrument's reliability, validity, and generalizability in different contexts. By comparing PID-5 scores across diverse regions, researchers were able to understand how cultural factors might influence personality trait expression and identify potential cultural biases within the instrument. Subsequently, several reviews and meta-analyses have advanced our understanding of the good validity of PID-5 versions across cultures by combining and summarizing data from these regional studies (20-23). However, these reviews and meta-analyses did not include all studies conducted on Iranian populations, which are threatened by relatively heterogeneous results. The purpose of our study was to summarize this work in terms of the internal consistency of PID-5 scales, the fit of those tools to a five-factor dimensional model, and the congruence of that model across samples.

Current Study

Several studies have assessed the Farsi form of the PID-5 in Iran (43-50). All of these validation studies assessed the psychometric features of the 5-factor structure of the scale for the DSM-5 model using 25 maladaptive traits; three studies also reported the psychometrics of the 5-factor structure for the ICD-11 model using 16 maladaptive traits (43, 44, 50). Regarding the psychometric features of the PID-5-BF, two studies consisting of three samples examined these issues in clinical and community samples (46, 51), while only one study reported the psychometric features of the PID-5-SF in Iranian adolescents (46). Although these reports provide some data for the validity and applicability of different versions of the PID-5 in Iran, there are some research gaps including heterogeneous data (some problems with disinhibition as an independent factor) for the 5-factor structure of the PID-5 to measure the DSM-5 model, lack of access to pooled estimates for PID-5 factor loadings to measure the ICD-11 model, heterogeneous alpha coefficients for the maladaptive traits measured by the PID-5 and the domain scales assessed by the PID-5-BF, and very few data for congruency coefficients or similarity degree with international reports. Additionally, two of the four international reviews (21, 22) included one validation study of the Persian version of the PID-5 (44), ignoring other studies conducted in the context of Iran. This has to do with the number of reports published after those review studies and the fact that they only included studies published in English. These international review studies have other limitations as well. Firstly, none reported the factor structure of the PID-5 to measure the ICD-11 model, which was the target of several studies (8, 24, 43, 44, 50). Secondly, only one review study reported the psychometric features of the PID-5-SF and PID-5-BF, and it did not include a meta-analysis of pooled estimates (21).

The current meta-analytic study aims to address these limitations, except for estimating the 5-factor structural pattern of the PID-5-SF due to limited data. The present meta-analysis had three objectives: First, we aimed to calculate pooled estimates of factor loadings for the five factors (negative affectivity, detachment, antagonism, disinhibition, and psychoticism by 25 maladaptive traits) of the DSM-5 model measured by the PID-5. We also estimated Cronbach's alpha coefficients of both factors and traits, as well as the degree of similarity of the five factors with data reported by international studies (7, 22) using congruency coefficients. Second, we aimed to calculate pooled estimates of factor loadings for the five factors (negative affectivity, detachment, dissociality, disinhibition, and anankastia by 16 maladaptive traits) of the ICD-11 model measured by the PID-5. We also estimated Cronbach's alpha coefficients for all factors, as well as the degree of similarity of the five factors with data reported by international studies (8, 24) using congruency coefficients. Third, we aimed to calculate pooled estimates of factor loadings for the five factors (negative affectivity, detachment, antagonism, disinhibition, and psychoticism by 25 individual items) of the DSM-5 model measured by the PID-5-BF. We also estimated Cronbach's alpha coefficients for all factors.

Materials and Methods

The current meta-analysis, which was pre-registered in PROSPERO, complies with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist (52). The process involved identifying sources and databases, strategies for systematic searches, criteria for the selection of records, article quality assessment, data extraction, and synthesis of data.

Source and Database

All Persian and English articles published between January 2013 and December 2023 were entered into our meta-analysis. Scientific records indexed in PubMed (k = 7), Magiran (k = 129), and SID (k = 201) were systematically searched. We chose PubMed because it is one of the main databases for searching records in the field of biomedical literature. We also used the two national databases that comprehensively cover medical and behavioral science records in Farsi. Additionally, a manual search of references yielded six more records, bringing the total = 343.

Search Strategies

The more suitable keywords for searches were determined based on the research literature. The systematic searches in the title/abstract were conducted using the selected keywords list. The keywords used to search for articles were as follows: [*"Personality Inventory for DSM-5"* OR *"Personality Inventory for DSM-5-Brief Form"* OR *"PID-5"* OR *"PID-5-BF"*] (AND) [*"psychometrics"* OR *"validity"* OR *"reliability*" OR *"factor structure"* OR *"internal consistency"*] (AND) [*"Persian"* OR *"Farsi"* OR *"Iran"*]. We used the Boolean operators "OR" and "AND." We searched the Persian translations/equivalents of the keywords in the national databases of Iran (i.e., Magiran and SID). We left out the keywords “Persian,” “Farsi,” and “Iran” to search in the national databases. We did not use any filters to search three databases and all databases were searched on February 1, 2024.

Inclusion Criteria for Studies

All English and Farsi original articles published in an academic journal involving subjects aged 12 and above were included in the systematic review (k = 343). We applied multiple exclusion criteria to access more pure data and reduce the risk of bias. These criteria included duplication (when a single record appears in several databases), the irrelevance of research content or study design (RCTs, for example, do not focus on psychometrics), lack of original data (meta-analyses and

reviews, for example, use data from original studies), lack of full text (abstracts do not provide all data for calculating effect sizes), animal samples, unreported psychometrics (because they are essential data for our research purposes), and low-quality reporting (due to their contribution in increasing the risk of bias). Therefore, the following studies were excluded from the analysis: a) duplicate documents (k = 96); b) records not related to the PID-5 and PID-5-BF (excluded k = 114); c) books, chapters, abstracts, theses, unpublished evidence, reviews and meta-analyses, records with inappropriate design such as longitudinal and interventional studies (k = 38); d) studies not assessing the psychometric properties of the scales (k = 67); e) abstracts without full-text (k = 4); f) records without a human sample (k = 11); g) studies with duplicate samples (k = 1); h) studies that did not report factor loadings for the PID-5 or the PID-5-BF (k = 3); and i) low-quality reports with a cut-off point of ≤ 7 (k = 0). Consequently, the present meta-analysis included 9 studies. Diagram 1 presents the selection process of the studies.

Study Quality Evaluation

Using the checklist for the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE; Table S1), the first author and one of his Iranian institutional colleagues independently estimated the quality of the identified scientific reports. The quality of various types of observational studies, including cohort, case-control, and cross-sectional studies, is evaluated using this 22-item checklist (each item has one point and the total score is between 0 and 22). The STROBE is designed to improve the quality and clarity of observational research, making it easier for readers to understand the study's methods, results, and conclusions (53). Studies are categorized as low-quality (score from 0 to 7), medium-quality (score from 8 to 14), and high-quality (score from 15 to 22) reports according to a previous document (54). Therefore, we considered a cut-off score of ≤ 7 to identify and exclude low-quality studies to avoid increasing the risk of biased pooled estimates (but no studies were excluded for this reason; see Table S2). The two researchers had a discussion to settle their disagreement regarding the final quality score of each study. If they did not reach an agreement, the disagreement was resolved by discussion with a third party.

Data Extraction

The specific criteria for categorization depend on the research question and the type of individual studies including study design, population characteristics, outcome measures, intervention or exposure, and data tabulation method. Categorizing studies based on their data tabulation methods is one key aspect of reviews, which helps to ensure the review's comprehensiveness and reliability. By the PICO framework (55), we summarized the relevant collected data in a data extraction table adapted from previous reviews (20, 22, 54). Following an evaluation of the chosen studies' quality, each study's data set was coded. Since the data synthesis required tabulation and full explanations of methods and findings for each study, the selected studies were arranged according to the study year, the location of the data collection, the sample features (e.g., sample size, subjects' average age, and gender distribution), the study's design, data collection strategies, statistical techniques, results, methodological limitations, and the quality assessment score. Some methodological constraints were extracted from the original reports included in the meta-analysis, and others were identified through exploration by the research team.

Synthesis of Data and Analytic Plan

We used several meta-analyses to compute pooled standardized factor loadings (e.g., effect sizes). The pooled factor loadings were computed for (a) all 25 traits of the PID-5 on 5-factor structural pattern of the DSM-5 model including antagonism, psychoticism, detachment, disinhibition, and negative affectivity; (b) all 16 traits of the PID-5 on 5-factor structural pattern of the ICD-11 model including dissociality, anankastia, disinhibition, detachment, and negative affectivity; (c) all 25 items of the PID-5-BF on 5-factor structural pattern of the DSM-5 model. Based on the sample size and correlation coefficients between the personality facets/items and latent factors, the chosen studies were combined. To interpret the results more easily (56), the effect sizes for factor loadings were classified as follows: small (≥ 0.10), medium (≥ 0.30), large (≥ 0.50), and very large (≥ 0.70). This analytic approach was also used to compute pooled internal consistency (Cronbach's alpha) for all domains, facets, and items. The reliability of the scale was acceptable if internal consistency (i.e., α) was equal to or above 0.70 (57). Each meta-analysis's effect sizes were determined by the Fisher z-transformation of correlation coefficients. To make the results easier to interpret, the z-transformed correlations were back-transformed to the original level of correlations. The Fisher z-transformation converts a Pearson correlation coefficient into a normally distributed value. This transformation is often used for statistical analysis, such as calculating confidence intervals or performing hypothesis tests. To get back to the original level of correlation, it is needed to apply the inverse transformation, which is the hyperbolic tangent function. This process is known as back-transformation.

We employed the I^2 statistics for a 95% confidence interval to estimate the heterogeneity of the research reports. The random-effects method was used to compute pooled estimates of the correlations for all traits and items because of the high level of heterogeneity across the measures. A random-effects model acknowledges that the effect size may vary across studies and accounts for this variation. This means a random-effects model gives more weight to studies with smaller sample sizes and less precise estimates of the

effect size (58). At the end, Egger's test was employed to identify publication bias. Publication bias occurs when research findings are more likely to be published if they show statistically significant results. This can lead to an inaccurate representation of the true effects of associations because negative or inconclusive results are less likely to be published. The second version of the Comprehensive Meta-Analysis (CMA-2) software was used for all analyses and two-tailed $p \leq 0.05$ was considered for statistical significance.

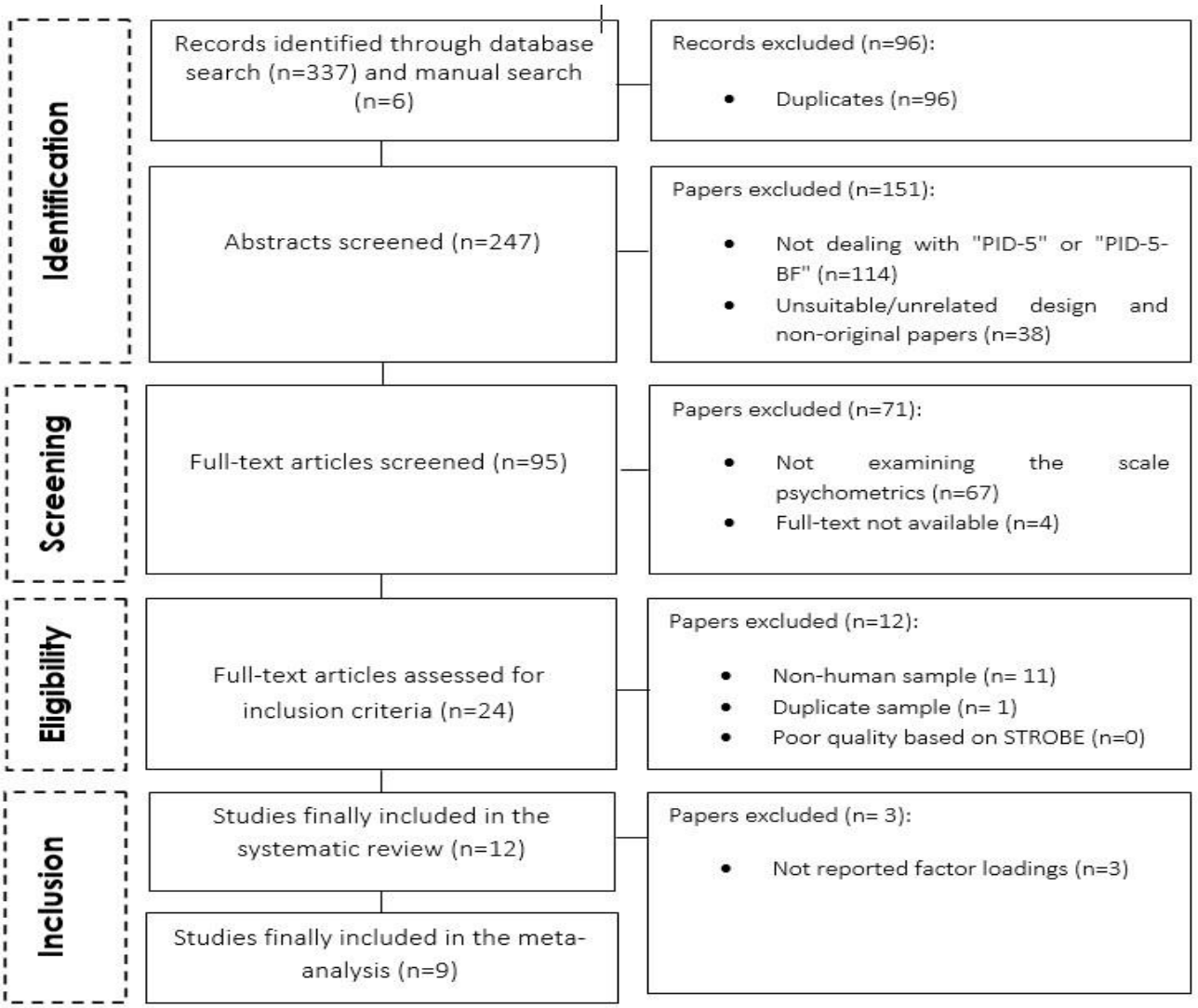

Diagram 1. The Study Selection Process Based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)

We also reported the similarity of all pooled standardized factor loadings for the domain scales of both the DSM-5 and ICD-11 models with international studies (7, 8, 22, 24). This is important because it ensures that the results of the research are not overly influenced by methodological biases or cultural differences. Tucker's congruence coefficients which range from −1 to +1 were used to evaluate the similarity level between the pooled standardized factor loadings and factor loadings reported by some previous studies. It measures the degree of agreement between the loadings of two-factor analyses whereas a higher coefficient indicates greater similarity between the two factors. In the present study, similarity was acceptable when the agreement coefficients were ≥ 0.85 (59). For congruency analyses, we used the free version of the Microsoft Excel spreadsheets of congruence coefficients for factor analysis (see https://www.stat-help.com/spreadsheets.html).

Ethical Consideration

Not applicable. The study protocol was preregistered in PROSPERO (CRD42024498144).

Results

In the first step, 343 scientific records were found through manual searches and systematic literature reviews. Finally, the meta-analysis contained 9 studies (13 independent samples) with 7,608 participants (7,204 adults and 404 adolescents). The average age of adults (55% female) and adolescents (54% female) were 31 and 15 years, respectively. The population of non-patients included 6,002 people while the number of psychiatric patients was 1,606. Table S2 displays the findings of the STROBE checklist-based quality assessment of the articles. One hundred percent of the individual studies were of medium or high quality. The quality of the research reports was between 12 and 17, the median and mean were 15 and 14.6, respectively. The structural patterns of the PID-5 and the PID-5-BF were evaluated by eight and two (three independent samples) studies, respectively. These investigations were carried out in Tehran, the center of Iran, (k = 3), Kermanshah and Kurdistan in the west of Iran (k = 3), and unspecific different regions of Iran (k = 3). We did not find studies from the northern, southern, and eastern regions of Iran, which suggests potential limitations in the generalizability of the present findings. Six studies included community residents or college students, and three included mixed samples (i.e., community and clinical cases). Although all individual studies reported factor loadings of five domains, the analytic methods used to extract the latent structural patterns of the PID-5 and the PID-5-BF were exploratory structural equation modeling (ESEM; k = 4), a combination of exploratory factor analysis (EFA) and confirmatory factor analysis (CFA; k = 1), CFA alone (k = 2), and EFA alone (k = 2). Table 1 indicates a summary of the research methods and findings.

Table 1. Data Extraction of the Psychometric Properties of the Persian Version of the PID-5 and PID-5-BF

Author (year)	Region and Samples	Design	Scale (Statistical Method)	Findings	Limitations (Score: Quality of Study)
Amini *et al*. (2019)*(45)	285 community adults from different regions (30.1 ± 8.3 years old, 66% female)	CS	PID-5 (CFA, Cronbach alpha)	The DSM-5 model: CFI = 0.90, NFI = 0.88, NNFI = 0.89, alpha between 0.52 (suspiciousness) & 0.90 (eccentricity)	Small sample size, lack of clinical samples, Failure to use EFA (15: high)
Amini *et al*. (2021)* (46)	404 community adolescents from Tehran (15.1 ± 1.5 years old, 54% female)	CS	PID-5, PID-5-SF, PID-5-BF (EFA, Cronbach alpha)	The DSM-5 model: EFA confirmed the five-factor structure of both the PID-5 & PID-5-BF, the PID-5 alpha between 0.66 (perseveration) & 0.93 (submissiveness), the PID-5-BF alpha between 0.63 (detachment) & 0.76 (psychoticism)	Small sample size, lack of clinical sample, Failure to use CFA (15: high)
Athar & Ebrahimi (2023) (51)	941 college students from different regions (28.4 ± 9.1 years old, 61% female), 178 clinical patients from Tehran (33.8 ± 10.6 years old, 100% male)	CS	PID-5-BF (CFA, Cronbach alpha)	The DSM-5 model: CFI = 0.94, TLI = 0.93, RMSEA = 0.07, alpha between 0.53 (antagonism) & 0.75 (psychoticism) for students, alpha between 0.65 (detachment) & 0.85 (antagonism) for patients	Failure to use EFA, clinical sample limited to the male group (15: high)

Ghamkharfa rd *et al*. (2023) (47)	695 community adults from Tehran (33.6 ± 9.7 years old, 62% female)	CS	PID-5 (ESEM, Cronbach alpha)	The DSM-5 model: CFI = 0.94, TLI = 0.91, RMSEA = 0.07, alpha between 0.54 (suspiciousness) & 0.93 (eccentricity)	Medium sample size, lack of clinical sample (12: medium)
Hemmati *el al*. (2021) (43)	2,444 college students from Kurdistan (27.2 ± 9.9 years old, 52% female), 376 clinical patients from Kurdistan (29.4 ± 7.6 years old, 30% female)	CS	PID-5-BF (EFA, CFA, Cronbach alpha)	The DSM-5 model: CFI = 0.96, TLI = 0.93, RMSEA = 0.06, the ICD-11 model: CFI = 0.98, TLI = 0.96, RMSEA = 0.05, alpha between 0.57 (suspiciousness) & 0.94 (eccentricity) in the full sample	(14: medium)
Komasi *el al*. (2023) (48)	1,007 community adults from Kermanshah and Sanandaj (33.6 ± 11.1 years old, 64% female), 257 clinical patients from Kermanshah and Sanandaj (34.3 ± 11.9 years old, 71% female)	CC	PID-5 (ESEM, Cronbach alpha)	The DSM-5 model: CFI = 0.96, TLI = 0.94, RMSEA = 0.06, alpha between 0.51 (suspiciousness) & 0.91 (eccentricity & depressivity) in the full sample	Clinical sample limited to patients with somatization (17: high)
Lotfi *et al*. (2018) (44)	285 community adults from different regions (30 ± 8.3 years old, 66% female)	CS	PID-5 (ESEM, Cronbach alpha)	The DSM-5 model: CFI = 0.93, TLI = 0.88, RMSEA = 0.07, the ICD-11 model: CFI = 0.97, TLI = 0.92, RMSEA = 0.07, alpha between 0.52 (suspiciousness) & 0.90 (eccentricity)	Small sample size, lack of clinical samples (14: medium)
Soraya *et al.* (2017)* (49)	114 college students and 103 clinical patients from Tehran (full sample: 28.1 ± 9.6 years old, 66% female)	CS	PID-5 (EFA, Cronbach alpha)	The DSM-5 model: EFA confirmed the five-factor structure of the PID-5, the alpha between 0.70 (suspiciousness) & 0.94 (eccentricity & depressivity)	Small sample size, Failure to use CFA (14: medium)
Vaysi *et al.* (2024) (50)	516 community adults from Kermanshah (31.6 ± 9.5 years old, 72% female)	CS	PID-5 (ESEM, Cronbach alpha)	The DSM-5 model: CFI = 0.96, TLI = 0.94, RMSEA = 0.06, the ICD-11 model: CFI = 0.98, TLI = 0.96, RMSEA = 0.05, alpha between 0.55 (suspiciousness) & 0.92 (eccentricity)	Medium sample size, lack of clinical sample (15: high)

Note 1: The articles marked with an asterisk are in the Persian language.
Note 2: The STROBE scoring for bias risk: a score between 0 and 7 is low-quality, a score between 8 and 14 is medium-quality, and a score of 15 and above is high-quality.
Abbreviations: DSM = Diagnostic and Statistical Manual of Mental Disorders, ICD = International Classification of Diseases, PID-5 = Personality Inventory for DSM-5, PID-5-BF = Personality Inventory for DSM-5-Brief Form, EFA = exploratory factor analysis, CFA = confirmatory factor analysis, ESEM = exploratory structural equation modeling, RMSEA = root mean square error of approximation, CFI = comparative fit index, TLI = Tucker-Lewis index, NFI = Normed Fit Index, NNFI = Non Normed Fit Index, CS = cross-sectional, CC = case-control

Table 2 shows the pooled estimates of factor loadings for the PID-5 to measure the DSM-5 model. As can be seen, all facets exhibited weak to moderate loadings on at least one factor. These factors include negative affectivity (9 facets: anxiousness, depressivity, separation insecurity, distractibility, submissiveness,

emotional liability, perseveration, impulsivity, and suspiciousness; all loadings ranging from 0.29 to 0.68), detachment (4 facets: withdrawal, restricted affectivity, intimacy avoidance, and anhedonia; all loadings ranging from 0.47 to 0.63), antagonism (7 facets: manipulativeness, grandiosity, attention seeking, deceitfulness, callousness, hostility, and rigid perfectionism; all loadings ranging from 0.22 to 0.50), disinhibition (1 facet: irresponsibility with a factor loading of 0.35), and psychoticism (4 facets: unusual beliefs and experiences, perceptual dysregulation, eccentricity, and risk-taking; all loadings ranging from 0.33 to 0.82). Some facets also moderately loaded on other factors (e.g., anhedonia and hostility on negative affectivity; impulsivity on disinhibition; and callousness on detachment). The disinhibition facets (e.g., distractibility and impulsivity) more strongly tended to load on negative affectivity. All factors are weakly to moderately correlated, ranging from 0.25 (between disinhibition and detachment) to 0.55 (between antagonism and psychoticism). The publication bias ($p \leq 0.05$ for Egger's statistic) and heterogeneity ($p \leq 0.05$ for I^2) were observed for about 10% and 98% of the PID-5 factor loadings (ESs), respectively.

Table 2 also shows the pooled estimates of alpha coefficients and the congruence of factor pattern coefficients with the international studies for the DSM-5 model (7, 22). The pooled estimates of internal consistency of items for antagonism (α = 0.82), psychoticism (α = 0.90), disinhibition (α = 0.84), detachment (α = 0.83), and negative affectivity (α = 0.83) were acceptable. Alpha coefficients for all facets were between 0.58 (suspiciousness) and 0.91 (depressivity and eccentricity), with the median and mean of 0.80 and 0.79, respectively. The median congruence coefficients were equal to 0.86, 0.91, 0.96, 0.88, and 0.95 for antagonism, psychoticism, disinhibition, detachment, and negative affectivity, respectively. The median for all similarity coefficients was equal to 0.91.

Table 2. Pooled Factor Loadings and Alpha Coefficients for the PID-5: The DSM-5 Trait Model (k = 8, N = 6,489)

Scales	NA	DT	AN	DI	PS	α
Anxiousness ^{NA}	**0.68**	0.09	0.02	0.15	0.11	0.86
Depressivity ^{DT}	**0.61**	**0.30**	–0.01	0.17	0.18	0.91
Separation insecurity ^{NA}	**0.58**	–0.09	0.20	0.13	0.09	0.81
Distractibility ^{DI}	**0.56**	0.15	0.13	0.25	0.14	0.85
Submissiveness ^{NA}	**0.50**	0.03	0.10	0.13	–0.01	0.71
Emotional liability ^{NA}	**0.49**	–0.09	0.17	0.23	0.22	0.78
Perseveration ^{NA}	**0.48**	0.18	0.08	0.05	0.20	0.78
Impulsivity ^{DI}	**0.42**	–0.03	0.20	**0.31**	0.21	0.82
Suspiciousness ^{DT}	0.29	0.19	0.16	0.12	0.15	0.58
Withdrawal ^{DT}	0.14	**0.63**	0.05	0.03	0.09	0.84
Restricted affectivity $^{NA-}$	–0.07	**0.63**	0.11	0.09	0.10	0.71
Intimacy avoidance ^{DT}	–0.03	**0.60**	–0.02	–0.02	0.10	0.71
Anhedonia ^{DT}	**0.43**	**0.47**	–0.02	0.14	0.06	0.81
Manipulativeness ^{AN}	–0.07	0.03	**0.67**	0.16	0.12	0.72
Grandiosity ^{AN}	–0.17	0.05	**0.66**	0.11	0.16	0.74
Attention seeking ^{AN}	0.27	–0.17	**0.60**	0.20	–0.04	0.82
Deceitfulness ^{AN}	0.13	0.04	**0.55**	0.24	0.19	0.80
Callousness ^{AN}	0.03	**0.33**	**0.42**	0.24	0.16	0.83
Hostility ^{NA}	**0.31**	0.18	**0.35**	0.26	–0.03	0.81
Rigid perfectionism $^{DI-}$	0.15	0.07	0.22	–0.11	0.12	0.80
Irresponsibility ^{DI}	0.28	0.15	0.25	**0.35**	0.15	0.75
Unusual beliefs ^{PS}	0.02	0.05	0.08	0.01	**0.82**	0.79
Perceptual dysregulation ^{PS}	**0.30**	0.10	0.06	0.10	**0.61**	0.85
Eccentricity ^{PS}	0.14	0.17	0.12	0.15	**0.57**	0.91
Risk-taking ^{DI}	–0.00	–0.08	0.28	0.27	**0.33**	0.79
α (k = 5, N = 3,164)	0.83	0.83	0.82	0.84	0.90	
Congruence coefficients						

Krueger *et al*. (2012)[US]	0.83	0.88	0.95	00.80	0.95	
Somma *et al*. (2019)[US]	0.86	0.91	0.97	0.88	0.94	
Somma *et al*., (2019)[non-US]	0.86	0.93	0.96	0.90	0.95	
Median	0.86	0.91	0.96	0.88	0.95	0.80
Mean	0.85	0.91	0.96	0.86	0.95	0.79
Intercorrelations (k = 5, N = 5,509)						
DT	0.38					
AN	0.38	0.28				
DI	0.28	0.25	0.32			
PS	0.43	0.49	0.55	0.44		

Note 1: Factor loadings ≥ 30 are highlighted.
Note 2: I^2 is significant for all except deceitfulness and grandiosity factor loadings on Detachment.
Note 3: Publication bias (Egger test) is significant for separation insecurity, grandiosity, irresponsibility, impulsivity, attention-seeking, perseveration, rigid perfectionism, risk-taking, and submissiveness on Disinhibition, impulsivity and callousness on Antagonism, and submissiveness on Negative Affectivity.
Abbreviation: NA = Negative Affectivity, DT = Detachment, AN = Antagonism, DI = Disinhibition, PS = Psychoticism, DSM = Diagnostic and Statistical Manual of Mental Disorders, PID-5 = Personality Inventory for DSM-5, US = United States.

Table 3 shows the pooled estimates of factor loadings for the PID-5 to measure the ICD-11 model. As can be seen, all facets moderately loaded on at least one factor of negative affectivity (3 facets: anxiousness, depressivity, and emotional liability; all loadings ranging from 0.37 to 0.84), detachment (3 facets: intimacy avoidance, withdrawal, and restricted affectivity; all loadings ranging from 0.59 to 0.68), dissociality (3 facets: callousness, manipulativeness, and grandiosity; all loadings ranging from 0.54 to 0.68), disinhibition (5 facets: impulsivity, distractibility, irresponsibility, risk-taking, and hostility; all loadings ranging from 0.38 to 0.65), and anankastia (2 facets: rigid perfectionism and perseveration; all loadings ranging from 0.45 to 0.68). Some facets also moderately loaded on other factors (e.g., emotional liability on disinhibition and anankastia, and grandiosity on anankastia). All factors are weakly to moderately correlated, ranging from 0.15 (between negative affectivity and dissociality) to 0.55 (between negative affectivity and disinhibition). The publication bias and heterogeneity were observed for about 3% and 73% of the PID-5 factor loadings (ESs), respectively.

Table 3 also shows the pooled estimates of alpha coefficients and the congruence of factor pattern coefficients with the international studies for the ICD-11 model (8, 24). Alpha coefficients for all facets were between 0.68 (intimacy avoidance and restricted affectivity) and 0.91 (depressivity), with the median and mean of 0.78 and 0.78, respectively. The medians of all congruence coefficients were equal to 0.95, 0.91, 0.90, 0.84, and 0.74 for detachment, disinhibition, dissociality, negative affectivity, and anankastia, respectively. The median for all similarity coefficients is equal to 0.90.

Table 3. Pooled Factor Loadings and Alpha Coefficients for the PID-5: The ICD-11 Trait Model (k = 2, N = 3,624)

Scales	NA	DT	DS	DI	AK	α
Anxiousness [NA]	**0.84**	–0.01	–0.02	–0.03	0.17	0.85
Depressivity [NA]	**0.63**	0.17	0.20	0.17	–0.07	0.91
Emotional liability [NA]	**0.37**	–0.14	0.07	**0.38**	**0.34**	0.75
Intimacy avoidance [DT]	–0.02	**0.68**	–0.01	–0.00	0.03	0.68
Withdrawal [DT]	0.18	**0.60**	0.13	0.02	0.11	0.83
Restricted affectivity [DT]	0.02	**0.59**	0.23	0.05	0.09	0.68
Callousness [DS]	0.02	0.29	**0.68**	0.28	–0.00	0.83
Manipulativeness [DS]	0.06	–0.02	**0.63**	0.07	0.15	0.68
Grandiosity [DS]	–0.06	0.04	**0.54**	–0.03	**0.54**	0.74
Impulsivity [DI]	0.14	0.03	0.14	**0.65**	–0.05	0.79
Distractibility [DI]	0.29	0.15	–0.06	**0.55**	0.11	0.85
Irresponsibility [DI]	0.14	0.18	**0.30**	**0.50**	–0.15	0.72
Risk-taking [DI]	–0.19	–0.13	0.29	**0.47**	0.06	0.76

Hostility [DS + NA]	0.15	0.13	0.13	**0.38**	0.26	0.82
Rigid perfectionism [AK]	0.10	0.17	0.02	–0.09	**0.68**	0.77
Perseveration [AK]	0.27	0.18	–0.05	**0.31**	**0.45**	0.79
Congruence coefficients						
Bach *et al.* (2017)[DK]	0.84	0.95	0.86	0.94	0.71	
Bach *et al*. (2017)[US]	0.89	0.95	0.92	0.91	0.96	
Sellbom *et al.* (2020)[CN]	0.83	0.94	0.90	0.81	0.74	
Median	0.84	0.95	0.90	0.91	0.74	0.78
Mean	0.85	0.95	0.89	0.89	0.80	0.78
Intercorrelations						
DT	0.39					
DS	0.15	0.26				
DI	0.55	0.32	0.47			
AK	0.41	0.23	0.21	0.28		

Note 1: Factor loadings ≥ 30 are highlighted.
Note 2: I^2 is significant for 58 out of 80 effect sizes of all factors.
Note 2: Publication bias (Egger test) is significant for depressivity on Negative Affectivity and for impulsivity on Detachment and Dissociality.
Abbreviation: NA = Negative Affectivity, DT = Detachment, DS = Dissociality, DI = Disinhibition, AK = Anankastia, ICD = International Classification of Diseases, PID-5 = Personality Inventory for DSM-5, DK = Denmark, US = United States, CN = Canada.

Table 4 indicates the pooled factor loadings and alpha coefficients for the PID-5-BF. As can be seen, all items moderately to strongly loaded on at least one factor of negative affectivity (5 items: 8, 9, 0, 11, and 15; all loadings ranging from 0.44 to 0.69), detachment (5 items: 4, 13, 14, 16, and 18; all loadings ranging from 0.38 to 0.67), antagonism (5 items: 17, 19, 20, 22, 25; all loadings ranging from 0.46 to 0.72), disinhibition (5 items: 1, 2, 3, 5, and 6; all loadings ranging from 0.42 to 0.70), and psychoticism (5 items: 7, 12, 21, 23, and 24; all loadings ranging from 0.44 to 0.76). Alpha coefficients for antagonism (α = 0.72), psychoticism (α = 0.76), disinhibition (α = 0.75), detachment (α = 0.65), and negative affectivity (α = 0.73) were acceptable. The publication bias and heterogeneity were observed for about 8% and 84% of the PID-5-BF factor loadings, respectively.

Table 4. Pooled Factor Loadings and Alpha Coefficients for the PID-5-BF (k = 3, N = 1,523)

Scale Items	NA	DT	AN	DI	PS
8 [NA]	**0.61**				
9 [NA]	**0.69**				
10 [NA]	**0.44**				
11 [NA]	**0.55**				
15 [NA]	**0.65**				
4 [DT]		**0.38**			
13 [DT]		**0.47**			
14 [DT]		**0.66**			
16 [DT]		**0.67**			
18 [DT]		**0.39**			
17 [AN]			**0.57**		
19 [AN]			**0.46**		
20 [AN]			**0.56**		

22 AN			**0.68**		
25 AN			**0.72**		
1 DI				**0.66**	
2 DI				**0.70**	
3 DI				**0.68**	
5 DI				**0.60**	
6 DI				**0.42**	
7 PS					**0.71**
12 PS					**0.44**
21 PS					**0.76**
23 PS					**0.61**
24 PS					**0.55**
Median	0.61	0.47	0.57	0.66	0.61
Mean	0.59	0.51	0.60	0.61	0.61
α	0.73	0.65	0.72	0.75	0.76

Note 1: Factor loadings ≥ 30 are highlighted.
Note 2: I^2 is significant for items 1-7, 9-11, 13-18, 20-22, 24, & 25.
Note 3: Publication bias (Egger test) is significant for items 8 & 22.
Abbreviation: NA = Negative Affectivity, DT = Detachment, AN = Antagonism, DI = Disinhibition, PS = Psychoticism, PID-5-BF = Personality Inventory for DSM-5-Brief Form.

Discussion

The present meta-analysis first aimed to explore the structural validity of the Farsi form of the PID-5 to measure recent trait models by the DSM-5 and ICD-11. Although the pooled estimates of factor loadings addressed the 5-factor structural pattern of the PID-5 to assess the ICD-11 model, the pooled factor loadings did not support disinhibition as an independent factor to measure the DSM-5 model. We hypothesize that the five latent factors are valid when multiple maladaptive traits load moderately on each factor. The pattern of correlations between maladaptive traits and five latent factors in the DSM-5 model indicate that most traits are moderately loaded on at least one of the factors. However, the pattern of correlations between maladaptive traits and the disinhibition factor was weak, except for irresponsibility. We believe that irresponsibility alone is not enough to form an independent factor, and since other disinhibited traits tend to load on negative affectivity, disinhibition scores in Iranian populations should be interpreted with caution. Regarding the ICD-11 model, the pattern of correlations between maladaptive traits and five latent factors showed that most traits are moderately to strongly loaded on at least one of the factors. As a result, it seems that the ICD-11 scoring algorithm is more suitable than the DSM-5 algorithm for the Iranian culture. However, the 5-factor structure to measure both trait models was supported by both the pooled estimates of alpha coefficients and the factor congruency with previous research reports (7, 8, 22, 24). The alpha and similarity medians for the DSM-5 model were 0.83 and 0.91 (higher than 0.70 and 0.85 which were our criteria), respectively. Also, the alpha and similarity medians for the ICD-11 model were 0.78 and 0.90 (again higher than our criteria), respectively. All pooled estimates are strongly valid because all reports included in the meta-analysis were of moderate- to high-quality reports and publication bias was minimal.

When the latent structure of the PID-5 was examined to assess facets/traits of the DSM-5 model, the results showed that all facets loaded well on at least one factor of negative affectivity (anxiousness, depressivity, separation insecurity, distractibility, submissiveness, emotional liability, perseveration, impulsivity, and suspiciousness), detachment (withdrawal, restricted affectivity, intimacy avoidance, and anhedonia), antagonism (manipulativeness, grandiosity, attention seeking, deceitfulness, callousness, hostility, and rigid perfectionism), disinhibition (irresponsibility), and psychoticism (unusual beliefs, perceptual dysregulation, eccentricity, and risk-taking). Except for disinhibition, all factor loadings were following the pattern reported by previous meta-analyses (22, 23). Some of the disinhibition facets more strongly tended to load on negative affectivity (i.e., distractibility and impulsivity) and psychoticism (i.e., risk-taking). While risk-taking was previously found to be interstitial between

antagonism, disinhibition, and even psychoticism (60), findings concerning cross-loadings of impulsivity and distractibility deviated substantially from previous meta-analyses. Therefore, our results do not support the Persian version of the PID-5 to evaluate disinhibition as an independent factor to measure the DSM-5 trait model. Although this finding is different from the results of cross-cultural studies (22, 23), it was not unexpected for us because previous studies in Iran pointed out the tendency of disinhibition to be conjoined to negative affectivity (43, 50). There may be some justification for this finding. Since impulsivity is considered a facet of neuroticism in other common models (61), disinhibition and negative affectivity share some features. At the same time, distractibility can be the result of rumination related to anxiousness, which is one of the core traits of negative affectivity. This structure pattern could be the result of cultural, language, or translation issues since distractibility and impulsivity in a Czech-speaking population also had a strong tendency to load on negative affectivity (62). Therefore, the differences in the factor structure of the PID-5 to measure the DSM-5 model may not be unique to the Persian version and reflect broader cultural trends. Anyway, Iran is a multi-ethnic country with different languages and dialects for local subcultures. Personalized translations are not available for these heterogeneous populations, which could inflate the degree of commonality between negative affectivity and disinhibition. Another possibility is the nature of the links between some features of negative affectivity and disinhibition. For example, the separation insecurity facet may be a driving factor behind the hybrid factor, as leaving it out in the ICD-11 rotation leads to more clearly separable negative affectivity and disinhibition factors. Therefore, separation insecurity in the Persian language/culture may have a differing nomological net which is associated more with distractibility and impulsivity facets. Considering that separation insecurity captures a main characteristic of borderline personality disorder, which in turn is linked to heightened scores on negative affectivity and disinhibition, future PD research may also investigate differences concerning the etiology and individual expression of borderline PD in the Persian culture. However, in line with the findings of earlier reviews and meta-analytic reports (20-23), we found that the pooled alpha coefficients for all factors and facets (except for suspiciousness) were acceptable, and the congruence of factor pattern coefficients with international studies was good. Compared to the factor intercorrelations reported by Somma *et al*. (22), the pattern of the factor intercorrelations of the present meta-analysis was somewhat stronger. Although Somma *et al.* (22) reported very weak negative correlations between negative affectivity and both antagonism and disinhibition, the direction of these correlations was positive and stronger in the present meta-analysis.

Our results showed that all PID-5 facets to measuring the ICD-11 model loaded well on at least one factor of negative affectivity (anxiousness, depressivity, and emotional liability), detachment (intimacy avoidance, withdrawal, and restricted affectivity), dissociality (callousness, manipulativeness, and grandiosity), disinhibition (impulsivity, distractibility, irresponsibility, risk-taking, and hostility), and anankastia (rigid perfectionism and perseveration). Some facets were also well-loaded on other factors (e.g., emotional liability on disinhibition and grandiosity on anankastia). The pooled alpha coefficients for all facets as well as the factor congruency (except for anankastia) were acceptable. Although we did not have access to any previous meta-analysis to compare the current pattern of factor intercorrelations with its results, the present intercorrelations pattern was almost identical to a previous report (24). These findings validated the use of the 5-factor structural pattern of the Farsi form of the PID-5 to evaluate the elements of the ICD-11 model, and they are in line with the findings of preliminary validation studies (8, 24). Although various measures have been generated to assess the elements of the ICD-11 model (13, 15-17), our results also support the ability of the Persian version of the PID-5 to measure the constructs of the ICD-11 model.

Computing the pooled estimates of factor loadings and alpha coefficients for the 5-factor structural pattern of the Farsi form of the PID-5-BF was another goal of the current meta-analysis. We found that all scale items loaded well on at least one factor of antagonism, psychoticism, disinhibition, detachment, and negative affectivity (five items for each factor). The pooled alpha coefficients for all factors (except for detachment that was marginal) were acceptable. All pooled estimates are valid because the two studies included in our meta-analysis were high-quality reports and publication bias was minimal. The 5-factor structural pattern of the Farsi version of the PID-5-BF was supported by these results, which are in line with the findings of other studies conducted internationally (19, 21, 63). However, the pooled effect sizes were obtained from only three independent samples, which makes it necessary to re-evaluate the estimates if data from more samples become available.

Strengths and Limitations

As far as we are aware, this meta-analysis is the first to estimate the structural validity of the Farsi forms of the PID-5 and PID-5-BF to measure the DSM-5 model. Additionally, our study provides the first official attempt at a meta-analysis of the PID-5's structural validity as a means of measuring ICD-11 model constructs. Although a previous meta-analysis to explore the replicability of the PID-5 in non-US samples included only one study (44) from Iran (n = 215), we synthesized and analyzed data from eight studies (43-50) with independent samples (n = 6,489). For the first time, we also analyzed the data of three independent samples (n = 3,624) (46,

51) to assess the structural validity of the Persian version of the PID-5-BF. We report the factor congruency of the present pooled estimates of factor loadings with previous studies to further ensure the generalizability of the five-factor nature of PID-5 to Iranian populations. The pooled estimates probably represent the population of Iran since the data included community/student and clinical samples, adolescents and adults, and male and female gender groups. However, it should be noted that all studies included in the meta-analysis were from the central and western regions of Iran, which suggests caution when generalizing the findings. To prevent overestimated results, we reported the quality of studies and publication bias and employed the random-effects method.

However, some methodological limitations must be considered. First, the meta-analysis of the PID-5 for the constructs of the ICD-11 model synthesized data from only three studies, all of which included adult samples. Conversely, the meta-analysis of the PID-5 to assess the elements of the DSM-5 model synthesized data from eight studies including only one adolescent sample. Second, the structural validity of the PID-5-BF was calculated using data from three samples (only two studies) including one adolescent sample and two adult samples. Using the data of only one adolescent sample in the meta-analysis may affect the heterogeneity of some results. Future meta-analysis could overcome heterogeneity if studies containing adolescent populations were accessed. Third, we used Cronbach's alpha coefficients to estimate reliability where more data were not available to provide other types of reliability. We know that using Cronbach's alpha coefficients for multidimensional measures such as the PID-5 and PID-5-BF leads to an overestimation of true correlation (64). However, the studies that entered into the meta-analysis did not report data for the unidimensional structure of the measures, which makes us unable to estimate the internal consistency of the items for a unidimensional structure. This limitation could have been solved if we had access to the original data of all studies entered into the meta-analysis. Access to the original data enabled us to calculate the correlation matrix and, in turn, relatively more reliable results. We recommend that future studies report McDonald's Omega in addition to alpha coefficients because it is considered a more robust measure of internal consistency reliability than Cronbach's alpha. Omega is particularly beneficial when dealing with multidimensional scales, as it can account for different factors that contribute to the overall scale score. Additionally, omega is less sensitive to the number of items in a scale compared to Cronbach's alpha, which makes it a more reliable measure for shorter scales (65). We also recommend the use of alternative reliability measures such as test-retest and inter-rater methods. Reporting these additional measures would likely help provide a more robust assessment of the reliability of versions of the PID-5. Fourth, because the validation studies did not report alpha coefficients of the scale domains to measure the ICD-11 model including dissociality, anankastia, disinhibition, detachment, and negative affectivity, we were unable to calculate pooled alpha coefficients. Fifth, most of the meta-analytic data were for samples from the central and western populations of Iran, which makes us cautious in generalizing the data to the people of other regions. Sixth, only one of the research reports (43) included in the analysis checked the validity of the data collected by the PID-5 using a Response Inconsistency Scale to detect invalid cases (66). Response bias affects the validity of 10-15% of data collected by the PID-5 (67). We hypothesize that response bias to the PID-5 may threaten the pooled estimates of the current meta-analysis. Seventh, the PID-5 and PID-5-BF factors were extracted using either EFA or CFA in four of the studies that made up the meta-analysis (45, 46, 49, 51). Each of these statistical methods alone may not provide valid results. If more studies are available, future meta-analyses could use more rigorous selection criteria to reduce the bias of the results. Eighth, the sample sizes were too small to estimate the factor structure and reliability of the PID-5-BF. Future meta-analyses, if larger and more diverse independent samples are available, will increase the statistical power and can provide more accurate estimates. Meta-analysis of other validation properties of the PID-5 such as the correlation of scale domains with other personality measures and cut scores to differentiate clinical and non-clinical samples (68) can be the target of future meta-analyses.

Conclusion

The objective of our meta-analysis was to estimate the structural validity of Farsi forms of the PID-5 (to measure trait models by the DSM-5 and ICD-11) and the PID-5-BF. Although the pooled estimates of factor loadings supported the 5-factor structural pattern of the PID-5 to assess the ICD-11 model, negative affectivity and disinhibition were not clearly separable within 5-factor rotations including all 25 DSM-5 facets. Specifically, some disinhibition traits of the DSM-5 trait model including distractibility and impulsivity tended more strongly to load on negative affectivity. However, the 5-factor structural pattern of the PID-5 to measure both models was almost similarly supported by both the pooled estimates of alpha coefficients and the factor congruency with international research reports. Although all pooled estimates are strongly valid because all studies entered into in the meta-analysis were of moderate- to high-quality reports and publication bias was minimal, the future meta-analysis should take into account some of the discussed methodological considerations that may lead to overestimated effect sizes. The pooled estimates of factor loadings and alpha coefficients also supported the 5-factor structural pattern of the Farsi version of the PID-5-BF. Since both the original and brief versions of the PID-5 are valid and strongly similar to international

structures, the clinical and research applications of these questionnaires are recommended to mental health professionals in Iran. However, our analyses are mainly limited to non-clinical adult samples from some regions of Iran. Thus, further research using more diverse samples including adolescents and clinical groups from cultural contexts across the country is recommended. We also recommend the examination of separation insecurity in relation to disinhibition features in non-Western contexts.

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Conflict of Interest
None.

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