Check for updates

Received: 14 February 2024 | Accepted: 9 September 2024

DOI: 10.1002/pmh.1637

RESEARCH ARTICLE

Personality and Mental Health

# Verification of five-factor models and reference scores for personality dysfunction and trait domains of the Personality Assessment Questionnaire for ICD-11 (PAQ-11), revised version

**Youl-Ri Kim**[1,2] | **Jisu Choi**[3] | **Peter Tyrer**[4]

[1]Department of Psychiatry, Inje University Ilsan Paik Hospital, Goyang, South Korea

[2]Institute of Eating Disorders and Mental Health, Inje University, Seoul, South Korea

[3]Department of Psychology, The Catholic University of Korea, Bucheon, South Korea

[4]Division of Psychiatry, Imperial College London, London, UK

**Correspondence**
Youl-Ri Kim, Department of Psychiatry, Inje University Ilsan Paik Hospital, Goyang, South Korea.
Email: yrkim@inje.ac.kr

**Funding information**
This work was supported by the National Research Foundation of Korea (NRF) funded by the Korean government (The Ministry of Science and ICT, MSIT; Grant No. 2021R1A2C2009668).

**Abstract**

A brief self-reported measure of the Personality Assessment Questionnaire for the 11th edition of the World Health Organization's International Classification of Disease (ICD-11) (PAQ-11) was developed to evaluate ICD-11 personality traits. The aim of this study was to investigate the validity of the revised PAQ-11 version (PAQ-11R) with an additional item in the Dissociality domain and thresholds for the severity of personality dysfunction and domains. Study 1 examined the construct validity of the PAQ-11R in 192 university students in Korea. Study 2 estimated tentative reference scores of personality dysfunction and domains of the PAQ-11R in 91 patients in Korea. In study 1, the PAQ-11R had a five-factor structure and the revised Dissociality scale had better convergent and discriminant validities than the previous version. In study 2, the receiver operating characteristic (ROC) curve of the PAQ-11R identified a threshold score of 35. Reference scores for domains were estimated as 15 for Negative Affectivity, 10 for Detachment, 8 for Anankastia, and 5 each for Disinhibition and Dissociality. These scores contribute to severity of personality disturbance but remain qualifiers only; they are not diagnostic. The results suggest that the PAQ-11R is useful as a quick assessment tool for identifying the domains of personality dysfunction in clinical practice in harmony with the ICD-11 guidelines.

## INTRODUCTION

The 11th edition of the World Health Organization's International Classification of Disease (ICD-11) is an authoritative classification for the diagnosis of mental disorders in the 194 member countries where its coding system is required (World Health Organization, 2024). It uses a dimensional trait model to classify personality disorder (PD), and the domain traits are connected to normal personality qualities through the five-factor model (FFM).

The ICD-11 dimensional trait model includes the five broad domains of negative affect, detachment, dissociality, disinhibition, and anankastia, which are cross-

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.
© 2024 The Authors Personality and Mental Health Published by John Wiley & Sons Ltd.

culturally applicable (Bach et al., 2017; Kim et al., 2015; Lotfi et al., 2018). The monothetic classification system of the ICD-11 was partly derived from the Personality Assessment Schedule (PAS; Tyrer & Alexander, 1979) for the assessment of 24 traits (e.g., anxiousness, rigidity, conscientiousness, childishness, hypochondriasis, irritability, shyness, worthlessness, vulnerability, aggression, submissiveness, and pessimism). A previous field trial showed that the ICD-11 trait domains were convergent with the PAS traits (Kim et al., 2015).

The Personality Assessment Questionnaire ICD-11 version (PAQ-11) is a short self-reported measure of the five-domain ICD-11 maladaptive trait model (Kim et al., 2021). It is a 17-item self-reported measure, which was derived from the PAS (Tyrer & Alexander, 1979). The five traits of the PAQ-11 have a close relationship with the FFM and *Diagnostic and Statistical Manual of Mental Disorders*, Fifth Edition (DSM-5; American Psychiatric Association, 2013) trait models, with acceptable internal consistency. Its convergent and discriminant validities were adequate for the normal as well as the maladaptive personality scale. These initial findings showed the potential of using the PAQ-11 as a brief self-reported assessment tool for ICD-11 PD traits. Although the construct validity was replicated in a US general population, further revision is required, particularly regarding the Dissociality domain (Sellbom et al., 2023). The traits in the domain include callousness, lack of empathy, aggression, ruthlessness, hostility, manipulativeness, and exploitativeness. Two items, "Do you care about other people?" and "Do you tend to manipulate others to get what you want in life?", in the PAQ-11, can cover callousness, lack of empathy, ruthlessness, manipulativeness, and exploitativeness. However, an additional item assessing aggression and hostility is needed to enhance the instrument (Kerber et al., 2022; Krueger et al., 2012; Maples et al., 2015; Oltmanns & Widiger, 2018; Oltmanns & Widiger, 2020).

Adopting a fully trait-dimensional approach would require the mass retraining of mental health professionals and complicate medical recordkeeping. Even short interviews require specific clinical training. Therefore, self-reported questionnaires can be useful clinical and research tools, particularly when employed as part of a stage design for case identification (Oltmanns & Widiger, 2020). The existing self-reported measures for assessing the personality dimensions of the ICD-11 model are the Personality Inventory for ICD-11 (PiCD; Oltmanns & Widiger, 2018) and the Five-Factor Personality Inventory for ICD-11 (FFiCD; Oltmanns & Widiger, 2020). The PID-5 was developed as an DSM-5 Alternative Model of Personality Disorders (AMPD) specific measure (Krueger et al., 2012), and the briefer Personality Inventory for DSM-5 Brief Form Plus (PID5BF+) provides the operationalization of the ICD-11 trait domains (Kerber et al., 2022). ICD-11 uses the severity of personality disturbance as the first element in the classification, and the second order of classification defines the five domains (Tyrer et al., 2011). Screening for the simple presence of personality dysfunction and the identification and selection of domains using short self-reported questionnaires can be completed by practitioners with limited time to make a detailed assessment and provide simple guidance in clinical practice. After screening, a brief structured interview, which is incorporated into a standard psychiatric interview backed up with corroborative information, is conducted (Germans et al., 2008). The Personality Disorder Severity ICD-11 (PDS-ICD-11) was developed to provide a quick impression of the severity of personality dysfunction according to the ICD-11 PD guidelines but is not aimed at specific ICD-11 domain assessments (Bach et al., 2021). The PAQ-11 can provide the opportunity for a more specific prediction of dysfunctions in distinct domains. The need for estimated reference scores for personality dysfunctions is considered relevant for healthcare policies and planning (Bach et al., 2023). While brief interview tools for PD screening, such as the Iowa Personality Disorder Screen (IPDS; Langbehn et al., 1999), the Standardized Assessment of Personality-abbreviated Scale (SAPAS; Moran et al., 2003), and the PDS-ICD-11 Clinician-Rating Form, are available (Sellbom et al., 2024), few measures of domain-specific assessments, as well as PD screening, are available.

The objective of this study was to construct a self-reported instrument for screening ICD-11 PD by scoring for absence–presence of personality dysfunction and identifying domains. As the trait domains contribute to personality disturbance, the domains dysfunction cannot be regarded as independent from personality dysfunction (World Health Organization, 2024). Therefore, the total scores of the instrument may be relevant to personality dysfunction, even though the PAQ-11 was designed as a trait measure. The aim of study 1 was to examine the validity of the revised version of the PAQ-11 with an additional item on the Dissociality domain and the deletion of an item duplicated from the Anankastia domain. The expectation was that the new item would primarily load on the respective factors corresponding to each domain. In addition, the Dissociality and Anankastia items were expected to have better discriminant validity compared to the previous version. In study 2, we aimed to estimate the tentative reference scores for the presence of personality dysfunction and domains in the PAQ-11-revised (PAQ-11R).

1932863x, 2024, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/pmh.1637 by Imperial College London, Wiley Online Library on [13/01/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

# STUDY 1: CONSTRUCT VALIDITY OF THE PAQ-11R

## Methods

### Participants

A total of 192 undergraduate or graduate students were recruited for the study between June and September 2022. Recruitment was advertised via online community boards at 20 universities in Korea. The students who signed up by calling, sending an email, or scanning a QR code were screened for participation eligibility. Students consisted of 154 women (80.2%) and 38 men (19.8%), with a mean age of 22.05 (SD = 3.17). Participants who provided informed consent by online completed a survey in which they rated the PAQ-11R as well as NEO-FFI for assessing normal personality, and PID-5 SF for maladaptive personality. This procedure was done by a PhD student in psychology. This study was approved by the institutional review board of the Catholic University of Korea (Nno. 1040395-202105-02).

### Measures

#### *Personality Assessment Questionnaire for ICD-11-revised (PAQ-11R)*

The PAQ-11 is a self-reported questionnaire assessing the personality trait domains in the ICD-11 (Kim et al., 2021). The PAQ-11 contains 17 items rated on a 5-point Likert ranging from 0 (never) to 4 (always). Each item corresponds to one of the five domains in the trait model. In the PAQ-11R, an item ("Do you often get angry or aggressive?"), reflecting aggression and hostility was added to the Dissociality domain. One item from the Anankastia domain ("Are you normally a fussy person?"), was omitted as it overlapped with the item, "Do people ever say you are too fussy or conscientious, or even a perfectionist?"

Thus, the PAQ-11R has 17 items consisting of five items on Negative affectivity, four items on Detachment, three items on Anankastia, two items on Disinhibition, and three items on Dissociality. Cronbach's $\alpha$ for the PAQ-11R was 0.77 for the total score. For each domain, Cronbach's $\alpha$ was 0.83 for Negative Affectivity, 0.73 for Detachment, 0.61 for Anankastia, 0.55 for Disinhibition, and 0.48 for Dissociality.

#### *NEO Five-Factor Inventory (NEO-FFI)*

NEO-FFI (Costa & McCrae, 1992) is a self-report instrument used to measure normal personality traits. The instrument is a short form of NEO personality inventory to assess five factors: Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness. We used the standardized Korean version of the NEO-FFI (Min et al., 1997). It consists of 60 items (12 items per trait) with a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Cronbach's $\alpha$ for the NEO-FFI total score was 0.81. Cronbach's $\alpha$ of the NEO-FFI was 0.81 for the total score. For each factor, the Cronbach's $\alpha$ was 0.88 for Neuroticism, 0.89 for Extraversion, 0.68 for Openness, 0.75 for Agreeableness, and 0.87 for Conscientiousness.

#### *Personality inventory for the DSM-5 Short Form (PID-5 SF)*

PID-5 SF (Maples et al., 2015) is a short form of the Personality Inventory for the DSM-5 (PID-5; Krueger et al., 2012), a self-report instrument developed to assess pathological personality traits from the DSM-5 Section III, the AMPDs. PID-5 consists of 5 higher-order domains (Negative affect, Detachment, Antagonism, Disinhibition, and Psychoticism) and 25 lower-order facets. We used the Korean version of the PID-5 SF (Hong, Kim, & Hwang, 2018), with the factor structure identical to the Korean version of the PID-5 (Hong, Hwang, & Kim, 2018). It includes 100 items with a 4-point Likert scale ranging from 0 (very false or often false) to 3 (very true or often true). Cronbach's $\alpha$ for the PID-5 SF total score was 0.96. Cronbach's $\alpha$ of the PID-5 SF was 0.96 for the total score. For each domain, the Cronbach's $\alpha$ was 0.91 for Negative affect, 0.91 for Detachment, 0.88 for Antagonism, 0.84 for Disinhibition, and 0.88 for Psychoticism.

### Data analyses

The expected factor structure of the PAQ-11R was examined using an exploratory factor analysis (EFA) with principal axis factoring with varimax rotation and Kaiser normalization. The reason we used the exploratory approach instead of confirmatory factor analysis was that Sellbom et al.'s (2023) EFA findings of the PAQ-11 items showed support for a four-factor model than a FFM. A parallel analysis was used to ensure the most suitable number of factors (i.e., the number of eigenvalues from the actual dataset that were larger than the mean or 95th percentile eigenvalues in a randomly generated dataset). Then, we investigated correlations between the PAQ-11R domains and other domains of the scale, the five factors of the NEO-FFI, and the facets of the PID-5 SF to evaluate convergent and discriminant validities. The statistical analyses were performed using IBM SPSS statistics version 27.0 (IBM Corporation, 2020) and R version 4.3.2 (R Core Team, 2023).

1932863x, 2024, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/pmh.1637 by Imperial College London, Wiley Online Library on [13/01/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

**TABLE 1** Factor loadings for the five-factor model of the PAQ-11R in EFA.

| | | Factor | | | | |
|---|---|---|---|---|---|---|
| **Domains** | **Items** | **1** | **2** | **3** | **4** | **5** |
| Negative Affectivity | 16. Are you more nervous than most other people? | **0.88** | | | | |
| | 15. Do you ever worry about things that most people would not be concerned about? | **0.71** | | | | |
| | 10. Do you feel gloomier about the future than most other people? | **0.65** | | | | |
| | 12. Do you lack self-confidence? | **0.62** | | | | |
| | 3. Do you expect the worst to happen in life? | **0.52** | | | 0.37 | |
| Detachment | 2. Do you normally trust them?[a] | | **0.77** | | | |
| | 8. Do you have any really close relationships?[a] | | **0.67** | | | 0.31 |
| | 1. How well in general do you get on with other people?[a] | | **0.66** | | | |
| | 17. Are you a person who likes to stay apart from other people? | | **0.45** | | 0.36 | |
| Anankastia | 7. Do people ever say you are too fussy or conscientious, or even a perfectionist? | | | **0.66** | | |
| | 4. Are you a person with high standards? | | | **0.53** | | |
| | 6. Do you plan everything in detail in life? | | | **0.55** | −0.31 | |
| Disinhibition | 11. Do you ever do things on the spur of the moment without caring about the consequences? | | | | **0.56** | 0.32 |
| | 5. Have you ever done things on impulse and regretted them afterward? | 0.36 | | | **0.63** | |
| Dissociality | 14. Do you often get angry or aggressive?[b] | | | | | **0.36** |
| | 13. Do you tend to manipulate others to get what you want in life? | | | | 0.40 | **0.45** |
| | 9. Do you care about other people?[a] | | 0.42 | −0.35 | | **0.48** |

*Note*: An exploratory factor analysis (EFA) was performed using Principal Axis Factoring with Varimax rotation and Kaiser normalization. Factor loadings <|0.30| are hidden. The largest factor loading of each item is in bold.
Abbreviation: PAQ-11R, revised version of the Personality Assessment Questionnaire for ICD-11 personality trait domains.
[a]Reversed-scored items.
[b]The item was added to the Dissociality domain, and an item was omitted from the Anankastia domain in the revised version.

## Results

### Five-factor structure of the PAQ-11R

The EFA results showed that the factor structure of the PAQ-11R was aligned with the PAQ-11: Factor 1 = Negative Affectivity; Factor 2 = Detachment; Factor 3 = Anankastia; Factor 4 = Disinhibition; and Factor 5 = Dissociality (Table 1). These results explained 64.2% of the total variance of the PAQ-11R. The new item (item 14) was loaded on the Dissociality domain. Eigenvalues from the parallel analysis of the observed data and simulated data showed that the five factors were retained (Table S1). Parallel analysis scree plot for the PAQ-11R is shown in Figure 1.

### Convergent and discriminant validities

Table 2 shows the correlations between the scores for the PAQ-11R, NEO-FFI, and PID-5 SF. No large effect-size ($r > |0.50|$) correlations were observed between the PAQ-11R domains, although some small to medium effect-size correlations were present.

The overall pattern of correlations between the PAQ-11R and NEO-FFI was similar to that of a previous study using the PAQ-11 (Kim et al., 2021). The revised Dissociality domain was negatively correlated with Agreeableness, followed by negative correlations with Conscientiousness and Extraversion, and a positive correlation with Neuroticism. The revised Anankastia domain was only significantly correlated with Conscientiousness, while its correlations with other domains observed in the previous study did not remain.

Regarding the PID-5 SF, the PAQ-11R domains of Negative Affectivity, Detachment, and Disinhibition were most strongly correlated with their corresponding PID-5 SF domains. Furthermore, the revised Dissociality domain had the strongest correlation with the Callousness facet within the PID-5 SF Antagonism, and the revised Anankastia domain had the strongest correlation with the Rigid perfectionism facet within the PID-5 SF Disinhibition.

1932863x, 2024, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/pmh.1637 by Imperial College London, Wiley Online Library on [13/01/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

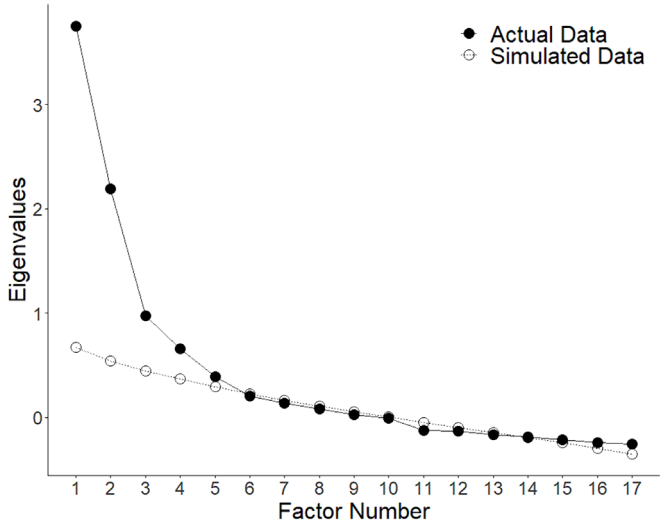



**FIGURE 1** Parallel analysis scree plot for the PAQ-11R. *Note*: Parallel analysis was performed to confirm the number of factors to retain. The solid line with black dots indicates the eigenvalues from the actual data, and the dashed line with white dots indicates the eigenvalues from the simulated data. The number of eigenvalues above the point where two lines intersect is determined to retain (i.e., five factors in this case). Abbreviation: PAQ-11R, the revised version of personality assessment questionnaire for ICD-11 personality trait domains.

## STUDY 2: REFERENCE SCORES FOR PERSONALITY DYSFUNCTION AND FIVE DOMAINS OF THE PAQ-11R

## Method

### Participants

A total of 99 psychiatric patients aged 17 to 60 were recruited from a department of psychiatry at a university hospital in Seoul, South Korea, from June to September 2022. The hospital has a specialized clinic for eating disorders, but approximately half of the participants recruited were patients with common mental disorders other than eating disorders. The exclusion criteria were patients with learning disability, organic brain disease, psychotic disorders and/or acute mania, as these conditions were likely to have altered personality functioning. Seven patients who had psychotic disorder ($n = 4$), bipolar I disorder ($n = 1$), and intellectual disability ($n = 2$) were excluded. Also, one patient who provided incomplete and unreliable answers was not included in the study. Finally, a total of 91 patients participated in study 2. The research protocol was approved by the Seoul Paik Hospital Ethics Committee (No. PAIK 2022-05-003).

### Procedure

The diagnostic procedure was conducted as a part of routine clinical work. The psychiatrist who was treating the patients interviewed them according to the diagnostic algorithm of the ICD-11 for PD (World Health Organization, 2022). The algorithm consisted of three stages. In stage 1, personality disturbance was assessed as either present, uncertain, or absent. In each case, the algorithm was terminated if the participant did not exhibit personality disturbance. In stage 2, each patient with personality disturbance was graded as either having personality difficulty or PD. In the case of having PD, the five monothetic trait domains were assessed using a dichotomous global clinical impression method in Stage 3. A clinical psychologist conducted interviews independently from the psychiatrist based on the AMPD and obtained collateral information from informants or notes to make psychiatric diagnoses as in routine clinical procedures. Finally, the treatment team, including the psychiatrist and the psychologist, reached a consensus on the best estimation of diagnosis for PD to make treatment plans. The participants completed the PAQ-11R and self-reported questionnaires, including the BDI and the State–Trait Anxiety Inventory (STAI), to measure general psychopathology as part of the routine clinical assessment.

### Measures

#### *PAQ-11R (see study 1)*

As we found in study 1 that the PAQ-11R has the same factors as PAQ-11 and acceptable validity, we administered the PAQ-11R to the participants.

#### *Beck's Depression Inventory (BDI)*

BDI (Beck et al., 1961) is a self-report inventory widely used to evaluate depression. It consists of 21-items with a 4-point Likert scale for each question ranging from 0 to 3. The total score is in the range of 0 to 63 points, and higher scores are considered to indicate higher levels of depression. We used the validated Korean version of the BDI (Lee & Song, 1991).

#### *State-Trait Anxiety Inventory (STAI)*

STAI (Spielberger et al., 1983) is a 40-item self-report questionnaire for measuring anxiety. It is rated on a 4-point Likert scale and divided into two parts. Each part consists of 20 items, one part measuring the degree to which one feels anxious at a moment (i.e., state anxiety) and the other measuring the degree to which one

1932863x, 2024, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/pmh.1637 by Imperial College London, Wiley Online Library on [13/01/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

**TABLE 2** Intracorrelation and intercorrelation of the PAQ-11R with personality domains.

| | | PAQ-11R Negative Affectivity | PAQ-11R Detachment | PAQ-11R Anankastia | PAQ-11R Disinhibition | PAQ-11R Dissociality |
|---|---|---|---|---|---|---|
| PAQ-11R | Negative Affectivity | | | | | |
| | Detachment | 0.35** | | | | |
| | Anankastia | 0.17* | 0.00 | | | |
| | Disinhibition | 0.38** | 0.20** | 0.02 | | |
| | Dissociality | 0.10 | 0.43** | −0.12 | 0.18* | |
| NEO-FFI | Neuroticism | 0.62** | 0.33** | 0.10 | 0.39** | 0.16* |
| | Extraversion | −0.40** | −0.60** | 0.02 | −0.16* | −0.24** |
| | Openness | −0.27** | −0.19* | 0.13 | −0.04 | −0.01 |
| | Agreeableness | −0.17* | −0.52** | −0.09 | −0.20** | −0.53** |
| | Conscientiousness | −0.21** | −0.20** | 0.25** | −0.32** | −0.28** |
| PID-5 SF | Negative affect | 0.55** | 0.37** | 0.11 | 0.42** | 0.24** |
| | Anxiousness | 0.60** | 0.29** | 0.13 | 0.30** | 0.04 |
| | Depressivity | 0.50** | 0.50** | 0.02 | 0.22** | 0.21** |
| | Emotional lability | 0.37** | 0.19** | 0.15* | 0.41** | 0.15* |
| | Perseveration | 0.35** | 0.22** | 0.15* | 0.39** | 0.18* |
| | Separation insecurity | 0.15* | 0.14 | −0.05 | 0.12 | 0.23** |
| | Submissiveness | 0.29** | 0.07 | −0.08 | 0.27** | 0.02 |
| | Hostility | 0.25** | 0.26** | 0.14* | 0.29** | 0.37** |
| | Detachment | 0.44** | 0.65** | 0.10 | 0.30** | 0.29** |
| | Anhedonia | 0.46** | 0.55** | 0.04 | 0.19** | 0.21** |
| | Withdrawal | 0.34** | 0.54** | 0.15* | 0.33** | 0.24** |
| | Restricted affectivity | 0.29** | 0.46** | 0.15* | 0.20** | 0.24** |
| | Intimacy avoidance | 0.14 | 0.37** | −0.12 | 0.15* | 0.15* |
| | Suspiciousness | 0.35** | 0.53** | 0.15* | 0.28** | 0.28** |
| | Antagonism | −0.01 | 0.06 | 0.18* | 0.18* | 0.31** |
| | Deceitfulness | 0.21** | 0.17* | 0.10 | 0.29** | 0.31** |
| | Manipulativeness | 0.07 | 0.17* | 0.19** | 0.26** | 0.25** |
| | Grandiosity | −0.31** | −0.16* | 0.10 | −0.06 | 0.05 |
| | Callousness | 0.01 | 0.26** | 0.05 | 0.12 | 0.45** |
| | Attention seeking | 0.00 | −0.14 | 0.17* | 0.11 | 0.09 |
| | Disinhibition | 0.34** | 0.24** | 0.04 | 0.53** | 0.29** |
| | Distractibililty | 0.35** | 0.07 | −0.04 | 0.44** | 0.16* |
| | Rigid perfectionism | 0.28** | 0.27** | 0.30** | 0.15* | 0.14 |
| | Irresponsibility | 0.21** | 0.28** | −0.02 | 0.35** | 0.34** |
| | Impulsivity | 0.13 | 0.16* | −0.09 | 0.51** | 0.25** |
| | Psychoticism | 0.31** | 0.37** | 0.20** | 0.37** | 0.33** |
| | Unusual beliefs | 0.16* | 0.27** | 0.20** | 0.26** | 0.30** |
| | Risk taking | 0.10 | 0.22** | 0.16* | 0.34** | 0.25** |
| | Eccentricity | 0.26** | 0.37** | 0.18* | 0.25** | 0.26** |
| | Cognitive perceptual dysregulation | 0.39** | 0.30** | 0.10 | 0.27** | 0.25** |

*Note*: Large effect-size correlations (> |0.50|; Cohen, 1992), medium (> |0.30|), small (>|0.10|).

Abbreviations: NEO-FFI, NEO Five-Factor Inventory; PAQ-11R, revised version of the Personality Assessment Questionnaire for ICD-11 personality trait domains; PID-5 SF, Personality Inventory for DSM–5 Short Form.

*$p < 0.05$, and **$p < 0.01$.

1932863x, 2024, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/pmh.1637 by Imperial College London, Wiley Online Library on [13/01/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

generally feels anxious (i.e., trait anxiety). We used the Korean version of STAI (Kim & Shin, 1978).

### Data analyses

We conducted a receiver operating characteristic (ROC) curve analysis to identify threshold PAQ-11R scores that indicated the presence of PD and dysfunction in the five personality trait domains. The predictive performance of different reference scores was assessed. The optimal reference score was evaluated by calculating the J-index: J = sensitivity + specificity − 1. Thus, the largest J-index score indicated that the sum of sensitivity and specificity was at its maximum. Statistical analyses were performed using IBM SPSS statistics version 27.0 (IBM Corporation, 2020).

## Results

### Characteristics of participants

The patients ($n = 91$) consisted of 62 women (68.1%) and 29 men (31.9%). Their mean age was 34.2 ± 12.9 years old. Their primary psychiatric diagnoses were as follows: adjustment disorders ($n = 8$; 8.8%), alcohol-related disorders ($n = 2$; 2.2%), anxiety disorders ($n = 9$; 9.9%), eating disorders ($n = 36$; 39.6%), impulse-control and conduct disorders ($n = 1$; 1.1%), mood disorders ($n = 10$; 11.0%), obsessive-compulsive disorder ($n = 3$; 3.3%), panic disorder ($n = 10$; 11.0%), posttraumatic stress disorder ($n = 2$; 2.2%), and somatoform disorders ($n = 10$; 11.0%). The patients were assessed mood and anxiety status with BDI (mean = 25.5, SD = 14.0), STAI-State (mean = 55.5, SD = 11.8), and STAI-Trait (mean = 56.8, SD = 12.0).

### Threshold PAQ-11R scores

Among 91 patients, 34 (37.4%) received clinical diagnoses of PD. We performed an ROC analysis to investigate the PAQ-11R total score predicting personality dysfunction. The ROC curve had an area under the curve (AUC) of 0.78 (95% confidence interval 0.68–0.89, $p < 0.001$). The ROC curve for PD corresponding to total PAQ-11R scores is shown in Figure 2. The predictive performance of the PAQ-11R was assessed in terms of sensitivity, specificity, predictive values, and correctly classified percentages (Table 3). As seen in Table 3, a score of 35 offered the largest J-index and correctly classified 71.6% of the patients as having PD. The positive predictive value

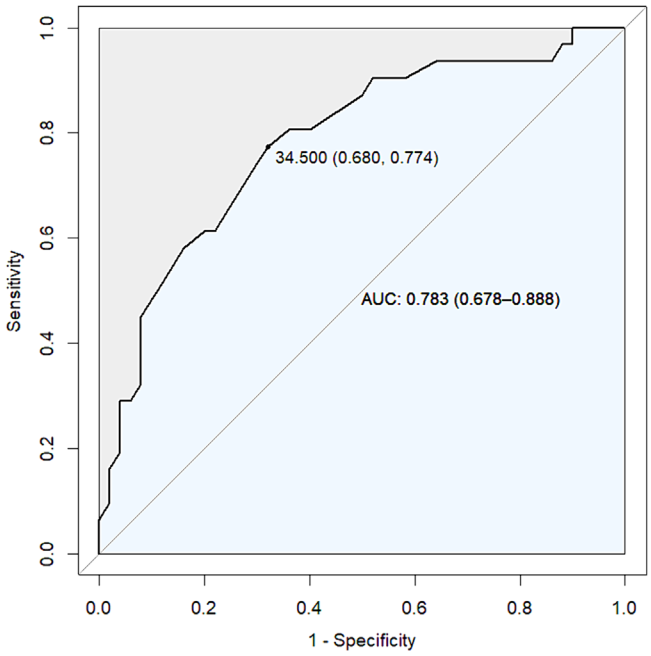



**FIGURE 2** Receiver operating characteristic (ROC) curve of the PAQ-11R for personality disorder. *Note*: The diagonal line serves as a reference because it represents random classification (i.e., no-discrimination). A ROC curve above the diagonal line shows the points with 1 - specificity as x-axis and sensitivity as y-axis at reference scores of the PAQ-11R. An area under the curve (AUC) is 0.783 (95% CI 0.678–0.888). The ROC curve indicates the total score of PAQ-11R greater than 34.5 is a tentative reference score (sensitivity = 0.774, specificity = 0.680). Abbreviation: PAQ-11R, the revised version of Personality Assessment Questionnaire for ICD-11 personality trait domains.

was 0.60, meaning that 60% of the patients who had that score or higher truly had PD.

We conducted an ROC analysis to estimate the reference scores for predicting personality trait domains in patients with PD. The ROC curve had an AUC of 0.79 for Negative Affectivity, 0.77 for Detachment, 0.88 for Anankastia, 0.76 for Disinhibition, and 0.75 for Dissociality. The tentative reference scores of the five domains in the PAQ-11R were evaluated based on the J-index (Table 4). A reference score of 15 on the Negative Affectivity domain correctly classified 75% of domain dysfunctions, with a positive predictive value of 0.72. A reference score of 10 on the Detachment domain correctly classified 73.5% of domain dysfunctions, with a positive predictive value of 0.69. A reference score of 8 on the Anankastia domain correctly classified 70.6% of domain dysfunctions, with a positive predictive value of 0.47. A reference score of 5 on the Disinhibition domain correctly classified 61.8% of domain dysfunctions, with a positive predictive value of 0.43. A reference score of 5 on the Dissociality

1932863x, 2024, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/pmh.1637 by Imperial College London, Wiley Online Library on [13/01/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

**TABLE 3** J-index, sensitivity, specificity, predictive values, and correctly classified percentages to predict personality dysfunction at different PAQ-11R scores.

| Score | J-index | Sensitivity | Specificity | Positive predictive value | Negative predictive value | Correctly classified (%) |
|---|---|---|---|---|---|---|
| 33 | 0.406 | 0.81 | 0.60 | 0.56 | 0.83 | 67.9 |
| 34 | 0.446 | 0.81 | 0.64 | 0.58 | 0.84 | 70.4 |
| 35 | 0.454 | 0.77 | 0.68 | 0.60 | 0.83 | 71.6 |
| 36 | 0.442 | 0.74 | 0.70 | 0.61 | 0.81 | 71.6 |
| 37 | 0.405 | 0.65 | 0.76 | 0.63 | 0.78 | 71.6 |

*Note*: The J-index was calculated at each cut-off score: J = sensitivity + specificity − 1. The J-index reaches its largest value when the sum of sensitivity and specificity is maximized, yielding the tentative reference score for diagnosis.
Abbreviation: PAQ-11R, revised version of the Personality Assessment Questionnaire for ICD-11 personality trait domains.

domain correctly classified 72.7% of domain dysfunctions, with a positive predictive value of 0.36.

## DISCUSSION

PAQ-11, a brief self-reported measure for ICD-11 personality trait domains, was developed to assess ICD-11 traits in primary and secondary care settings in ordinary practice. The revised version of PAQ-11 was created to improve the internal structure of the Dissociality domain by adding an item and deleting a duplicated item from the Anankastia domain. In this study, we investigated if the instrument could be used as the first step in a two-stage procedure for case identification by examining if the revised version provided a threshold score for the presence of personality dysfunction and trait domains. The addition of an item and the deletion of redundancy in the PAQ-11R showed good convergent coefficients, supporting the use of the brief scale and suggesting that the revised scale could be efficient at detecting trait domains in clinical practice.

The exploratory approach was used to analyze the FFM of PAQ-11R with a new additional item loaded on the Dissociality domain. The convergent and divergent validities of the PAQ-11R replicated findings in previous studies on PAQ-11 (Kim et al., 2021; Sellbom et al., 2023). Overall, we found that the PAQ-11R domains could be regarded as generally independent, as no large effect-size correlations were observed between them, despite some degree of overlap.

With respect to the FFM, PAQ-11R Negative Affectivity was positively correlated with NEO-FFI Neuroticism; Detachment was negatively correlated with Extraversion; Anankastia was positively correlated with Conscientiousness; Disinhibition was positively correlated with Neuroticism and negatively correlated with Conscientiousness; and Dissociality was negatively correlated with Agreeableness. The results indicated that the five domains of the ICD-11 were aligned with the FFM (Mulder et al., 2016). Though Anankastia and Dissociality in the PAQ-11R were on opposite sides regarding the relationships with Conscientiousness in the FFM, they were not negatively correlated. These findings are not surprising considering that most measures of the FFM are largely unipolar. The results support the approach of assessing each independently and suggest that it is difficult to get two maladaptive trait scales to correlate negatively, even when they are conceptualized as being opposite to each another (Crego et al., 2020). In addition, the bipolarity of Anankastia and Disinhibition was not supported in the Big Five system, so mechanisms of recording them separately have been suggested (Crego et al., 2020). Our findings confirm that Anankastia and Disinhibition should be assessed independently as personality measures; they superficially appear to be on opposite poles but in practice they can both score highly and be independent. To place these two traits on the same dimension is fundamentally wrong and should be abandoned. The PAQ-11R acknowledges this distinction by rating them independently.

Regarding the relationship with the AMPD, the results support the construct validity of the PAQ-11R. Negative Affectivity, Detachment, and Disinhibition had large effect-size correlations, and Dissociality had a medium effect-size correlation with the corresponding domains in the PID-5. The correlations of Dissociality with detachment, disinhibition, and psychoticism domains of the PID-5 were of similar magnitude with antagonism. The convergent validity but relatively less divergent validity suggests that the validity of Dissociality might not have been fully resolved after all even though there is improvement with adding an item in the revised version. Anankastia was associated with the Rigid Perfectionism facet within Disinhibition domain in the PID-5.

This study provides evidence supporting the usefulness of the PAQ-11R in linking personality dysfunction

1932863x, 2024, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/pmh.1637 by Imperial College London, Wiley Online Library on [13/01/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

**TABLE 4** J-index, sensitivity, specificity, predictive values, and correctly classified percentages to predict domain dysfunction at different scores in PAQ-11R domains.

| Score | J-index | Sensitivity | Specificity | Positive predictive value | Negative predictive value | Correctly classified (%) |
|---|---|---|---|---|---|---|
| Negative Affectivity | | | | | | |
| 13 | 0.313 | 0.94 | 0.38 | 0.60 | 0.86 | 65.6 |
| 14 | 0.438 | 0.94 | 0.50 | 0.65 | 0.89 | 71.9 |
| 15 | 0.500 | 0.81 | 0.69 | 0.72 | 0.79 | 75.0 |
| 16 | 0.375 | 0.69 | 0.69 | 0.69 | 0.69 | 68.8 |
| 17 | 0.438 | 0.63 | 0.81 | 0.77 | 0.68 | 71.9 |
| Detachment | | | | | | |
| 8 | 0.249 | 0.93 | 0.32 | 0.52 | 0.86 | 58.8 |
| 9 | 0.407 | 0.93 | 0.47 | 0.58 | 0.90 | 67.6 |
| 10 | 0.470 | 0.73 | 0.74 | 0.69 | 0.78 | 73.5 |
| 11 | 0.375 | 0.53 | 0.84 | 0.73 | 0.70 | 70.6 |
| 12 | 0.228 | 0.33 | 0.89 | 0.71 | 0.63 | 64.7 |
| Anankastia | | | | | | |
| 6 | 0.360 | 1.00 | 0.36 | 0.36 | 1.00 | 52.9 |
| 7 | 0.600 | 1.00 | 0.60 | 0.47 | 1.00 | 70.6 |
| 8 | 0.689 | 0.89 | 0.80 | 0.47 | 1.00 | 70.6 |
| 9 | 0.578 | 0.78 | 0.80 | 0.58 | 0.91 | 79.4 |
| 10 | 0.436 | 0.56 | 0.88 | 0.63 | 0.85 | 79.4 |
| Disinhibition | | | | | | |
| 3 | 0.167 | 1.00 | 0.17 | 0.33 | 1.00 | 41.2 |
| 4 | 0.067 | 0.90 | 0.17 | 0.31 | 0.80 | 38.2 |
| 5 | 0.400 | 0.90 | 0.50 | 0.43 | 0.92 | 61.8 |
| 6 | 0.392 | 0.60 | 0.79 | 0.55 | 0.83 | 73.5 |
| 7 | 0.258 | 0.30 | 0.96 | 0.75 | 0.77 | 76.5 |
| Dissociality | | | | | | |
| 3 | 0.352 | 0.83 | 0.52 | 0.27 | 1.00 | 51.5 |
| 4 | 0.185 | 0.67 | 0.52 | 0.24 | 0.88 | 54.5 |
| 5 | 0.407 | 0.67 | 0.74 | 0.36 | 0.91 | 72.7 |
| 6 | 0.278 | 0.50 | 0.78 | 0.33 | 0.88 | 72.7 |
| 7 | 0.185 | 0.33 | 0.85 | 0.33 | 0.85 | 75.8 |

*Note*: The J-index was calculated at each cut-off score: J = sensitivity + specificity − 1. The J-index reaches its largest value when the sum of sensitivity and specificity is maximized, making the tentative reference score for domain dysfunction.
Abbreviation: PAQ-11R, revised version of the Personality Assessment Questionnaire for ICD-11 personality trait domains.

to trait domains. A score of 35 or more on the PAQ-11R correctly identified the presence of PD in 71.6% of the general psychiatric patients. For trait domains, scores of 15 on the Negative Affectivity domain, 10 on the Detachment domain, 8 on the Anankastia domain, 5 on the Disinhibition domain, and 5 on the Dissociality domain correctly identified the presence of each domain dysfunction in 75.0%, 73.5%, 70.6%, 61.8%, and 72.7%, respectively, of patients with PD. The positive predictive rates were 72% for Negative Affectivity, 69% for Detachment, 47% for Anankastia, 43% for Disinhibition, and 36% for Dissociality. Dissociality had a low positive predictive value. The prevalence of the Dissociality domain was 6.6% in our patients, and this low prevalence might yield a low positive predictive value in this setting. The obtained outcomes suggest that the PAQ-11R could focus on trait domains exceeding threshold scores in routine clinical settings. A high score on a single domain trait

1932863x, 2024, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/pmh.1637 by Imperial College London, Wiley Online Library on [13/01/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

does not necessarily indicate the presence of personality disturbance but is likely to be correlated with it. In this context, it is reasonable to have a set of domain trait scores that can be regarded as tentative references of personality dysfunction.

It could be argued that it is inappropriate to use reference scores in the PAQ-11R to indicate personality pathology, as the domain traits are only qualifiers to pathology, not diagnoses in themselves. But the use of reference scores can be defended as the traits contribute to pathology, and if the cut-off score is equaled or exceeded, this alone is a strong indicator to the clinician that significant pathology exists, irrespective of the severity of PD. It can then be reported as such and is likely to influence clinical decision making.

The studies had several limitations. In study 1, a major limitation is that we could not include a measure of inconsistent or careless responses in online data collection. However, a researcher (JC) did thoroughly monitor the entire data collection process and responded to any unusual data. A limitation in study 2 was the lack of reliability information for the diagnoses of the clinician and the psychologist, although a consensus on a final diagnosis of PD was reached in all cases. Lastly, the study samples only consisted of Koreans, and further studies are needed to examine the validity of the new instrument in other cultures.

In summary, the results of the current study support the utility of the PAQ-11R as a measure of ICD-11 traits. The results showed that it resolved problems related to the discriminant validity and structural integrity of the Dissociality domain scale in the previous version. The PAQ-11R would be a satisfactory option as a screen for ICD-11 trait domains, particularly when assessments are time-restricted. It could be useful for the initial assessment of personality pathology but is not a substitute for diagnosis. Future work is needed in populations of different ethnicities and cultural backgrounds.

## ACKNOWLEDGEMENTS

This work was supported by the National Research Foundation of Korea (NRF), funded by the Korean government (The Ministry of Science and ICT, MSIT; grant no. 2021R1A2C2009668).

## CONFLICT OF INTEREST STATEMENT

All authors declare no conflicts of interest. We thank Dr. Jin-Sup Eom for valuable advice regarding the statistical methods.

## DATA AVAILABILITY STATEMENT

Data will be available upon request to the corresponding author.

## ETHIC STATEMENT

The study was approved by the Institutional Review Board of the Catholic University (No. 1040395-202105-02) and the Seoul Paik Hospital Ethics Committee (No. PAIK 2022-05-003).

## ORCID

*Youl-Ri Kim* https://orcid.org/0000-0002-5538-7180
*Jisu Choi* https://orcid.org/0009-0008-1019-8563
*Peter Tyrer* https://orcid.org/0000-0002-0358-1459

## REFERENCES

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). American Psychiatric Publishing. https://doi.org/10.1176/appi.books.9780890425596

Bach, B., Brown, T. A., Mulder, R. T., Newton-Howes, G., Simonsen, E., & Sellbom, M. (2021). Development and initial evaluation of the ICD-11 personality disorder severity scale: PDS-ICD-11. *Personality and Mental Health*, *15*, 223–236. https://doi.org/10.1002/pmh.1510

Bach, B., Sellbom, M., Kongerslev, M., Simonsen, E., Krueger, R. F., & Mulder, R. (2017). Deriving ICD-11 personality disorder domains from dsm-5 traits: Initial attempt to harmonize two diagnostic systems. *Acta Psychiatrica Scandinavica*, *136*, 108–117. https://doi.org/10.1111/acps.12748

Bach, B., Simonsen, E., Kongerslev, M. T., Bo, S., Hastrup, L. H., Simonsen, S., & Sellbom, M. (2023). ICD-11 personality disorder features in the Danish general population: Cut-offs and prevalence rates for severity levels. *Psychiatry Research*, *328*, 115484. https://doi.org/10.1016/j.psychres.2023.115484

Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry*, *4*, 561–571. https://doi.org/10.1001/archpsyc.1961.01710120031004

Costa, P. T., & McCrae, R. R. (1992). NEO PI-R professional manual. In *Revised NEO personality inventory (NEO PI-R) and NEO five-factor inventory (NEO-FFI)*. Psychological Assessment Resources.

Crego, C., Oltmanns, J. R., & Widiger, T. A. (2020). Obtaining and losing the bipolarity of the five-factor model through factor analysis. *Personality Disorders, Theory, Research, and Treatment*, *11*(2), 119–130. https://doi.org/10.1037/per0000378

Germans, S., Van Heck, G. L., Moran, P., & Hodiamont, P. P. G. (2008). The self-report standardized assessment of personality-abbreviated scale: Preliminary results of a brief screening test for personality disorders. *Personality and Mental Health*, *2*, 70–76. https://doi.org/10.1002/pmh.34

Hong, T. H., Hwang, S. T., & Kim, Y. R. (2018). Replication of a validation study on the Korean version of the personality inventory for DSM-5 (K-PID-5). *Korean Journal of Clinical Psychology*, *37*, 558–572. https://doi.org/10.15842/kjcp.2018.37.4.008

Hong, T. H., Kim, Y. R., & Hwang, S. T. (2018). Construction and validation of the Korean version of the personality inventory for DSM-5 short form (K-PID-5-SF). *Korean Journal of Clinical Psychology*, *37*, 396–410. https://doi.org/10.15842/kjcp.2018.37.3.010

IBM Corporation. (2020). *IBM SPSS statistics for windows, version 27.0*. IBM Corp.

1932863x, 2024, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/pmh.1637 by Imperial College London, Wiley Online Library on [13/01/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Kerber, A., Schultze, M., Müller, S., Rühling, R. M., Wright, A. G. C., Spitzer, C., Krueger, R. F., Knaevelsrud, C., & Zimmermann, J. (2022). Development of a short and ICD-11 compatible measure for DSM-5 maladaptive personality traits using ant colony optimization algorithms. *Assessment*, *29*, 467–487. https://doi.org/10.1177/1073191120971848

Kim, J. T., & Shin, D. K. (1978). A study based on the standardization of the STAI for Korea. *The New Medical Journal*, *21*, 69–75.

Kim, Y. R., Tyrer, P., & Hwang, S. T. (2021). Personality assessment questionnaire for ICD-11 personality trait domains: Development and testing. *Personality and Mental Health*, *15*, 58–71. https://doi.org/10.1002/pmh.1493

Kim, Y. R., Tyrer, P., Lee, H. S., Kim, S. G., Hwang, S. T., Lee, G. Y., & Mulder, R. (2015). Preliminary field trial of a putative research algorithm for diagnosing ICD-11 personality disorders in psychiatric patients: 2. Proposed trait domains. *Personality and Mental Health*, *9*, 298–307. https://doi.org/10.1002/pmh.1305

Krueger, R. F., Derringer, J., Markon, K. E., Watson, D., & Skodol, A. E. (2012). Initial construction of a maladaptive personality trait model and inventory for DSM-5. *Psychological Medicine*, *42*, 1879–1890. https://doi.org/10.1017/S0033291711002674

Langbehn, D. R., Pfohl, B. M., Reynolds, S., Clark, L. A., Battaglia, M., Bellodi, L., Cadoret, R., Grove, W., Pilkonis, P., & Links, P. (1999). The Iowa personality disorder screen: Development and preliminary validation of a brief screening interview. *Journal of Personality Disorders*, *13*, 75–89. https://doi.org/10.1521/pedi.1999.13.1.75

Lee, Y. H., & Song, J. Y. (1991). A study of the reliability and the validity of the BDI, SDS, and MMPI-D scales. *Korean Journal of Clinical Psychology*, *10*, 98–113.

Lotfi, M., Bach, B., Amini, M., & Simonsen, E. (2018). Structure of DSM-5 and ICD-11 personality domains in Iranian community sample. *Personality and Mental Health*, *12*, 155–169. https://doi.org/10.1002/pmh.1409

Maples, J. L., Carter, N. T., Few, L. R., Crego, C., Gore, W. L., Samuel, D. B., Williamson, R. L., Lynam, D. R., Widiger, T. A., Markon, K. E., Krueger, R. F., & Miller, J. D. (2015). Testing whether the DSM-5 personality disorder trait model can be measured with a reduced set of items: An item response theory investigation of the personality inventory for DSM-5. *Psychological Assessment*, *27*, 1195–1210. https://doi.org/10.1037/pas0000120

Min, B. M., Lee, K. I., & Jeong, J. C. (1997). *NEO-PI-R*. PSI Consulting.

Moran, P., Leese, M., Lee, T., Walters, P., Thornicroft, G., & Mann, A. (2003). Standardised assessment of personality – abbreviated scale (SAPAS): Preliminary validation of a brief screen for personality disorder. *The British Journal of Psychiatry*, *183*, 228–232. https://doi.org/10.1192/bjp.183.3.228

Mulder, R. T., Horwood, J., Tyrer, P., Carter, J., & Joyce, P. R. (2016). Validating the proposed ICD-11 domains. *Personality and Mental Health*, *10*, 84–95. https://doi.org/10.1002/pmh.1336

Oltmanns, J. R., & Widiger, T. A. (2018). A self-report measure for the ICD-11 dimensional trait model proposal: The personality inventory for ICD-11. *Psychological Assessment*, *30*, 154–169. https://doi.org/10.1037/pas0000459

Oltmanns, J. R., & Widiger, T. A. (2020). The five-factor personality inventory for ICD-11: A facet-level assessment of the ICD-11 trait model. *Psychological Assessment*, *32*, 60–71. https://doi.org/10.1037/pas0000763

R Core Team. (2023). R: A language and environment for statistical computing. R Foundation for Statistical Computing.

Sellbom, M., Brown, T. A., & Bach, B. (2024). Development and psychometric evaluation of the personality disorder severity ICD-11 (PDS-ICD-11) clinician-rating form. *Personality and Mental Health*, *18*, 60–68. https://doi.org/10.1002/pmh.1596

Sellbom, M., Chiasson, P. M., Brown, T. A., & Bach, B. (2023). Examining the construct validity of the personality assessment questionnaire for ICD-11 (PAQ-11) personality trait domains in a community sample. *Personality and Mental Health*, *17*, 197–207. https://doi.org/10.1002/pmh.1573

Spielberger, C., Gorsuch, R., Lushene, R., Vagg, P., & Facobs, G. (1983). *Manual for the state-trait anxiety inventory, STAI (form Y)*. Consulting Psychologists Press.

Tyrer, P., & Alexander, J. (1979). Classification of personality disorder. *The British Journal of Psychiatry*, *135*, 163–167. https://doi.org/10.1192/bjp.135.2.163

Tyrer, P., Crawford, M., Mulder, R., & Group IRW. (2011). Reclassifying personality disorders [editorial material]. *Lancet*, *377*, 1814–1815. https://doi.org/10.1016/S0140-6736(10)61926-5

World Health Organization. (2022). International Classification of Diseases for Mortality and Morbidity Statistics (11th Revision). Accessed June 13, 2024. https://icd.who.int/

World Health Organization. (2024). *Clinical descriptions and diagnostic requirements for ICD-11 mental, behavioural and neurodevelopmental disorders*. World Health Organization.

## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

**How to cite this article:** Kim, Y.-R., Choi, J., & Tyrer, P. (2024). Verification of five-factor models and reference scores for personality dysfunction and trait domains of the Personality Assessment Questionnaire for ICD-11 (PAQ-11), revised version. *Personality and Mental Health*, *18*(4), 424–434. https://doi.org/10.1002/pmh.1637

1932863x, 2024, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/pmh.1637 by Imperial College London, Wiley Online Library on [13/01/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License