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Psychometric properties of the Persian version of the Mental Health Inventory-5 (MHI-5)

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ABSTRACT

The Mental Health Inventory-5 (MHI-5) is a valid and reliable brief instrument for assessing mental health internationally. This study aimed to investigate the validity of the Persian version of the MHI-5 among the Iranian adult population. Data were collected electronically from December 2020 to June 2020 using social networks (Google form). The questionnaire gathered information on demographics, the Generalized Anxiety Disorder-7 (GAD-7), Patient Health Questionnaire-9 (PHQ-9), Mental Health Inventory-28 (MHI-28), and Mental Health Inventory-5 (MHI-5). Content validity was assessed, and internal consistency was evaluated using Cronbach's alpha. Descriptive and correlational analyses were conducted on 1208 participants with a mean age of 32.80±12.37 years, of which 29.3% were male. The internal consistency for the Persian MHI-5 scale was 0.85 and Cronbach's alpha 0.78. Item-total correlations ranged from 0.49 to 0.52. The mean total score was 15.25±2.50. Negative statistically significant correlations were found between the Persian MHI-5 and anxiety/depression scores ($p<0.05$), demonstrating valid criterion validity. The findings support the reliability and validity of the Persian MHI-5 for screening mental illness among the general Iranian population. A short inventory such as the MHI-5 can effectively aid healthcare systems in mental health screening.

1. Introduction

The World Health Organization defines health as a global situation of complete mental, social, and physical well-being and a state of default of disease and existence of well-being (1). One of the components of health is mental health. Mental health is "a state of well-being in which the individual realizes his or her abilities, can cope with the normal stresses of life, can work productively and fruitfully, and can contribute to his or her community" (2). Mental disorders provide a considerable economic burden for countries (3). Many instruments and questionnaires were developed to appraise mental health/psychological distress in the general population (4). Assessing the mental state of the general population is essential, both in terms of influencing the treatment process of medical diseases and preventive acts (5). Early detection of mental health problems can be performed with screening instruments in primary care settings. Screening can help create more effective and immediate interventions for identified issues (6). Unfortunately, past mental health studies have mainly focused on psychopathology and psychological distress, neglecting the positive aspects of mental health, like well-being (7). However, studies on the relationship between positive psychological variables and disease development over the past two decades have shown their importance (8). Several instruments now exist for assessing various aspects of mental health (9). One such tool, developed in 1983, is the Mental Health Inventory (MHI) by Veit and Ware. The validated inventory consists of 38 items (MHI-38) to measure psychological well-being and distress in the general population (10). The psychometric properties of MHI-38 have been confirmed in subsequent research (10, 11). Berwick et al. (12) later created a shorter 5-item version called the Mental Health Inventory-5 (MHI-5) derived from the original MHI. Providing valid screening tools is important for improving early diagnosis of psychological disorders (12). The present study evaluates the psychometric properties of one such tool, the MHI-5. The MHI-5 is highly correlated with MHI-38

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scores (0.95) (13), and a cut-off point of 52 is commonly used for screening (14). The full-length MHI can also reveal a broader concept of mental health (6). The MHI-5 has several advantages for use as a screening tool. It is brief and easy for respondents to complete, making it suitable for large surveys and studies (12, 15). The MHI-5 demonstrates good reliability and validity across cultures as well. Research has validated the psychometric properties of the MHI-5 for use with general populations in several countries, including Brazil (16), Portugal (6), Finland (17), and Ireland among psoriasis patients (18). Its ability to assess psychological well-being and distress makes the MHI-5 suitable for screening the non-psychiatric population (19). Further, the MHI-5 has shown sensitivity for detecting anxiety and depression according to the DSM-IV criteria (5). It can identify mental health problems and has been used successfully in quality of life, public health, and mental health surveys (20). The brevity and psychometric validity of the MHI-5 across diverse populations support its continued use as a screening tool for psychological well-being and distress. The MHI-5 can be divided into two subscales to measure anxiety (MHI-a) and depression (MHI-d) specifically (21-23). It has demonstrated superior psychometric properties compared to the lengthier Mental Health Component Summary (MCS) (24). Scores on the MHI-5 also correlate well with other validated scales, such as the Zung Self-Rating Depression Scale, in identifying depressive symptoms among Japanese populations (25). The MHI-5 performs better than shorter versions of the Hopkins Symptom Checklist (SCL-25, SCL-10, SCL-5) (26) for assessment. Furthermore, its predictive ability for mental health problems is comparable to the 12-item General Health Questionnaire (GHQ-12) (27). The high association between MHI-5 and SCL scores suggests that MHI-5 could also replace the SCL (20). Given its brevity, validity, and versatility for measuring both anxiety and depression, the MHI-5 has been widely employed in general and mental health surveys (4). Longitudinal surveys have shown adequate agreement between the Kessler Psychological Distress Scale (K10) and MHI-5 in measuring psychological well-being over time (28). The MHI-5 effectively distinguishes individuals with low to high levels of mental health (6). Furthermore, the MHI-5 and Major Depression Inventory (MDI) are robust predictors of long-term sickness absence, though the MHI-5 performs better than the MDI specifically (9). Considerable evidence supports the validity of the MHI-5 for screening and evaluating depression through both clinical interviews and comparison to tools like the MDI (5, 12, 22, 29). There is also cultural diversity in conceptualizations of mental health (30). The translation and validation of the MHI-5 across multiple countries thus allows for valuable international comparative studies (13). Despite the widespread use of the MHI-5, its psychometric properties have not been examined in Iran. Therefore, the present study aims to investigate the validity and reliability of a Persian version of the MHI-5 among the general Iranian population. Given its brevity, prior validation history, and potential for cross-cultural comparisons, this research could enable broader application and understanding of the MHI-5 in Iran.

2. Materials and methods

This research was carried out in Tehran from December 2020 to June 2020. Data were gathered through an electronic questionnaire distributed via social networks (Google Form). Information was collected regarding demographic characteristics, the Generalized Anxiety Disorder-7 (GAD-7), Patient Health Questionnaire-9 (PHQ-9), Mental Health Inventory-28 (MHI-28), and Mental Health Inventory-5 (MHI-5). 10 experts assessed content validity and Cronbach's alpha was used to assess reliability. The internal consistency coefficient was used for assessing reliability. The MHI-5 was translated into Farsi using the forward-backward method. Cronbach's α and test-retest were calculated as 0.92 ($p<0.01$) and 0.86, respectively (Kendall's $t = 0.97$, $p<0.001$ for 2 consecutive administrations of the scales 1 week apart). The Content Validity Index (CVI) was used for this study. The scale was sent to 10 psychologist specialists for validation. This revised version used a simplified 6-point Likert scale ranging from 1 to 6 (one = never, two= very low, three = sometimes, four = high, five= very high, and six = always). The total score ranges from one to 30, with higher scores indicating better mental health.

2.1. Demographic characteristics

The data regarding age, gender, education, work experience, marriage status, income level, living alone or with family, and the number of children were recorded.

2.2. Generalized anxiety disorder-7 (GAD-7)

Anxiety symptoms were evaluated using the self-rating screening tool GAD-7 questionnaire. It is a 7-item question, ranging from 0 (not at all) to three (nearly every day). The severity of extreme anxiety disorders (generalized anxiety disorder or panic disorder) is shown based on its total score: minimal (0-4), mild (5-9), moderate (10-14), and severe (15-21) (31). The Cronbach's alpha coefficient of the GAD-7 for the present study was [insert value], and after two validations, it was accepted with an interrater agreement of 0.89.

2.3. Patient health questionnaire-9 (PHQ-9)

Symptoms of depression were evaluated using the self-rated screening tool PHQ-9 scale. It is a 9-item question based on depression symptoms scaled from 0 (not at all) to three (nearly every day). The participants report the frequency of symptoms experienced within the last two weeks. The severity of depression is classified into minimal (0-4), mild (5-9), moderate (10-14), moderately severe (15-19), and severe (20-27) (32). The Cronbach's alpha coefficient of the PHQ-9 for the present study was 0.86.

2.4. Mental health inventory-28 (MHI-28)

The mental health of individuals was assessed using the

Mental Health Inventory (MHI-28) (33), which is a short form of the 34-item Mental Health Scale (10). It has 28 items that measure psychological well-being and distress on a 5-Likert scale ranging from 1 (completely disagree) to 5 (completely agree). The psychometrics of the 28-item form were studied. Cronbach's alpha coefficients of psychological well-being and psychological distress for the scores were 0.94 and 0.91. The correlation coefficients between the scores were calculated with a 2-week interval for test-retest reliability assessment. Coefficients for psychological well-being and psychological distress were r = 0.90, r = 0.89, and p<0.001 respectively. The concurrent validity of the MHI-28 was measured by the simultaneous implementation of the General Health Questionnaire (27). The results of Pearson correlation coefficients showed that there was a significant negative correlation between the general score of the subjects in the general health questionnaire and the subscale of psychological well-being (r = -0.86, p<0.001), and a significant positive correlation with the subscale of psychological distress (r = 0.89, p<0.001) (33). In the present study, the subscales were consistent internally, and Cronbach's alpha coefficients were 0.90 for psychological well-being and 0.88 for psychological distress.

2.5. Mental health inventory-5 (MHI-5)

The MHI is a 38-item inventory for assessing mental health developed by Veit and Ware (10). The MHI-5 is a short version of the MHI. It is included in two versions of the Medical Outcome Study (MOS), the MOS Short Form 20 (SF-20) (34), and the MOS Short Form 36 (SF-36) (35). The MHI-5 is suitable for general population assessments and has items measuring psychological well-being (12). It appraises mood during the past month and measures the existence of psychological well-being with 2 items and the absence of psychological distress with 3 reverse-scored items. The inventory was first translated into Persian and then back-translated into English. Higher scores on the inventory indicate higher levels of mental health. The internal consistency in previous studies with general populations has ranged from 0.80 to 0.96 (36).

2.6. Data analysis

Descriptive statistics were used for the demographic data. Appropriate correlational statistics (Pearson or Spearman) based on the variable type (normal or non-normally distributed) were used to examine relationships among variables. Three dependent variables were assessed separately, including moral distress intensity, frequency, and composite score. The Content Validity Index (CVI) was used to measure questionnaire validity in this study. Quantitative variables were compared between groups using the independent t-test and Kruskal-Wallis/Mann-Whitney U tests depending on whether variables were normally or non-normally distributed, respectively. Normal distribution of all data was checked using the Kolmogorov-Smirnov test. Data were then analyzed using SPSS 20 software. A p-value less than 0.05 was considered statistically significant.

3. Results and discussions

A total of 1208 cases were included in the study. The mean age of participants was 32.80±12.37 years, and 29.3% were male. 44.0% of participants reported being currently single. 68.7% of the sample were employed. Those with bachelor's degrees represented 35.6% of the sample, and 23.84% had a master's degree. The internal consistency for the total scale score of the Persian version of the MHI-5 was 0.85. Cronbach's alpha coefficient for the total score was 0.78. The item-total correlations ranged between 0.49 and 0.52. The mean total score was 15.25±2.50. The mean score for each item is presented in Table 1. There were no statistically significant differences regarding gender (p>0.05).

Table 1. The means and standard deviation for scale items.

Scale items	Mean	SD
1. During the past month, how much of the time were you a happy person?	3.39	1.13
2. How much of the time have you felt calm and peaceful during the past month?	3.51	1.21
3. How much of the time during the past month have you been a very nervous person?	2.74	1.12
4. How much of the time have you felt downhearted and blue during the past month?	3.18	1.27
5. How much of the time, during the past month have you felt so down in the dumps that nothing could cheer you up?	2.41	1.41

The criterion validity of the Persian version MHI-5 was assessed according to its correlation with another measurement of anxiety and depression. There was a negative and statistically significant correlation between the Persian version of MHI-5 and well-being score and the anxiety and depression disorder score (p<0.05).

Table 2. Correlations of the Persian version of the MHI-5 and another measurement of anxiety and depression.

Items	MHI-5	Well-being	Distress
Anxiety disorder	-0.23	-0.19	0.45
Depression disorder	-0.42	-0.58	0.70

These results indicate valid criterion validity for the Persian version of MHI-5 (Table 2). The present study investigated the psychometric characteristics of the Persian version of the MHI-5 among the general Iranian population. The findings are consistent with previous studies that confirmed the validity and reliability of the inventory (6, 12, 15-18). Reliability based on Cronbach's alpha showed that the internal consistency of the inventory was suitable. Suitable internal consistency and content validity, coupled with high reliability, demonstrate the potential to evaluate mental health in the Iranian population using a brief previously validated questionnaire used substantially in other populations (4, 37-41) and preliminarily

in adolescents (19). The internal consistency and reliability of the questionnaire used in the current study were comparable to other studies on samples from diverse cultures and populations (4, 5, 19, 39, 40). The results demonstrated that the inventory has distinct validity and can differentiate between individuals with standard versus abnormal mental health and distress. The present study had some limitations. First, the participants were Iranian, so generalizing to other countries should be done cautiously. Second, the instrument used was only a questionnaire; a diagnostic interview would have provided a more comprehensive assessment. One of the present study's main strengths was its large sample size. Future studies could further explore the validity and reliability of the inventory in other age groups, such as adolescents and children. The convergent validity could also be investigated using different mental health scales. It is suggested that the normalization of MHI-5 be explored in future research.

4. Conclusion

The results of this study demonstrate that the Persian version of the MHI-5 is a valid and reliable tool for assessing mental health and screening for emotional disorders in the Iranian population. Its criterion validity was confirmed through significant negative correlations with measures of anxiety and depression, consistent with previous validations of the scale in other cultures and languages. Additionally, the MHI-5 showed good internal consistency and test-retest reliability. As a brief 5-item instrument, the Persian MHI-5 can help address the need for efficient screening and early diagnosis of mental health issues in both clinical and research settings in Iran. Its usefulness was also supported by significant correlations in the expected directions between MHI-5 scores and generalized psychological distress. Overall, this validation establishes that the Persian MHI-5 is a psychometrically sound option for mental health screening that can aid healthcare systems in Iran by facilitating the timely identification and management of emotional disorders.

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