

Reliability, validity, and factorial structure of the World Health Organization-5 Well-Being Index (WHO-5) in Iranian psychiatric outpatients

Confiabilidade, validade e estrutura fatorial do World Health Organization-5 Well-Being Index (WHO-5) em pacientes psiquiátricos ambulatoriais iranianos

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Abstract

Introduction: The association between psychological well-being and physical and mental health has been shown in the literature. Psychological well-being is a multifaceted concept. The World Health Organization-5 Well-Being Index (WHO-5) is a 5-item instrument used to screen for depression. However, the validity of the WHO-5 has not been investigated in Iranian psychiatric or psychological settings.

Objective: To investigate the validation of the Farsi version of the WHO-5 in a sample of Iranian psychiatric outpatients.

Methods: A cross-sectional study was conducted with a convenience sample of 116 Iranian volunteer psychiatric outpatients selected from the psychiatric and psychological clinics at the School of Behavioral Sciences and Mental Health – Tehran Institute of Psychiatry, Iran University of Medical Sciences. Patients completed the WHO-5, the Patient Health Questionnaire-9 (PHQ-9), the Patient Health Questionnaire-15 (PHQ-15), and the short form of the Beck Depression Inventory-13 (BDI-13).

Results: The mean score of the WHO-5 was 8.95 (standard deviation [SD] = 5.49). Cronbach's α for the WHO-5 was 0.91. The WHO-5 negatively correlated with PHQ-9 (-0.358), PHQ-15 (-0.328), and BDI-13 (-0.475), indicating good validity. Factor analysis of the WHO-5 items identified one factor labeled psychological well-being.

Conclusions: The WHO-5 has a single dimensional structure and acceptable psychometric parameters. The results of this study suggest that WHO-5 can be used in a clinical context in Iran.

Keywords: Psychological well-being, validity, reliability, factorial structure, WHO-5, psychiatric outpatients, Iran.

Resumo

Introdução: A associação entre bem-estar psicológico e saúde física e mental tem sido demonstrada na literatura. Bem-estar psicológico é um conceito multifacetado. O World Health Organization-5 Well-Being Index (WHO-5) é um instrumento composto por 5 itens utilizado para avaliar depressão. No entanto, a validade do WHO-5 não foi investigada em contextos psiquiátricos ou psicológicos iranianos.

Objetivo: Investigar a validade da versão persa do WHO-5 em uma amostra de pacientes psiquiátricos ambulatoriais iranianos.

Métodos: Um estudo transversal foi conduzido com uma amostra de conveniência composta por 116 pacientes psiquiátricos ambulatoriais iranianos voluntários selecionados nas clínicas psiquiátrica e psicológica da School of Behavioral Sciences and Mental Health, Tehran Institute of Psychiatry, Iran University of Medical Sciences. Os pacientes completaram o WHO-5, o Patient Health Questionnaire-9 (PHQ-9), o Patient Health Questionnaire-15 (PHQ-15) e a versão abreviada do Beck Depression Inventory-13 (BDI-13).

Resultados: O escore médio obtido no WHO-5 foi de 8,95 (desvio padrão = 5,49). O alfa de Cronbach para o WHO-5 foi 0,91. O WHO-5 se correlacionaram negativamente com o PHQ-9 (-0,358), o PHQ-15 (-0,328) e o BDI-13 (-0,475), indicando validade adequada. A análise fatorial dos itens do WHO-5 identificaram um único fator, a saber, bem-estar psicológico.

Conclusão: O WHO-5 tem uma estrutura dimensional única e parâmetros psicométricos aceitáveis. Os resultados deste estudo sugerem que o WHO-5 pode ser usado em contextos clínicos no Irã.

Descritores: Bem-estar psicológico, validade, confiabilidade, estrutura fatorial, WHO-5, pacientes psiquiátricos ambulatoriais, Irã.

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Introduction

Well-being is a multifaceted, dynamic, complicated construct. There are many different studies of key dimensions of well-being.¹ Well-being has components of psychological well-being/subjective well-being and emotional well-being.^{2,3}

Psychological well-being and emotional well-being concepts were developed by researchers in the field of positive psychology, health psychology, organizational psychology and organizational behavior. Psychological well-being assesses well-being and it correlates with physical health. It refers to how people evaluate their personal and social life (i.e., internal experience and their perception of life).⁴⁻⁷ Emotional well-being, in turn, is necessary to the individual's health as a whole. It has been correlated with mental health issues^{8,9} and related to facets or Ryff's six domains of psychological well-being.^{10,11}

The World Health Organization-5 Well-Being Index (WHO-5) can be used as a tool when screening for depressive symptoms, monitoring emotional well-being and psychological well-being,¹²⁻¹⁷ and also to assess the severity of suicide attempts.^{18,19}

The validity of the WHO-5 has not been so far investigated in Iranian psychiatric and psychological settings. We examined psychometric and screening parameters for psychological well-being of this index in a sample of Iranian psychiatric outpatients.

Methods

A convenience sample of 116 Iranian volunteer psychiatric outpatients was selected from the psychiatric and psychological clinics at one site in Tehran, Iran, namely, the School of Behavioral Sciences and Mental Health – Tehran Institute of Psychiatry, affiliated with the Iran University of Medical Sciences. The patients were invited to voluntarily participate in the study after completing a psychiatric interview with one psychiatrist. Patients who agreed to participate provided written consent. The study protocol was approved by an institutional review board.

The patients completed the Farsi versions of the WHO-5, the Patient Health Questionnaire-9 (PHQ-9), the Patient Health Questionnaire-15 (PHQ-15), and the short form of the Beck Depression Inventory-13 (BDI-13).

World Health Organization-5 Well-Being Index (WHO-5)

The five items of the WHO-5 are associated with positive mood, vitality, and general interests; each of

the items is rated on a 6-point Likert scale. Previous studies have reported acceptable psychometric parameters of the WHO-5 in different versions and in various clinical and non-clinical samples.^{15,20-27} The Farsi version of the WHO-5 was available at the WHO website in 2017.²⁸

Patient Health Questionnaire-9 (PHQ-9)

The PHQ-9 is a tool designed for the assessment of depression. It contains nine items focusing on the past two weeks; each item is scored using a 4-point Likert scale ranging from 0 to 3. Previous studies have shown good psychometric characteristics for the PHQ-9.^{21,29-38}

Patient Health Questionnaire-15 (PHQ-15)

The PHQ-15 is a short, self-reported instrument used to screen for somatoform symptoms. It covers 15 somatic symptoms and focuses on the past four weeks. Each symptom is scored from 0 to 2. Studies have indicated high internal consistency and acceptable validity for the PHQ-15.³⁷ For example, the PHQ-15 correlated with the Patient Health Questionnaire-2 (PHQ-2) at 0.45.²⁷

Short form of the Beck Depression Inventory-13 (BDI-13)

The BDI-13 is a screening instrument for depressive symptoms. Good psychometric properties have been reported, and three factors identified, for the BDI-13.³⁹ The BDI-13 correlated with the PHQ-2 at 0.69.²⁷

Results

The mean age of the patients was 35.48 years (standard deviation [SD] = 12.20). Mean duration of psychiatric disorder was 5.61 years (SD=5.16). In the total sample, 81.8% were female; 48.1% were single, 46.3% married, 4.6% divorced, and 0.9% widowed. The majority had 12 years of education (59.7%), and 40.4% had a bachelor's degree (BA) and higher degree. With regard to mental health diagnoses, 22.5% had an anxiety disorder, 70% a depressive disorder, and 7.5% had other disorders.

The mean score of the WHO-5 was 8.95 (SD=5.49). The lowest mean score obtained was 1.58 (SD=1.33) for item 4, and the highest mean score was 2.03 (SD=1.20) for item 1 (Table 1).

In the present study, the mean scores of the other tools were calculated, and resulted as follows: PHQ-9, 12.83 (SD=6.25); PHQ-15, 10.46 (SD=5.70); and BDI-13, 9.65 (SD=5.92).

Reliability coefficients of the WHO-5

Cronbach's α for the WHO-5 was 0.91, indicating high internal consistency. For the other questionnaires, Cronbach's α values were as follows: PHQ-9, 0.88; PHQ-15, 0.85; and BDI-13, 0.80.

Inter-item and item-total correlations in the WHO-5

The correlations between items and the total score of the WHO-5 were high, ranging from 0.79 to 0.90. The correlations between items ranged from 0.54 for items 3 and 5, to 0.75 for items 4 and 5, denoting moderate correlation (Table 2).

Correlations between WHO-5 and other questionnaires

Table 3 shows the correlations between the WHO-5 and other measures, demonstrating moderate validity and association between the instruments (Table 3).

Factor analysis of the WHO-5

The Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) was 0.874, indicating sample adequacy; Bartlett's test of sphericity was 377.330 ($df=10$, $p<0.001$), suggesting that factor analysis was justified in the sample. The results of the exploratory factor analysis on the WHO-5 found only one factor.

Table 1 - Scores obtained for each WHO-5 item and total score

WHO-5	Minimum	Maximum	Mean	SD
1. Being cheerful and good spirits	0.00	5.00	2.03	1.20
2. Being calm and relaxed	0.00	5.00	2.02	1.29
3. Being active and vigorous	0.00	5.00	1.66	1.22
4. Waking up fresh and rested	0.00	5.00	1.58	1.33
5. Being interested in things	0.00	5.00	1.64	1.33
Total score	0.00	25.00	8.95	5.49

SD = standard deviation; WHO-5 = World Health Organization-5 Well-Being Index.

Table 2 - Pearson's inter-item and item-total correlations (r)

Items	1	2	3	4	5	Total
1	1					
2	0.736*	1				
3	0.570*	0.617*	1			
4	0.679*	0.742*	0.679*	1		
5	0.650*	0.715*	0.547*	0.754*	1	
Total	0.844*	0.890*	0.792*	0.902*	0.860*	1

* Significant at 0.01 level.

Table 3 - Pearson's correlations (r) between the questionnaires

Questionnaires	r with WHO-5
The PHQ-9	-0.358*
The PHQ-15	-0.328 [†]
The BDI-13	-0.475 [†]

BDI-13 = Beck Depression Inventory-13; PHQ-9 = Patient Health Questionnaire-9; PHQ-15 = Patient Health Questionnaire-15; WHO-5 = World Health Organization-5 Well-Being Index.

* Significant at the 0.05 level.

[†] Significant at the 0.01 level.

Factor 1 (5 items) explained 73.67% of the variance and was labeled psychological well-being (Table 4 and Figure 1).

Discussion

The aim of the study was to investigate psychometric parameters for depression of the WHO-5 in an Iranian clinical sample.

The mean score of the WHO-5 was 8.95 (SD=5.49), denoting poor psychological well-being in the sample. A study by Khosravi et al.²⁵ reported a mean WHO-5 score of 13.4 (SD=6.5) in an Iranian sample. In another study, the Thai version of the WHO-5 showed a mean score of 14.32 (SD=5.26) in primary care patients.²⁴

Cronbach's α for the WHO-5 was 0.91, indicating good reliability. Other studies have shown good Cronbach's α values for the WHO-5.^{1,16,20,21,24-26,40-45}

Inter-item correlations were significant for items 3 and 5, and also for items 4 and 5. The associations between the items and the WHO-5 total score were significant for items 3, 4, and the total score.

In our study, the WHO-5 negatively correlated with the other measures assessed, denoting good validity. Findings of Khosravi et al.²⁵ and Mortazavi et al.²⁶ showed that the WHO-5 negatively correlated with the 28-item General Health Questionnaire (GHQ-28; $r=-0.66$ and $r=-0.64$, respectively). The study by Blom et al.⁴⁵ found that the WHO-5 negatively correlated with the Beck Depression Inventory (BDI-6; $r=-0.49$). Guðmundsdóttir et al.⁴⁰ reported that the

Table 4 - Factor loadings of the WHO-5 in Iranian psychiatric outpatients

WHO-5 Items	Component
Over the last two weeks:	
1. I have felt cheerful and in good spirits.	0.84
2. I have felt calm and relaxed.	0.89
3. I have felt active and vigorous.	0.78
4. I woke up feeling fresh and rested.	0.90
5. My daily life has been filled with things that interest me.	0.85
Eigenvalue	3.68
% of Variance	73.67

WHO-5 = World Health Organization-5 Well-Being Index.

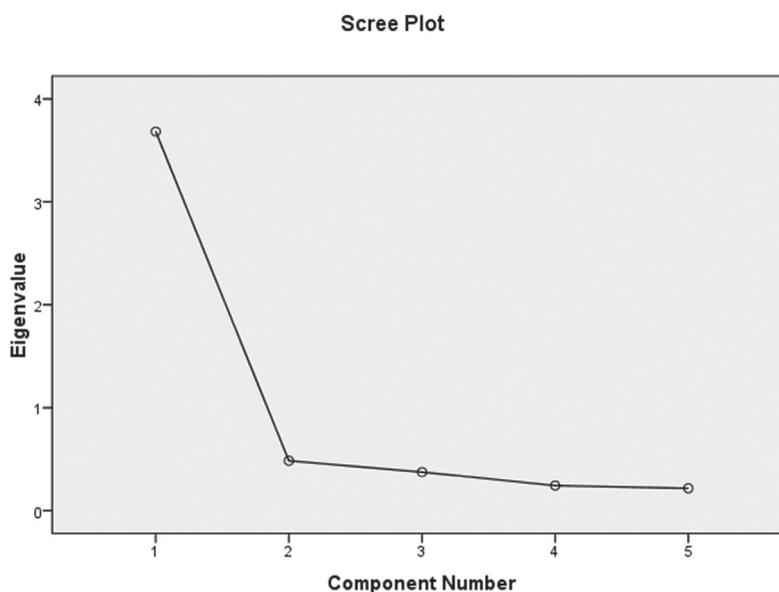


Figure 1 - Scree plot for the World Health Organization-5 Well-Being Index (WHO-5).

WHO-5 negatively correlated with other inventories of depression and anxiety. Wu²¹ and Saipanish et al.²⁴ found that the WHO-5 negatively correlated with the Hospital Anxiety and Depression Scale (HADS-Depression; -0.54 and -0.57, respectively). Also, Wu²¹ indicated that the WHO-5 positively correlated with the World Health Organization Quality of Life (WHOQOL) and negatively associated with the PHQ-9 in patients with metabolic syndrome.

We identified one factor, labeled psychological well-being, which accounted for 73.67% of the variance. Our finding is similar to previous studies that also obtained a single factor.^{2,21,24,25,38} It seems that the 1-factor solution represents the best fit for the WHO-5.

Conclusions

The validation process of the Farsi version of the WHO-5 showed psychometric parameters consistent with those reported in previous studies, suggesting that it measures concepts that are similar to those measured by the original version. The WHO-5 has a single dimensional structure and acceptable psychometric parameters.

The results of this study suggest that the WHO-5 can be used in a clinical context in Iran. The use of distinct cut-off points for different purposes and populations, Rasch's item response theory (IRT) approaches, and receiver operating characteristic curve (ROC) for depression or more severe mental disorders, are all suggested.

Disclosure

No conflicts of interest declared concerning the publication of this article.

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