

Original article

Psychometric properties of the Persian version of Whiteley Index

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Abstract: *Background* — Health anxiety affects the doctor–patient relationship and also causes unnecessary further procedures. Therefore, early diagnosis of it with a valid instrument is very important.

Objectives — The aim of this study was to evaluate psychometric properties of the Persian version of 14-item Whiteley Index.

Material and Methods — This research was a cross sectional study carried out in the medical school of Kerman University of Medical Sciences. Our statistical population included all medical students who were studying in clerkship and internship in 2016. Data collected by using the Persian version of 14-item Whiteley Index and general health questionnaire. The reliability of the questionnaire determined using Cronbach's alpha and test-retest. The construct validity evaluated by principal component analysis and confirmatory factor analysis.

Results — Three hundred and ten medical students participated. The reliability of Whiteley Index was 0.88 and 0.82 using Cronbach's alpha and intra class correlation coefficients. In the principal component analysis, two factors were extracted with the total amount of 50.4% explained variance. In confirmatory factor analysis the models had acceptable goodness of fit indices.

Conclusion — Persian version of 14-item Whiteley Index can be used as a reliable and valid instrument for assessing Health anxiety among Iranian young population.

Keywords: health anxiety, hypochondriasis, reliability, validity

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Introduction

Hypochondriasis is a mental disorder characterized by belief in having a serious illness and thinking anxiously about it [1]. Although the patient reports symptoms, no abnormal physical finding can be found in most cases [2]. “According to DSM-5, patients previously diagnosed with hypochondriasis are diagnosed with either somatic symptom disorder (if physical complaints are prominent) or illness anxiety disorder (if physical complaints are minimal or nonexistent)” [3]. The prevalence of hypochondriasis, in various studies, has been reported between 3.0-6.3%. Symptoms of health anxiety reported 5-30 and 2-13 percent in the primary care and general population, respectively [3]. The disorder affects interpersonal relationships, especially, the doctor–patient relationship and also has economic burden due to unnecessary further procedures. Despite these negative effects, often, it is not diagnosed [2].

Different instruments have been developed to screen hypochondriasis and health anxiety [2, 4]. Whiteley Index (WI), Illness Attitude Scales, Somatosensory Amplification Scale are examples of these tools [4]. A 14-item version of the Whiteley Index has been developed by Pilowsky and has been used in several studies in original or modified versions, in different population, and in clinical settings [5]. In this tool, responses are dichotomous with total score ranges from zero to fourteen [6]. Also, a five-point scale (1 = “Not at all” and 5 = “Extremely”) has been used in some literatures [7]. Psychometric properties of 14-

item Whiteley Index have been evaluated in different studies. Some of them found a three-factor solution including disease phobia, bodily preoccupation, and disease conviction while others revealed single factor with good internal consistency [2, 6, 7].

It seems that according to the new definition of disease, the instrument evaluated mainly illness anxiety rather than somatic symptom disorder. Furthermore, it has been revealed that Likert-scale has better psychometric properties [8]. So, we investigated psychometric properties of the Persian version of Likert-scale 14-item Whiteley Index.

Material and Methods

Design

This research was a cross sectional study carried out in the medical school of Kerman University of Medical Sciences (Kerman, Iran). Our statistical population included all medical students who were studying in clerkship and internship in 2016. The participants selected by census method.

The study was approved by the research review board at Kerman University of Medical Sciences (Kerman, Iran).

The questionnaires were completed anonymously and voluntarily. The participants were assured that the data would be used only for research purposes. The questionnaires were distributed and completed either before or after weekly formal classes. Ten minutes required to complete the questionnaire.

Table 1. Exploratory factor loading of Whiteley Index

No.	Items	Factor	FL
1	Do you often worry about the possibility that you have got a serious illness?	1	0.83
2	Are you bothered by many aches and pains?	1	0.78
3	Do you find that you are often aware of various things happening in your body?	1	0.71
4	Do you worry a lot about your health?	1	0.46
5	Do you often have the symptoms of very serious illnesses?	1	0.40
6	If a disease is brought to your attention (through the radio, television, newspapers or someone you know) do you worry about getting it yourself?	2	0.61
7	If you feel ill and someone tells you that you are looking better, do you become annoyed?	2	0.54
8	Do you find that you are bothered by many different symptoms?	2	0.55
9	Is it easy for you to forget about yourself and think about all sorts of other things?	2	-0.65
10	Is it hard for you to believe the doctor when he tells you there is nothing for you to worry about?	2	0.60
11	Do you get the feeling that people are not taking your illness seriously enough?	2	0.71
12	Do you think that you worry about your health more than most people?	2	0.52
13	Do you think there is something seriously wrong with your body?	2	0.65
14	Are you afraid of illness?	2	0.65

FL, factor loading.

Table 2. Comparison of the goodness of fit indices in one-factor and two-factor models

Model	χ^2/df	SRMR	RMSEA (CI 95%)	GFI	AGFI	NFI	CFI
OFM	297/77	0.06	0.11 (0.09-0.12)	0.86	0.81	0.92	0.94
TFM	190/74	0.05	0.07 (0.06-0.08)	0.91	0.88	0.95	0.97

χ^2 , Chi-square; df, degree of freedom; OFM, one-factor model; TFM, two-factor model; SRMR, standardized root mean square residual; RMSEA, root mean square error approximation; GFI, goodness of fit Index; AGFI, adjusted goodness of fit index; NFI, normed fit index; CFI, comparative fit index.

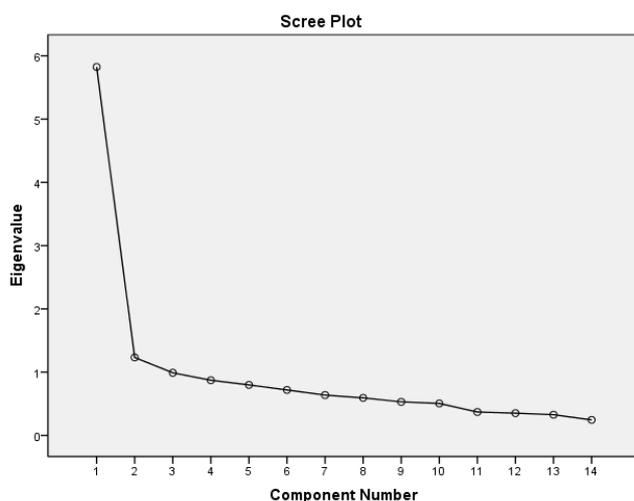


Figure 1. Scree plot in principle component analysis of Whiteley Index

Subjects

A total of 310 medical students participated in the study (participation rate: 76.1%). Their mean age was 24.1±1.1 years with minimum and maximum of 21 and 28 years, respectively. One hundred and eighty six (60%) participants were studying at clerkship and 233 (75%) were single.

Whiteley Index (WI)

The original version of WI was translated into Persian by two professors who were highly qualified in English. By comparing the text of two translations, a Persian version was prepared. This Persian version was back translated into English by a translator who was not familiar with the content of the original questionnaire.

General Health Questionnaire-28 (GHQ28)

The Persian version of General Health Questionnaire (GHQ28) was used. The validity and reliability of this version was confirmed in previous studies [9]. The four point scale (0-3) scoring system was used in this study with a total possible score ranging from 0 to 84 [10].

Statistics analysis

Data analyzed by SPSS version 19 and Lisrel 8.8. Face and content validity of the questionnaire was confirmed by a number of medical experts. The reliability of the questionnaire determined in a pilot study using internal consistency (Alfa Cronbach) and test-retest. Exploratory principal component analysis conducted on the items of using Kaiser Criterion and scree plot. Confirmatory factor analysis also employed.

Results

Internal consistency of WI and GHQ28 by the Cronbach's alpha was determined 0.88 and 0.82, respectively. In test-retest reliability, intraclass correlation of WI was calculated 0.82. There was a statistical significant correlation between the scores of the WI and GHQ28 ($r=0.4$, $P=0.001$).

In exploratory factor analysis, Kaiser-Meyer-Olkin Measure of Sampling Adequacy was 0.9 and Bartlett's Test of sphericity was statistically significant ($P=0.001$, $\chi^2=1451.9$, $df=91$). These results indicated proper correlation of factors, adequacy of sampling and the justifiability of factor analysis.

In the principal component analysis, two factors with eigenvalues greater than 1.00 are extracted (Table 1 and Figure 1).

The total amount of variance explained by these factors was 50.4% (41.6% and 8.8% for first and second factor, respectively). First factor included items 1, 2, 3, 4, 5, and other items placed in second factor.

The Cronbach's alpha coefficient was 0.75 for first factor and 0.85 for second factor. Confirmatory factor analysis was used to compare the goodness of fit indices in one-factor and two-factor models (Table 2).

Discussion

Our study evaluated psychometric characteristics of the Persian version of 14-item WI in a sample of medical students in Kerman University of Medical Sciences (Kerman, Iran).

Total reliability of 14-item WI was 0.88 using Cronbach's alpha coefficient indicating good internal consistency [11, 12] that was compatible with similar studies. Speckens et al. revealed good to satisfactory internal consistency for the instrument. They found the Cronbach's alpha of the total WI was 0.76, 0.80 and 0.78 in general population, medical outpatients and general practice setting, respectively [4].

Conradt et al. reported the alpha consistency coefficient as 0.68 for the WI-7 [2]. Schulte-van Maaren et al. found Cronbach's Alpha as 0.90 and sensitivity/specificity 0.95/0.93 for 14-item WI [6]. Also, in present study, intraclass correlation of WI was calculated as 0.78 that was good [11] but lower than similar studies. Speckens and colleagues found intraclass correlation as 0.9 [4] and another study revealed high test-retest reliability of the instrument [8].

In our study, Kaiser-Meyer-Olkin measure and Bartlett's test of sphericity revealed proper correlation of factors, adequacy of sampling and the justifiability of factor analysis [12]. Principal component analysis confirmed the presence of two factors that are inconsistent with other studies. However, Speckens found a one factor solution in all three study populations [4]. Pilowsky et al. extracted three factors by exploratory principal component analysis, interpreted as disease phobia, bodily preoccupation, and disease conviction [2]. Other studies also proposed three factor solutions for this instrument but factors are not exactly the present factors in the original questionnaire developed by Pilowsky [2, 13, 14]. The discrepancy between the results of present study with others may be derived from differences in cultural backgrounds, dissimilar studied samples and diversity in methods for statistical analysis.

In addition, we conducted confirmatory factor analysis for one and two factor solution of the instrument. According to this analysis, both models had acceptable goodness of fit indices while, two-factor model had a slightly better indices. So, according to the results of this study the Persian version of 14-item WI can be used as a reliable and valid instrument for assessing hypochondriasis among Iranian young population.

Conclusion

The Persian version of 14-item WI had good reliability and validity.

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Conflict of interest

The authors have no conflict of interest.

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