Journal of Depression and Anxiety
ISSN: 2167-1044

Mehdi et al. J Depress Anxiety 2013, 2:1
DOI: 10.4172/2167-1044.1000125

Research Article Open Access

Factor Structure Analysis, Validity and Reliability of the Health Anxiety Inventory-Short Form

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Abstract

The purpose of this study was to examine the factor structure, validity and reliability of the Persian-language version of Health Anxiety Inventory-Short. Participants were 500 (170 male and 326 female) selected randomly (cluster sampling sample) studied in a sample of Iranian college students. Convergent validity of Health Anxiety Inventory—Short Form with Yale–Brown Obsessive Compulsive Scale modified for BDD, The Obsessive–Compulsive Inventory-Revised and Depression Anxiety Stress Scales 21-item version were r=0.45, r=0.51 and r=0.7 (p<0.001). Confirmatory factor analyses revealed, HAI-SF (18 items) that health anxiety, as measured by the HAI-SF, adequately fits the current data. The Cronbach's alpha for total factor was 0.89. Also, results were shown to possess discriminant validity and classification accuracy, in both clinical and community populations. It can be concluded that this instrument is a useful measure for assess health anxiety and hypochondria symptoms in clinical assessment.

Keywords: Health anxiety; Hypochondria; HAI-SF; Assessment; Factor analysis

Introduction

Hypochondriasis is associated with increased disability and health costs, as well as degree of worry about illness. Hypochondriasis is usually identified as a categorical diagnostic entity. However, Hypochondriasis may be better conceptualized as an extreme form of health anxiety [1]. Hypochondriasis is much more serious than these normal and fleeting worries. Hypochondriasis is severe and preoccupying and often leads to substantial impairment in life functioning. The worries must last for at least six months according to DSM-IV-TR criteria [2]. The mean prevalence rate of hypochondriasis in the general population is reportedly about 4.8 percent [3,4].

Screening instruments also exist for possible hypochondriasis. Common ones include the *Cognitions about Body and Health Questionnaire* and *Scale for the Assessment of Illness Behavior* [5,6]. Other questionnaires specific to hypochondriasis include the *Illness Behaviour Questionnaire, Illness Attitude Scales, Whiteley Index,* and *Somatosensory Amplifi cation Scale* (SAS). These scales measure perceptions of illness, diagnostic symptoms, and awareness of internal sensations.

What is required is a validated scale that is sensitive across the full range of health anxiety, which can be used to help identify people who will meet diagnostic criteria without the requirement for separate medical examination.

The Whiteley Index [7] was devised in order to clarify the symptom clusters that are seen in clinical Hypochondriasis by using factor analysis. Three factors were identified `bodily preoccupation', `disease phobia' and `conviction of the presence of disease with non-response to reassurance'. The Whiteley Index includes some items that do not seem to be directly measuring hypochondriasis, such as, ` Is it easy for you to forget yourself and think about all sorts of other things? '. There is no evidence that the Whiteley Index can discriminate between hypochondrial patients and psychiatric patients who are matched for levels of anxiety. The Illness Behaviour Questionnaire was developed from the Whiteley Index. The IBQ is not solely concerned with hypochondriasis. The scales have been criticized for containing items that do not all measure the same aspect of illness behaviour [8]. The IBQ was developed with pain clinic patients and there have been no studies examining the extent to which the IBQ or scales from it can identify hypochondrial patients.

The Illness Attitude Scale [9] purports to measure `psychopathology which tends to be associated with hypochondriasis and which can be responsible for abnormal illness behavior. The questions were constructed from statements made by patients who were either diagnosed as having hypochondrial neurosis or who showed abnormal illness behavior. Some of the items on the IAS do not relate to hypochondriasis, such as the ones assessing smoking and healthy eating [10] reported the preliminary development and validation of a scale intended to measure the full range of health anxiety, referred to in its development here as the Health Anxiety Inventory (HAI). The items chosen were closely based on the cognitive theory of health anxiety and Hypochondriasis [11], and were found to distinguish between patients with Hypochondriasis and non-clinical controls.

Although these studies have provided some basics about instruments hypochondria disorder, still there is some problems in diagnostic and assessing hypochondria disorder and there is a need for a standard assessment tool to assess special hypochondria disorder.

In the current study, we examined the psychometric properties of 18 item Persian-language version of the Health Anxiety IInventory-Short Form. A positive feature of the HAI-SF is that the scale now includes items that cover each of the impairment domains in a proposed diagnostic criteria for hypochondria distress and functional impairment [12].

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Received January 15, 2013; **Accepted** March 08, 2013; **Published** March 16, 2013

Citation: Mehdi R, Mehrdad K, Kariem A, Fatemeh B (2013) Factor Structure Analysis, Validity and Reliability of the Health Anxiety Inventory-Short Form. J Depress Anxiety 2: 125. doi:10.4172/2167-1044.1000125

The main aim of this study was to presentation a strong standard assessment tool to assess hypochondria disorder and determine its validity (construct and convergent), reliability and comparison of its factors in patients with hypochondria and people without the illness.

Method

Participants

The data for the Iranian sample were collected in 2012. The Iranian sample consisted of 500 students participants (170 male and 326 female) attending University of Isfahan of Iran. Participants ranged in age from 15 to 40 years (M=26.5; SD=2.7). Eighty (80%) of the participants were single and 20% were married. Their socio-economic status was average or above average. Classification of socioeconomic status was based on coding of the subjects' income, education and job.

Cluster sampling method was used to select the sample. *First sampled colleges (4 colleges from 8 colleges selected), then sampled 500 students (500 students from 4 colleges selected).*

Moreover, we had 30 patients with hypochondria disorder and 30 normal persons without hypochondria disorder for assessment of the diagnostic validity. Patients were drawn from consecutive referrals made by general practitioners and psychiatrists to medical clinics in the city of Isfahan, Iran. Hypochondria disorder diagnosis was established using the structured clinical interview for DSM-IV diagnoses [2]. Thirty patients were, thus, recruited (17 females), ages ranging from 16 to 37 years (mean=44.12; SD=2.95). Sixty (60%) of the participants were single and 40% were married. Their socio-economic status was average or above average. Classification of socioeconomic status was based on coding of the subjects' income, education and job. Also, they all had some high school diploma and university education. Ten of the patients were currently taking psychotropic medication (6 patients had previously taken clomipramine and another one fluvoxamine and buspirone). The duration of their hypochondria disorder ranged from 6 month to 7 years.

Measure

The measuring tools in this study have been Health Anxiety Inventory-Short Form, Yale-Brown Obsessive Compulsive Scale Modified for BDD and Depression Anxiety Stress Scales 21-item version and OCI-R.

Health Anxiety Inventory-Short Form (HAI-SF): The Health Anxiety Inventory-Short Form (HAI-SF); Salkovskis et al. [12] is an 18-item self-report measure of health anxiety/hypochondria symptoms. Specifically, the HAI-SF assesses for the presence of current health worries/concerns as well as how individuals believe that they would react if they believed that they had a serious medical condition. Items are rated on a four-point scale that allows for the assessment of symptom presence and severity. Total scores range from 0 to 54, with higher scores being indicative of greater symptomology. The HAI-SF assesses the degree of anxiety individuals experience about their health as well as how they think they would react if they thought that they had a serious medical condition. Good internal consistency (α=0.89) and test–retest reliability (r=0.90) have been found for the HAI-SF Salkovskis et al. [12]. Convergent validity support for the HAI-SF has been found with measures of Hypochondriasis Salkovskis et al. [12]. The original version of Health Anxiety Inventory-Short Form was translated to Persian by two of the authors and back-translated by a bilingual psychologist. The back-translation was verified by the authors of the original version.

Example items from the HAI-SF are:

1.

(a) I do not worry about my health.

(b) I occasionally worry about my health.

(c) I spend much of my time worrying about my health.

(d) I spend most of my time worrying about my health.

2.

(a) I notice aches}pains less than most other people (of my age).

(b) I notice aches}pains as much as most other people (of my age).

(c) I notice aches}pains more than most other people (of my age).

(d) I am aware of aches}pains in my body all the time.

3.

(a) As a rule I am not aware of bodily sensations or changes.

(b) Sometimes I am aware of bodily sensations or changes.

(c) I am often aware of bodily sensations or changes.

(d) I am constantly aware of bodily sensations or changes.

Yale-Brown Obsessive Compulsive Scale Modified for Body Dysmorphic Disorder (BDD-YBOCS) [13]: This is a reliable and valid 12-item semi-structured clinician administered instrument that evaluates current BDD severity. It assesses BDD-related preoccupations, repetitive behaviors, insight, and avoidance [3]. The reliability and validity of the BDD-YBOCS Persian version was and translated version was demonstrated by [14] in both normal and clinical samples. They showed that alpha coefficients ranged from 0.78 to 0.93 for the BDD-YBOCS total score and for its subscales (preoccupations, repetitive behaviors).

Depression Anxiety Stress Scales 21-item version (DASS-21) [15]: The DASS-21 is a self-report measure designed to assess current symptoms of depression, anxiety and stress. On each of the three (7-item) scales, participants are asked to rate how much the items applied to them during the past week using a Likert scale from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time). Thus, scores can range from 0 to 21 on each scale. Previous studies have demonstrated acceptable psychometric properties of the DASS-21 and data from a non-clinical samples showed average score of 3.51 (SD=3.78), 2.12 (SD=3.64), and 1.22 (SD=1.77) for the stress, depression and anxiety scales, respectively [16]. Also, it was shown that the Persian version of the DASS-21 had satisfactory psychometric properties [17].

OCI-R [18]: The OCI-R is an 18-item self-report questionnaire that assesses obsessive–compulsive symptoms, with a total score ranging from 0 to 72 and subscale scores ranging from 0 to 12. The OCI-R assesses OCD symptoms across six factors: (1) washing, (2) checking, (3) obsessions, (4) mental neutralizing, (5) ordering, and (6) hoarding. Foa et al. [18] evaluated the psychometric properties of the OCI-R by extracting the 18 OCI-R items from responses to the 42-item OCI. The OCI-R demonstrated good internal consistency among patients with OCD (a=0.83), patients with other anxiety disorders (a=0.88), and in the combined sample (a=0.89) [19]. The results of Abramowitz and Deacon [19] replicate those reported by Foa et al. [18] and indicate an adequate fit for the six-factor model of the OCI-R. Also, [20] it has

been shown that the OCI-R-Persian appears to be a reliable and valid measure of obsessive-compulsive symptoms in this non-clinical sample of Iranian college students.

Data analysis: For these analyses the Structural Equation Modeling program AMOS 5 was used [21]. Values of the Goodness of Fit Index (GFI) and the Adjusted Goodness of Fit Index (AGFI) close to 1 represents a good fit, values of the Root Mean Square Residual (RMR) and Standardized Root Mean Square Residual (SRMR) below 0.05 represents a good fit, and values less than 0.08 represents an acceptable fit. In order to examine possible differences of HAI-SF factors within the patients with hypochondria cohort, we performed a multivariate analysis of variance test (ANOVA) on the scores with patients with hypochondria and peoples without hypochondria as independent variables. Since in large sample sizes, the delta chi-square ($\Delta\chi^2$) is likely to be significant.

Procedure: All the scales were administered (paper-and-pencil) to the students in a group setting during a class session after a brief description of the aim of the study. The students were told that the participation is voluntary and no payment or course credit was offered to the participants. The Health Anxiety Inventory-Short Form was administered first, followed by Yale-Brown Obsessive Compulsive Scale Modified for BDD and Depression Anxiety Stress Scales 21-item version and OCI-R.

Results

Scale validity

Confirmatory factor analysis of the HAI-SF

A confirmatory factor analytic model was used to examine the conceptual structure underlying the HAI-SF, the Persian version.

Measurement in variance was tested by examining the measurement model of the latent construct of The global fit indices for the nested model indicated excellent fit χ^2 (363.65, N=500) 21.4, p=0.06; CFI=0.85, IFI=0.99, RMSEA=0.060, GFI=0.92, AFGI=0.904. These results suggest that health anxiety as measured by the HAI-SF fits the data suggesting that the health anxiety factor as measured by the HAI-SF appears to be adequate in the current sample comprised of Iranian sample.

Convergent validity

Convergent validity of HAI-SF total scale was determined by correlating the HAI-SF with, OCI-R, (BDD-YBOCS) and DASS-21. The OCI-R and the *BDD-YBOCS* total scores correlated 0.51 and 0.45, respectively with the HAI-SF, indicating moderate convergent validity. And Correlations of the HAI-SF with the DASS-21 was 0.70, indicating moderate highest convergent validity (p=0.0001).

Discriminant validity

The discriminant validity of the HAI-SF was examined by comparing the HAI-SF total scores of clinically hypochondria people with people without the illness. The overall test *t* was significant (t=4.52, p=001). Comparisons generally showed that patients with hypochondria had higher scores on the corresponding HAI-SF total scores than people without the illness. The average the HAI—SF total scores was 44.12 (*SD*=2.95) for patients with hypochondria and 8.83 (*SD*=1.53) for people without the illness.

Internal consistency

Calculation of Cronbach's coefficient alpha demonstrated acceptable internal consistency of the Persian-language version of the Health Anxiety Inventory-Short Form total score (a=0.89).

Discussion

The current study examined the psychometric properties, factor structure, and convergent and discriminant validity of the Iranian version of the HAI-SF.

Results from the present study indicate that the HAI-SF has acceptable psychometric properties, with assessing symptom severity and impairment. This finding is consistent with those from a number of earlier studies examining the psychometric properties of the HAI-SF in non-clinical and clinical samples [12,22-24]. Our work extends this line of investigation by examining the psychometric properties of the HAI-SF in a non-Western setting.

The model showed an acceptable fit in the sample. This confirms the construct validity of the measure and the underlying assumption of distinct symptom dimensions/subtypes belonging to category hypochondria. Findings of this study revealed that the Persian version of the HAI-SF has a clear factor structure, congruent with its theoretical conceptualization. This result is congruent with the results of Salkovskis et al. [12].

Similar to other studies Stemberger et al. [22] and Richter et al. [24], we found that the HAI-SF correlated strongly with OCD, depression, anxiety, BDD symptoms. Results indicated the higher positive correlation and significance of this scale with depression, anxiety, stress and BDD represents good convergent validity of this scale. This may be partly related to the disorders characterized by impulsivity (i.e., sensation seeking/self-stimulatory behaviors) and compulsivity including anxiety-driven harm-reductive/avoidant behaviors [25-27].

Furthermore, our results strongly support the discriminant validity of the HAI-SF. The result showed that the HAI-SF scores in hypochondria group were significantly more than normal group that is indicator of its satisfied diagnostic validity. Hypochondria patients had higher scores than peoples without hypochondria on the HAI-SF and its subscales. This result is congruent with results of Salkovskis et al. [12,23], who proposed a corollary to the cognitive-behavioural theory of severe anxiety. If patients experience severe health anxiety since they have an enduring tendency to misinterpret ambiguous medical information as a sign of physical illness, it would follow that those with relatively high levels of health anxiety should be more likely to misinterpret ambiguous medical information such as medical consultations.

The scale possesses high internal consistency (0.89). This is congruent with the results of Salkovskis et al. [12].

In summary, our findings demonstrate that the Iranian version of the HAI-SF is, like the original version, a brief, psychometrically sound and valid measure for the assessment of a broad range of hypochondria disorder symptoms, appropriate for the use in clinical and research settings. The present study replicated and extended previous findings with the original scale in a different cultural context.

It would be necessary to determine the structure and reliability over time and with other samples (lower educated and other age ranges, and particularly with larger sample sizes). In addition, studies are required to examine the sensitivity of scale to treatment effects and recovery, if the scales are to prove useful treatment evaluation tools. Future work also needs to assess the potential utility of the HAI-SF in distinguishing hypochondria disorder from other types

of anxiety disorders, somatoform disorders and depression in this setting.

However, despite these limitations, all in all, it can be concluded that this instrument is a useful measure to assess hypochondria disorder symptoms in clinical assessment.

Acknowledgements

The authors would also like to acknowledge the assistance of participants and all of the clinicians and research assistants who conducted the assessments.

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