

## Validation of Worry Behaviors Inventory (WBI) among Normal Population

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### Abstract

**Introduction:** This study aimed to evaluate the psychometric properties of Worry Behaviors Inventory (WBI) in normal population.

**Methods:** For this purpose, 286 participations (first study) and 40 participations (Second study) were selected in 2017. Then Worry Behaviors Inventory (WBI), Patient Health Questionnaire-9, WHODAS-II, HAQ, PHQ-15 and CABAHA were distributed among them to respond. After collecting data, the reliability of the Inventory was assessed using SPSS-22 and Lisrel 8.8, Cronbach's alpha, retest and split-half coefficient, then the Construct validity with other questionnaires to determine the psychometric properties of the Worry Behaviors Inventory (WBI). The Factor structure was assessed by confirmatory factor analysis.

**Results:** The results of the factor analysis indicated that WBI has two factors and checking the reliability of the Inventory using Cronbach's alpha, test-retest and split-half coefficient reflects the stability of the scale, the Construct validity of the WBI with other questionnaires showed desirable discriminant and convergence validity.

**Conclusions:** The findings indicated that WBI has good psychometric properties in normal population, and the tool can be used in studies in somatoform disorders. However, it seems that Worry Behaviors is the fundamental structure of somatoform disorders.

**Declaration of Interest:** None.

**Key words:** Somatoform disorders, Worry behavior inventory, Psychometric properties.

### Introduction

Somatoform disorders are among the most common public health problems (1, 2). People with somatoform disorders suffer from various symptoms that can create distress for the with a huge healthcare costs (3). Somatoform disorders have been modified in DSM-5. The current diagnostic of DSM-5 for Somatic symptom disorder (4) include the former diagnoses of somatization disorders. It is contain of two changes from Previous DSM: Somatic symptoms is no limited to

unexplained symptoms and eliminating the unexplained symptoms (5, 6). Secondly, criterion B added to the diagnosis includes, positive psychological symptoms criteria, excessive thoughts, and behaviors related to this somatic symptoms. One of the following must be present: 1) persistent and inappropriateness thoughts about symptoms, 2) a high anxiety about this symptoms, and 3) excessive time devoted to symptoms.

The importance of cognitive dimensions of somatoform disorders has also been emphasized (7). In addition to an emphasis on

bodily processes and catastrophizing interpretations, Rief et al. (7) results showed that individuals with somatoform disorders hold exclusive beliefs about health and self-concept with being weakness and intolerance of distress.

The model proposed by Brown (8) and previous models of somatoform disorders (9, 7) emphasize the role of memory structures that bias perceptual processes (i.e., worry). Whereas, somatic symptoms can be assessed via the Patient Health Inventory (10, 11, 12), or the Somatic Symptom (13, 14), psychological characteristics of individuals with somatoform disorders can be assessed with other measures (16, 16, 17) such as health anxiety by Whiteley Index (18). However, no measure has been exist to assess emotional traits, illness and cognitions aspects for somatoform disorders.

Avoidant behaviors are related with somatoform disorders and have clinical importance. Avoidance behaviors are important to diagnosis anxiety disorder in DSM-5. Behavioral criteria of DSM-5 included (a) avoidance of negative situations, (b) preparing for negative consequences, (c) procrastination and (d) reassurance-seeking (19). These criteria were not included into DSM-5. This may be due to the limited

investigation and the lack of validated measures. The worry Behavior Inventory included two-factor: Safety Behaviors (e.g., planning, checking and controlling others) and Avoidance (e.g., situations, people and activities). The aim of present study was to evaluate worry Behavior Inventory psychometric properties in normal population.

### Methods

The total number of participants in this study were 286 normal population, 40 of whom were re-tested in two weeks intervals in 2017. The sample was selected using the Hu and Bentler proposed approach (20). This number of participants was selected from the Urmia University. Inclusion criteria: aged 18 or older; participants with a psychotic, substance abuse, suicidality, insufficient language skills, or cognitive impairment were excluded. Self-report and medical records (22) were used to measure the inclusion and exclusion criteria. In one month, data were collected from the participants. Informed consent was obtained from all individual participants included in the study. Descriptive and demographic characteristics of the participants are presented in Table 1.

**Table 1:** Research participants' descriptive and demographic characteristics

Study	Aim	Group	Number	Percent	Age M (SD)	Marital Status	
						Single%	Married%
Study 1	Factor Analysis, Validity Reliability	Women	114	57.4	(3/6) 27/8	6.7	93.3
		Men	72	42.6	(4/8) 22/4	11.6	88.4
		Total	186	100	(4/1) 25/9	9/2	90.8
Study 2	test-retest	Women	27	61.7	(3/2) 25/9	7.1	92.9
		Men	13	38.3	(3/9) 23/5	10.6	89.4
		Total	40	100	(3/7) 24/6	8.6	91.4

**10-item Worry Behavior Inventory:** This inventory containing the sorts of things individuals do to avoid worrying. Items are rated on a 5-point scale. The WBI scale, Safety Behaviors and Avoidance subscales yielded  $\alpha$ 's of .86, .85, and .75 respectively (23).

**Patient Health:** The PHQ is for diagnosis of depression. Internal consistency ( $\alpha$ .86) (24). The findings have supported the psychometric properties of this questionnaire (25, 26, 27, 28).

**Disability Assessment:** The questionnaire measures disability in the previous month (29),

including Cronbach's alpha ( $\alpha$ .98), concurrent validity, discriminant validity, and responsiveness to treatment (29, 30).

**Health Anxiety:** The HAQ assesses the symptoms and severity of health anxiety. It focuses on patients' health concerns, fear of death, reassurance-seeking behavior. The HAQ was found to have good internal consistency (0.92) and test-retest reliability (0.87), as well as appropriate discriminate validity (31).

**The PHQ:** It comprises of 15 somatic symptoms from the Patient Health Questionnaire, is used in screening for somatization symptom. Each symptom scored from 0 to 2. Internal consistency PHQ  $\alpha$ : 85 are favorable (11).

**Body and Health Questionnaire:** The Questionnaire measures cognitions about somatic symptoms (Catastrophizing, Bodily Weakness, Health Habits, intolerance of Bodily Complaints) (32).

SPSS version 22 (SPSS IBM, New York) and LISREL software (33) were used to perform statistical analyses. Bivariate correlations, Cronbach's alpha, split-half and

test-retest coefficients and confirmatory factor analysis were assessed to examine the convergent validity, internal consistency and factor structure of Worry Behavior Inventory.

### Results

Of the total participants, 129 participants were undergraduates (57.07%), 78 participants with master degrees (34/51%) and 19 ones were Ph.D students (8.40%). Prior to addressing the research results, the indicators of data natural distribution were examined, results revealed the variables Skew and kurtosis were within a conventional range (-1 to 1) Kolmogorov-Smirnov test and Shapiro-Wilk test were not significant which represents the normal distribution of data (34).

### Factor Analysis

In order to investigate the fit of factor structure of the Worry Behavior Inventory (WBI) (23), CFA by maximum likelihood method and LISREL software was used (33). Following, standardized and unstandardized solutions are presented in Table 2.

Table 2. Unstandardized and standardized solution of the Worry Behaviors Inventory model

Unstandardized solution		Standardized solution		
ITEM	Factor load	ITEM	Factor load	T index
1	0.58	1	0.55	9.45
2	0.48	2	0.48	7.22
3	0.24	3	0.22	3.12
4	0.86	4	0.79	10.93
5	0.93	5	0.83	14.73
6	0.77	6	0.75	12.35
7	0.38	7	0.46	5.51
8	0.52	8	0.49	7.25
9	0.23	9	0.23	3.53
10	0.59	10	0.50	7.52

In order to investigate the fit of the two factor structure of the Worry Behavior Inventory (WBI) diagram of conformity factor analysis

with path's coefficients are shown in Figure 1 and fit indices are presented in Table 3.

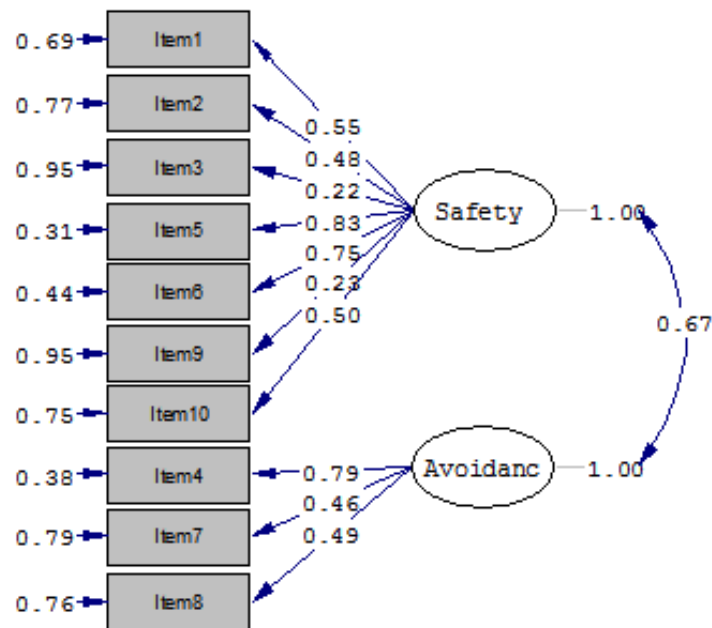


Figure 1. The diagram of CFI and path's coefficients

Table 3. The fit indices of the Worry Behaviors Inventory model

Study	Present study												Original study		
Index	X <sup>2</sup>	df	P.value	RMSEA	SRMR	CFI	NFI	NNFI	RFI	IFI	GFI	AGFI	RMSEA	CFI	NFI
Value	119.20	74	P<0.05	0.08	0.07	0.98	0.95	0.91	0.97	0.89	0.88	0.91	0.10	0.95	0.97

The CFA using LISREL software, offered 3 levels of fit indices (35, 36): (1) Absolute fit indices such as Chi-square index and Standardized Root Mean Square Residual (SRMR), (2) Parsimony goodness-of-fit index such as Root Mean Square Error of Approximation (RMSEA) and (3) Comparative Fit Index (CFI). There is controversy over the precise cutting scores of fit indices (20, 35, 36, 37). More the scores of Normed Fit Index (NFI), Relative Fit Index (RFI), and Goodness of Fit Index (GFI) are closer to 1, more they indicate the pattern's more desired fit. In the present study, the most valid fit scores have been used in order to assess the model's fit. SRMR < .08 shows a desired fit and SRMR < .10 indicates an acceptable fit and the model is failed when SRMR > .10 (20). The index with value of RMSEA ≤ .8 shows the model is good, and when the RMSEA is between 0.10 and 0.08, the model is acceptable. Eventually, CFI ≥ .95 states the good fit of the model (20). Since the X<sup>2</sup> statistic is sensitive to the sample size, to assess the overall fit of the model, the amount

of X<sup>2</sup> is calculated along with the degree of freedom (X<sup>2</sup>/df). X<sup>2</sup>/df < 2 represent the model's good fit and when X<sup>2</sup>/df is around 3, the model is acceptable. The amount of X<sup>2</sup>/df was 1.61, which is lower than 2, so represent model's good fit. In addition, SRMR = .07 fit index showed the two factor model's good fit and the CFI = .98 and RMSEA = .08 showed the good fit of the model.

To investigate the Reliability of the Worry Behavior Inventory (WBI), Cronbach's alpha, split-half and test-retest coefficients were calculated. The 10 question scale's Cronbach's coefficient was 0.85 which showed that the scale has a good internal coordination. The split-half coefficient also indicated the scale and its subscale's high reliability. Forty normal population answered the questionnaire's questions again in 2-week time to calculate the retest coefficient, and the obtained scores' correlation coefficients was calculated after the two test conduction. The results of the Cronbach's alpha, the split-half and test-retest coefficients are presented in Table 5.

Table 5. The mean, standard deviation, alpha and test-retest coefficients of the Worry Behaviors Inventory

subscale	Item	Alpha Coefficient (N=186)	Test-retest Coefficient (N=40)	Split-half Coefficient (N=186)
Safety Behaviors	1,2,3,5,6,9,10	0.85	0.67	0.84
Avoidance	4,7,8	0.92	0.73	0.86

Table 5 shows that Cronbach's alpha coefficients were satisfactory and the data of all the test-retest and split-half's coefficients were significant. Therefore, it can be concluded that the Worry Behavior Inventory (WBI) has the desirable internal consistency in participations.

The Worry Behavior Inventory (WBI) (23) validity in participations were examined

through two ways; the Construct validity [conducting simultaneously with Patient Health Questionnaire-9 (24), WHODAS-II (27), HAQ (29), PHQ-15 (11), CABAH (30), and the correlation between subscales. The results are shown in Table 6.

Table 6. Correlation coefficients between the subscales of Worry Behaviors Inventory with other Measures

subscale	1	2	PHQ-9	WHODAS-II	HAQ	PHQ-15	Catastrophizing Cognitions	Intolerance of Bodily Complaints	Bodily Weakness	Autonomic Sensations	Health Habits
Safety Behaviors	-	-	0.11	0.26**	0.34**	0.22**	0.41**	0.17*	0.36**	0.31**	-0.13*
Avoidance	0.32**	-	0.28**	0.19*	0.08	0.25**	0.30**	0.33**	0.14*	0.18*	-0.09

\*\*= P < 0.01 \*= P < 0.05

The pattern of correlation coefficients between the subscales in Table 6 shows there is a suitable internal consistency between the subscales. The pattern of correlation coefficients between the subscales with Worry Behavior Inventory (WBI) (23), Patient Health Questionnaire-9 (24), WHODAS-II (29), HAQ (31), PHQ-15 (11), and CABAH (32) indicates the concurrent construct validity of the Worry Behavior Inventory (WBI), in participations.

### Discussion

Present study was done to evaluate and validate the Worry Behavior Inventory (WBI) in participations. The Worry Behavior Inventory (WBI) factor analysis showed that the 2 factor solution has a good fit. This finding is consistent with the studies which examine the scale WBI's factor structure (23). The findings also indicated that 2 factor of Safety Behaviors and Avoidance have a desirable internal reliability. Studying the WBI's factor structure and patterns of factor loadings, using CFA represented similar results to what Mahoney et al. (23) obtained by 2 factor solution. All the factor loadings were higher than 0.4.

Investigating the WBI's reliability, using alpha coefficients, test-retest coefficients and split-half showed the scale's appropriate reliability. The Safety Behaviors and Avoidance subscale's alpha coefficients were respectively 0.85, and 0.92 and the amplitude of test-retest and split-half's coefficients suggested the WBI's suitable reliability to measure the Worry Behavior in participations with somatoform disorders. The findings are consistent with the study of Mahoney et al. (23) who designed the original brief measure of avoidant behaviors associated with GAD: the Worry Behaviors Inventory (WBI). Although similar to the results of Cronbach's alpha coefficients in participations was Stronger and higher than the original sample in generalized anxiety disorder. However, the results indicate acceptable internal consistency. Perhaps with some changes in the questionnaire, that can build a better questionnaire for other samples, especially in clinical samples.

The validity of the Worry Behavior Inventory (WBI) with the Patient Health Questionnaire-9 (24), WHODAS-II (29), HAQ (31), PHQ-15 (11), and CABAH (32) showed a positive correlation between the subscales of the WBI



with Patient Health Questionnaire-9 (24), WHODAS-II (29), HAQ (31), PHQ-15 (11), and CABAHA (32), and this correlation was significant. This result demonstrated the convergent validity of the Worry Behavior Inventory.

The Worry Behavior Inventory (WBI) psychometric properties of the present study were respectively consistent with the studies done in the original version in generalized anxiety disorder (23). According to what was said, the lack of a concise, yet valid and useful tool to assess the Worry Behaviors, is the weakness of the researches. As a result, it seems that, regardless of language and culture, and considering the pattern of factor loadings, which is similar to previous studies (21), WBI is a useful tool in measuring the fundamental structures, which are related to Worry Behaviors. But it seems that in normal samples should be more careful. Totally, the psychometric properties of Worry Behavior Inventory (WBI) is applicable broadly and has the capacity to measure Worry Behaviors associated with Somatization disorder, and it can be also used in clinical and normal levels.

### Conclusion

In total, the reliability and validity analysis and confirmatory analysis demonstrated the desirable psychometric characteristics of the Worry Behavior Inventory (WBI) and the present study's findings are consistent with the original version's (23). The Worry Behavior Inventory (WBI) in participations showed that it is a valid tool for assessing Worry Behaviors. The calculated indices to evaluate the fit of the Worry Behavior Inventory's model suggested that (SRMR), (RMSEA), and ( $X^2/df$ ) indices, as the most valid fit indices (20, 35, 36, 37) support the model's fit. This result is consistent with the original version of Worry Behavior Inventory (WBI). So, according to what was said, the present study was conducted among normal samples and since it did not cover the clinical groups, the results should be treated with caution in generalizing. It is also suggested that future studies examine the Worry Behavior Inventory's validity by using other psychological ways and clinical groups. The

result of the present study indicates that the Worry Behavior Inventory (WBI) has acceptable validity and reliability in normal samples. In addition, the questionnaire's factor structure was in compliant with the designers' theory and the CFA two produced factors were consistent with the original version of the Worry Behavior Inventory (WBI) (23).

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