Psychometric Properties of the Persian Version of the Brief Illness Perception Questionnaire in Chronic Diseases

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Original Article

Abstract

Introduction: The aim of this study was to evaluate the psychometric properties of Persian version of Brief Illness Perception Questionnaire in three groups of chronic diseases (myocardial infarction, diabetes mellitus, and multiple sclerosis).

Materials and Methods: This study was a psychometric study. One hundred and thirty five patients with myocardial infarction (MI), multiple sclerosis (MS) and diabetes mellitus were selected through available sampling and they completed the Brief Illness Perception Questionnaire (BIPQ), and Hospital Anxiety and Depression Score (HADS) and the World Health Organization-Brief Quality of Life form (WHOQOL-BREF-26). Then information analyzed by descriptive statistics, factor analysis, Cronbach's alpha and Pearson correlation coefficient.

Results: The reliability of the questionnaire was 0.73 using Cronbach's alpha and the correlation coefficients between the BIPQ questionnaire and the HADS scale and the WHO-BREF-26 questionnaire showed a significant correlation. The KMO index was 0.70, indicating the adequacy of the sample size. By using exploratory factor analysis, the two main factors (the nature and the recognition of the disease-effect of disease), which explained 59% of the total variance.

Conclusion: The Persian version of the Brief Illness Perception Questionnaire (BIPQ) has a relatively acceptable reliability and validity for the population of patients with chronic diseases and can be used in clinical and psychological studies.

Keywords: Psychometry, Illness Perception, Questionnaire, Chronic Disease, Myocardial infarction, Multiple sclerosis, Diabetes mellitus

Introduction

Illness perception is one of the most important psychological variables to be studied in chronic diseases, which is defined as the patient's organized cognitive representation of the disease. According to Leventhal et al. (1) and Hagger and Orbell (2), patients adjust their emotional behavior and response to the disease based on their perception of the nature, causes, consequences, controllability, treatment, and duration of the disease. Two important aspects should be regarded on the perception of the disease: first, in most cases, the patient's beliefs about the conditions in which he or she is differ from what the therapist thinks about, and second, that the perception of illness varies from person to person. Even when patients have the same conditions, they can have very different views of their illness (3).

According to Leventhal et al., the individual plays a dynamic and active role in the perception of his or her illness (1). Illness perception includes information in five dimensions: the nature as the label and symptoms related to the disease, causes or beliefs about the causes of the disease, duration or perception of the disease duration in terms of being acute, periodic, or chronic, consequences and findings of the disease expected by the individual in terms of the economic, social, psychological, and physical effects, and effectiveness of the control, treatment, and

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recovery (4). Since chronic illnesses can affect the physical function, psychological status, and quality of life (QOL) of individuals and affect their perception of their illnesses, several instruments have been designed to examine the perception of the disease (5).

The Illness Perception Questionnaire (IPQ) was developed by Weinman et al. (6) and included only cognitive issues (5). Moss-Morris et al. designed the IPQ-Revised (IPQ-R) questionnaire, which lacked most of the limitations of the IPQ questionnaire (7). Since the IPQ-R instrument consisted of 43 items and most patients with incurable illnesses were unable to complete the tool and given the large number of old patients who were unable to answer such questions, Broadbent et al. introduced the brief form of the IPQ-R questionnaire, called Brief IPQ (BIPQ) in the United Kingdom. This tool consisted of 9 items and its reliability was calculated as 0.42 to 0.75 through the test-retest coefficient (5). In addition, the concurrent validity of the BIPQ scale with IPQ-R in a sample of patients with asthma, diabetes mellitus (DM), and renal diseases was estimated to be between 0.32 and 0.63 using the correlation coefficient (5). The Chinese translation of the BIPQ questionnaire was published in 2011, with the reliability reported between 0.53 and 0.75, besides, its validity was assessed in relation with the Hospital Anxiety and Depression Scale (HADS) and the Short Form Health Survey-36 (SF-36) (8). de Raaij et al. conducted a study in Germany to localize the BIPQ questionnaire and concluded that the German translation of the instrument was understandable to patients, specialists, and first-year students. The reliability of the scale was obtained using Kappa coefficient after one week for disease outcomes and emotional factors greater than 0.70, and for personal control, treatment control, and disease identity less than 0.70. The concurrent validity showed a significant relationship for 4 to 8 illnesses. In sum, de Raaij et al. stated that the face and content validity were acceptable, however the reproducibility and concurrent validity had to be re-examined in future studies (9).

Given the prevalence of chronic illnesses [Multiple Sclerosis (MS), myocardial infarction (MI), and DM type 2] and the subsequent psychological problems, the lack of reliable tools to assess illness perception in this group of patients, numerous studies conducted in this area worldwide, and also the shorter form of the scale compared to other tools, the present study was carried out with the aim to evaluate the Persian version of the BIPQ questionnaire in the most important chronic diseases in Isfahan, Iran, so that in case of confirmation of these characteristics for the

Iranian community, it could be used with more confidence for assessing perception in patients.

Materials and Methods

This study was a psychometric analysis performed to evaluate the psychometric properties of the Persian version of BIPQ in chronic diseases in Isfahan. The study population consisted of all patients with MS, MI, and type 2 DM who referred to Noor Medical Center and the MS Association for treatment. The study inclusion criteria included diagnosis of MS by a neurologist (patients referred to the MS Association of Isfahan), diagnosis of a MI by a cardiologist, and diagnosis of type 2 DM by an internal medicine specialist or endocrinologist. Moreover, the inability to complete the questionnaires for any reason (cognitive problems, high severity of illness, mental retardation, and illiteracy) was considered as the exclusion criterion.

The tools used to collect the data included:

BIPQ: This questionnaire was designed by Broadbent et al. to assess emotional and cognitive visualization of the disease. The range of the first 8 items is from 1 to 10, with a higher score indicating a more threatening view toward the illness, meaning that the person has a misconception of the illness. Item 9 is open-ended and addresses the three major causes of the disease in order. The six-week test-retest reliability coefficient for different items ranged from 0.42 to 0.75, with the concurrent validity reported to be between 0.32 and 0.62 (5).

Brief form of the World Health Organization Quality of Life Questionnaire (WHOQOL-BREF-26): This tool consists of 26 items in four main areas of "physical health, psychological health, social relations, and life status" (10). Each area scores from 4 to 20, with 4 and 20 representing the worst and the best status of the individual in that area, respectively. In the study by Nejat et al., the intra-cluster correlation coefficient (ICC) and Cronbach's alpha coefficient of the scale were higher than 0.70 in all areas, but it was 0.55 in the area of social relations. Additionally, in 83% of cases, the correlation of each item with its main area was higher than that of other areas (11).

HADS: This tool consists of two measures of anxiety and depression, each comprising of 7 items. Overall, the score of each part ranges from 0 to 21, with scores of 0 to 7, 8 to 10, and above 11 indicating health, borderline disorder, and suspected of the disorder, respectively. The Cronbach's alpha coefficient for the depression and anxiety scores were reported between 0.80 and 0.90 (12).

First, the BIPQ questionnaire was translated into Persian by a person fluent in English and Persian, then a reverse translation was performed by another person fluent in Persian and English and the final Persian version was prepared. In the next step, its face and content validity were examined by the experts in this field (psychiatrist, psychologist, and language specialist). Given the prevalence of MS, MI, and type 2 DM in Isfahan, 135 patients referred to health centers were selected based on the convenience sampling method and the inclusion criteria. In case of agreement and consent, the patients completed the BIPQ questionnaire and then the WHOQOL-BREF-26 and HADS questionnaires.

Descriptive statistics were employed to determine the mean values, the Cronbach's alpha coefficient to determine the reliability of the questionnaire and its areas and items, and Pearson's correlation coefficient and factor analysis to determine the concurrent validity of the tool (in addition to the face and content validity). Finally, the data were analyzed in SPSS software (version 20, IBM Corporation, Armonk, NY, USA).

Results

Of the 135 patients studied, 48 (35.6%), 46 (34.1%), and 41 (30.4%) had type 2 DM, MS, and MI, respectively. The mean age and the mean duration of illness of the participants were 46.40 ± 14.02 and 5.42 ± 5.50 years, respectively. 55 (40.7%) and 80 (59.3%) of the subjects were men and women, out of whom 22 (16.3%), 112 (83.0%), and 1 (0.7%) were respectively single, married, and divorced. 32 (23.7%), 13 (9.6%), 49 (36.3%), and 41 (30.4%) had primary education, secondary education, high school education, and university education, respectively.

Reliability: The reliability of the BIPQ questionnaire calculated by the Cronbach's alpha coefficient for the whole instrument, factor I, and factor II were 0.73, 0.59,

and 0.60, respectively. Besides, the Cronbach's alpha coefficient of the questionnaire was evaluated if each item was omitted, and by omitting none of the items, there was no significant change in the Cronbach's coefficient of the whole tool, and none of the items needed to be eliminated.

Content validity: The content validity was confirmed by the consensus of the research team members and colleagues.

Concurrent validity: The correlation coefficients of the BIPQ scale items with the HADS and WHOQOL-BREF-26 questionnaires are presented in table 1.

Based on the data in table 1, there was a significant relationship between items 1, 2, 5, 6, and 8 of the BIPQ questionnaire with the two subscales of the HADS questionnaire. Moreover, there was a significant relationship between items 1, 2, 6, and 8 of the BIPQ questionnaire with the four subscales of the WHOQOL-BREF-26 questionnaire. Items 3 and 4 of the BIPQ questionnaire were only correlated with the psychological subscale, and item 5 was related to the subscales of physical health, psychological status, and life status of the WHOQOL-BREF-26 questionnaire. Exploratory factor analysis (EFA) was utilized to determine the factors of the BIPQ questionnaire. Prior to performing the factor analysis, the Kaiser-Meyer-Olkin (KMO) index was evaluated and estimated to be 0.70, indicating the adequacy of the sample size and the justification of the factor analysis. In EFA using Varimax rotation and deletion of items with factor loadings below 0.3, two main factors were identified which explained 58.7% of the common variance of illness perception, including the two factors of the nature and recognition of illness (items 2, 3, 5, 6, and 7) with 36.2% of the common variance and illness effect (items 8, 4, and 1) with 22.5% of the common variance (Table 2).

Table 1. Coefficients of correlation of Brief Illness Perception Questionnaire (BIPQ) items with Hospital Anxiety and Depression Scale (HADS) and World Health Organization Quality of Life (BREF-26) questionnaires (WHOQOL-BREF-26)

BIPQ	HADS		WHOQOL-BREF-26			
	Anxiety	Depression	Physical health	Psychologic	Community Relations	Life condition
Consequences of illness	0.33**	0.42**	0.38**	0.44**	0.42**	0.36**
Duration of illness	0.26**	0.28**	0.21*	0.31**	0.27**	0.19*
Personal control of illness	0.12	0.07	0.08	0.21*	0.10	0.12
Control of treatment of illness	0.07	0.06	0.16	0.23**	0.02	0.16
Understanding symptoms of illness	0.25**	0.23**	0.31**	0.36**	0.16	0.22**
Worry about the illness	0.32**	0.38**	0.35**	0.38**	0.29**	0.36**
Understanding and perception of illness	0.01	0.06	0.03	0.04	0.02	0.07
Emotional reaction to illness	0.42**	0.40**	0.43**	0.41**	0.42**	0.42**

*P < 0.050, **P < 0.001

BIPQ: Brief Illness Perception Questionnaire; HADS: Hospital Anxiety and Depression Scale; WHOQOL-BREF-26: World Health Organization Quality of Life-BREF-26

Table 2. Factor analysis of the Brief Illness Perception Questionnaire (BIPQ)

Questions	Factors	
	Nature and recognition of illness	Illness effect
Consequences of illness	0.25	0.76
Duration of illness	0.67	0.14
Personal control of illness	0.78	0.04
Control of treatment of illness	0.38	0.62
Understanding symptoms of illness	0.83	0.17
Worry about the illness	0.74	0.13
Understanding and perception of illness	0.64	0.21
Emotional reaction to illness	009	0.80

Discussion

The present study was conducted to determine the psychometric properties of the Persian version of the BIPQ scale in chronic diseases in a sample of Iranian population. The total reliability of the questionnaire and the two subscales, the nature and recognition of the illness and the illness effect were 0.73, 0.59, and 0.60, respectively. In addition, in case of omitting any items, there was no significant change in the overall reliability coefficient. Therefore, all items remained in the questionnaire. In a study, Broadbent et al. obtained the reliability of the BIPQ scale through the re-test coefficient as 0.42 to 0.75 (5).

Yu-Ping et al. calculated the reliability of the instrument using Cronbach's alpha coefficient to be between 0.53 and 0.75 (8) and this coefficient was reported to be 0.69 in a study by Timmermans et al. (13). Moreover, in a study in Turkey, Karatas et al. obtained this value as 0.85, and respectively 0.80 and 0.83 for the two subscales (14). The results of the BIPQ scale reliability in the present study were consistent with other studies (5,8,13,14).

The HADS and WHOQOL-BREF-26 questionnaires were completed by the individuals to assess the concurrent validity. Using correlation coefficient, there was a significant relationship between items 1, 2, 5, 6, and 8 of the BIPQ questionnaire with the two subscales of the HADS questionnaire. Moreover, there was a significant relationship between items 1, 2, 6, and 8 of the BIPQ questionnaire with the four subscales of the WHOQOL-BREF-26 questionnaire. Items 3 and 4 of the BIPQ questionnaire were only correlated with the psychological subscale, and item 5 was related to the

subscales of physical health, psychological status, and life status of the WHOQOL-BREF-26 questionnaire. Broadbent et al. estimated the concurrent validity of the BIPQ questionnaire with the IPQ-R scale in a sample of patients with asthma, DM, and kidney disease between 0.32 and 0.63 (5). Yu-Ping et al. evaluated the validity of this tool using the HADS and SF-36 scales and concluded that items 1, 4, and 5 of the BIPQ questionnaire were significantly correlated with the two subscales of the HADS questionnaire, and item 8 showed a significant relationship only with anxiety. Moreover, there was a significant relationship between items 1, 5, and 8 with the SF-36 scale (8). This can be attributed to the lack of measurement of the items by these areas in the tools examined. The results of factor analysis of the BIPQ questionnaire using the Varimax rotation and deletion of items with factor loadings below 0.3 identified two main factors, explaining 58.7% of the illness perception common variance. These two factors included the nature and recognition of the illness with 36.2% of the common variance for items 2, 3, 5, 6, and 7 and the illness effect with 22.5% of the common variance for items 1 to 4. In the original form, Broadbent et al. presented three factors of cognitive reaction, emotional response, and illness perception (5). In a study in Turkey, Karatas et al. obtained two factors of cognitive responses and emotional responses (14). Timmermans et al. pointed out two subscales of perception and control (13). Diversity and variation in the type and number of factors can be related to socio-cultural issues, patient population type, and sample size studied. Given the findings and the low correlation coefficients of items 3, 4, and 7, it is necessary to repeat the study in other regions of Iran in order to achieve acceptable results in this regard.

Limitations

Since the sampling was conducted from the centers affiliated to Isfahan University of Medical Sciences, it cannot probably well represent the general population of the community.

Recommendations

In future studies, it is suggested that the content of these items be reevaluated and examined in different populations of chronic diseases.

Conclusion

The BIPQ questionnaire has an acceptable level of reliability and validity for the population of patients with the above-mentioned chronic diseases and can be used in clinical, psychological, and rehabilitation studies.

Authors' Contribution

Nasrin Masaeli: Study design and ideation, study support and implementation services, providing study equipment and samples, data collection, analysis and interpretation of results, manuscript preparation, final manuscript approval for submission to the journal; Reza Bagherian: Study design and ideation, attracting funding for the study, analysis and interpretation of results, expert manuscript evaluation, final manuscript approval for submission to the journal; Gholamreza Kheirabadi: Study design and ideation, analysis and interpretation of results, expert manuscript evaluation, final manuscript approval for submission to the journal, responsibility for maintaining the study integrity from beginning to publication, and responding the comments; Anahita Khedri: providing study equipment and samples, data collection, manuscript preparation, final manuscript approval for submission to the journal; Behzad Mahaki: analysis and interpretation of results, specialized statistics services, final manuscript approval for submission to the journal.

Conflict of Interests

None of the authors have any particular conflict of interest with this study.

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