

Validation of the Personal Impact Health Assessment Questionnaire in Patients with Rheumatoid Arthritis in Kerman, Iran

İran Kerman'da Romatoid Artrit Hastalarında Kişisel Sağlık Değerlendirme Anketi'nin Doğrulanması

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Objectives: We aimed to generate a valid and adapted version of the Personal Impact Health Assessment Questionnaire (PI HAQ) compatible with Iranian culture.

Patients and methods: Between October 2006 and February 2007, data obtained from 100 patients with rheumatoid arthritis (RA) (80 females, 20 males; mean age 51 years; range 20 to 78 years) in a referral rheumatologic clinic in Kerman, Iran were included in this cross-sectional study. The study had five phases; (i) translation and back translation; (ii) cultural adaptation seeking advice of expert rheumatologists in the country; (iii) assessment of face validity by deep interview technique with 20 patients; (iv) assessment of reliability and internal consistency of questionnaire and (v) assessment of content and construct validity using factorial analysis. The results of the PI HAQ were also compared with Short-Form Health Survey (SF-36) and Visual Analog Scale (VAS).

Results: The Persian version of the PI HAQ had small changes in three items compatible with Iranian culture in terms of the ability of cutting meat, taking a tub bath and using a toilet. The correlation coefficient in test and re-test was high ($r=0.86$, $p\text{-value} < 0.001$). Cronbach's alpha was 0.94. The correlation coefficient between the VAS and PI HAQ scores was significantly high ($r=0.93$, $p \leq 0.001$). The factorial analysis showed that the main hidden variable explained over 50% of total variance (Eigenvalue=50.6%).

Conclusion: It seems that the adapted version of the questionnaire is a valid and reliable tool to assess the quality of life of Iranian RA patients.

Key words: Health Assessment Questionnaire; quality of life; rheumatoid arthritis.

Amaç: Bu çalışmanın amacı, geçerli ve İran kültürüne uyarlanmış bir Kişisel Sağlık Değerlendirme Anketi (SDA) üretmektir.

Hastalar ve yöntemler: Bu çapraz kesitli çalışmaya Ekim 2006 ve Şubat 2007 tarihleri arasında İran, Kerman'da bir romatoloji sevk kliniğinde 100 romatoid artrit (RA) hastasına (80 kadın, 20 erkek; ort. yaş 51; dağılım 20-78 yıl) ait elde edilen veriler dahil edildi. Bu çalışma beş aşamadan oluşuyordu; (i) çeviri ve yeniden çeviri; (ii) ülkedeki uzman romatologların önerilerinin kültürel uyarlaması; (iii) 20 hasta ile derin mülakat yöntemi ile yüzeysel geçerliliğin değerlendirilmesi; (iv) anketin güvenilirliğinin ve iç tutarlılığının değerlendirilmesi ve (v) faktörel analiz ile içeriğin ve yapısal geçerliliğin değerlendirilmesi. Kişisel SDA anketinin sonuçları, Kısa Form Sağlık Anketi (SF-36) ve Görsel Analog Ölçeği (GAÖ) ile karşılaştırıldı.

Bulgular: Kişisel SDA'nın İran versiyonunda et doğramak, banyo yapmak ve tuvalet ihtiyacını gidermek becerileri açısından üç maddede küçük değişiklikler mevcuttu. Test ve yeniden testte korelasyon katsayısı yüksekti ($r=0.86$, $p < 0.001$). Cronbach alfa 0.94 idi. GAÖ ve kişisel SDA arasındaki korelasyon katsayısı anlamlı düzeyde yüksekti ($r=0.93$, $p \leq 0.001$). Faktöriyel analizde ana saklı değişkenin total varyansın %50'sini açıkladığı gösterildi (Özdeğer= %50.6).

Sonuç: Anketin uyarlanmış versiyonunun, İran'daki RA hastalarının yaşam kalitesinin değerlendirilmesinde geçerli ve güvenilir bir araç olduğu görülmektedir.

Anahtar sözcükler: Sağlık Değerlendirme Anketi; yaşam kalitesi; romatoid artrit.

Received: April 19, 2011 Accepted: March 5, 2012

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Rheumatoid arthritis (RA) is an inflammatory disease which occurs mainly in women 30-50 years of age. This disease is chronic and disabling, which might increase the risk of depression and premature death for patients.^[1,2] RA affects joint movement;^[3] therefore, it could have a significant impact on a person's quality of life (QoL). However, in order to assess this, special tools and questionnaires are needed because of the nature and impact of RA in their lives. These can also very useful for the evaluation of different forms of therapy to be used for these patients.

The English version of the Personal Impact Health Assessment Questionnaire (PI HAQ) is a tool with high reliability and validity in the assessment of the QoL of RA patients. It measures different aspects of performance capacity, including joint destruction, disease activity, muscle strength, and psychosocial features.^[4] The PI HAQ consists of 20 questions measuring eight dimensions, including dressing and grooming, rising, eating, walking, hygiene, reach, grip, and various daily activities. Patients score their disabilities from 0 to 3 (0= without any difficulty, 1= with some difficulty, 2= with much difficulty, 3= unable to do).

The precision and simplicity of the PI HAQ in assessment of RA disability has encouraged many countries to adapt and validate this questionnaire to their language and culture. Validated versions of this tool are now available in several countries, including France, Spain, Korea, Italy, and many Arabic nations.^[5]

Although the Persian translation of the PI HAQ was used in the Rastmanesh study,^[6] the author did not explain whether the adaptation and standardization of the items were totally finished. It has also been translated into a Persian version and been checked for some aspects of validity and reliability.

The adaptation of a questionnaire is a multi-stage process with special technical considerations. Generally, it is suggested that there are three main stages in the validation process: (i) the translation stage, (ii) the cross-cultural confirmation and adjustments stage, and (iii) the confirmation stage in which the psychometric properties of the instrument in the target population are examined.^[7] These properties are determined by their reliability, validity, and responsiveness. Reliability is the degree to which a test reproduces the same results if it is repeated.^[8] Consideration is given to the extent to which the items in the questionnaire are consistent. This is measured by the degree of correlation between the various components in the

questionnaire or between the items and the total score on the questionnaire.^[9]

Validity is measured primarily by two main approaches. One approach seeks the views of experts on the concept of instrument, face, and content validity.^[8] The other approach is criterion validity which measures the correlation between scales gained from the current instrument with a gold standard. In the absence of a gold standard, a widely used instrument which has already been established for the same purpose can be applied.^[10] This type of validity is called convergent validity.^[8] Although different aspects of validity should be explored, the PI HAQ questionnaire is mainly examined using face and content validity. Construct and convergent validity have been given little attention in previous studies.^[11]

Iran is a Middle Eastern country with the formal language of Farsi. Most people are Muslims and have their own culture and lifestyle.

Although there have been some efforts to translate and adapt the PI HAQ questionnaire into Persian,^[8] these have failed to take into consideration all the aspects of validity. In this study, we aim to conduct a multi-method strategy which includes translation, cross-cultural adjustment, and evaluation of psychometric properties so as to develop a Persian version of the PI HAQ questionnaire for Iranian RA patients.

PATIENTS AND METHODS

This cross-sectional study carried out on patients with RA who were referred to a rheumatology clinic in the city of Kerman. All patients fulfilled the criteria of the American College of Rheumatology (ACR).^[12] Cases which were accompanied by other mental or physical health problems such as depression, diabetes, backache, or cerebrovascular accident (CVA) were excluded. The data was collected from October 2006 to February 2007.

This study had five main phases:

Phase 1: Translation and Back Translation

A professional English interpreter and a rheumatologist developed two separate translations of the PI HAQ questionnaire independently. These two translated versions were compared, and inconsistencies were discussed and resolved via group discussion. Two English language professionals translated the revised translated questionnaire back into English. Discrepancies were discussed in the group, and a final translated version was developed.

Phase 2: Cultural adaptation

Ten rheumatologists from around the country reviewed the English and Persian versions and checked whether the requested activities were applicable in Iranian culture. Those activities which were not applicable were replaced with comparable ones. The type of activity, joints and muscles used, and loads of force were taken into account in this phase.

Phase 3: Face validity

The comprehensibility and face validity of the questionnaire were checked by administering the Persian version of the PI HAQ questionnaire to 20 RA patients. Having answered the questions, they were interviewed by one of the research team members. This was conducted to check whether the patients understood the questions correctly. They were also interviewed regarding any awkward and difficult questions.

Phase 4: Reliability

In order to examine the reliability, ten RA patients answered the Persian version of the PI HAQ questionnaire and then re-answered it again two weeks later. The consistencies in the responses of these ten patients were explored using the test/re-test analysis.

Phase 5: Internal consistency; content and construct validity.

In order to check the construct validity, 100 RA patients were given the Persian version of the PI HAQ, the Short Form (SF)-36 health survey, and the visual analog scale (VAS) questionnaires simultaneously. The SF-36, a multi-dimensional questionnaire, is a well-established instrument for measuring QoL and is used worldwide. The Farsi version of this questionnaire has been examined and has shown satisfactory reliability and validity.^[13] Another instrument of measurement is the VAS which aims to measure features that cannot be measured in a straightforward manner, such as pain. This instrument is based on a continuous range from now to the maximum feeling of the characteristic which is being measured. It usually has a range from 0 to 100.^[14]

Sample size was calculated using the judgement of the clinician to determine the minimum acceptable correlation and maximum acceptable change.^[15] A sample size of 100 was estimated, considering the minimum acceptable correlation was 0.6 ($\alpha=0.05$, $\beta=0.1$), and the maximum acceptable change for correlation was 0.04.

Participants were recruited through a sequential method in a rheumatology clinic. Patients were informed verbally about the study and objectives, and those who agreed to participate were enrolled. The subjects were given Persian versions of two questionnaires, either the PI HAQ, SF-36, or VAS. The results of the PI HAQ were compared with the findings of the VAS and SF-36 using Spearman's correlation coefficients. Furthermore, internal consistency of response to the PI HAQ questions was assessed using Cronbach's alpha coefficient. Finally, the hidden factors and components in the PI HAQ were explored using factorial analysis. The structure of the scale was evaluated with exploratory factorial analysis, and varimax rotation was applied. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was also used, and hidden factors with eigenvalues above 1.0 were accepted.

All of these analyses were carried out using STATA version 9.0 (StataCorp LP, College Station, Texas, USA).

RESULTS

In order to explain the findings, the results were organized on the basis of the defined phases as described in the Materials and Methods section.

Phase (1): The discrepancies between translations were very few and were resolved easily in group discussions.

Phase (2): Cultural adaptation

Although most of the measured activities in the PI HAQ were applicable to Iranian culture, the authors found four items to be unsuitable. Adaptation was carried out for the following questions:

Question number 3a: Cutting meat

In Iranian culture, meat is generally not served as a main dish but instead is an ingredient in a stew. Therefore, the question about cutting meat is not relevant as it is not a normal activity for most people. However, there is nothing comparable that can be used to replace this question. Therefore, it was suggested that questions on the ability to cut vegetables and chop apples be added.

Question number 5b: The ability to take a tub bath

In Iranian culture, people mostly take a shower instead of a tub bath. Therefore, it was suggested that the ability to use a squat toilet, which uses almost the same muscles and joints, be added.

Table 1. Cultural adaptation of the Persian version of the PI HAQ

Activity	Questions in the English version of the PI HAQ	Added questions in the Persian version
Eating	Cutting your meat (3a)	Cutting vegetables and fruit Cutting apples and peeling fruit
Hygiene	Taking a tub bath	Using squat toilets
Hygiene	Getting on and off the toilets	Using chair toilets
Reach	Reaching and picking up a 5 lb. object	Reaching and picking up a 2 kg. object
Other activities	Doing yard work	Sweeping the yard

Question number 5c: Ability to use a toilet

Because of the different design of toilets currently used in Iran (squat toilets or Turkish toilets), a question about chair toilets should be added. These toilets are designed like a chair and are very similar to western toilets. People usually use them when sitting is more convenient than squatting, such as the case with RA.

Question number 6: The ability to reach and pick up a five pound object

Due to the metric system used in Iran, the pound measurement was replaced by the equivalent in kilogram units.

Question number 8c: Ability to carry out yard work

This was changed to the ability to sweep a yard. These results are summarized in Table 1.

Phase 3: Face validity

In the interviews with the patients, there was no report of any difficult or awkward questions. All 10 RA patients clearly understood all the questions without any confusion or misunderstanding.

Table 2. Demographic variables of the rheumatoid arthritis patients recruited in Phase 5

Variable	Frequency (n)	Mean±SD
Age		51.2±14.9
Number of children		4.2±2.6
Duration of disease		7.3±6.6
Gender		
Female	80	
Male	20	
Place of residence		
Urban	77	
Rural	23	
Education		
Illiterate	40	
Basic	12	
Diploma	40	
Higher education	7	

SD: Standard deviation.

Phase 4: Reliability

The correlation coefficient between responses in the test and re-test analysis showed a high correlation between the total scores was obtained [$r=0.86$, confidence interval (CI): (0.5-0.97), $p<0.001$]. This strong correlation was also observed in all the questions.

Phase 5: Internal consistency and content and construct validity

Among the 100 RA patients (with a mean age of 51 years), 80% were female. Urban residents composed 77% of the study participants. On average, each patient had been living with RA for 7.3 years (min=0.6 year max=40 years) (Table 2).

Using Cronbach's alpha coefficient, the authors found a high internal consistency between responses to different items ($\alpha=0.94$). Further scrutiny showed that these results were comparable in various subgroups, (female=0.94 and male=0.94; urban residents=0.93 and rural residents=0.97).

In addition, comparing the score gained from the SF-36 questionnaire with the score of PI HAQ questionnaire showed an acceptable Spearman's correlation coefficient ($r=0.5$; $p<0.001$). The correlation was also explored in the same subgroups, with male participants ($r=0.63$ versus $r=0.49$) and urban citizens ($r=0.57$ versus $r=0.42$) showing a higher correlation than their female and rural counterparts (Table 3).

Table 3. Spearman's correlation coefficients between the score gained from the Personal Impact Health Assessment Questionnaire and Short Form-36

Variable	Correlation coefficient	<i>p</i>
Gender		
Female	0.49	<0.001
Male	0.63	<0.003
Place of residence		
Urban	0.57	<0.001
Rural	0.42	0.043
Total	0.5	<0.001

The Spearman's correlation coefficient between the VAS and PI HAQ scores was also very high ($r=0.95$, $p\leq 0.001$).

Finally, when a factor analysis was applied, it showed that there were four hidden dimensions with a variance over one. However, three of them had eigenvalues very close to one (1.52, 1.23 and 1.04), and the main dimension had a variance of over 10. This variable explained over 50% of the eigenvalues (eigenvalue=50.6%) (Figure 1).

The component score coefficients of all questions in the prediction of the main variable was more than 0.5. The maximum coefficient was 0.87 for the ability to shampoo the hair, and the minimum coefficient was 0.5 for the ability to vacuum or do yard work.

DISCUSSION

The current study examining the psychometric properties and cross-cultural adjustments for the Persian version of the PI HAQ questionnaire showed a relatively good performance of this instrument in assessing the health status of Iranian patients with RA. There was high internal consistency and stability. Considerable face and construct validity were other promising factors when the Persian version of the PI HAQ questionnaire was used as a measuring instrument. The convergent validity was acceptable. The English version of the PI HAQ questionnaire needed to be adjusted, based on Iranian culture, in order to gain optimum results.

Factors such as an aging population and rising chronic disease rates with no permanent cure drew attention to the QoL as an important index for evaluating and monitoring the healthcare of these groups. The main aim was to improve the quality of patients' lives. Rheumatoid arthritis is a chronic and disabling disease that affects the QoL considerably. The PI HAQ is a well known disease-specific instrument for measuring and evaluating QoL in RA patients.^[16] However, it should be adjusted before being applied to different populations with different cultures.

It was crucial that the adopted questions should conceptually and functionally measure the same value. Cultural adjustment is one of the main issues in adapting an assessor to different environments.^[17] In this study, different lifestyles and habits, such as different nutritional and body washing methods along with distinctive toilet designs, led to some cultural adaptations to the PI HAQ questionnaire.

Such adjustments were also needed in the Arabic version of the PI HAQ by Meidany.^[5]

Regarding the psychometric properties, the results of the test/re-test in our study was significantly smaller than that of the Brazilian-Portuguese version (0.99),^[18] but it was comparable to the Tunisian version (0.84). The Arabic version of the PI HAQ showed Kappa statistics between 96.2 and 98.9.^[5] These figures cannot be compared directly with ours due to the application of different statistics in our study and theirs.

Our results showed a high internal consistency that was comparable to the Arabic Cronbach's alpha of 0.97. When compared with the Chinese and Spanish versions it was considerably higher (Cronbach's alpha 0.86 and 0.83, respectively).^[19,20]

The convergent validity in our study showed good results with the VAS and an acceptable result with the SF-36. However, the level of convergence was greater in men and in urban residents. This might be explained through the association of QoL with gender and place of residence.^[21] In the Tunisian study, the PI HAQ was evaluated in relation to the Lee index and with the Rheumatoid Arthritis Quality of Life (RAQoL) questionnaire. Compared with our study, theirs gained a higher correlation with the Tunisian PI HAQ and Lee index ($r=0.75$) along with the Tunisian PI HAQ and the RAQoL ($r_s=0.96$).

Furthermore, the single-factor result of factor analysis necessitates that the questionnaire only checks

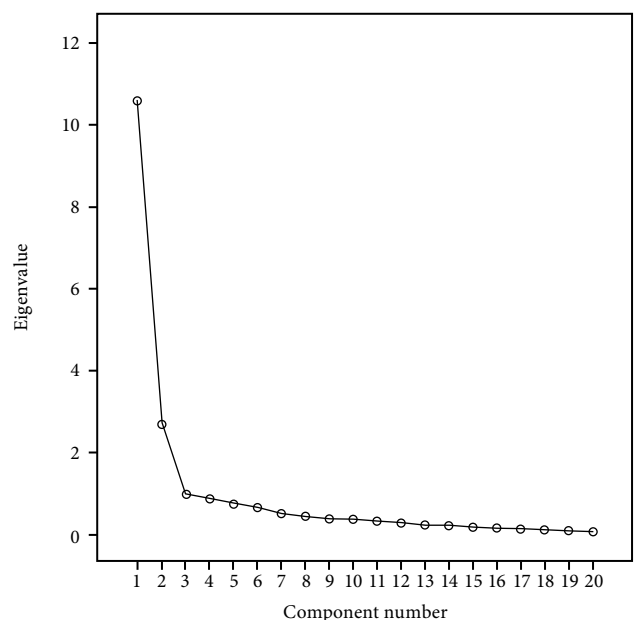


Figure 1. Scree plot variables in the Persian version of the PI HAQ questionnaire.

one dimension. In other words, it showed a high construct validity. This was consistent with the results of the study by Cole et al.^[22]

Personal contact with the patients and interviews with them led the authors to apply a multidimensional method for adoption of the PI HAQ and to avoid some existing limitations in the previous study^[6] conducted in Iran, including having limitations on examinations for construct validity and face validity. The authors also bore in mind that each activity involves specific muscles and joints, so the questionnaire was adapted to reflect cultural differences. This may not have been the case in the previous study.

This study was conducted on only 100 subjects; therefore, to consolidate the results, a larger study is suggested. In addition, a larger sample size will provide the opportunity for data analysis based on different variables such as duration of disease. It is also suggested that similar research should be conducted in other regions of Iran as it is composed of different sub-groups with different sub-cultures.

As a whole, although, as with many studies, our study had some limitations, the results concluded that the PI HAQ is a valid and reliable questionnaire to use for Iranian patients with RA and is, therefore, a useful assessment tool.

Acknowledgment

I would like to acknowledge and express my thanks to the patients for donating their time to be interviewed. Also, I am grateful to Bodil Upton (UK) for proofreading the English edition and for devoting time to the improvement of the paper.

Declaration of conflicting interests

The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

Funding

The authors received no financial support for the research and/or authorship of this article.

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