

## Measuring the Validity and Reliability of the Persian Version of Stanford Health Assessment Questionnaire in Iranian Patients with Osteoarthritis

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### Abstract

**Background:** Reliability and validity of health assessment questioner have been shown for rheumatoid arthritis but not osteoarthritis in Iranian patients. Having an instrument for measuring of pain and disability is needed for evaluation of patients and disease course in studies. So this study was designed for evaluating of validity and reliability of Persian HAQ in osteoarthritis.

**Materials and Methods:** From 177 patients with hand and/or knee osteoarthritis, 100 patients were chosen according HADS score equal or less than 7. Short Form of Health Survey (SF-36), pain and disability according Visual analogue scale (VAS) and Persian version of Health assessment questioner (HAQ) were completed. HAQ was re-evaluated after one week. Correlation between Persian HAQ, SF 36 and VAS and test-retest reliability were evaluated by Spearman correlation coefficient and Cronbach's alpha coefficient.

**Results:** Correlation coefficient for HAQ 1 and VAS for pain was ( $r=0.75$ ,  $p=0.001$ ) and for SF 36 was ( $r=0.70$ ,  $p=0.001$ ). Correlation coefficient for HAQ 1 and HAQ 2 was 0.93 for hand OA, 0.96 for knee OA and 0.94 for all patients ( $r=0.92$ ,  $p=0.001$ ). HAQ had a good internal consistency in osteoarthritis (Cronbach's alpha coefficient=0.87). Criterion and structure validity used in study.

**Conclusion:** This study has shown good validity reliability for Persian HAQ in Iranian patients with osteoarthritis.

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## Introduction

Osteoarthritis (OA) is the most common chronic joint disorder and manifests with particular pain and deformity and can lead to disability. Hand, hip and knee OA become more frequent with age and women are more affected than men after age 50 [1]. Prevalence of OA in Iranian population was evaluated as 14.1-16.4% [2]. There are some aspects of disease with qualitative specialty such as pain or disability those should be measurable in clinical studies. There are some instruments those are designed for measuring of pain and disability in OA patients such as Western Ontario and McMaster university (WOMAC) for knee OA [3], Lequesne index for hip and knee OA [4], functional Index for Hand Osteoarthritis (FIOHA) for hand OA [5]. The Health assessment questioner (HAQ) originally developed for assessment of outcome in patients with rheumatoid arthritis (RA) by Fries in 1980 in full forms with 5 section including disability, discomfort, drug toxicity, dollar costs of health care utilization and death [6] and in short form with 8 items about pain and disability [7]. The fact that HAQ has been translated to more than 60 different languages or dialects indicates the reliability, validity, adaptability, and ease of use of this instrument. It can be used by mail, in the office, by telephone and has been correlated with other patient-reported outcomes [7, 8].

Because of wide utilities of this questionnaire, it was translated and modified for using in another disorders including systemic lupus erythematosus, ankylosing spondylitis, fibromyalgia and OA of knee and hand [8-11]. HAQ was originally designed for english speaking population in North America. So it is necessary to considering some adaptation in items. There are some differences in type of daily activities in Iranian patients for example usage of squat toilet, doing chores and praying. Translation and measuring of reliability of HAQ in Iranian patients with RA were done by Rastmanesh and coworkers in 2009 [12] but not for patients with OA. They translated it by two independent bilinguals those translated the items and two others translated the response categories and after cultural adaptation, a tentative version was provided. The questioner was not evaluated for Iranian patients with OA. The purpose of this study is evaluating of validity and reliability of Persian HAQ in OA.

## Materials and Methods

HAQ was translated and modified for Iranian patients with rheumatoid arthritis. So we used Persian HAQ for our patients. The approval of the study protocol was given

by the institutional ethics committee of Mazandaran University of medical sciences. The patients were referred by a rheumatologist to two medical students who was trained for questionnaires. Patients with cognitive or language impairment were excluded from the study. According other studies in this field we estimated a simple size as 100 patients [11]. 177 consecutive OA patients visited in a rheumatology clinic in Sari, north in Iran, from 2011-12, and 100 patients were selected according to HADS (Hospital of Anxiety and Depression Scale) questionnaire. People who live in this area speak Mazandarani or Persian and they were considered as Parsi [12]. All participants had a diagnosis of OA of hand and/or knee according to American College of Rheumatology criteria [13, 14]. Patients with inflammatory arthritis such as rheumatoid arthritis and spondyloarthropathies were not included. Patients information including age, sex, disease duration and site of OA, pain according VAS, health according SF 36 questionnaire were recorded and HAQ was estimated simultaneously by direct interview and one week later by phone. HAQ assesses function in 8 categories in 20 questions: dressing and grooming, arising, eating, walking, hygiene, reach, grip, and other activities. There are 2-3 questions for each category and patients' answers recorded as: without any difficulty (0), with a little difficulty (1), with much difficulty (2) and unable to do (3). Then the highest sub category scores are summed and divided by the number of categories to obtain a HAQ score of 0-3. SF-36 is a self reported multi dimensional measure of general health status or quality of life with 8 scales of health that representing physical and mental status. t standardized to have a mean of  $50 \pm 10$  in the US population [15]. VAS is a horizontal roller from 0-10 for measurement of pain or disability and 10 is the worth. Validity and reliability of Persian HADS and SF-36 have been shown lastly [16-18]. Two trained medical students, discussed about HAQ and interviewed with patients. We used internal consistency and test re test methods to assess reliability. Internal consistency was evaluated according to Cronbach's alpha coefficient ( $\alpha > 0.7$ ) and reliability by Spearman's correlation coefficient ( $p < 0.05$ ). We computed correlation between scales from HAQ with SF-36 and VAS instruments. This is called convergent validity or criterion validity. The hidden factors and components in the HAQ were explored using factor analysis. The structure validity was evaluated by exploratory factorial analysis with varimax rotation. The hidden factors with Eigen values over than one were accepted. SPSS-18 software was used for statistical analysis.

## Results

In this study, from 177 patients with hand and/or knee osteoarthritis, 100 patients were chosen according HADS score equal or less than 7. The patients consisted of 62 patients with knee OA, 8 with hand OA and 30 with OA

in both knee and hand OA. Ninety seven percent of patients were female. The mean of age and duration of disease were  $54.6 \pm 4.4$  years and  $2.3 \pm 1.21$  years respectively. Characteristics of the patients were shown in table 1. Correlation coefficient for HAQ 1 (HAQ in first time) and VAS for pain was ( $r=0.75$ ,  $p=0.001$ ) and for HAQ 1 and SF 36 was ( $r=0.70$ ,  $p=0.001$ ). The convergent validity in our study showed good results with the VAS and an acceptable result, with the SF-36. Disability was highest in Q8C (other activities) and lowest in Q3B (eating). Correlation coefficient for HAQ 1 and HAQ 2 (HAQ after one week) was 0.93 for hand OA, 0.96 for knee OA and 0.94 for all patients ( $r=0.92$ ,  $p=0.001$ ). Spearman's rho ranged from 0.93 to 1.0 for each item. Scores of questions and correlation coefficient for each item have been shown in table 2. Factor analysis showed high construct validity that there were four hidden dimensions with Eigen values over than one, (7.41, 3.95, 1.36 and 1.02) that was explained 68.8% variance and showed with bold scores in table 3.

## Discussion

The results of present study have shown reasonably good internal consistency, test-retest reliability and validity for persian HAQ in patients with OA of knee and/or hand. The questionnaire covers most important activities that are influenced by hand or knee OA. Because of a lot of international or multi center studies, existence of some instrument for measurement of pain or disability is needed. HAQ was translated to persian and measured its reliability by Rastmanesh in 2009 in Iranian patients with rheumatoid arthritis, and it had high a good correlation coefficient with original Stanford HAQ and test-retest reliability [12].

In a study by Wylde and coworkers, in patients with OA, a good correlation and internal consistency and moderate one week test-retest reliability were found [19]. We had a greater r, it may be because screening the patients with anxiety or depression. Activities such as getting up and down from Iranian style futon and doing chores were more difficult for patients may be because having to use of lower limbs. It may be need to considering some facilities for patients with OA in houses or public places.

**Table 1.** Characteristics of the patients (total number =100)

Characteristics	Mean $\pm$ SD
Age	54.6 $\pm$ 4.4
Female N (%)	97(97%)
Disease duration	2.3 $\pm$ 1.21
Hand OA N (%)	38(38%)
Knee OA N (%)	92(92%)
HADS score	5.8 $\pm$ 1.28
SF-36 score	80.35 $\pm$ 9.22
VAS for pain	5.40 $\pm$ 1.6
HAQ 1 score	0.88 $\pm$ 0.35
HAQ 2 score	0.89 $\pm$ 0.36

\*30 patients had OA of hand and knee simultaneously

**Table 2.** Shows scores for every item of HAQ and correlation coefficient

Question number	Question Can you:	Kind of activity	Mean±SD	Correlation coefficient (HAQ 1-2)
Q1A	Dress yourself?	Dressing	0.03±0.17	0.92
Q1B	Shampoo your hair?	Dressing	0.13±0.36	0.98
Q2A	Stand up from a straight chair?	Arising	0.87±0.76	0.92
Q2B	Get in and out of bed?	Arising	0.95±0.67	0.95
Q3A	Use spoons and forks?	Eating	0.05±0.21	1
Q3B	Lift a full cup or glass?	Eating	0.02±0.14	1
Q3C	Open a new milk carton?	Eating	0.21±0.45	0.93
Q4A	Walk out door?	Walking	1.2±0.61	0.95
Q4B	Climb up 5 steps?	Walking	1.3±0.65	0.93
Q5A	Wash and dry your body?	Hygiene	0.24±0.47	0.97
Q5B	Take a tube bath?	Hygiene	0.12±0.38	0.98
Q5C	Get up and down from Iranian style futon?	Hygiene	1.5±0.70	0.94
Q6A	Reach and get down 2.5 kilograms?	Reach	0.43±0.65	0.98
Q6B	Bend down to pick up?	Reach	0.25±0.57	0.99
Q7A	Open car doors?	Grip	0.08±0.30	1
Q7B	Open previously opened jars?	Grip	0.07±0.29	1
Q7C	Turn faucets on and off?	Grip	0.9±0.40	0.98
Q8A	Run errands and shop?	activities	1.3±0.69	0.97
Q8B	Get in and out of a car?	activities	0.84±0.67	0.98
Q8C	Do praying from the standing position? (Or do chores such as vacuuming?)	activities	1.7±0.71	0.94

**Table 3.** Results of factor analysis, Rotated Component Matrix

	1	2	3	4
Q1A	0.061	0.272	0.206	0.751
Q1B	-0.021	0.513	0.686	0.083
Q2A	0.746	0.083	0.162	-0.075
Q2B	0.776	0.107	0.094	-0.286
Q3A	0.121	0.718	0.089	-0.093
Q3B	0.200	0.881	0.172	0.101
Q3C	-0.055	0.219	0.850	-0.039
Q4A	0.647	0.185	-0.080	0.336
Q4B	0.784	0.063	-0.065	0.251
Q5A	0.121	0.539	0.671	0.166
Q5B	0.056	0.718	0.417	0.181
Q5C	0.672	-0.170	0.124	0.351
Q6A	0.259	0.052	0.764	0.324
Q6B	0.296	0.605	0.147	0.293
Q7A	0.031	0.697	0.429	0.110
Q7B	0.059	0.672	0.519	0.072
Q7C	0.018	0.326	.842	-0.018
Q8A	0.678	0.181	0.320	-0.067
Q8B	0.781	0.195	-0.074	-0.031
Q8C	0.806	0.084	-0.047	0.091

Extraction Method: Principal Component Analysis Rotation Method: Varimax with Kaiser Normalization, \* Rotation converged in 6 iterations

Anxiety and depression are very common in patients with OA. In a large study on co- morbidities in OA patients, 12.4% were with depression, 6.6% with anxiety and 11.9% with sleep disorders, and in another study they were evaluated as 40.7% [20, 21]. HADS is a valid and reliable screening tool for detecting of mood disorder. In our study 43.5% of OA patients had HADS>7 and were not entered the study. We screened these patients for omitting of role of mood disorders that may influence on the answers of patients. Persian HAQ is easy, valid and

reliable instrument for evaluating of functional disability in Iranian patients with OA.

We have noticed some limitations in this study. First patients with hand OA were fewer in comparison with knee OA (38% vs. 92%). It may be influence on mean of items that related to functions that involve in hand OA. Second we don't expect that patient only with knee OA have difficulties in hands functions and vice versa. So it may be in future studies, Persian HAQ be divided according to site of involvement.

In summary, the findings from this study indicates that the persian version of the HAQ is a reliable and valid measure of disability of OA and now it can be used in studies of health assessment in OA patients. The next step is to use the questionnaire in different articular disorders or other chronic disease populations.

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### Authors' Contributions

All authors had equal role in design, work, statistical analysis and manuscript writing.

### Conflict of Interest

The authors declare no conflict of interest.

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