

Translation and validation of Modified Health Assessment Questionnaire score in local language Urdu in patients with rheumatoid arthritis presenting in a tertiary care center of Pakistan

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Abstract

Objective: To translate and validate the Modified Health Assessment Questionnaire from English to Urdu.

Method: The validation study was conducted at the Rheumatology outpatient department of Fauji Foundation Hospital, Rawalpindi, Pakistan, from July 1 to September 30, 2019. Two translators were given the modified health assessment questionnaire for translation from English to Urdu. It was then back-translated by two independent translators. The translated version of the tool was applied to rheumatoid arthritis patients to check for reliability, test-retest and internal consistency. It was applied to another group of patients to check for criterion validity. Reliability analysis was checked by applying Cronbach alpha. Criterion validity was checked by assessing disease activity score-28 and its correlation with Modified Health Assessment Questionnaire. Data was analysed using SPSS 23.

Results: Of the 30 patients in the initial testing, 28(93%) were females and 2(6.6%) were males, with an overall mean age of 38 ± 13.2 years. Of the 100 patients in the second group, 97(97%) were women and 3(3%) were men, with an overall mean age of 42 ± 12.37 years. The mean disease duration of the cohort was 8.4 ± 4.8 years. The Cronbach alpha value was 0.797 and interclass coefficient was 0.7, reflecting good reliability. A significantly high correlation between Modified Health Assessment Questionnaire and disease activity score-28 was noted along with pain, tenderness, swollen joints, patient global assessment, age and erythrocyte sedimentation rate ($p < 0.05$), while poor correlation was found with gender, disease duration, rheumatoid arthritis factor and anti-cyclic citrullinated peptide antibody ($p > 0.05$).

Conclusions: The Urdu version of the Modified Health Assessment Questionnaire was found to be a reliable tool for the indigenous population.

Keywords: Modified health assessment questionnaire, Disability, Rheumatoid arthritis. (JPMA 72: 674; 2022)

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Introduction

Rheumatoid arthritis (RA) is the most common autoimmune condition with polyarticular involvement, causing pain and swelling of the joints. It is characterised by progressive articular destruction that may lead to varying degrees of physical disability.¹ It affects 0.5% to 1% population globally.² RA has prevalence of 0.14% in the urban population of southern Pakistan,³ while in northern Pakistan it is 0.55%.⁴ The onset of RA is most common in the fourth and sixth decades of life. Therefore, it is vital that we keep a check on the disease activity in new onset and follow-up patients in order to limit morbidity and mortality. There are multiple clinical scales to quantify the disease activity of RA into mild, moderate and severe.⁵ Different scales have also been developed for the purpose of assessing the functional status and disability. The functionality of RA patients is measured by

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the original Health Assessment Questionnaire (HAQ) disability index which is the gold standard having 20 questions.⁶ It was modified three years later as Modified HAQ (MHAQ) with only 8 questions.⁷

HAQ was initially developed for use in RA and osteoarthritis patients, but it also has function in a wide range of rheumatologic disorders, including, ankylosing spondylitis, juvenile idiopathic arthritis, systemic sclerosis, systemic lupus erythematosus, fibromyalgia, and psoriatic arthritis.⁸ Although now translated into >60 languages,⁸ HAQ was originally developed and validated for English-speaking populations. The MHAQ has also been translated into other languages.⁹ A study revealed that after combining with age and co-morbidities, the MHAQ was better at predicting 5-year mortality than radiographic and laboratory data.¹⁰

In Pakistan the age group >10 years has a literacy rate of 60%, according to a survey in 2017¹¹ but it does not necessarily reflect the number of people who can read and speak the English language. Both English and Urdu

are the official languages of Pakistan but the national language is Urdu, and the medium of communication in the outpatient departments (OPDs) in Pakistan is primarily Urdu. Most of the patients presenting to government-sector hospitals in Pakistan are unacquainted with the English language. Hence, to assess disease activity, the MHAQ questionnaire has to be verbally translated for them by the physician. This process is both time-taking and arbitrary, because it contains observer-related translation errors from one language to the other.

The current study was planned to translate and validate the MHAQ tool from English to Urdu.

Materials and Methods

The validation study was carried out at the Rheumatology OPD of Fauji Foundation Hospital, Rawalpindi, Pakistan, from July 1, 2019, to September 30, 2019. After approval from the institutional ethics review board, the MHAQ tool was translated and then subjects were enrolled for testing the reliability and validity of the translated tool. The participants in the two groups were included successively, and a registered doctor/nurse at the Rheumatology OPD reviewed if the participant had adequate comprehension of Urdu to be able to answer the questionnaire.

Both reliability and validity groups comprised RA patients diagnosed according to the American College of Rheumatology (ACR) 2010 criterion¹², with age >18 years.

Those excluded were patients who could not understand Urdu, did not want to volunteer, and patients with congenital abnormalities or disability due to any other reason.

To measure the concurrent validity of the Urdu version of MHAQ (MHAQ-U), Disease Activity Score-28 (DAS-28) was used.

The MHAQ-U consisted of eight questions related to activities of daily life: dressing, walking into and out of the bed, lifting a cup to the mouth, walking outside, washing entire body, bending down to pick up something from the floor, turning taps on and off, and getting in and out of the car. These are scored 0-3, with 0= without any trouble, 1= with some trouble, 2= with much trouble, and 3 =unable to do. The aggregate of the answers is then divided by three, which gives a score between 0 and 3.

The translation and modification of the MHAQ was done in accordance with the relevant guidelines¹³ which consists of the following steps: Translation by two autonomous trained translators; comparison of the

translated version with the aim of achieving lucidity in translation; back-translation by two self-reliant back-translators; and review by a committee, which in this case comprised a rheumatologist, a physiotherapist and a nurse. One final step was added in line with a protocol¹⁴ which calls for having the tool tested on patients in the presence of an interviewer. The interviewer can be used as a descriptive informer, if required. The interviewer monitors whether there is difficulty reading or responding to the questionnaire.

Test-retest was used to check reliability, with a two-week interval. Reliability was also tested with Cronbach's alpha for internal consistency. Face validity was also measured in this group by asking the participants about the appropriateness of the questions.

The floor and ceiling effects of the MHAQ-U were also checked in the validity test group. Floor effects were thought to be present if $\geq 15\%$ scored an item as 0 (lowest possible score), and ceiling effects were considered to be present if $\geq 15\%$ scored an item as 3 (highest possible score) on the MHAQ-U. Criterion validity was tested by MHAQ-U and also DAS-28 was calculated.

In the reliability test group, the participants responded to the questionnaire two times, on one occasion at the visit to the OPD and a second time two weeks after that.

In the validity test group, the participants answered the questionnaires once only. The doctor in the OPD handed over and collected the questionnaires and also performed clinical examination to assess swollen joints (SJs) and tender joints (TJs) count, and patient global assessment. A blood sample was drawn to test erythrocyte sedimentation rate (ESR) and thus DAS-28 was calculated. Patients' blood samples were also checked for the presence or absence of RA factor and anti-cyclic citrullinated peptide (Anti-CCP) antibody.

Data was analysed using SPSS 23. The Cronbach's alpha for internal consistency was used to assess the reliability and test-retest for reproducibility and inter-class correlation. A high alpha >0.7 shows that the items are sufficiently inter-related. Concurrent validity was checked by measuring the level of association between scores of the MHAQ-U and DAS-28 with Spearman rank order correlation. Coefficients >0.6 were considered strong, 0.6-0.3 as moderate, <0.3 as weak. The level of significance was set at $p < 0.05$.

Results

Of the 30 patients in the initial testing, 28(93%) were females and 2(6.6%) were males, with an overall mean age of 38 ± 13.2 years. Of the 100 patients in the second group,

Table-1: Demographic and clinical features of the patients.

	Mean $\pm$ SD	Range
Age, years	42 $\pm$ 12.37	20-68
Disease duration, years	8.4 $\pm$ 4.8	3-25
Tender joints	6.7 $\pm$ 3.2	0-18
Swollen joints	1.8 $\pm$ 1.5	0-8
Pain	4.3 $\pm$ 1.0	1-7
Patient global assessment	4.0 $\pm$ 1.0	1-7
ESR	22.3 $\pm$ 6.8	10-42
DAS-28	4.4 $\pm$ 0.64	2.3-6.5

ESR: Erythrocyte sedimentation rate, DAS-28: Disease activity score-28.

97(97%) were women and 3(3%) were men, with an overall mean age of 42 $\pm$ 12.37 years. The mean disease duration of the cohort was 8.4 $\pm$ 4.8 years (Table-1).

Test-retest kappa statistics were checked for each domain of MHAQ-U (Table-2).

The Cronbach alpha value was 0.797 and interclass coefficient was 0.7, reflecting good reliability. The alpha value was modified up to 0.809 if one of the items was deleted.

Table-2: Description of eight domains of Modified Health Assessment Questionnaire-Urdu (MHAQ-U) and correlation matrix for each domain (n=100).

M HAQ domain	Mean $\pm$ SD	D & G	Arising	Eating	Walking	Hygiene	Reach	Grip	Activities
D & G	1.03 $\pm$ 0.13	1.000	0.452	0.473	0.602	0.602	0.422	0.523	0.732
Arising	1.60 $\pm$ 0.58		1.000	0.320	0.727	0.727	0.764	0.386	0.433
Eating	1.14 $\pm$ 0.34			1.000	0.850	0.850	0.620	0.711	0.319
Walking	1.10 $\pm$ 0.30				1.000	1.000	0.431	0.627	0.326
Hygiene	1.10 $\pm$ 0.30					1.000	0.431	0.627	0.326
Reach	1.47 $\pm$ 0.50						1.000	0.554	0.614
Grip	1.30 $\pm$ 0.47							1.000	0.643
Activities	1.33 $\pm$ 0.48								1.000

SD: Standard deviation, D&G: Dressing and grooming.s

Table-3: Correlation between Modified Health Assessment Questionnaire (MHAQ) and various parameters.

	R	P value
Age	0.3	0.002
Gender	0.08	0.3
Disease duration	0.17	0.07
Tender joints	0.63	0.001
Swollen joints	0.62	0.001
Pain	0.46	0.001
Patient global assessment	0.48	0.001
ESR	0.30	0.002
DAS-28	1	0.001
RA factor	0.16	0.10
Anti CCP	0.08	0.4

ESR: Erythrocyte sedimentation rate, DAS-28: Disease activity score-28, RA: Rheumatoid arthritis, CCP: Cyclic citrullinated peptide.

Face validity was also measured among the participants by asking them whether the questions were relevant in elucidating the goal of the study. The translation and adaption process did not need change of, addition or deletion of any question as all the questions were compatible with Pakistani culture. None of the items in the MHAQ-U was needed to be deleted or added according to the participants in the reliability test group and they considered the MHAQ-U to be comprehensible and acceptable, reflecting a high face validity.

No floor and ceiling effects were observed. Correlation between MHAQ-U and DAS-28 showed significantly high correlation (Table-3).

Discussion

Rheumatoid arthritis affects about 0.5% to 1% of the global population.¹⁵ Since a significant portion of the population has the disease, it is important to know the disability index in RA. There are various tools to measure the functioning in RA patients, of which the Health Assessment Questionnaire Disability Index (HAQ-DI) is the most widely used one.¹⁶

Disability has been acknowledged as a central outcome measure in RA¹⁷ but there is no established tool to measure the functionality and disability in RA patients in Pakistan. It has been shown that the HAQ contains 70% of the items important to quantify disability in RA patients.¹⁸

The current study aimed at developing and validating the MHAQ into Urdu for the convenience of both the local doctors and the local patients. The MHAQ does not only tell us the functional status, but also helps us in making the future management plans for the patient because it can help us assess the work impairment and work disability in a patient.¹⁹ It can help us assess the progression and outcome of the disease. Outcomes are irreversible, and for a functional disability to be considered as an outcome measure, it should be present

at a certain level for a sustained period of time.²⁰ Using this questionnaire, one can choose modalities of treatment according to the functional disability and outcome of the patient.

The results of the current study in the reliability group showed that MHAQ-U was well understood by the patients, and there was no need of addition, deletion or modification of any question. This is in contrast to the results of a study²¹ in Bangladesh. The current study revealed good internal consistency of MHAQ-U, with Cronbach's alpha value 0.797 whereas a previous study²² showed Cronbach's alpha value 0.883. This may be due to the reason that HAQ contains more items compared to MHAQ which results in increased value of Cronbach's alpha as it is a function of items.

Item-total statistics showed that Cronbach's alpha increased to 0.80 if the first question was deleted which is related to dressing and grooming. Another study showed Cronbach's alpha of 0.897.²³ In the current study, intra-class correlation coefficient was also reasonable which depicted good test-retest reliability. So it can be used over a period of time with good reliability.

In measuring the convergent validity, the current study checked the correlation of MHAQ with different clinical parameters, including age, gender, disease duration, TJs, SJs, pain, patient global assessment, ESR, RA factor and anti-CCP antibodies. MHAQ-U was significantly correlated with age. Besides disability, another reason for it may be that age itself contributes to various comorbidities which result in functional dependence, although we tried to balance this effect by excluding patients with disability due to any other reason. These results are in accordance with a study done earlier which also showed significant correlation with increase disease activity.²⁴

Our cohort consisted mainly of female patients, but no significant correlation of gender with MHAQ-U was seen. Another unexpected result in the current study was that the disease duration was not significantly correlated with MHAQ-U. This result is surprising as with increased disease duration, more disability is expected.

Of all the parameters, TJs and SJs had significantly positive correlation with MHAQ-U. This was an anticipated finding because more TJs and SJs will obviously add to disability. Similarly, pain and patient global assessment were also significantly correlated with MHAQ. DAS-28 was very strongly correlated with MHAQ-U. ESR was mildly to moderately correlated with MHAQ, reflecting increased inflammation and

uncontrolled disease leading to disability. RA factor and anti-CCP positivity were not significantly correlated with MHAQ-U.

Conclusion

There was good reliability and validity of MHAQ-U, and it can be used in OPDs for quick assessment of functional level of RA patients.

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Conflict of Interest: None.

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