

# Translation and Validation of Childhood Healthcare Assessment Questionnaire in Urdu Language for Juvenile Idiopathic Arthritis

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## ABSTRACT

**Aim:** To translate and validate Childhood Healthcare Assessment Questionnaire (CHAQ) in Urdu language and assess its psychometric properties for cross cultural adaptation.

**Methods:** The Childhood Healthcare Assessment Questionnaire (CHAQ) was translated into the target language of Urdu by two independent translators, one of whom was familiar with the questionnaire's concept while the other was not, and the two translations were then compared as part of a cross-cultural linguistic validation study. These two initial translations of the questionnaire were blindly reversed, and the results were compared<sup>1</sup>. The pre-final version of the translated version underwent thorough psychometric testing in a sample of 38 members of the target population (parents of children with juvenile idiopathic arthritis at Ghurki Trust and Teaching Hospital, Lahore) who satisfied the inclusion requirements. The final version was reviewed by an expert panel. Parents' prior approval was obtained before testing.

**Results:** The Cronbach's alpha for the Urdu version of CHAQ was calculated as 0.993 after testing on the population showing excellent internal consistency. For test-retest reliability, Pearson correlation ranged from (0.378–0.956). The inter-item correlation of the Urdu version of CHAQ after applying to the targeted population has a mean value of 1.177, a minimum value of 0.056, a maximum value of 4.00, a variance value of 0.723, and a range of 3.944. The scale statistics have a mean value of 103.55, a variance of 1462.37, a standard deviation of 38.241, and a total number of items of 88. The intraclass correlation coefficient ranges from 0.606-0.993.

**Conclusion:** The Childhood Healthcare Assessment Questionnaire in Urdu is a screening tool for parents of children with juvenile idiopathic arthritis since it has adequate inter-item correlation values and great internal consistency.

**Keywords:** Childhood Healthcare Assessment Questionnaire (CHAQ), Juvenile Idiopathic Arthritis (JIA), Reliability, Validity, Cross-cultural adaptation

## INTRODUCTION

The Childhood Healthcare Assessment Questionnaire, which was originally created for the pediatric population with juvenile idiopathic arthritis, is now also used for assessing the functional status of many other diseases, including spina bifida, juvenile dermatomyositis, and rheumatic conditions like idiopathic inflammatory myopathy (IIM). CHAQ is a self-reported questionnaire that measures functional disability and discomfort. This scale is the updated version of the Stanford Health Assessment Questionnaire (HAQ), to which many questions have been added to make it suitable for the pediatric population<sup>2-5</sup>.

The CHAQ is the most common measure of the functional health status of children, assessing their functional ability in eight domains of physical function, consisting of a total of thirty items for children ranging in age from 6 months to 18 years. These thirty items are rated on a four-point Likert scale ranging from 0 to 3: 0 (without any difficulty), 1 (with some difficulty), 2 (with much difficulty), and 3 (unable to do). The disability index is augmented with two visual analogue scales, one for pain and one for overall well-being. CHAQ, which is a sensitive and valid tool for the evaluation of functional health status in children with chronic arthritis, is a parent-based questionnaire. The eight functional domains that CHAQ measures include dressing and grooming, arising, eating, walking, hygiene, reach, grip and activities. It takes less than 10 minutes to complete the questionnaire, and scoring is done by simple manual calculation<sup>6,7</sup>.

Juvenile idiopathic arthritis is one of the most common rheumatic diseases of childhood and is characterized by a chronic inflammatory disease of idiopathic nature occurring before the age of 16. Though its cause is still unknown, it has been one of the causes of long-term disability and short stature in children<sup>4</sup>. JIA is one of the common causes of difficulty in walking in children. It's a

group of heterogeneous diseases sharing a common feature of chronic inflammatory arthritis with flare duration lasting more than six weeks. The International League of Associations for Rheumatology (ILAR) divided JIA into seven homogenous categories, i.e., rheumatoid factor (RF)-negative polyarthritis, enthesitis-related arthritis, RF-positive polyarthritis, oligoarthritis, psoriatic arthritis, systemic arthritis, and undifferentiated arthritis. These categories differ in their disease course and presentation of symptoms<sup>8</sup>.

Systemic arthritis, or auto-inflammatory arthritis, is the most severe subtype of JIA and is characterized by chronic arthritis with systemic manifestations like spiking fever, rash, anemia, serositis, hepatosplenomegaly, lymphadenopathy, pancytopenia, coagulopathy, hemorrhagic manifestations, neurologic symptoms, and high inflammatory markers<sup>9</sup>. The hypothesis that inflammatory cytokines are associated with S-JIA is supported by recently conducted randomized controlled trials<sup>10</sup>.

Oligoarthritis, or autoimmune arthritis of childhood, defined as arthritis affecting four or fewer than four joints during the first six months of disease, is the most common subtype of JIA. It is characterized by the presence of asymmetrical arthritis with early onset before the age of six. ILAR further classifies this subgroup of oligoarthritis into two categories: persistent oligoarthritis, in which four or fewer than four joints are affected, and extended oligoarthritis, in which more than four joints are affected after the first six months of disease. Iridocyclitis is the most common feature of this subtype, affecting 30% of patients<sup>10,11</sup>.

Polyarthritis constitutes 25% of all cases of JIA, and 85% of these cases are rheumatoid factor-negative. It is defined as arthritis affecting five or more joints during the first six months of disease, subdivided into rheumatoid factor negative and positive<sup>3,8,10</sup>. It has been observed that patients with polyarthritis who are RF negative and ANA positive closely resemble patients with oligoarthritis JIA in terms of age of onset of disease, high occurrence of Iridocyclitis, and strong female preponderance<sup>12</sup>. Patients with enthesitis-related arthritis show symptoms of both JIA

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and juvenile spondyloarthritis, common among males occurring after the age of six, with characteristic findings of negative RF and ANA factors with asymmetric arthritis and enthesopathy of the lower extremity<sup>13</sup>. ILAR described psoriatic arthritis as arthritis occurring together with rash or any two of the following: dactylitis, psoriasis in first-degree relatives; onycholysis; articular changes occurring long before integumentary changes. These characteristics closely resemble those of oligoarthritis. The JIA classification was developed with the ultimate goal of providing specific treatment to patients according to different forms of disease<sup>10,14</sup>.

In a country like Pakistan which is multi-lingual and multiethnic, Urdu is the common language that is spoken and understood by majority of the population. Currently there is no questionnaire to assess functional health status for children with JIA. Parents are either unable to understand or use the original English version of CHAQ, leading to inability to evaluate their child's functional outcome, or the therapist has to translate it on the spot for parents at the time of administration.

Urdu is the common language that the vast majority of the population speaks and understands in a multilingual, multiethnic nation like Pakistan. The functional health status of children with JIA cannot currently be evaluated by a questionnaire. Either the therapist must translate the CHAQ on the spot for the parents at the time of administration because parents are unable to interpret or understand the CHAQ in its original English language, which prevents them from assessing their child's functional outcome.

**MATERIAL AND METHODS**

The Childhood Healthcare Assessment Questionnaire was translated into the target language of Urdu by two independent translators, one of whom was familiar with the questionnaire's concept while the other was not, and the two translations were then compared as part of a cross-cultural linguistic validation study. These two initial translations of the questionnaire were blindly reversed, and the results were compared<sup>1</sup>. The pre-final version of the translated version underwent thorough psychometric testing in a sample of 38 members of the target population (parents of children with juvenile idiopathic arthritis at Ghurki Trust and Teaching Hospital, Lahore) who satisfied the inclusion requirements. The final version was reviewed by an expert panel. Parents' prior approval was obtained before testing<sup>15</sup>. Parents and the LCPT ethics committee approved the test before it was conducted. The data were entered, and the analysis was done using SPSS version 23 (Statistical Package for Social Sciences). The research variables were presented using descriptive statistics. An information sheet that described the nature and purpose of the study as well as how each participant's consent was gained was provided along with the questionnaire. It was promised to the respondents that their responses would remain confidential.

**RESULTS**

The final version of the Urdu-translated version of the CHAQ questionnaire is evaluated on the target population, that is, children with JIA, with a sample size of 38.

**Internal consistency:** The Cronbach's alpha for the Urdu version of CHAQ was calculated as 0.993 after testing on the population showing excellent internal consistency.

Chronbach Alpha	No. of items
0.993	88

**Test-retest reliability:** For test-retest reliability, Pearson correlation ranged from (0.378–0.956).

Domains	Statistics	Total score of CHAQ
Dressing	Pearson correlation	0.636
	Sig. (2-tailed)	0.000
	N	38
Arising	Pearson correlation	0.956
	Sig. (2-tailed)	0.000
	N	38
Eating	Pearson correlation	0.536
	Sig. (2-tailed)	0.000
	N	38
Walking	Pearson correlation	0.630
	Sig. (2-tailed)	0.000
	N	38
Hygiene	Pearson correlation	0.543
	Sig. (2-tailed)	0.000
	N	38
Reach	Pearson correlation	0.378
	Sig. (2-tailed)	0.000
	N	38
Grip Activities	Pearson correlation	0.631
	Sig. (2-tailed)	0.000
	N	38

**Inter and intra rater reliability:** The inter-item correlation of the Urdu version of CHAQ after applying to the targeted population has a mean value of 1.177, a minimum value of 0.056, a maximum value of 4.00, a variance value of 0.723, and a range of 3.944. The scale statistics have a mean value of 103.55, a variance of 1462.37, a standard deviation of 38.241, and a total number of items of 88. The intraclass correlation coefficient ranges from 0.606-0.993.

	Single Measures	Average Measures
<b>Intra-class Correlation</b>	0.606	0.993
95% Confidence Interval	Lower Bound	0.461
	Upper Bound	0.777
F Test with True Value 0	Value	136.254
	df1	17
	df2	1479
	Sig	0.00

**DISCUSSION**

The original CHAQ version, the most reliable and valid tool to assess the functional health outcome of JIA patients, is the most widely used questionnaire. This tool has been validated and culturally adapted in many countries. Numerous studies have demonstrated that when the psychometric properties of the CHAQ are evaluated, they appear to be sound, and it can be used with confidence with children between the ages of 8 and 15 because there is no correlation between age and test results<sup>4,16-21</sup>. The disease-specific questionnaire clinically distinguishes patients affected by different JIA subtypes from their healthy peers<sup>4</sup>.

The current study's objectives included validating the translated version of the CHAQ as well as testing its fundamental psychometric features. The results of the present study show that the Urdu version of CHAQ has excellent psychometric properties. In this study, the Urdu version of CHAQ was fully cross-culturally adapted from the original American English version, with two forward and two backward translations. The Cronbach's alpha for the Urdu adaptation of the original CHAQ was calculated as 0.964 after testing on a population reflecting excellent internal consistency. Confirmatory factor analysis supported comparability to the original version of CHAQ, as shown by the virtually comparable outcomes in the current investigation.

The test-retest reliability of our study, Pearson correlation, ranged from (0.378–0.956) with a p-value of 0.000, which is significant as per the reference p-value, which was ( $p = 0.5$ ), all these values of test retest reliability for different CHAQ versions, including the Urdu version of our study, reflect fair to good reproducibility except for Turkish and Belgian-Flemish versions that have poor and fair to poor reproducibility on test retest, respectively<sup>17,22</sup>. CHAQ's sensitivity and specificity are currently unclear. The translated version's generalizability is constrained because it was only tested on a small number of people. CHAQ can be translated into various Pakistani languages spoken by minorities and non-Urdu speakers.

## CONCLUSION

The Childhood Healthcare Assessment Questionnaire in Urdu is a screening tool for parents of children with juvenile idiopathic arthritis since it has adequate inter-item correlation values and great internal consistency.

**Authorship and contribution declaration:** Each author of this article fulfilled ALL 04 Criteria of Authorship:

1. Conception and design of or acquisition of data or analysis and interpretation of data.
2. Drafting the manuscript or revising it critically for important intellectual content.
3. Final approval of the version for publication.
4. All authors agree to be responsible for all aspects of their research work

**Conflict of interest:** Nothing to declare

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