

The Arabic version of childhood health assessment questionnaire modified for Arabic children

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ABSTRACT

Objective: To determine the feasibility, reliability and validity of the childhood health assessment questionnaire - modified for Arab children (CHAQ- MAC).

Methods: One hundred and eighteen modified questionnaires were completed by 75 juvenile rheumatoid arthritis (JRA) patients and their parents attending the Pediatric Rheumatology Clinic at the King Faisal Specialist Hospital and Research Centre, Riyadh, Kingdom of Saudi Arabia over an 18 month period (January 1996 to May 1997).

Result: The modified questionnaire was self-administered by 82% of the parents. The median time to complete the

questionnaire was 10 minutes. The main difficulty in comprehension was discomfort dimension (visual analogue scale [VAS] and morning stiffness). Test retest reliability was good ($r=0.79$). Validity of the CHAQ-MAC was confirmed by the strong correlation between disability index and VAS score ($r=0.58$). Functional activities that caused the most difficulties were cross sitting, assuming the prayer position, and using the Arabic style toilet.

Conclusion: The modified CHAQ is a suitable assessment tool for Arab children suffering from JRA.

Saudi Med J 2004; Vol. 25 (1): 83-87

Different functional assessments for the measurement of disability related to chronic arthritis in children have been established including the arthritis impact measurement scales (AIMS), juvenile arthritis functional assessment report (JAFAR), and childhood health assessment questionnaire (CHAQ).¹⁻³ The CHAQ has been standardized for children from 1-17 years of age. It has been accepted as a reliable and valid scale.³ The CHAQ has been validated and used in Swedish and Brazil, Spanish, and Costa Rican children with juvenile rheumatoid arthritis (JRA).⁴⁻⁶ These versions were standardized on the Western populations and are not entirely suitable for Arab children, due to different styles of dress and household fittings such as chairs, beds, showers and toilets; moreover joints flexibility is essential to accommodate

Salah (prayer) position (includes kneeling and the ability to rise from the floor), and cross sitting. For this reason, the modification of the original questionnaire to suit Arab children suffering from JRA was proposed. This scale has been named as Childhood Health Assessment Questionnaire - Modified for Arab Children (CHAQ-MAC). The aim of the study was to determine the feasibility, reliability and validity of the CHAQ- MAC

Methods. Seventy-five children with JRA patients and their parents attending the Pediatric Rheumatology Clinic at the King Faisal Specialist Hospital and Research Centre, Riyadh, Kingdom of Saudi Arabia (KSA) were asked to complete the questionnaire

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Received 9th June 2003. Accepted for publication in final form 28th September 2003.

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(Table 1). One hundred and eighteen questionnaires were completed, (12 questionnaires were filled by the patient themselves and 106 questionnaires were filled by parents). Disease activity was evaluated by physician on a 4-point scale: 1) Disease in remission - no evidence of disease activity, no medication. 2.) Disease under control - no evidence of disease activity but on medication for JRA. 3.) Moderate disease activity - clinical signs of disease activity, but requiring modification of the current medication. 4.) Severe disease activity - clinical signs of disease activity despite maximum therapy. Functional status of the subjects was evaluated using Steinbrocker functional class:⁷ Class 1 = complete functional capacity; ability to carry on all usual duties without handicaps. Class 2 = functional capacity adequate to conduct normal activities despite handicap of discomfort or limited mobility of one or more joints. Class 3 = functional capacity adequate to perform only little or none of the duties of usual occupation or self-care. Class 4 = largely wholly incapacitated with patient bedridden or confined to a wheelchair, permitting little or no self-care. The assessment was undertaken on a voluntary basis. The parents completed the questionnaire. The physical or occupational therapist then checked the form to ascertain whether all questions had been completed, and whether there were any uncertainties. The time taken to fill the questionnaire and difficulty were recorded. The physical therapist rated the modified CHAQ score and the Steinbrocker functional class.

Questionnaire. Childhood Health Assessment Questionnaire is an instrument contains 2 different

indexes, one related to the functional capacity and the other one to the pain. The disability section of CHAQ assesses function in 8 areas: dressing, eating, arising, walking, hygiene, reach, grip, and general activities. Three components are evaluated for each area, rating the degree to which daily function are difficult to perform, the requirement of assistance from another person for each activities, and report for use of special aids or devices.³ The translation of the CHAQ was performed independently by 3 persons (Rheumatologist, Physical Therapist and Occupational Therapist) working in pediatric rheumatology. All 3 versions were re-reviewed and completed by 4 experts working in pediatric rheumatology, physical and occupational therapy. The questionnaire that resulted from this process was then back translated into English by 2 independent English translator with no knowledge of original CHAQ and the English language version they had produced. The original CHAQ was modified as follows: 1) Reflecting the Arabic dress (including thobe and head cover). 2) Living arrangements (asking for reports as to whether an Arabic or Western-style toilet was used, style of feeding, showering versus bathing). 3) Assessing the ability to assume the cross leg position (hip flexion, abduction and external rotation) and perform salah (prayer). To effectively perform the salah; one patient was required to perform forward trunk flexion in a standing position, and short kneeling (hip and knee flexion). The discomfort dimension was evaluated according to: 1) Duration of morning stiffness recording in minutes. 2) Pain scored measured with a 15-cm visual analogue scale (VAS) with no pain at one end and severe pain at the other end.⁸

Administration and score. A detailed explanation on the modified questionnaire was given to the parent and patient as well. Children over 10 years of age, both the child and one of the parents filled the questionnaire. In the cases where the child was below 10 years of age; one of the parents filled the questionnaire. The physical or occupational therapist presented the questionnaire verbally, when there was difficulty in self administering the questionnaire. The functional capacity index evaluated as follow: 0 = no difficulty, 1 = some difficulty, 2 = much difficulty, and 3 = unable to do. The questionnaire with the highest score determines the score for that functional area. If either aids or device are used or help is needed from others were reported for category, a minimum score of 2 was given. The disability index was calculated by adding the scores for each area and dividing them by 8 to give us a score between 0-3. The pain index was calculated by measuring the child's marks on the VAS in cm and multiplied by 0.2 to give a value from 0-3.⁸

Data analysis. Feasibility was measured by the percentage of successful self-administrations and time required to fill out the questionnaire. Reliability was

Table 1 - Characteristics of the study population (N=75).

Characteristics	
Age (years)	2.5 - 17 mean = 9.7 SD = 3.07
Gender	
Male to Female ratio	42:33
Disease activity	
None	1
Mild	55
Moderate	13
Severe	6
Type of onset	
Systemic onset	52
Polyarticular onset	14
Pauciarticular onset	9
Functional class	
Class 1	55
Class 2	13
Class 3	7
Class 4	0
Disease duration (years)	0.5-10
Morning stiffness (minutes)	0-180 mean 21

tested by test - retest and interobserver score correlation. Test - retest: 33 questionnaires were refilled by the parents and calculated using coefficient and intraclass correlation. Interobserver score correlation was calculated by parent-child correlation: parent child correlation was assessed by requesting the parents and over 10-year-old children to complete the questionnaire at the same visit. Twelve children whose age ranged from 10-17 years were studied.

Validity. Cross cultural validity. The modified CHAQ was initially tested on a small group of patients (n=20) to determine its usefulness and most appropriate modifications depend on the parents and patient feedback.

Convergent validity. It was tested by calculating the correlation of disability index with pain score, functional class, disease activity and types of JRA.

Statistical analysis. all data entered into Statistical Package for Social Sciences (SPSS) database and analyzing using the SPSS package. Test-retest was assessed using Spearman's correlation.

Results. Feasibility. The global percentage for self-administration was 82%. Eighteen percent respondent needed help from Physical Therapy to complete the questionnaire; the main difficulty was the discomfort dimension (VAS and morning stiffness). Five point six percent needed help to complete the disability index. The median time taken to fill the questionnaire was 10 minutes (range from 5-15) for the parents and 15 minutes (range from 10-20) for the children.

Reliability. Test-retest. The mean disability index on the clinic administered questionnaire was 0.748; retest at next visit revealed a mean score of 0.88. The mean pain score on the clinic administered questionnaire was 0.6; retest at next visit revealed a mean score of 0.81. Correlation between disability index on the clinic administered questionnaire and retest next visit ($r=0.855$), while the correlation

between pain score on the clinic administered questionnaire and retest next visit ($r=0.66$). Mean morning stiffness on the clinic administered questionnaire 13 minutes (range from 0-3 hours), retest in the next visit was 11 minutes (range from 0-2.30 hours)

Parent-child correlation. The mean disability index score on the parent-administered questionnaire was 0.47 and that on the children administered questionnaire was 0.5. The mean pain score on the parent- administered questionnaire was 0.45; and that of the children administered questionnaire was 0.36. The Spearman's correlation between disability index on the parents administered questionnaire and children administered questionnaire was 0.93, while the VAS on the parents administered questionnaire with children administered questionnaire was 0.61.

Validity. Cross cultural validity was 22 items of the original North American CHAQ had satisfactory agreement, one item was excluded in eating category because the question was considered out of cultural context, and this item was replaced by a new item to suite Arab culture. Four items required modification such as change of the example given, and 4 items were added to suit the Arab cultural on hygiene, grip and activities.

Convergent or discriminative validity. High correlation was found between disability index and Steinbrocker functional class 0.76, followed by the correlation between disability index and VAS 0.58. The means for disability index and its 8 categories for the 75 children according to Steinbrocker functional class were all in the predicted direction, increasing according to worsening in the functional class. The highest mean score was for the categories hygiene² in the class III, while the lowest mean score was for the categories eating (0.24) in the class I.

The correlation between the disability index, pain (VAS) and disease activity, Steinbrocker functional class and type of onset of JRA, they were all good and

Table 2 - Correlation between childhood health assessment questionnaire - modified for Arab children disability index, pain index and disease activity, functional class and juvenile rheumatoid arthritis type of onset.

Characteristics	Disease activity	Functional class	Juvenile rheumatoid arthritis type of onset
Disability index	0.406	0.71	Pauci articular: 0.05 Polyarticular: 0.81 Systemic: 0.82
Viral analogue scale	0.5	0.37	Pauci articular: 0.09 Polyarticular: 0.64 Systemic: 0.63

Table 3 - Means and range for the 8 categories of the childhood health assessment questionnaire - modified for Arab children disability index.

Disability index	Parents Mean \pm SD	Patient Mean \pm SD
Dressing	0.85 \pm 1.1	0.5 \pm 0.67
Arising	0.61 \pm 0.9	0.41 \pm 0.9
Eating	0.41 \pm 0.79	0
Walking	0.54 \pm 1.01	0.08 \pm 0.28
Hygiene	1.12 \pm 1.2	0.58 \pm 1.1
Reaching	0.7 \pm 0.87	0.58 \pm 0.7
Gripping	0.63 \pm 0.98	0.33 \pm 0.49
Activities	1.37 \pm 1.28	1.08 \pm 1.2

in the predicted direction (Table 2). The means disability index for 75 children according to disease activity were 0.56 for group 1, 1.31 for group 2 and 1.4 for group 3. The values were all in the predicted direction, with highest mean score for the active group. The highest mean score in the entire onset group of JRA was the Activities (0.33-1.71), followed by Hygiene in polyarticular 1.57, and 1.01 in systemic onset. Table 3 shows the means, and the ranges of each of the 8 categories of the disability index for the parents and patient's questionnaire. No statically significant differences were found between the disability index mean score for the categories of dressing, arising, hygiene, reaching, gripping and activities, but there is significant statistical difference in eating and walking categories in which the parents got the highest score. Four patients reported on the use of some aids (cane or walker), 3 patients reported the use of wrist splint, 2 reported the use of long handle appliances for reaching, 2 reported the use of raised toilet seat, and 2 patients reported the use of wheel chair (W/C) for transportation outdoors, but 16 patients required help from others, in at least 2 items. The highest frequency of need of help was reported for dressing item (11 patients), followed by arising and hygiene (8), then gripping (6 patients), activities and walking (6 patients) and eating (4 patients). The mean pain index was 0.65, and the mean morning stiffness was 21 minutes. The correlation between pain and disease activity was 0.5, while the correlation between pain and Steinbrocker functional class was 0.37.

Discussion. Validated versions of the CHAQ in different languages have been tested in some countries, showing the cross-cultural reliability of the instrument.³⁻⁶ However, none of these measurements was suitable for Arab children due to language barrier, and different style of daily living activities. It has been found that the CHAQ-MAC easy to administer by children (>10 years) and their parents. They could answer the questionnaire quickly and easily without any assistance in most cases. The test retest reliability for the CHAQ-MAC was remarkably high ($r=0.855$) and in the same order as that found by other authors when validating other version of CHAQ.³⁻⁶ The correlation between CHAQ-MAC and Steinbrocker functional class 0.76 was significantly high and comparable to previous reports.³⁻⁵ The interobserver score correlation between patient- parent questionnaire was high for disability index, and slightly low for pain index. However, the mean score for the disability index calculated for the patient questionnaire was almost similar to that calculated by parent questionnaire, but the pain score (0.4) that calculated by parent questionnaire was slightly higher than the score that calculated by the patient (0.34). The pattern

of disability correlates well with the joint involvement according to onset subtype. The highest mean score of disability index was for the category of activity in all onset groups, followed by hygiene, reaching for the poly articular and systemic onset types. It was found that the concept of using a VAS (pain scale) was not understood; therefore data did not truly reflect pain levels. For instance, 3 subjects indicated pain levels at 3 yet were fully independent with no loss of function. We suggest that these difficulties will probably be solved in the future by using more suitable scales especially designed for children such as scales with faces and colors. The original CHAQ had a rating of not applicable meaning that the child was developmentally too young to perform certain activities. Some parents ($n=10$) considered household tasks (activity 5) as inappropriate for male children to perform. However, after explanation regarding assessment of function, the 10 reduced to one who declined to complete this component. These items would perhaps be better if they were rewritten to suit cultural norms.

In conclusion, this was a cross sectional study aiming to modified a Western-based assessment tool in order to suit Arab customs and to determine whether such a tool is acceptable to patients and their families, and whether it is a suitable measure to assess activities of daily living in Arab population. The sample size was small (limited to 75 children) but it is considered that this assessment tool is preferable to this group due to the inclusion of modifications to allow for different customs in an Arab Countries.

Acknowledgment. The authors would like to thank Abdulkader Al-Attas, Physiotherapist, Physical Therapy Department, King Faisal Specialist Hospital and Research Centre, Riyadh, Kingdom of Saudi Arabia for his assistant in manuscript.

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