The Mexican version of the Childhood Health Assessment Questionnaire (CHAQ) and the Child Health Questionnaire (CHQ)

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ABSTRACT

We report herein the results of the cross-cultural adaptation and validation into the Mexican language of the parent's version of two health related quality of life instruments. The Childhood Health Assessment Questionnaire (CHAQ) is a disease specific health instrument that measures functional ability in daily living activities in children with juvenile idiopathic arthritis (JIA). The Child Health Questionnaire (CHQ) is a generic health instrument designed to capture the physical and psychosocial well-being of children independently from the underlying disease. The Mexican CHAQ was already published and therefore it was revalidated while the Mexican CHQ was derived from the European Spanish version with changing of the few words whose use is different in the 2 countries. A total of 182 subjects were enrolled: 89 patients with JIA (26% systemic onset, 47% polyarticular onset, 13.5% extended oligoarticular subtype, and 13.5% persistent oligoarticular subtype) and 93 healthy children. The CHAQ clinically discriminated between healthy subjects and JIA patients, with the systemic onset,and polyarticular onset subtypes having a higher degree of disability, pain,and a lower overall well-being when compared to their healthy peers. Also the CHQ clinically discriminated between healthy subjects and JIA patients, with the systemic onset, and polyarticular onset having a lower physical and psychosocial well-being when compared to their healthy peers.

In conclusion the Mexican version of the CHAQ-CHQ is a reliable, and valid tool for the functional, physical and psychosocial assessment of children with JIA.

Introduction

The aim of this study was to cross-culturally adapt and validate the Mexican parent's version of the Childhood Health Assessment Questionnaire (1) and the Child Health Questionnaire (2) in a cohort of healthy children and in patients with juvenile idiopathic arthritis (JIA) being followed by the Mexican members of the Paediatric Rheumatology International Trials Organisation (PRINTO). This project formed a part of a larger international survey conducted by PRINTO and supported by the European Union (contract BMH4 983531 CA) (3-5), whose scope is to evaluate the health-related quality of life in children with JIA as compared to their healthy peers.

Patients and results

The methodology used is described in detail in the introductory paper of this supplement (6). The complete Mexican version of the CHAQ-CHQ, with the corresponding lines of the original American-English questionnaires marked in the left column, is reproduced at the end of this paper.

In brief, after obtaining ethics committees approval of the respective participating institutions and the consent of at least one parent per child, children were recruited into a prospective study performed from April 1998 to March 2000, by the Mexican members of PRINTO. Patients included children with JIA of either systemic onset, polyarticular onset, extended oligoarticular or persistent oligoarticular subtype (Durban criteria) (7). The controls consisted of healthy children (6 to 18 years of age) attending local schools and/or healthy sibling(s) of the JIA participants.

Demographic and clinical characteristics of the subjects (Table I)

A total of 182 subjects were enrolled: 89 patients with JIA (26% systemic onset, 47% polyarticular onset, 13.5% extended oligoarticular subtype, and 13.5% persistent oligoarticular subtype) and 93 healthy children. The CHAQ-CHQ were completed in 71% of the cases by the mother (mean age 36.3 ± 6.4),and in 29% of the cases by the father (mean age 38.7 ± 5.8).

Clinical discriminant validity

Table II reports the results (mean ± SD) for the 8 CHAQ domains, the disability index (DI) and the 2 VAS scores for parental assessment of pain and overall well-being. The CHAQ clinically discriminated between healthy subjects and JIA patients, with the systemic onset, and polyarticular onset having a higher degree of disability, pain, and a lower overall well-being when compared to their healthy peers.

Table III reports the CHQ results (mean ± SD) for the 15 health concepts (see table for abbreviations) and summary scores. The CHQ clinically discriminated between healthy subjects and JIA patients, with the systemic onset, and polyarticular onset having a lower physical and psychosocial well-being when compared to their healthy peers.

Cross cultural adaptation

The Mexican CHAQ has already been published (8), and therefore it was revalidated in this study. Since the Spanish spoken in Mexico derives from the Spanish spoken in Spain, the Mexican version of the CHQ have been derived from the European Spanish version of the CHQ (9) with the changing of words

Table I. Demographic and clinical characteristics of the Mexican sample.

	Systemic onset n = 23	Polyarticular onset n = 42	Extended oligoart. n = 12	Persistent oligoart. n = 12	Healthy controls n =93
Age of the children[1]	9.9 ± 4.2	11.1 ± 3.7	11.5 ± 3.2	10.9 ± 3.8	11.0 ± 4.3
Disease duration[1]	4.1 ± 3.3	3.7 ± 2.7	3.5 ± 3.0	2.6 ± 1.5	
ESR[1]	30.4 ± 13.3	31.7 ± 12.7	29.5 ± 15.2	28.0 ± 15.6	
MD VAS (0-10 cm)[1]	2.3 ± 3.1	3.4 ± 3.0	2.3 ± 2.2	1.4 ± 2.2	
No. swollen joints[1, 2]	7.2 ± 9.3	8.8 ± 8.8	7.0 ± 7.1	1.0 ± 1.1	
No. joints with pain[1, 2]	7.3 ± 15.6	12.4 ± 13.3	6.1 ± 7.2	0.9 ± 0.9	
No. joints with limited range of motion[1, 2]	18.7 ± 17.9	18.5 ± 14.7	12.8 ± 11.7	1.0 ± 1.3	
No. active joints[1, 2]	8.3 ± 10.3	11.6 ± 11.4	7.3 ± 7.7	1.0 ± 1.1	
Female[3]	11 (48%)	34 (81%)	8 (67%)	6 (50%)	48 (52%)
Persistent systemic features[3]	12 (60%)	0	0	0	
Antinuclear antibody[3]	6 (29%)	11 (28%)	0 (0%)	2 (18%)	
Rheumatoid factor[3]	3 (14%)	20 (48%)	2 (17%)	2 (17%)	
Chronic iritis[3]	1 (5%)	1 (3%)	0	0	

[1]Mean ± SD; [2]ANOVA $p < 0.05$; [3]number and percentage.

Table II. The 8 CHAQ domains (range 0-3), the disability index (DI) (range 0-3), and the 2 VAS scores (range 0-10 cm) for pain and parent assessment of the child's overall well-being. Lower scores indicate better functional ability. Values are expressed as means ± SD.

	Systemic onset n = 23	Polyarticular onset n = 42	Extended oligoart. n = 12	Persistent oligoart. n = 12	Healthy controls n =93
Dressing	1.4 ± 1.2	1.4 ± 1.1	1.1 ± 0.8	0.9 ± 0.9	0.4 ± 0.6
Arising	1.2 ± 1.0	1.2 ± 1.0	0.8 ± 0.8	0.7 ± 0.7	0.0 ± 0.1
Eating	0.8 ± 1.1	1.0 ± 1.0	0.5 ± 0.7	0.2 ± 0.4	0.2 ± 0.4
Walking	0.9 ± 1.0	1.3 ± 1.1	0.5 ± 0.8	0.8 ± 0.8	0.0 ± 0.0
Hygiene	1.2 ± 1.0	1.2 ± 1.0	0.6 ± 0.8	0.9 ± 0.9	0.2 ± 0.5
Reach	1.5 ± 1.1	1.6 ± 1.0	1.2 ± 1.2	0.9 ± 0.8	0.2 ± 0.4
Grip	1.3 ± 1.0	1.5 ± 1.1	1.0 ± 1.1	0.7 ± 0.9	0.2 ± 0.5
Activities	1.7 ± 1.0	1.6 ± 1.1	0.8 ± 1.1	0.9 ± 1.1	0.3 ± 0.5
Disability index	1.3 ± 0.9	1.4 ± 0.9	0.8 ± 0.7	0.7 ± 0.5	0.2 ± 0.3
Parent's evaluation of pain	2.8 ± 3.1	4.1 ± 3.2	3.6 ± 2.7	2.7 ± 3.0	0.3 ± 1.1
Parent's evaluation of overall well-being	2.5 ± 3.0	4.0 ± 2.8	3.9 ± 2.6	1.5 ± 2.1	0.3 ± 0.9

ANOVA $p < 0.001$ for all variables.

Table III. The 15 CHQ health concepts (and their abbreviations) and the 2 summary scores. Higher score indicates better physical or psychosocial well being (range 0-100). Values are expressed as means ± SD.

	Systemic onset n = 23	Polyarticular onset n = 42	Extended oligoart. n = 12	Persistent oligoart. n = 12	Healthy controls n =93
Global health (GGH)	51.5 ± 28.2	41.3 ± 25.5	42.5 ± 20.1	49.2 ± 25.3	83.6 ± 15.3
Physical functioning (PF)	66.9 ± 29.9	65.1 ± 28.8	75.5 ± 25.0	77.6 ± 27.2	97.4 ± 10.9
Role/social limitations - Emotional/Behavioural (REB)	79.2 ± 28.7	82.8 ± 28.8	95.4 ± 10.0	75.9 ± 34.1	96.8 ± 9.4
Role/social limitations - Physical (RP)	75.4 ± 29.2	76.4 ± 31.6	77.8 ± 35.1	68.1 ± 35.1	98.9 ± 8.8
Bodily pain/discomfort (BP)	72.2 ± 27.8	52.4 ± 26.3	58.3 ± 30.1	54.2 ± 35.8	93.3 ± 14.3
Behaviour (BE)	75.3 ± 13.4	73.0 ± 17.9	69.0 ± 11.0	68.6 ± 17.0	73.9 ± 16.2
Global behaviour (GBE)	67.7 ± 25.0	52.4 ± 24.5	57.5 ± 27.3	56.3 ± 27.2	69.5 ± 20.6
Mental health (MH)	72.2 ± 13.2	67.9 ± 18.6	61.7 ± 17.4	67.7 ± 20.0	77.7 ± 13.6
Self esteem (SE)	69.7 ± 22.3	64.7 ± 21.1	62.2 ± 21.9	63.9 ± 25.1	86.4 ± 17.7
General health perceptions (GH)	45.4 ± 18.0	44.9 ± 12.2	45.6 ± 19.8	55.8 ± 14.4	69.0 ± 13.4
Change in health (CH)	75.0 ± 29.9	67.7 ± 31.7	66.7 ± 32.6	72.9 ± 37.6	74.5 ± 23.1
Parental impact - Emotional (PE)	53.3 ± 34.2	39.0 ± 29.9	45.1 ± 25.2	45.1 ± 36.0	62.7 ± 35.2
Parental impact - Time (PT)	82.1 ± 29.0	68.2 ± 29.4	77.8 ± 28.8	77.8 ± 28.4	90.1 ± 22.4
Family activities (FA)	85.7 ± 18.5	72.9 ± 22.4	71.9 ± 30.2	78.7 ± 24.4	88.0 ± 16.3
Family cohesion (FC)	68.7 ± 20.2	57.4 ± 21.9	58.3 ± 23.5	55.8 ± 24.8	70.5 ± 19.4
Physical summary score (PhS)	44.9 ± 11.6	44.0 ± 9.8	48.0 ± 9.7	45.6 ± 11.5	55.3 ± 3.0
Psychosocial summary score (PsS)	48.0 ± 6.3	43.7 ± 7.9	42.1 ± 6.9	44.9 ± 10.1	49.2 ± 8.3

ANOVA $p < 0.05$ except for BE ($p = 0.7$), and CH ($p = 0.7$).

whose use is different in Mexico with respect to Spain.

Probe technique

For the 69 lines of the translated CHAQ, all the lines of translation were understood by more than 80% of the 21 parents tested (median = 100%; range: 100-100%). For the 99 lines of the translated CHQ, all the lines of translation were understood by more than 80% of the parents (median = 100%; range: 90-100%). No change in the text of the Mexican CHAQ-CHQ was necessary after the probe technique.

Psychometric issues

Descriptive statistics (first Likert assumption). For the CHAQ the total number of missing responses was 3.7% (range 1.1-9.2%) with dressing and activity having more missing values; the response pattern were most often normally distributed except for eating. All response choices of the CHAQ items have been used except for eating and hygiene. The mean ± SD of the items within a scale were roughly equivalent for all CHAQ domains. The total number of missing responses on the CHQ was 1% (range: 0.5-2.3%); the response pattern was most often normally distributed except for REB, and RP. All response choices of the CHQ items have been used except for BE. The means ± SD of the items within a scale were roughly equivalent except for GH.

Equal items-scale correlation (second Likert assumption). Pearson items-scale correlations corrected for overlap were roughly equivalent for items within a scale for all of the CHAQ domains except for hygiene, and reach, and for all CHQ health concepts except for BE, MH, and GH.

Items internal consistency (third Likert assumption). Pearson items scale correlations were ≥ 0.4 for 100% of the CHAQ items and for 83% of the items of the CHQ (except BE, MH, and GH).

Items discriminant validity. For the CHAQ, Pearson items correlations with its scale corrected for overlap were greater than at least 1 standard error (SE) of the correlation with other scales for 76% of the items (29% by 2 SE); scaling failure was observed for arising, and walking, where the items were better correlated with other domains. For the CHQ, Pearson items correlations with its scale were greater by at least 1 SE for 95% of the items (83% by 2 SE); scaling failure was observed only for BE, MH, and GH.

Floor and ceiling effect. The CHAQ floor effect had a median of 78% (range 68-86%) while for the CHQ the median was 0.8% (range 0-10.5%). The CHAQ ceiling effect had median of 0.0% (range 0.0-0.0) while the CHQ had a median of 19% (range 0.0-77%).

Cronbach's alpha internal consistency. Cronbach's alpha was ≥ 0.7 for 6/8 domains (75%) of the CHAQ (overall 0.96; range 0.5-0.88) with the exception being arising (0.5), and walking (0.67). Cronbach's alpha was ≥ 0.7 for 9/11 (82%) measurable health concepts (*i.e.* health concepts with more than 1 item) of the CHQ (overall 0.93; range 0.5-0.96) with the exception being MH (0.68), and GH (0.48).

Inter scale correlation. The Pearson correlation of each domain with all other domains of the CHAQ-CHQ was lower than their Cronbach's alpha only for dressing, grip,and activities for the CHAQ domains. For the CHQ all 11 measurable health concepts have correlation lower than their Cronbach's alpha except for GH.

Test-retest reliability. After a median of 7 days (range 7-14 days; number of JIA patients retested = 10) the intra-class correlation coefficients for the 8 CHAQ domains showed a poor to fair reproducibility with a median of 0.35 (range -0.1;0.7) with a poor reproducibility for arising, walking, hygiene, and reach. Also the 15 CHQ health concepts showed fair reproducibility with a median of 0.6 (range -0.1;0.9) with a poor reproducibility for REB, RP, MH, GH, CH, PE, and FC.

External validity. The Spearman correlation of the CHAQ with the JIA core set variables (10) showed a median of 0.5 (range 0.0 to 0.7), with the highest correlation being with the parent's evaluation of overall well-being (r = 0.7). For the CHQ the median correlation was for the PhS -0.5 (range -0.7 to -0.0) and for the PsS was -0.2 (range -0.3 to -0.0). The best correlation was for the PhS with the physician's evaluation of disease activity (-0.7) and for the PsS with the parent's evaluation of overall well being (-0.3).

Discussion

The results of the present study show that the Mexican versions of the CHAQ-CHQ have excellent psychometric properties.

This study focuses on revalidating the Mexican version of the CHAQ already published by Goycochea-Robles *et al.* (8). This disease-specific questionnaire proved its ability to clinically discriminate between the JIA subtypes and healthy controls, with the systemic onset,and polyarticular having a higher degree of disability, pain, and a lower overall well-being when compared to their healthy peers. Some minor statistical problems were found for internal consistency, discriminant validity, Cronbach's alpha, and test-retest reliability for arising, and walking.

In this study the Mexican CHQ was derived from the European Spanish version of the CHQ by De Inocencio *et al.* (9) with changing of the few words whose use is different in the 2 countries. The generic CHQ questionnaire proved less able to clinically discriminate between the different JIA types than the CHAQ with the JIA patients with systemic onset, and polyarticular onset having a lower physical and psychosocial well-being when compared to their healthy peers. Some minor statistical problems were found for internal consistency, discriminant validity, Cronbach's alpha, and test-retest reliability for BE, MH, and GH.

In conclusion, the Mexican version of the CHAQ-CHQ is a reliable and valid tool for the functional, physical and psychosocial assessment of children with JIA.

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