The Czech 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 Czech 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 Czech CHAQ-CHQ were fully validated with 3 forward and 3 backward translations. A total of 150 subjects were enrolled: 81 patients with JIA (14% systemic onset, 44% polyarticular onset, 10% extended oligoarticular subtype, and 32% persistent oligoarticular subtype) and 69 healthy children. The CHAQ clinically discriminated between healthy subjects and JIA patients, with the systemic, polyarticular and extended oligoarticular 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, polyarticular onset and extended oligoarticular subtypes having a lower physical and psychosocial well-being when compared to their healthy peers.

In conclusion the Czech 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 Czech parent's version of the Childhood Health Assessment Questionnaire (1) and Child Health Questionnaire (2) in a cohort of healthy children and in patients with juvenile idiopathic arthritis (JIA) being followed by the Czech 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 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 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 members of the Czech PRINTO co-ordinating centre. 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 150 subjects were enrolled: 81 patients with JIA (14% systemic onset, 44% polyarticular onset, 10% extended oligoarticular subtype, and 32% persistent oligoarticular subtype) and 69 healthy children. The CHAQ-CHQ were completed in 88% of the cases by the mother (mean age 37.6 ± 6.3), and in 12% of the cases by the father (mean age 41.9 ± 6.9).

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, polyarticular and extended oligoarticular subtypes 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 abbreviation) and summary scores. The CHQ clinically discriminated between healthy subjects and JIApatients, with the systemic onset,polyarticular onset and extended oligoarticular subtypes having a lower physical and psychosocial well-being when compared to their healthy peers.

Cross cultural adaptation

The Czech CHAQ was fully cross-culturally adapted with 3 forward and 3 backward translations; there was a concordance with the original American English version of the CHQ in at least 2 out of 3 back translations for 60/69 (87%) lines of the translations. The Czech CHQ was fully cross-culturally adapted with 3 forward and 3 backward translations; there was a concordance with the original American

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

	Systemic onset n = 11	Polyarticular onset n = 36	Extended oligoart. n = 8	Persistent oligoart. n = 26	Healthy controls n = 69
Age of the children[1]	11.0 ± 6.0	12.6 ± 4.6	12.1 ± 4.0	9.5 ± 5.4	12.6 ± 4.6
Disease duration[1]	5.3 ± 4.0	4.5 ± 4.8	4.5 ± 3.8	3.3 ± 3.1	
ESR[1, 2]	41.1 ± 38.9	37.5 ± 30.9	33.3 ± 18.8	16.7 ± 14.4	
MD VAS (0-10 cm)[1, 2]	4.4 ± 2.2	3.7 ± 1.7	3.7 ± 1.6	1.8 ± 1.2	
No. swollen joints[1, 2]	8.4 ± 11.7	7.7 ± 6.6	3.0 ± 2.2	0.8 ± 0.9	
No. joints with pain[1, 2]	6.8 ± 11.8	5.4 ± 6.7	3.8 ± 2.7	0.5 ± 0.6	
No. joints with limited range of motion[1, 2]	13.3 ± 13.5	15.9 ± 13.8	4.9 ± 2.5	1.2 ± 0.7	
No. active joints[1, 2]	9.2 ± 11.7	8.4 ± 7.0	4.1 ± 2.5	0.9 ± 1.0	
Female[3]	8 (73%)	23 (64%)	5 (63%)	14 (54%)	34 (50%)
Persistent systemic features[3]	6 (60%)	0	0	0	
Antinuclear antibody[3]	1 (10%)	5 (14%)	5 (63%)	11 (42%)	
Rheumatoid factor[3]	0	8 (23%)	0	0	
Chronic iritis[3]	0	2 (6%)	0	2 (8%)	

[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 = 11	Polyarticular onset n = 36	Extended oligoart. n = 8	Persistent oligoart. n = 26	Healthy controls n = 69
Dressing	1.0 ± 1.3	0.6 ± 0.9	0.4 ± 0.5	0.8 ± 1.0	0.4 ± 0.8
Arising[1]	1.0 ± 1.0	0.5 ± 0.7	0.8 ± 0.9	0.2 ± 0.5	0.0 ± 0.0
Eating	0.5 ± 0.7	0.4 ± 0.6	0.3 ± 0.5	0.2 ± 0.6	0.1 ± 0.5
Walking[1]	0.9 ± 0.9	0.4 ± 0.7	0.6 ± 0.7	0.5 ± 0.8	0.0 ± 0.0
Hygiene[1]	0.9 ± 1.2	0.4 ± 0.7	0.8 ± 0.7	0.5 ± 0.9	0.1 ± 0.5
Reach[1]	1.4 ± 1.0	0.7 ± 1.0	0.5 ± 0.8	0.3 ± 0.7	0.1 ± 0.3
Grip[1]	1.2 ± 1.1	0.8 ± 1.0	0.8 ± 0.9	0.2 ± 0.6	0.1 ± 0.5
Activities[1]	1.2 ± 1.1	0.7 ± 0.8	1.1 ± 0.8	0.5 ± 0.8	0.2 ± 0.5
Disability index[1]	1.0 ± 0.8	0.6 ± 0.5	0.6 ± 0.5	0.4 ± 0.5	0.1 ± 0.3
Parent's evaluation of pain[1]	2.6 ± 2.8	2.1 ± 2.0	2.6 ± 2.1	1.1 ± 1.5	0.0 ± 0.1
Parent's evaluation of overall well-being[1]	3.4 ± 2.7	2.3 ± 2.1	2.0 ± 2.1	1.6 ± 1.8	0.0 ± 0.1

[1]ANOVA $p < 0.01$.

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 = 11	Polyarticular onset n = 36	Extended oligoart n = 8	Persistent oligoart n = 26	Healthy controls n = 69
Global health (GGH)[1]	32.7 ± 24.9	52.4 ± 23.4	55.0 ± 28.2	59.8 ± 24.0	84.6 ± 16.4
Physical functioning (PF)[1]	62.0 ± 31.0	72.1 ± 24.8	62.4 ± 21.6	74.8 ± 23.6	97.2 ± 11.8
Role/social limitations - Emotional/Behavioural (REB)[1]	68.9 ± 37.0	84.6 ± 26.8	76.4 ± 24.1	86.8 ± 23.2	99.0 ± 4.9
Role/social limitations - Physical (RP)[1]	70.0 ± 33.1	73.0 ± 34.1	70.8 ± 33.0	77.0 ± 28.6	98.6 ± 8.9
Bodily pain/discomfort (BP)[1]	57.3 ± 32.9	62.6 ± 24.0	53.8 ± 27.2	69.6 ± 26.5	94.2 ± 10.9
Behaviour (BE)	73.5 ± 21.4	78.0 ± 18.6	69.6 ± 18.0	76.0 ± 15.7	80.0 ± 12.7
Global behaviour (GBE)	67.3 ± 31.6	78.1 ± 18.7	67.5 ± 21.7	75.4 ± 15.7	76.8 ± 14.6
Mental health (MH)[1]	73.0 ± 12.3	72.6 ± 21.4	68.8 ± 12.5	78.8 ± 12.9	81.5 ± 12.6
Self esteem (SE)	69.6 ± 12.4	70.5 ± 18.1	64.6 ± 19.0	75.5 ± 18.9	77.0 ± 10.8
General health perceptions (GH)[1]	39.3 ± 19.0	48.3 ± 16.6	43.5 ± 15.1	50.3 ± 19.6	75.7 ± 16.6
Change in health (CH)	59.1 ± 25.7	50.7 ± 35.1	50.0 ± 40.1	51.0 ± 37.1	55.8 ± 14.5
Parental impact - Emotional (PE)[1]	60.2 ± 30.8	48.3 ± 31.1	49.0 ± 26.9	44.2 ± 26.3	65.5 ± 24.6
Parental impact - Time (PT)[1]	74.4 ± 32.7	82.4 ± 24.8	76.4 ± 24.8	83.3 ± 20.9	93.8 ± 12.6
Family activities (FA)[1]	72.7 ± 19.5	78.1 ± 18.8	77.6 ± 20.3	80.1 ± 21.7	87.8 ± 15.5
Family cohesion (FC)	83.2 ± 12.9	74.5 ± 23.4	74.4 ± 16.1	74.0 ± 27.9	72.3 ± 18.0
Physical summary score (PhS)[1]	35.7 ± 14.0	44.9 ± 9.4	42.9 ± 8.0	45.4 ± 8.6	55.0 ± 3.0
Psychosocial summary score (PsS)	50.2 ± 4.9	48.0 ± 9.5	45.1 ± 7.6	49.7 ± 6.9	51.1 ± 6.3

[1]ANOVA $p < 0.05$.

English version of the CHQ in at least 2 out of 3 back translations for 70/99 (71%) lines of the translations.

Probe technique

For the 69 lines of the translated CHAQ, all the lines of translation were understood by more than 80% of the 16 parents tested (median = 100%; range: 75-100%) with the only exception being line 51 that was understood by 75% of the parents. 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: 81-100%). No change in the text of the Czech 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 3.1% (range 0.3-7.2%); the response patterns were skewed towards normal functional ability. All the CHAQ domains have some response choices not used. The mean ± SD of the items within a scale were roughly equivalent except for dressing, arising, and activities. The total number of missing responses on the CHQ was 3.7% (range: 1.3-8.2%); the response pattern was most often normally distributed except for REB, RP, and PT. All response choices of the CHQ items have been used except for response choices for items in BE, MH, and SE. The means ± SD of the items within a scale were roughly equivalent except for BE.

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

Items internal consistency (third Likert assumption). Pearson items scale correlations were ≥ 0.4 for 80% of the CHAQ items (except dressing, hygiene, and reach), and for 92% of the CHQ items (except BE, SE, 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 79% of the items (51% by 2 SE); scaling failure was observed for dressing, walking, hygiene, and reach, 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 97% of the items (69% by 2 SE); no scaling failure was observed.

Floor and ceiling effect. The CHAQ floor effect had a median of 89% (range 72-93%) while for the CHQ the median was 1% (range 0-9%). The CHAQ ceiling effect had median of 0.0% (range 0.0-0.0) while the CHQ had a median of 15% (range 3-76%).

Cronbach's alpha internal consistency. Cronbach's alpha was ≥ 0.7 for 3/8 (38%) domains of the CHAQ (overall 0.91; range 0.53-0.82) with the exception being arising (0.63), eating (0.69), walking (0.59), hygiene (0.53), and reach (0.62). Cronbach's alpha was ≥ 0.7 for 11/11 (100%) measurable health concepts (*i.e.* health concepts with more than 1 item) of the CHQ (overall 0.95; range 0.74-0.94).

Inter scale correlation. The Pearson correlation of each domain with all other domains of the CHAQ-CHQ was lower than their Cronbach's alpha for most of the CHAQ domains except for arising, walking, hygiene, and reach. For the CHQ all 11 measurable health concepts have correlation lower than their Cronbach's alpha.

Test-retest reliability. After a median of 7 days (range 7-16 days; number of JIA patients retested = 13) the intra-class correlation coefficients for the 8 CHAQ domains showed a fair to good reproducibility with a median of 0.84 (range 0.01-0.94) with a poor reproducibility for eating (0.01). Also the 15 CHQ health concepts showed a fair to excellent reproducibility with a median of 0.8 (range 0.4-1.0).

External validity. The Spearman correlation of the CHAQ with the JIA core set variables (8) showed a median of 0.4 (range 0.2 to 0.6), with the highest correlation being with the parent's assessment of overall well being (r = 0.6). For the CHQ the median correlation was for the PhS -0.4 (range -0.7 to -0.1) and for the PsS was -0.2 (range -0.3 to 0). The best correlation was for the PhS with the parent's assessment of overall well being (-0.7) and for the PsS with the DI of the CHAQ (-0.34).

Discussion

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

In this study the Czech CHAQ was fully cross-culturally adapted from the original American English version with 3 forward and 3 backward translations. This disease-specific questionnaire proved its ability to clinically discriminate between the JIA subtypes and healthy controls, with the systemic, polyarticular and extended oligoarticular subtypes having a higher degree of disability, pain, and a lower overall well-being when compared to their healthy peers. Minor statistical problems were found for dressing, hygiene, and reach, which showed different means ± SD, an unequal item scale correlation, and problems for discriminant validity, and Cronbach's alpha.

In this study the Czech CHQ was fully cross-culturally adapted from the original American English version with 3 forward and 3 backward translations. The generic CHQ questionnaire proved less able to clinically discriminate between the different JIA types than the CHAQ with the JIA patients with systemic, polyarticular onset or extended oligoarticular subtypes having a lower physical and psychosocial well-being when compared to their healthy peers. Some minor statistical problems were found for the equal item scale correlation, the item internal consistency, and the ceiling effect for BE, SE, and GH.

In conclusion, the Czech 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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