

Validity and Reliability of The Persian Version of The Short-Form Child Perceptions Questionnaire 11–14

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Research

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Abstract

Background

The Child Perception questionnaire 11-14 (CPQ 11-14) is an efficient tool for assessment of oral health-related quality of life (OHRQoL). This questionnaire has been shortened to 16 items (CPQ11–14 ISF-16) to facilitate its use. The purpose the present study was to translate CPQ11–14 ISF-16 in the Persian language, culturally adapt and initially validate among adolescent population.

Material and method

The questionnaire was translated to Persian, back-translated to English and underwent cultural adaptation and pretesting. It was then filled out by 318 young adults (175 girls and 143 boys) between 11 to 14 years in Shiraz, Iran. The Persian version of CPQ11–14 ISF-16 along with the Psychosocial Impact of Dental Aesthetics Questionnaire (PIDAQ) and two Suggested global questions were administered among participants to assess its Creition validity.

Results

Factor analysis extracted two domains and the factor loading of domains ranged from 0.423 to 0.837. Persian version of CPQ11–14 ISF-16 presented high internal consistency (Cronbach's alpha = 0.854); It showed excellent criterion validity with PIDAQ ($\rho = 0.731$, $p < 0.001$). There was a statistically significant positive moderate correlation between CPQ11–14 ISF-16 and its factors 1 and 2 and two global questions (first global question: $\rho = 0.439$, $p < 0.001$; second global question: $\rho = 0.457$, $p = 0.035$)

Conclusion

The Persian version of CPQ11–14 ISF-16 has optimal validity and reliability in a general population of 11–14-year-old Persian children.

Introduction

One of the imperative concepts related to children's health, which can play an effective role in their lives, is the concept of health related quality of life. Health related quality of life is a multidimensional notion that seeks aspects such as the physical, mental, and social dimensions based on the concept of health defined by the World Health Organization (WHO) and is influenced by personal experiences, beliefs, expectations, and feeling;¹ Health related quality of life expresses a personal feeling of physical and mental health and the ability to react to various aspects of the physical and social environment.² Health related quality of life is an important concept in dental health research.³

One of the questionnaire that deals with the relationship between oral health quality and children's life is the Child Oral Health Quality of Life (COHQoL) questionnaire.⁴ This questionnaire is a set of multidimensional measurement comparisons for the possible negative effects of oral and orofacial

problems on children aged 6 to 14 years and their families. One of the main components of this questionnaire is Child Perceptions Questionnaire aged 11 to 14 (CPQ 11–14); The CPQ Questionnaire is a 37-item questionnaire obtained from Oral Health Quality of Life (OHRQoL) and designed in 2002 in Canada.⁵ These 37 questions embrace the biopsychosocial model of health and are organized into four health sections including: oral symptoms (6 questions), functional limitations (9 questions) emotional well-being (9 questions), and social well-being (13 questions). To comfort the use of CPQ 11–13 in clinical population-based health study, it has been shortened to 16 items (CPQ11–14 ISF-16) with satisfactory psychometric properties.^{6–8}

The questionnaire also includes two global questions about the child's oral health and the extent to which the child's oral and orofacial condition affects his or her general health.⁵ Before employment of questionnaires in different cultures and countries, the fulfillment of a translation and validation process that accounts for the cultural and social aspect of the new region is indispensable.^{9,10} CPQ has been translated to several languages so far and its validity and reliability have been previously confirmed.^{2,11–24} To study the CPQ questionnaire in the Iranian population and its use for Iranian children with various oral disorders and malocclusion, it is crucial to translate this questionnaire into Persian and subsequently appraise it in terms of culture and validity.

This study was conducted to assess the validity and reliability of the Persian version of CPQ11–14 ISF-16 and its cultural adaptation.

Methods And Materials

In this cross-sectional study, 318 adolescents aged 11 to 14 living in Shiraz, Iran with an average age of 12.08 ± 1.76 were invited to participate in this study. The Ethics Committee of Shiraz Azad Dental School has approved the present study (No.48486, 2020). The following exclusion criteria were defined for this study:

- People with mental and physical disabilities, and psychological disorders
- People with carious teeth with cavities
- People with tooth fracture, severe or moderate fluorosis, or with color spots
- People with positive history of orthodontic treatment
- People who have had cosmetic treatments (lamine, etc.) on their anterior teeth

The original English short version of the CPQ11–14 ISF-16 questionnaire has 16 questions.⁵ This version includes four dimensions: oral symptom, functional limitation, emotional well-being, and social well-being. The questions are about the incidents related to the condition of the mouth and jaw in the last three months. The answer options to each of the questions include 0: Never, 1: Rarely, 2: Sometimes, 3: Often, and 4: Every day.

With the purpose of initial translation of the questionnaire, two fluent English-speaking dentists (with Persian as their mother language), separately and independently, translated the original version of the questionnaire into Persian. After discussion, these two translated copies were turned into a single questionnaire. In the next step, for back translation, the Persian version was translated into English by two individuals (with PhD in English translation) who were fluent in English and Persian and also familiar with the concept of quality of life. Then, this Persian translation was compared with the original version and all the detected errors were corrected.

Accordingly, the Persian version number I of CPQ11–14 ISF-16 was prepared. In order to evaluate the qualitative content of this translation, four experts, including two orthodontists, a specialist in oral health and social dentistry, and a person fluent in Persian writing, appraised the Persian Version No. I of the CPQ11–14 ISF-16 and presented their opinions in terms of accuracy, simplicity of the text, Persian grammar, the use of appropriate words and the assignment of words in their correct place. Consequently, the Persian version number II of the CPQ11–14 ISF-16 was created. Then two orthodontists did the necessary cultural adaptation in the CPQ11–14 ISF-16, and subsequently the Persian version number III of the CPQ11–14 ISF-16 was prepared. Before starting the main study, in order to evaluate the potential impediments and make the questions conceptual and contextual, this questionnaire was completed by 20 individuals who referred to the Dental School with age range of 11–14 years old. In order to determine any ambiguity in filling out the questionnaire, a person who was aware of all aspects of the questionnaire was consistently present with the participants at the time of completing the questionnaire and attempted to record any proclaimed objections. After conducting a preliminary study and correcting the existing problems at this stage, the questionnaire was distributed again among 10 other people. After ensuring the translation and fluency of the text, the final Persian version of the CPQ11–14 ISF-16 was finally established. (Table 1)

Table 1
The Persian version of CPQ11–14 ISF-16

1. چقدر احساس می‌کنید که دندان‌های شما به شما کمک می‌کند تا به راحتی غذا بخورید؟
2. چقدر احساس می‌کنید که دندان‌های شما به شما کمک می‌کند تا به راحتی حرف بزنید؟
3. چقدر احساس می‌کنید که دندان‌های شما به شما کمک می‌کند تا به راحتی بخوابید؟
4. چقدر احساس می‌کنید که دندان‌های شما به شما کمک می‌کند تا به راحتی در جمع‌ها حاضر شوید؟
5. چقدر احساس می‌کنید که دندان‌های شما به شما کمک می‌کند تا به راحتی در مدرسه یا محل کار حاضر شوید؟
6. چقدر احساس می‌کنید که دندان‌های شما به شما کمک می‌کند تا به راحتی در ورزش شرکت کنید؟
7. چقدر احساس می‌کنید که دندان‌های شما به شما کمک می‌کنند تا به راحتی در سفر شرکت کنید؟
8. چقدر احساس می‌کنید که دندان‌های شما به شما کمک می‌کنند تا به راحتی در مهمانی شرکت کنید؟
9. چقدر احساس می‌کنید که دندان‌های شما به شما کمک می‌کنند تا به راحتی در ملاقات شرکت کنید؟
10. چقدر احساس می‌کنید که دندان‌های شما به شما کمک می‌کنند تا به راحتی در ملاقات شرکت کنید؟
11. چقدر احساس می‌کنید که دندان‌های شما به شما کمک می‌کنند تا به راحتی در ملاقات شرکت کنید؟
12. چقدر احساس می‌کنید که دندان‌های شما به شما کمک می‌کنند تا به راحتی در ملاقات شرکت کنید؟
13. چقدر احساس می‌کنید که دندان‌های شما به شما کمک می‌کنند تا به راحتی در ملاقات شرکت کنید؟
14. چقدر احساس می‌کنید که دندان‌های شما به شما کمک می‌کنند تا به راحتی در ملاقات شرکت کنید؟
15. چقدر احساس می‌کنید که دندان‌های شما به شما کمک می‌کنند تا به راحتی در ملاقات شرکت کنید؟
16. چقدر احساس می‌کنید که دندان‌های شما به شما کمک می‌کنند تا به راحتی در ملاقات شرکت کنید؟

To evaluate the validity of the translated version of the CPQ11-1 questionnaire, the Persian version of the Psychosocial Impact of Dental Aesthetics Questionnaire (PIDAQ) questionnaire was used, whose validity and reliability have been previously assessed and reported.²⁵ In addition, two general questions about the dental and maxillofacial condition and its impact on a person's life were introduced. These questions included:

- (1) How do you assess the general health of your jaw, mouth, lips, and teeth?
- (2) In general, how much the condition of your jaw, mouth, lips, and teeth affected your life?

Statistical Analysis

The Statistical Package for Social Science (version 18.0, Chicago, IL, USA) was used for data analysis. Distribution of variables was evaluated via Kolmogorov Smirnov method. Factor analysis was applied using principle components analysis and Varimax rotation to assess Construct validity. Kaiser-Meyer-Olkin measure of sampling adequacy was performed before factor analysis to determine variables capacity for including in factor analysis. Internal consistency of Persian version of CPQ11–14 ISF-16 was tested using Cronbach's alpha coefficients for the subscales. Criterion validity was tested by comparing total score of CPQ11–14 ISF-16 and scores of its dimensions with PIDAQ and two global questions via one-way analysis of variance (ANOVA) and the Kruskal Wallis test. Test-retest reliability was evaluated with two-way random effects model for 30 randomly selected subjects who responded to the questionnaire a second time after two weeks.

Results

There were 320 participants in this study, of which 318 (175 girls and 143 boys) completed the questionnaire correctly. The mean age of participants was 12.08 ± 1.76 .

Construct Validity

The significance level of the Kaiser-Meyer-Olkin sample adequacy test was 0.789 and Bartlett's test was 0.005. These results indicated the adequacy of the sample size for factor analysis. The results of factor analysis of the Persian version of the CPQ11–14 ISF-16 showed two factors that explain a total of 48.711% variance. Questions 1 to 8 make up Factor 1 (Well-being), Factor 2 (Symptom and function) includes questions 9 to 16. (Table 2)

Table 2

Factor loadings of the CPQ11–14 ISF-16 item scale scores after principal component analysis and orthogonal rotation

	Components		
	Symptom and function	Well-being	Cronbach's Alpha if Item Deleted
CPQ1	0.026	0.770**	0.846
CPQ 2	0.273	0.649**	0.842
CPQ 3	0.070	0.576**	0.852
CPQ 4	-0.068	0.703**	0.854
CPQ 5	0.219	0.709**	0.841
CPQ 6	0.241	0.789**	0.837
CPQ 7	0.146	0.423*	0.853
CPQ 8	0.132	0.704**	0.844
CPQ 9	0.522*	0.303	0.845
CPQ10	0.675*	0.371	0.835
CPQ11	0.877*	0.151	0.836
CPQ12	0.733*	0.037	0.846
CPQ13	0.706*	0.122	0.844
CPQ14	0.433*	0.042	0.854
CPQ15	0.711*	-0.155	0.852
CPQ16	0.618*	0.150	0.847
Variance Explained (Initial solution)	5.245	2.549	
% of Variance Explained (Initial solution)	32.782	15.928	
% of Variance Explained (rotation solution)	24.974	23.737	

	Components		
	Symptom and function	Well-being	Cronbach's Alpha if Item Deleted
Cumulative % of Variance Explained (rotation solution)	24.974	48.711	
Cronbach's Alpha	0.838	0.830	

A positive, moderate, and statistically significant correlation has been found between the total scores of the CPQ11–14 ISF-16 scale and its factors and the scores of two global questions. (Tables 3 and 4)

Table 3
Subscales and CPQ11–14 ISF-16 scores according to first global question.

	CPQ Mean ± SD	Symptom and function Mean ± SD	Well-being Mean ± SD
Overall, would you say that your oral and dental health is.....			
Excellent	7.23 ± 8.44	3.45 ± 4.24	3.77 ± 6.53
Very Good	10.26 ± 8.51	6.01 ± 4.68	4.26 ± 4.86
Good	15.43 ± 7.39	7.3 ± 4.28	8.13 ± 5.81
Fair	16.32 ± 10.78	8.86 ± 7.19	7.45 ± 5.17
Poor	23.0 ± 7.07	5.5 ± 2.12	17.5 ± 4.95
Spearman correlation	0.439**	0.556**	0.404**
sig	< 0.001***	< 0.001***	< 0.001***
<i>P</i> < 0.05; ** <i>P</i> < 0.01; *** <i>P</i> < 0.001			

Table 4
Subscales and CPQ 11–14 scores according to second global question.

	CPQ Mean ± SD	Symptom and function Mean ± SD	Well-being Mean ± SD
Overall, how much do your teeth affect your life?			
Very much	9.59 ± 8.97	6.09 ± 5.59	3.5 ± 4.10
A lot	16.33 ± 11.65	7.4 ± 5.49	8.93 ± 7.61
Somewhat	13.69 ± 9.98	6.62 ± 6.2	7.07 ± 5.79
Very little	13.24 ± 7.98	6.38 ± 4.82	6.86 ± 6.61
Not at all	8.5 ± 7.85	4.75 ± 4.30	3.75 ± 4.92
Spearman correlation	0.457**	0.570**	0.437**
sig	0.035*	0.048*	0.006*
* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$			

Reliability

Cronbach's alpha correlation coefficient for internal consistency evaluation was 0.854 and the standard value for Cronbach's alpha correlation coefficient was 0.855. (Table 2) Factor 1 had an acceptable reliability of 0.838 and factor 2 had a reliability coefficient of 0.830. Correlation coefficient of Persian version of PIDAQ questionnaire, global question No.1, global question No.2 were 0.898, 0.981, and 0.789, respectively. The test-retest correlation coefficient was 0.85.

Criterion Validity

There was a statistically significant correlation between CPQ11–14 ISF-16 and its factors 1 and 2 and PIDAQ questionnaire. (Table 5)

Table 5
Correlation between CPQ 11–14 scores and its subscales and PIDAQ.

		CPQ		
			Symptom and function	Well-being
pidaq	Correlation Coefficient	0.731**	0.652**	0.661**
	Sig	< 0.001***	< 0.001***	< 0.001***
<i>P</i> < 0.05; ** <i>P</i> < 0.01; *** <i>P</i> < 0.001				

No Floor and ceiling effects were found in this study. Ceiling or floor effects were considered not to be present as the percentages did not exceed 15%.

Discussion

Since 1980, several studies have introduced the impact of oral and maxillofacial problems on quality of life.²⁶ However, since most of the tools used in these studies were in English language, they must be translated, adopted, and validated to be feasible and applicable when employed in non-English speaking population.²⁷ The CPQ11–14 ISF-16 has been broadly used in studies on malocclusion and OHRQoL.^{27,28} This questionnaire has been employed for children with dental and maxillofacial malformations.⁵

The CPQ11–14 ISF-16 is a suitable tool to assess the perception of children and adolescents about the condition of their mouth and jaw. To facilitate the use of this questionnaire in population-based surveys, a short 16-item form of this questionnaire was proposed while retaining psychometric properties.⁶ In this study, the aim of translating the CPQ11-14 ISF-16 questionnaires into Persian was cultural adaptation and validation in a population of adolescents with malocclusion. In order to evaluate the appropriate equivalence between the translated version and the original version, four stages of equivalence including semantic, idiomatic, experiential, and conceptual were considered.¹⁰ The process of translation and cultural adaptation was completely performed regarding the four stages proposed by Herdman *et al.*²⁹

Cronbach's alpha correlation coefficient in the Persian version of CPQ11-14 ISF-16 was 0.855, which indicates sufficient internal reliability of the Persian version of the present questionnaire. This rate is similar to the results of studies performed in other countries.^{2,3,5,8,11,22,23}

Participants were asked to complete the questionnaires in person and in a non-clinical setting where an acquainted assistant was present. Since the participants in this study were not adults and were accompanied by their parents or guardians, their responses may have been possibly influenced by them.³¹ However, the results of a study refuted the impact of parents' responses on children while completing the OHRQoL questionnaire.³²

It should be noted that it might be possible that participants at this age-range become bored while filling out two questionnaires at the same time, and there will be a notion that this would lead them to fill out the questionnaires randomly and not precisely. However, the test-retest reliability results showed that the probability of random responses could be ignored.² Test-retest reliability in this study for the total scale was 0.85.

This value for the original version of the 16-question form was 0.77 in Canada and in other studies, it was reported to be 0.78 in Saudi Arabia, 0.97 in Brazil, and 0.72 in Greece.^{2,5,11,23} In this study, two dimensions of the Persian version of CPQ11-14 ISF-16 were extracted using Exploratory Factor Analysis (EFA). The first dimension, Well-being, included questions 1, 2, 3, 4, 5, 6, 7, and 8, and the second dimension, Symptom and function, included questions 9, 10, 11, 12, 13, 14, 15, 16, and 17. Similarly, in the study of Thomson et al.³, two dimensions of CPQ11-14 ISF-16 questionnaire were extracted. However, in the original version of CPQ11-14 ISF-16, four dimensions were extracted.⁵

Construct validity of the Persian version of CPQ11-14 ISF-16 was performed by evaluating the correlation between the average score of the two global questions and the total score and the average score of each of the dimensions of well-being and symptom and function. The results showed that there was a strong significant correlation between these three items. These results were similar to the results presented by several studies.^{7,11,33} However, the Arabic version did not report any correlation between well-being and symptom and function and global questions.¹⁸

To evaluate the criterion validity, the Persian version of CPQ11-14 ISF-16 was compared with the Persian version of the PIDAQ questionnaire. The validity and reliability of the Persian version of the PIDAQ questionnaire has already been evaluated in the Iranian population.²⁵ Moreover, the results showed a high correlation between PIDAQ questionnaire and CPQ11-14 ISF-16 questionnaire and two dimensions of well-being and symptom and function.

Conclusion

The appraisal of the validity and reliability of the Persian version of the questionnaire CPQ11-14 ISF-16-GR verified it to be a suitable questionnaire for evaluating OHRQoL.

Abbreviations

WHO: World Health Organization

COHQoL: Child Oral Health Quality of Life

OHRQoL: Oral Health Quality of Life

CPQ 11-14: Child Perceptions Questionnaire aged 11 to 14

PIDAQ: Psychosocial Impact of Dental Aesthetics Questionnaire

ANOVA: Analysis of variance

EFA: Exploratory Factor Analysis

Declarations

Ethics approval and consent to participate: Ethical approval to conduct the study was granted by the Medical Ethics Committee, Shiraz branch, Islamic Azad university, Iran (No.48486, 2020). This study performed based on the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. Written informed consents were obtained from all participants included in the study. Participation was on a voluntary basis and no remuneration was involved.

Consent for publication: Not applicable

Availability of data and material: The datasets used and/or analyzed during the present study are available from the corresponding author upon request.

Competing interests: The authors declare that they have no competing interests.

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Authors' contributions: TBM and SH contributed in the design of the study. NN and TBM wrote the first draft of the manuscript, revised the manuscript, participated in data interpretation, and gained permission from the Medical Ethics Committee, Shiraz branch, Islamic Azad university, Iran. SH was major contributor in writing and revising of the manuscript, participated in data interpretation, and provided critical comments. TBM and AG participated in acquisition of data. All authors read and approved the final manuscript

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