

Translation and Validation of Oral Health-Related Early Childhood Quality of Life Tool for Nepalese Preschool Children

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ABSTRACT

Background

Early childhood caries (ECC) in preschool children debilitate their quality of life affecting oral function, appearance and social well-being. A tool for measuring oral health-related quality of life for preschoolers may help in making clinical decisions and assist policy makers in planning and management of health programs in the country.

Objective

To translate oral health-related early childhood quality of life (OH-ECQoL) tool into Nepali language and test its validity and reliability.

Method

OH-ECQoL was translated into Nepali language by two Nepalese professional translators which was back translated by professional English translator. This was sent to three independent advisors to see the appropriateness of translation. Pilot testing was done in 20 parents and questionnaire was finalized after needed corrections. Final version was introduced to the 118 parents of children aged 24-71 months. Caries status was recorded for all children participating in the study. Concurrent, construct, discriminant validity and internal consistency reliability, test-retest reliability were evaluated.

Result

OH-ECQoL scores and perception of parents for general and oral health of their children was significant (at 0.01 level). There was significant difference in OH-ECQoL scores between no ECC and severe ECC groups and moderate and severe ECC groups (at 0.05 level). There was also a significant correlation between child impact section and family impact section (at 0.01 level). Cronbach's alpha was 0.891 demonstrating good internal consistency. Intra class coefficient was 0.963 suggesting excellent test-retest reliability. Ninety-one (77.1%) children had severe ECC and 40(33.9%) parents were from upper middle class.

Conclusion

The Nepali version of OH-ECQoL is a valid and reliable tool for assessing the oral health-related early childhood quality of life in children of Nepal.

KEY WORDS

Early childhood caries, Oral health-related quality of life, Preschool children

INTRODUCTION

Oral health-related quality of life (OHRQoL) is a multidimensional construct that includes a subjective evaluation of an individual's oral health, functional well-being, emotional well-being, expectations and satisfaction with care, and sense of self.¹ Since OHRQoL is an integral component in evaluating general health of a population, the concept has drawn interest over the past couple of decades.

The prevalence of untreated dental caries with severe consequences in preschool children of Nepal has been found to be higher than children of older age groups.² This could have a major impact on the quality of life in those children debilitating oral function, appearance and social well-being.

There are various tools that measure the OHRQoL of preschool children; Early Childhood Oral Health Impact Score (ECOHIS), Michigan OHRQoL and scale of oral health outcomes for 5 year old children (SOHO-5).³⁻⁵ Among these, ECOHIS has been adapted in various languages and has been widely used.⁶⁻¹⁰ None of these scales has been used in Nepali preschoolers.

Child-Oral Impact on Daily Performance (C-OIDP) was adapted in Nepali language and found to be a valid and reliable tool for assessing oral impact on daily performance in school children of Nepal.¹¹ The tool when used to measure OHRQoL in large scale, was applicable for older children but was not of much relevance for younger age groups (5-6 years).¹²

A tool for early childhood oral health related quality of life for North Indian population was developed by the name Oral Health-related Early Childhood Quality of Life (OH-ECQoL) in 2013.¹³

Nepal and North India share similar social and cultural context. With this background, the research was carried out with the objectives to translate oral health-related early childhood quality of life (OH-ECQoL) tool into Nepali language and test its validity and reliability and utilize the tool for recognizing the impact of child's oral health on quality of life.

METHODS

A cross sectional study was conducted in the department of Pediatric Dentistry in Dhulikhel hospital between September 2018 to December 2018. Ethical approval for research was obtained prior from Institutional Review Committee, Kathmandu University School of Medical Sciences, Dhulikhel. All the healthy children between age 24 months to 71 months of age and their parents who were willing to participate in the study were included. Children with systemic diseases were excluded from study. Written informed consent was obtained from parents.

A tool for early childhood oral health related quality of life for North Indian population developed by the name Oral Health-related Early Childhood Quality of Life (OH-ECQoL) was translated into Nepali language, validated and administered to the parents. The demographic characteristics of children; age, sex were recorded. The socioeconomic status of parents were scored based on modification of Kuppaswamy's socioeconomic status scale in the context of Nepal.¹⁴

The children were examined under standard aseptic conditions on dental chair in the operatory with mouth mirror and probe under dental unit light. The oral health status was recorded for dentition status as per WHO oral health assessment form.

There were total 18 questions which included 16 questions regarding child's oral health. Each question on the OH-ECQoL has responses recorded on a three-point scale; (1) Never, (2) occasionally, (3) often. Other two questions were regarding perception of parents about their child's general and oral health which have a five-point response; (1) Excellent (2) Very good (3) Good, (4) Fair and (5) Poor.

Translation of OH-ECQoL tool

a) Translation into Nepalese

Two accredited bilingual professional translators whose first language was Nepali did the forward translation of the questionnaire. Both translations were matched for similarity and no gross differences were found between the two. A group of five investigators then looked at the translation for the scientific terms, flow and understandability of each question. Special attention was paid to semantic equivalence of the English version and maintaining the colloquial expressions of the local culture.

b) Back translation

This was made by independent native English (professional) translators who were fluent in Nepali and who had no prior knowledge of the original version. It was then compared with original questionnaire.

c) Panel of experts

The translated version was sent to three independent advisors, who were experts in odontology and familiar with surveys to see if they found the translation to be appropriate.

d) Pilot testing

This was done to assess the level of understanding of the words used by the general public and, where required to make any changes. For this, Nepali questionnaire tool was administered to 20 participants by a Pediatric dentist. Those participants were not included in the study. After feedback from participants, appropriate changes were made and the present version was finalized. This version was then administered to the study participants.

The data was entered and analysed using version 20.0 of the Statistical Package for Social Sciences (IBM Corporation, Armonk, New York, USA).

Validity and reliability of the questionnaire tool was tested as:

1. Concurrent or criterion – related validity: This was tested by comparison of OH-ECQoL scores (cumulative score) with the answers to the two self rating questions on general and oral health. It was based on the assumption that the higher level of satisfaction among parents had better perception of general and oral health.

2. Construct validity: This was tested by correlating scores in the child impact section with the family impact section. It was based on the hypothesis that the impacts of the child’s oral health condition also have impacts on the family.

3. Discriminant validity: This was tested by comparing the OH-ECQoL scores in children with different status of early childhood caries (ECC). The hypothesis for this test was that OH-ECQoL would be higher among children affected with caries than without it. Based on classification of ECC given in AAPD guidelines, children were categorized into three groups; no ECC, mild to moderate ECC and severe ECC.¹⁵

4. Internal consistency reliability: It was tested by assessing the correlation of items within OH-ECQoL. Cronbach’s alpha coefficient was used to assess it.

5. Test-retest reliability: Amongst the total sample, random sample of 20 parents were recalled after about two weeks and the questionnaire was readministered to them. Test-retest reliability was assessed by evaluating the level of agreement between scores of OH-ECQoL at first and recall visit using intra - class coefficient (ICC).

RESULTS

The result demonstrated that 91(77.1%) children had severe ECC, 40(33.9%) were from upper middle class and only 1(0.84%) was from lower class (table 1).

In child impact section, food caught between the teeth and bad breath were reported more than other responses whereas being worried in the family was reported more in family impact section by parents (table 2).

The lowest possible score in both the section; (i.e 12 and 4) floor effect was reported by 4 parents in child impact section where as 27 parents in family impact section respectively.

No ceiling effect was observed in both the child and family section (i.e score of 36 and 12 respectively).

Concurrent validity was analysed by Pearson correlation between child and family impact section with general and oral health perception respectively. The Pearson correlation coefficient between total OH-ECQoL scores and perception of parents for general and oral health of their child was

Table 1. Demographic characteristics of parents and children (n=118)

Child	n (%)
Age	
24-35 months	4 (3.4%)
36-47months	31 (26.3%)
48-59months	31 (26.3%)
60-71months	52(44.1%)
Sex	
Male	66 (55.9%)
Female	52 (44.1%)
Caries Status	
No ECC	10 (8.5%)
Mild to moderate ECC	17 (14.4%)
Severe ECC	91 (77.1%)
Socioeconomic Status	
Upper	24 (20.3%)
Upper middle	40 (33.9%)
Lower Middle	28 (23.7%)
Upper Lower	25 (21.2%)
Lower	1 (0.8%)

Table 2. Items included in OH-ECQoL

Child Impact Items	Never	Occasionally	Often
Pain	30(25.4%)	73(61.9%)	15(12.7%)
Swelling	79(66.9%)	34(28.8%)	5(4.2%)
Difficulty in eating	60(50.8%)	46(39.0%)	12(10.2%)
Food caught between teeth	14(11.9%)	71(60.2%)	33(28.0%)
Bad breath	34(28.8%)	67(56.8%)	17(14.4%)
Mouth Breathing	58(49.2%)	45(38.1%)	15(12.7%)
Fever	75(63.6%)	40(33.9%)	3(2.5%)
Difficulty sleeping	62(52.5%)	50(42.4%)	6(5.1%)
Irritable, crying	47(39.8%)	64(54.2%)	7(5.9%)
Difficulty cleaning	69(58.5%)	43(36.4%)	6(5.1%)
Missed School	66(55.9%)	43(36.4%)	9(7.6%)
Told by teacher about bad teeth	81(68.6%)	30(25.4%)	7(5.9%)
Family Impact Items			
Worried	40(33.9%)	49(41.5%)	29(24.6%)
Missed work	52(44.1%)	63(53.4%)	3(2.5%)
Financial impact	64(54.2%)	45(38.1%)	9(7.6%)
Arguments among family members	90(76.3%)	23(19.5%)	5(4.2%)

found to be 0.238 and 0.385 which was significant at 0.01 level (table 3).

Convergent or construct related validity between child impact section score and family impact section score was calculated using Spearman’s correlation and was found to be 0.702 which was significant at 0.01 level (table 4).

Table 3. Concurrent validity (n=118)

Variables		Pearson correlation	
		Child section	Family Section
General health perception	Pearson correlation	0.231*	0.204*
	Significant (2-tailed)	0.012	0.027
		Child section	Family Section
Oral health Perception	Pearson correlation	0.375**	0.325**
	significant (2-tailed)	0.000	0.000

**Correlation significant at the 0.01 level (2-tailed)
 *Correlation significant at the 0.05 level (2-tailed)

Table 4. Construct validity (n=118)

Spearman's rho		Child impact section	Family impact section
Child impact section	Correlation coefficient	1.000	0.702*
	Significant (2-tailed)		0.000
Family impact section	Correlation coefficient	0.702*	1.000
	Significant (2-tailed)	0.000	

*Correlation significant at the 0.01 level (2-tailed)

Table 5. Discriminant validity using one-way ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1271.946	2	635.973	24.240	p < 0.001
Within Groups	3017.173	115	26.236		
Total	4289.119	117			

Table 6. Intergroup comparison using post-hoc Bonferroni

(I) ECC	(J) ECC	Mean Difference(I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-.76	2.041	1.000	-5.72	4.20
	3	-8.28*	1.706	.000	-12.43	-4.14
2	1	.76	2.041	1.000	-4.20	5.72
	3	-7.52*	1.353	.000	-10.81	-4.24
3	1	8.28*	1.706	.000	4.14	12.43
	2	7.52*	1.353	.000	4.24	10.81

*The mean difference is significant at the 0.05 level. 1: No ECC, 2: Mild to moderate ECC, 3: Severe ECC

Discriminant validity was calculated by one-way ANOVA (Analysis of Variance) (table 5) and post-hoc Bonferroni was done for intergroup comparison (table 6). Result showed that there were significant differences in OH-ECQoL scores between different ECC groups with higher scores seen in children with severe ECC followed by mild to moderate ECC

group. The significant differences were observed between children with no ECC and severe ECC groups and moderate and severe ECC groups at 0.05 level.

Internal consistency reliability was tested using Cronbach's alpha, the value of which for total items was 0.891 and based on standardized items was 0.894.

Cronbach's alpha for the child impact section was 0.865 and for family impact section was 0.700.

Test-retest reliability was assessed using Intra class coefficient (ICC) the value of which was 0.963.

DISCUSSION

Although poor oral condition may have a major impact on QoL of children and their parents, oral health care for primary dentition is often being neglected by parents in our society due to lack of awareness about its importance.

Developing a tool for assessing OHRQoL for very young children may also help clinicians to educate parents about importance of primary dentition. With this thought it was planned to develop a tool to assess the OHRQoL for preschool children of Nepal.

Among the available few tools in assessing OHRQoL for preschool children, OH-ECQoL was selected for adaptation and validation considering the similarity in social, economic and cultural aspect of population of Nepal with North India.^{3-5,13}

The study included lowest age as 24 months as many of the children even at this age may already have developed the severe consequences of ECC and there is always a communication gap with these children due to their difficulty in articulating their dental problems while conveying.

The questionnaire had child impact items and family impact items and parental perception of their child's general and oral health.

There were 16 questions on child and family impact sections and each had three-point Likert scale so it was not confusing and was easy for the parents to score.

The two questions; perception of parents on their child's general and oral health helped to test the concurrent validity. Parental perception on their child's health is an important domain in assessing QoL of children as how their child's health is perceived by them creates a drive in pursuing the care for it. Further, the complete decision about children's health in our society depends upon their parents. It has been documented that ECC causes missing workdays of the caretakers and also have impact on financial and time spent for their children's dental care.¹⁶

Caries status of children according to severity were recorded based on AAPD classification and comparing it with OH-ECQoL helped in testing discriminant validity.¹⁵ A

very high percentage of children had severe ECC (77.1%). It may be because most of the children visited dental clinic for treatment for their symptomatic dental condition. This may also be the reason for the less floor effect in the score.³

Concurrent or criterion related validity

This was tested by correlating general and oral health perception of parents with child impact score (0.231 and 0.375 respectively) and family impact score (0.204 and 0.325 respectively) which was found to be significant. Correlating the total OH-ECQoL scores with general and oral health was 0.238 and 0.385 respectively which was also found to be significant. This suggested that parents of children who had higher OH-ECQoL perceived their child's general and oral health to be poorer than those with low scores. Thus, Nepali version of OH-ECQoL was a valid tool in relation to concurrent or criterion related validity. Similar findings were reported in other research as well.^{3,8,13,17}

Construct related validity

This was tested by correlating child impact score with family impact score and was found to be significant. This suggested that impact on family has direct relation with impact on child's oral health. The developed tool was thus valid in terms of construct related validity.^{3,13,17}

Discriminant validity

This was tested by comparing OH-ECQoL between the three-group division of ECC status according to AAPD; no ECC, mild to moderate ECC and severe ECC. The result showed that OH-ECQoL was higher among the children with severe caries. There was a significant difference in OH-ECQoL in children with no ECC and severe ECC, moderate ECC and severe ECC groups.

It is assumed that poor oral health condition lead to high score in OH-ECQoL than children with no caries suggesting the tool being capable of discriminating different caries group.

These findings were in agreement with several other research.^{3,13,18-20}

Internal consistency reliability

Internal consistency contemplates the range to which items of an instrument measure various aspects of the same characteristic or construct.²¹

The value of Cronbach's alpha for child impact section was 0.865 and overall scale was 0.891 suggesting good internal consistency.²² However, the value of family impact section was 0.700 which was found to be lower than other studies.^{3,13} The reason for the low value may be due to lack of awareness in parents about importance of oral health of their children and attitude for pursuing care for it.

Test-retest reliability

It reflects the variation in measurements taken by an instrument on the same subject under the same conditions.²³ This was assessed by evaluating the level of agreement of OH-ECQoL scores between the first and second visit using ICC.

The value of ICC was 0.963 reflecting excellent reliability between the test and retest data.²³ Such an almost perfect agreement between the first and second assessment was also found in other research as well.^{13,19}

The strength of this study is that the validation has been done in the actual population in which it is intended to be used. The internal consistency of the domains is high. The Cronbach's alpha is more than acceptable level.

The limitation of this study is that the number of subjects in no ECC and mild to moderate ECC were very low and the discriminant validity score may be taken with caution in this case.

CONCLUSION

Nepali version of Oral Health-related Early Childhood Quality of Life is a valid and reliable tool for assessing the quality of life of Nepalese preschool children. Early childhood caries has a marked impact on the quality of life of Nepalese preschool children and their families. The developed tool can assist in planning and management of health programs in Nepalese region and compare OHRQoL of children with other regions/populations.

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