

Short Communication

The cross cultural adaptation and validity of the Child-OIDP scale among school children in Karnataka, South India

N. Agrawal, K. Pushpanjali and A.K. Garg

Objective: To carry out a cross-cultural translation and adaptation of the Child-OIDP instrument and to assess its reliability and validity among 11-12 year olds in Karnataka, South India. **Methods:** The original Child-OIDP was obtained from the author, cross-culturally adapted to the Kannada language then the translation's content, face criterion and construct validity and internal and external reliability were evaluated. Children recorded their oral health problems and rated their oral health in a cross sectional study of 505, 11-12 year olds selected from a list of Karnataka schools by using simple random sampling (89.7% participation rate). **Results:** The child OIDP revealed good validity and reliability. In relation to construct validity; an exploratory factor analysis provided two factors with eigenvalues greater than 1, which represented the physical and psychosocial health components. Cronbach's alpha was 0.60 and test-retest reliability, 0.85 (intra-class correlation coefficient). **Conclusions:** The Kannada Child-OIDP is a valid and reliable interviewer-administered instrument to measure the impact of the oral conditions on quality of life in children in Karnataka, South India.

Key words: child-OIDP, cross-cultural adaptation, reliability, validity

Introduction

Child populations are the primary target group for oral health care services in many countries and are the major focus of dental public health research and practice (Tubert *et al.*, 2005). Oral disorders are numerous in children globally and likely to affect their quality of life negatively (Gherunpong *et al.*, 2004).

Oral health-related quality of life (OHRQoL) indices have a specific application in the evaluation of the impacts of oral problems on daily activities (Cortes *et al.*, 2002). One such measure developed specifically for children is the Child Oral Impacts on Daily Performances (Child-OIDP) index which assesses the serious oral impacts on children's daily life in relation to eight daily performances: eating, speaking, cleaning mouth, sleeping, smiling, studying, emotion and social contact (Gherunpong *et al.*, 2006). The index has applications in public health for the assessment of oral health needs besides being a valuable indicator for the evaluation of oral health programs (Gherunpong *et al.*, 2006).

The availability of local language versions of instruments is important for epidemiological research (Castro *et al.*, 2008) and when a scale is used in a new context or with a different group of people, its psychometric properties need to be re-established (Streiner and Norman, 2000). The psychometric properties of the Child-OIDP have been successfully assessed across several cultures and languages but not in India. The aim of this study was to carry out a cross-cultural translation and adaptation of the Child-OIDP index and to assess its reliability and validity for application among 11-12 year olds of Karnataka, South India.

Method

A cross-sectional study was undertaken among a randomly selected set of six government and six private school's children aged 11-12 years, of Karnataka, South India. All their 563 children were invited to participate. Some 505 of those children participated in interview voluntarily (non-response rate 10.3%); their mean age was 11.5 years and 49.3% were female. Ethical clearance was obtained from the ethics committee of M.S. Ramaiah Dental College and Hospital, Bangalore. Both parental consent and school authorities' permission were obtained to include their children in the study.

The methods used to translate the questions in the Child-OIDP index to Kannada and to adapt the index to the South Indian culture followed published guidelines (Bernabé *et al.*, 2008; Castro *et al.*, 2008; Guillemin, 1995; Guillemin *et al.*, 1993). The original Child-OIDP was obtained from one of its authors and subjected to cross-cultural translation and adaptation combining several steps of translation, back-translation and expert judgment. Face validity was established in a pilot study and very minor changes were introduced prior to the main study. To test the Child-OIDP, the children were first asked to record all oral health related problems they have experienced in the past three months. This was done in small groups, to reduce time. Then, in face-to-face interviews, data were collected on the impacts of oral problems for the eight common daily performances.

Psychometric testing of the Child-OIDP involved the assessment of internal and test-retest reliability in addition to face, content and criteria validity and construct validity. Face validity was established prior to the main

study. Content validity was assessed by using the method developed by Lawshe (1975) and is essentially a method for gauging agreement among judges regarding how essential a particular item is.

Because of the lack of a gold standard for measuring OHRQoL, criterion validity was evaluated by testing the instrument against subjective proxy measures (Streiner and Norman, 2000) using Spearman rank correlation coefficients. For that purpose, data were collected on self-perceived oral health status (using a 5-point ordinal scale from very bad to very good) and satisfaction with oral health status and self-perceived oral treatment need (using yes/no questions).

Construct validity refers to highlighting underlying constructs of the instrument. Construct validity was evaluated using exploratory factor analysis (Hurley *et al.*, 1997). To evaluate test-retest reliability a randomly selected 10% of the children were re-interviewed after 2 weeks and the intra-class correlation coefficient calculated. Internal reliability was tested by using the standardised Cronbach alpha coefficient, as well as item-total and inter-item correlations. Data were analysed using the SPSS statistical package with $p=0.05$ being the limit for significance.

Results

Face validity of the Kannada Child-OIDP instrument was initially evaluated and the language simplified and made less official to improve understanding and responsiveness to the questions. According to the content validity ratio, the eight performances originally included in the instrument attained values of agreement of at least the recommended standard of 0.75. For criteria validity, there were significant associations between Kannada Child-OIDP scores and three proxy measures. Kannada Child-OIDP scores increased when the self-perceived oral health status decreased ($p<0.01$) and children were not satisfied with their oral health status ($p<0.01$). Kannada Child-OIDP scores increased when children reported self-perceived dental treatment need increased ($p<0.01$). Construct validity was further evaluated through exploratory factor analysis. Assumptions in the correlation matrix among performances were confirmed prior to conducting this analysis. The Kaiser-Meyer-Olkin measure of sampling adequacy (0.710) determined that partial correlations among items were small, and Bartlett's test of sphericity demonstrated that the correlation matrix was different from an identity matrix ($p<0.001$). The factor analysis of the eight performances provided two factors with eigenvalues greater than 1 (1.94 and 1.50, respectively) that explained 39.9% of the variance in the responses of children (26.8% and 13.1%, respectively). A rotated solution was then obtained to simplify their interpretation (Table 1). The exploratory factor analysis showed that children's responses were moderately correlated to each other but they were clustered around two different constructs. The first factor reflecting psychosocial components was characterised by high loadings on five variables: smiling, social contact, studying, emotion and sleeping performances. As the second factor was characterised by high loadings on three variables - eating, cleaning and speaking - it represents the physical component of oral health.

Regarding internal reliability, all inter-item correlations were positive and statistically different from zero ($p\leq 0.007$). Inter-item correlations ranged 0.04 to 0.33. The corrected item-total correlation varied from 0.21 for 'speaking' to 0.38 for 'emotion', whereas the Cronbach's alpha coefficient was 0.60, and did not increase when any performance was deleted (Table 2). Test-retest reliability was evaluated through intra-class correlation coefficient as 0.85.

Discussion

The main contribution of this study was to rigorously adapt the Child-OIDP index for Karnataka, South Indian 11-12 year olds and successfully assess its psychometric properties. The instrument used in the present study has already been cross-culturally adapted and validated among different populations (Bernabé *et al.*, 2008; Castro *et al.*, 2008). Such cross-culturally adapted versions can be as valid and reliable as the original and have advantages (Guillemin, 1995). Translations provide a common measure for the investigation of HRQoL across cultural boundaries and allow comparisons between them besides being less costly and less time-consuming than generating a new measure (Mtaya *et al.*, 2007).

Table 1. Evaluation of construct validity in the main study: pattern matrix (n=505); Kaiser-Meyer-Olkin measure of sampling adequacy 0.710; Bartlett's test of sphericity approximate chi-square 305.174; df 28; $p<0.001$

Variables	Factor 1	Factor 2
Eating		0.811
Speaking		0.615
Cleaning mouth	0.256	0.477
Sleeping	0.572	0.171
Emotion	0.645	0.114
Smiling	0.614	-0.164
Studying	0.578	
Social contact	0.523	

Extraction method: Principal Component Analysis.
Rotation method: Oblimin with Kaiser Normalisation.

Table 2. Evaluation of internal reliability in the main study: corrected item-total correlation and alpha if item deleted (n=505)

Performance	Corrected item-total correlation	Alpha if item deleted
Eating	0.276	0.556
Speaking	0.219	0.564
Cleaning mouth	0.331	0.534
Relaxing	0.380	0.518
Maintaining emotional state	0.386	0.516
Smiling	0.232	0.559
Studying	0.289	0.549
Social contact	0.247	0.557

The study showed that the Kannada Child-OIDP scale had appropriate validity and reliability. According to content validity evaluation it was agreed that the eight daily performances in the original Child-OIDP should be retained as with other studies (Bernabé *et al.*, 2008; Castro *et al.*, 2008). Proxy measures were used to assess the criteria validity since a gold standard to assess the same was not available. The findings were in line with those same other studies. The Kannada Child-OIDP was associated with different perceptions of oral health. This property facilitates its use in health surveys to provide needs-based interventions to children. In terms of internal reliability, all inter-item correlations were positive and no correlation was high enough for any performance to be redundant. Cronbach's alpha coefficient, at 0.60, in the study, was comparable to results obtained validating of the Child-OIDP elsewhere (Bernabé *et al.*, 2008; Castro *et al.*, 2008).

In the present study, exploratory factor analysis was carried out to identify the separable dimensions, representing theoretical constructs, within the OHRQoL domain. The number of factors obtained in this study is different from the Peruvian study where three factors representing physical, social and psychological components were obtained (Bernabé *et al.*, 2008). This difference may be attributed to the different populations, sample sizes and responses given by the children.

In the present study, test-retest reliability evaluated by intra-class correlation coefficient was very good showing the index to be a stable measure. This result is comparable to other validation studies of Child-OIDP (Bernabé *et al.*, 2008; Castro *et al.*, 2008).

Conclusion

The Kannada Child-OIDP is a valid and reliable interviewer-administered instrument to measure impacts of oral problems on quality of life in Karnataka, South Indian 11-12 year olds. Further studies are needed to verify these results, especially in relation to the methods used here.

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