Measuring Parental-Caregiver Perceptions of Child Oral Health-Related Quality of Life: Psychometric Properties of the Brazilian Version of the P-CPQ

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The Parental-Caregiver Perceptions Questionnaire (P-CPQ) is an instrument that assesses a parent's or a caregiver's perceptions regarding the impact of children's oral health status on quality of life. The aim of this study was to evaluate the psychometric properties of the Brazilian version of the P-CPQ. Following translation and cross-cultural adaptation, the P-CPQ was tested on 123 parents and caregivers of children between 11 and 14 years of age with dental caries and malocclusions. The parents/caregivers were recruited at dental clinics of the Federal University of Minas Gerais, where their children were receiving dental care. Psychometric properties were assessed through internal consistency, test-retest reliability, construct validity and discriminant validity. The mean P-CPQ score was 13.01 (SD=12.14) for the dental caries group and 16.57 (SD=13.13) for the malocclusion group. Internal reliability was confirmed by a Cronbach's alpha coefficient of 0.84. Test-retest reliability revealed satisfactory reproducibility (ICC=0.83). Construct validity was satisfactory, demonstrating significant correlations between global indicators and the total scale. The P-CPQ score was able to discriminate between different parental/caregiver perceptions of oral conditions in their children (dental caries and malocclusion). The results for the Brazilian version of the P-CPQ confirm that this questionnaire is a reliable and valid instrument to assess parental perceptions on the impact that oral health status has on children's life quality.

Key Words: oral health, quality of life, validation studies, questionnaires, children.

INTRODUCTION

Studies assessing the repercussion of oral disorders on the quality of life of individuals have been conducted worldwide. However, most instruments have been developed in English-speaking countries (1). In order to use them with a non English-speaking population, these instruments need to be translated, adapted and validated (2).

Oral health-related quality of life (OHRQoL) refers to the impact oral health or disease has on an individual's daily functions (3). Until recently, child health status was measured by proxy reports from parents or caregivers. Parents and caregivers are often the main decision makers regarding a child's health and their perceptions have a major influence over treatment choices (4-7).

Parent/caregiver and child HRQoL instruments should measure the same condition in order to enable comparisons between self and proxy reports. For young children, those with cognitive impairment and those who are too ill or fatigued to fill out the instrument, a parent/caregiver proxy report may be needed. Even when children are able to self report, parent/caregiver proxy reports should be considered a complementary outcome measure contributing to clinical decisions (6).

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The Parental-Caregiver Perceptions Questionnaire (P-CPQ) is one of the instruments of the Child Oral Health Quality of Life Questionnaire (COHQOL) (8). It was developed in Canada in the English language (8). Its validity has been demonstrated in English-speaking people in Canada, United Kingdom and New Zealand and, in Chinese in China. The objective of this study was to evaluate the psychometric properties of P-CPQ for use on Brazilian parents/caregivers of children between 11 and 14 years of age.

MATERIAL AND METHODS

Study Design

The study was conducted in 2007 on a sample of 123 parents/caregivers of children from 11 to 14 years of age. Participants were recruited from the pediatric dentistry and orthodontic clinics at the Federal University of Minas Gerais, Brazil. The study was approved by the institutional Human Research Ethics Committee. All parents and caregivers signed informed consent forms prior to participation in the study.

P-CPQ

The P-CPQ has 33 items distributed into 4 subscales: oral symptoms (OS), functional limitations (FL), emotional wellbeing (EWB) and social wellbeing (SWB). The questions refer only to the frequency of events in the previous 3 months. The items have 5 Likert response options: 'never=0', 'once or twice=1', 'sometimes=2', 'often=3', 'every day or almost every day=4'. A 'don't know' response also was permitted and scored as 0. Global ratings of the child's oral health and impact of the oral condition on his or her overall wellbeing were obtained from the parents/caregivers. The global ratings had a 5-point response format from 'excellent=0' to 'poor=4' for oral health and 'not at all=0' to 'very much=4' for wellbeing.

Translation and Cross-Cultural Adaptation

Translation of the instrument into Portuguese followed international guidelines for instrument linguistic validation (2,9,10). The original English-language version of the P-CPQ was translated into Brazilian Portuguese independently by 2 bilingual translators (a Brazilian fluent in the English language and a native English-speaker fluent in Portuguese) with experience in the translation of health-related questionnaires. All options were reviewed during a consensus meeting in which translation choices and cross-cultural adaptations were made. In order to determine the translation quality, the Brazilian Portuguese version of the P-CPQ was assessed by a translation panel consisting of researchers, 2 translators and 3 dentists - all fluent in English and Portuguese. This version was compared to the original version of the P-CPQ. Attention was given to the meaning of the words in the different languages in order to obtain similar effects on respondents of different cultures. An effort was made to identify possible difficulties in understanding the questionnaire. This version was pilot-tested on a convenience sample of 20 parents/caregivers. Modifications were made according to the comments made by the parents/caregivers in order to clarify the content of the questionnaire. The parents/caregivers suggested the substitution of a number of words and expressions for synonyms in order to facilitate comprehension.

This final Brazilian Portuguese version was back-translated into English by 2 bilingual translators whose native language was English and who were not previously involved in the study in order to verify the semantic equivalence between the translated and back-translated versions. The 2 back-translated English versions proved nearly identical. To determine semantic equivalence, a group composed of 3 dental surgeons fluent in both languages and with no prior knowledge of the study compared the back-translated English version with the original English version. The aim of this step was to achieve a "similar effect" on respondents who speak 2 languages (English and Portuguese). The structure of the instrument, instructions and mode of administration were similar to the original version of the P-CPQ. Functional equivalence (the combined effect of assessing conceptual, item, semantic, operational and measurement equivalence) was assessed by a group of specialists regarding the performance of the instrument and the possibility of comparisons to studies conducted in different cultures.

Clinical Measures

All children had current bitewing and panoramic radiographs, dental charts and medical histories. Caries

and malocclusion status were quantified. The children were separated into 2 groups: Group 1 - children with dental caries; and Group 2 - children with malocclusions. The groups were mutually exclusive (children with dental caries had no malocclusion and vice versa). All children were examined by a single dentist who was previously trained and calibrated (Kappa intra-agreement: 0.90 for dental caries and 0.77 for malocclusion).

Statistical Analysis

Initially descriptive analyses were performed (average, standard deviation, analyses of total and individual domain scores of the P-CPQ) to generate P-CPQ total and domain scores for each participant. The performance of the P-CPQ was assessed with regard to validity and reliability. The total and subscale scores were generated by totaling the numerical response codes. Internal consistency reliability of the scale and subscales was assessed using Cronbach's alpha (n=123). Test-retest reliability was assessed by the intraclass correlation coefficients (ICC), calculated using a one-way random-effect parallel model. The P-CPQ was filled out by 53 parents/caregivers twice, with a 3-week interval with parents/caregivers who reported that their child's oral condition had not changed between the 2 administrations of the questionnaire.

To test discriminant validity, the hypothesis was that scores would be higher among parents/caregivers with children in the malocclusion group and lower in the dental caries group (8). As the P-CPQ scores were not normally distributed, the non-parametric Mann-Whitney test was used to evaluate the difference in mean scores between the 2 groups (Group 1 with dental caries and Group 2 with malocclusion). Intra-group variation in scores regarding the severity of the child's condition was also examined, as this was feasible, given the clinical data collected. Construct validity was assessed by means of associations between the scale scores and global indicators of oral health and overall wellbeing using Spearman's correlation coefficient. The level of significance set was p<0.05.

RESULTS

Translation Process and Validation of Translation Quality

A few difficulties were encountered regarding the

translation of the P-CPQ from English language into Brazilian Portuguese language due to colloquial differences between the 2 languages. For example, the item 'sores in the mouth' was translated to 'did any other place in his/her mouth hurt' to facilitate the comprehension. In other items, synonyms were added to clarify the meaning. The item 'upset' was translated to 'upset, hurt'; 'acted shy or embarrassed' was translated to 'acted shy, embarrassed or ashamed'. The version was then tested on 20 parents/caregivers, who exhibited a satisfactory understanding of all items as well as the overall questionnaire.

Psychometric Testing

Among the sample of 123 parents/caregivers, the majority of participants were mothers (54.5%). A total of 70 children (56.9%) had dental caries and 53 (43.1%) had malocclusion. The average age was of children 11.89 years (SD=1.01), distributed as follow: 48.0% were 11 years old, 22.8% were 12 years old, 21.1% were 13 years old and 8.1% were 14 years old.

The total P-CPQ scale score ranged from 0 to 51, with a mean score of 13.01 (SD=12.14). Floor effects were detected in 5.7% and ceiling effects were detected in 0.8%. The number of 'don't know' responses was moderate. 51.2% of the participants had at least one 'don't know' response. However, this response option was scored as 0, following the option made by the authors who developed the instrument (8).

Correlations between global indicators and the P-CPQ were significant and ranged from moderate to high. Significant positive rank correlations were found between the global ratings of oral health and oral symptoms, functional limitations, emotional wellbeing, social wellbeing and total P-CPQ scale. Global ratings of overall wellbeing and functional limitations, emotional wellbeing, social wellbeing and total P-CPQ had positive correlations (Table 1).

Discriminant validity confirmed the hypothesis. As predicted, the mean of the total scale score was higher for parents/caregivers with children in the malocclusion group and lower in the dental caries group (Table 2). However, the difference between groups did not achieve statistical significance (p>0.05).

Reliability indicated good internal consistency. Cronbach's alpha for the total scale was 0.84 and ranged from 0.44 to 0.81 for the subscales. Test-retest reliability was determined based on data from 53 parents/caregiv-

Table 1. Construct validity: correlations between global indicators and P-CPQ scale/subscales.

	Global rating			
	Oral health		Overall wellbeing	
	r*	p-value	r*	p-value
Total scale	0.27	<0.001	0.42	<0.001
Subscales				
Oral symptoms	0.24	0.01	0.14	0.13
Functional limitations	0.21	0.02	0.30	<0.001
Emotional wellbeing	0.22	0.01	0.39	<0.001
Social wellbeing	0.20	0.03	0.37	<0.001

*Spearman's correlation coefficient.

Table 2. Discriminant validity: overall and subscale scores for pediatric dentistry group and orthodontic group.

P-CPQ	Children with dental caries (n=70)		Children with malocclusion (n=53)		p-value*
	Mean ± SD	median	mean ± SD	median	
Total scale	13.01 ± 12.14	8.00	16.57 ± 13.13	12.00	0.08
Subscales					
Oral symptoms	3.94 ± 3.27	4.00	2.81 ± 2.57	2.00	0.05
Functional limitations	2.53 ± 4.05	0.50	3.08 ± 3.84	2.00	0.20
Emotional wellbeing	3.77 ± 4.97	2.00	5.38 ± 6.05	3.00	0.13
Social wellbeing	2.77 ± 3.45	2.00	5.30 ± 4.37	4.00	<0.01

*Mann-Whitney test.

Table 3. Internal consistency reliability and test-retest reliability statistics (n=53).

P-CPQ	Number of items	Cronbach's alpha	Intraclass correlation coefficient (95% CI)*
Total scale	31	0.84	0.83 (0.70-0.90)
Subscales			
Oral symptoms	6	0.44	0.68 (0.45-0.81)
Functional limitations	8	0.67	0.80 (0.65-0.88)
Emotional wellbeing	7	0.81	0.76 (0.59-0.86)
Social wellbeing	10	0.57	0.82 (0.69-0.90)

* One-way random effect parallel model.

ers who reported that their child's oral condition had gone unchanged between the 2 administrations of the questionnaire. The ICC for the total scale was 0.83 and ranged from 0.68 to 0.82 for the subscales, indicating substantial agreement (Table 3).

DISCUSSION

Translation and validation of translation quality, although time consuming, raised issues that have relevance for all research involving child oral health-related quality of life. The issue is to find the appropriate word in the Portuguese language with conceptual equivalence to the original word in the English language. The process of translation and cross-cultural adaptation was carefully conducted following criteria described by Herdman et al. (1998) (10) and resulted in a back-translated version that was very similar to the original, thereby highlighting the suitability of the Brazilian Portuguese version of the instrument. The Brazilian Portuguese version of the P-CPQ exhibited acceptable validity and reliability. The overall results for the psychometric properties were satisfactory.

In the present study, significant correlations were found between the global rating of oral health, total scale and subscales of the P-CPQ. These correlations could be interpreted as being of medium strength (r ± 0.20-0.27). For the global rating of overall wellbeing, significant correlations were found between the FL, EWB, SWB subscales and total scale. These correlations were stronger that for the global rating of oral health (r ± 0.30-0.42). In the Chinese version of the P-CPQ, significant correlations were found between the global rating of oral health and all P-CPQ subscales. For the global rating of overall wellbeing, significant correlations were found with the FL, EWB and SWB subscales (13). These results were very

similar to those of the present study.

As expected, the mean total scale score was higher in the malocclusion group (poor oral health-related quality of life) and lower in dental caries group. Similar results were obtained in the Canadian and Chinese studies (8,13). However, the difference between groups did not achieve statistical significance. The different stages of treatment among children with malocclusion could have influenced this result. Another possible explanation is the index used for malocclusion - the DAI. This index evaluates the aesthetic impact caused by malocclusion. In our study, the impact was caused in some cases by the posterior cross bite, which is not evaluated by the DAI.

Internal consistency assessed by Cronbach alpha values examines the extent to which items addressing the same concept are actually doing so and this was tested for the overall scale and for each subscale. Cronbach alpha values were comparable with the values obtained in the original internal reliability testing (8). The Oral Symptoms subscale had a lower Cronbach's alpha (0.44) than what is considered good (values of 0.70 or greater) (11), but was nonetheless acceptable. This may have occurred due to the fact that the items on this subscale address different oral symptoms (13). Test-retest reliability was obtained from intraclass correlation coefficients. The ICC was performed with 53 (43.1%) parents/caregivers who reported that their child's oral condition had not changed between 2 administrations of the questionnaire. The ICC indicated good agreement for total scale (0.83) and substantial to good agreement for the subscales (0.68-0.82) (11,12). Similar results were found in the Canadian and Chinese studies (8,13).

The P-CPQ contains items for which a 'don't know' response is permitted. The exclusion of 'don't know' responses leads to the loss of valuable data. For this reason, all 'don't know' responses were recorded as 0. These adjusted scores demonstrate equally good discriminant and construct validity (8). The authors suggest that 'don't know' answers can be accommodated into the 0 category without affecting the performance of the questionnaire. In fact, the management of the 'don't know' response produced optimal internal consistency of the P-CPQ subscales (14).

In conclusion, the Brazilian Portuguese version of the P-CPQ exhibited adequate psychometric properties regarding the validity and acceptable reliability (internal consistency and test-retest). Futures studies should be encouraged to use this instrument on a population sample.

RESUMO

O *Parental-Caregiver Perceptions Questionnaire* (P-CPQ) é um instrumento que avalia a percepção do pai/responsável a respeito do impacto da saúde bucal da sua criança na qualidade de vida da mesma. O objetivo do estudo foi avaliar as propriedades psicométricas da versão brasileira do P-CPQ. Após a tradução e adaptação transcultural, o P-CPQ foi testado em uma amostra de 123 pais/responsáveis de crianças com idade entre 11-14 anos com cárie dentária e maloclusão. Os pais/responsáveis foram selecionados das clínicas dentárias da Universidade Federal de Minas Gerais, onde as crianças recebiam atendimento odontológico. As propriedades psicométricas foram avaliadas através da consistência interna, confiabilidade teste-reteste, validade de constructo e validade discriminante. O escore médio do P-CPQ foi 13,01 (dp=12,14) para o grupo com cárie dentária e 16,57 (dp=13,13) para o grupo com maloclusão. A consistência interna foi confirmada pelo coeficiente alfa de Cronbach de 0,84. A confiabilidade teste-reteste revelou satisfatória reprodutibilidade (ICC=0,83). A validade de constructo foi satisfatória, demonstrando correlações significativas entre os indicadores globais e a escala total. O escore do P-CPQ foi capaz de discriminar diferentes percepções dos pais/responsáveis sobre as condições bucais de suas crianças (cárie dentária e maloclusão). Os resultados da versão brasileira do P-CPQ confirmam ser este um questionário válido e confiável.

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