Family Impact Scale (FIS): psychometric properties of the Brazilian Portuguese language version

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ABSTRACT. Aim Evaluate the psychometric properties of the Brazilian version of the Family Impact Scale (FIS).

Methods Following translation and cross-cultural adaptation, the FIS was tested on 123 parents-caregivers of children between 11 and 14 years of age with dental caries and malocclusions. The parents were recruited from the Paediatric Dental and Orthodontic clinics where their children were receiving dental care. Psychometric properties were assessed through internal consistency, test-retest reliability, construct validity and discriminant validity. Results The mean FIS score was 6.97 (SD 7.81) for the dental caries group and 7.25 (SD 7.70) for the malocclusion group. The FIS score was unable to discriminate different family impact caused by children’s oral health conditions. Internal consistency was confirmed by a Cronbach’s alpha coefficient of 0.79. Test-retest reliability revealed good reproducibility (ICC 0.83). Construct validity was good, demonstrating highly significant correlations between parent’s perceptions regarding the overall wellbeing indicator for their children and the total FIS and subscales. Financial burden demonstrated no significant correlation with global indicators. Conclusions Overall psychometric results for the Brazilian version of the FIS confirm it as a reliable, valid questionnaire for assessing the family impact caused by children’s oral conditions.

Key words: Child; Family; Quality of life; Reliability; Validity.

Introduction

The concept of health-related quality of life (HRQoL) concerns the ability to perform daily activities and considers subjective aspects such as happiness, social wellbeing and emotional wellbeing [Kushnir et al., 2004]. Likewise, oral health-related quality of life (OHRQoL) concerns the impact of oral health or disease causes on an individual’s daily functioning, wellbeing and quality of life [Malden et al., 2008]. A pool of instruments known as the Child Oral Health Quality of Life Questionnaire (COHQoL) was developed in Canada in the English language to evaluate how children’s oral conditions affect their life and family and how parents perceive their child’s oral health condition. The questionnaires that make up the COHQoL are the Child Perceptions Questionnaire (CPQ), the Parental-Caregivers Perceptions Questionnaire (P-CPQ), and the Family Impact Scale (FIS) [Jokovic et al., 2002; Locker et al., 2002]. The CPQ is a measure of OHRQoL to be used on children aged 11 to 14 years. This instrument has proven valid and reliable in different countries, including Brazil [Jokovic et al., 2002; Marshman et al., 2005; Foster-Page et al., 2005; Brown and Al-Khayal, 2006; O’Brien et al., 2006; Goursand et al., 2008; McGrath et al., 2008]. The P-CPQ is a measure that evaluates parent’s perceptions regarding their child’s oral condition. The P-CPQ was designed to complement the information obtained from the CPQ. This questionnaire has been validated in Canada, the United Kingdom and China [Locker et al., 2002; McGrath et al., 2008; Marshman et al., 2007]. The FIS is an instrument developed to determine the impact of children’s oral and orofacial conditions on the family [Locker et al., 2002]. According to the American Academy of Pediatrics, children’s health is defined as “the social, physical and emotional functioning of the child and his or her family (…) therefore, measurement of health-related quality of life must be from the perspective of the child and family” [Fink, 1989]. The psychometric properties of the FIS have been assessed in Canada, the United Kingdom and China [Locker et al., 2002; McGrath et al., 2008; Marshman et al., 2007].

The objective of the present study was to evaluate the psychometric properties of the Brazilian version of the Family Impact Scale.
Methods

A sample of 123 parents-caregivers of children from 11 to 14 years of age took part in the present study, which was conducted in 2007. Participants were recruited from the paediatric dentistry and orthodontic clinics. The study received approval from the Human Research Ethics Committee of this same institution. All parents-caregivers signed informed consent form prior to participation.

The FIS evaluates the impact of a child’s oral condition on family life. It consists of 14 items divided into three subscales: parental/family activity (PA), parental emotions (PE), and family conflict (FC). The financial burden subscale (FB) is the only one that is evaluated separately, since it comprises a single item and addresses economic rather than psychosocial or behavioural impact [Locker et al., 2002; McGrath et al., 2008].

The questions refer only to the frequency of events in the previous three months. The items have five 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. The global ratings had a five-point response format ranging from ‘excellent = 0’ to ‘poor = 4’ for oral health and ‘not at all = 0’ to ‘very much = 4’ for wellbeing.

The translation of the instrument into Portuguese followed international guidelines for instrument linguistic validation [Sperber, 2004; Guillemin et al., 1993; Herdman et al., 1998]. The original English version of the FIS was translated into Brazilian Portuguese by two bilingual translators whose native language was Brazilian Portuguese. This Brazilian Portuguese version was back-translated into English by two bilingual translators whose native language was English in order to determine the semantic equivalence between the translated and back-translated versions. Functional equivalence (the combined effect of assessing conceptual, item, semantic, operational and measurement equivalence) was assessed by a group of specialists with regard to the performance of the instrument and the possibility of comparisons to studies conducted in different cultures.

All children had current bitewing and panoramic radiographs, dental charts and medical histories. The experience of dental caries (DMFT) was assessed by enumerating the number of decayed, missed and filled teeth [World Health Organization, 1997]. Malocclusion was classified using the Dental Aesthetic Index (DAI) [Cons et al., 1986]. Children were separated into two groups: Group 1, children with dental caries; Group 2, children with malocclusions. All children were examined by a single, previously standardized dentist (DG). A standardization program for the criteria used for the diagnosis of dental caries experience and malocclusion was carried out before the study began. Training for clinical diagnosis entailed the use of color photographs to show the major clinical characteristics of each situation of interest and the situations to be considered in the differential diagnosis. Twenty children were examined and re-examined after a one-week interval for the calculation of intra-examiner agreement. Cohen’s Kappa values were 0.90 for dental caries and 0.77 for malocclusion.

The performance of the FIS was assessed with regard to its validity and reliability. The total and subscale scores were generated by sum of 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 with parents who reported that their child’s oral condition had not changed between the two administrations of the questionnaire. Test-retest reliability was assessed with parents who answered the questionnaire twice, with a three-week interval. To test discriminant validity, the hypothesis was that scores would be higher for parents with children in the malocclusion group and lower in the dental caries group. This hypothesis based on the assumption that malocclusion group would have poorer oral health-related quality of life [Jokovic et al., 2002; Locker et al., 2002; McGrath et al., 2008]. Construct validity was assessed by means of associations between the scale scores and global indicators of oral health and overall well-being. Statistical analyses were conducted using the SPSS software program (version 15.0 SPSS Inc., Chicago, IL, USA).

Results

A total of 160 questionnaires were distributed to parent-caregivers, 123 of which were returned, giving a response rate of 76.9%. The 123 parents/caregivers took part in the study to assess discriminant and construct validity and internal consistency reliability of the FIS. Fifty-three parents/caregivers filled out the same questionnaire twice with a three-week interval, and provided data for the evaluation of test-retest reliability. The majority of informants were mothers (54.5%). Other informants included grandmother, grandfather, aunt and neighbor. The characteristics of the children in terms of age, gender and clinical group are displayed in Table 1. There was similar distribution regarding dental caries experience and malocclusion. The prevalence of oral health outcomes was 56.9% for dental caries and 43.1% for malocclusion.
Scores on the overall scale ranged from 0 to 40, with a mean value of 7.09 and standard deviation of 7.73.

For the overall scale, floor effects were low; 17.9% of subjects achieved a score of zero. The ceiling effect (maximum score) only occurred with one subject (0.8%). The ‘don’t know’ answer (DK) is allowed on the FIS. Only 4.06% of informants answered DK for at least one question on the instrument and these answers were recoded as 0.

Table 2 displays the percentage distribution of responses for parents who answered the FIS. Overall, 82.1% of the informants reported some family impact from the child’s oral condition during the previous 3 months. Impact on parental or family activities was reported by 54.5%; impact on parental emotions was reported by 60.2%; and conflict in the family and financial difficulties was reported by 27.6%.

Overall Family Impact Scale scores for the two clinical groups were higher in the malocclusion group (mean 7.25) and lower in the dental caries group (mean 6.97). The subscales scores (PA, FC, FB) were higher in the malocclusion group. For the dental caries group, the PE subscale achieved the highest score. However, these differences were not statistically significant (p>0.05) (Table 3).

Table 4 displays data regarding the construct validity of the instrument. There were significant associations...
between the total FIS score and parent-caregiver global ratings of the child’s oral health (p<0.001) and overall wellbeing (p<0.001) in the expected direction. The association was stronger for global ratings of wellbeing (r=0.38; p<0.001) than for global ratings of oral health (r=0.25; p<0.001). For all three subscales (PA, PE and FC), the global ratings of overall wellbeing and oral health were associated (p<0.05 for all analyses). The financial difficulty item was not associated (p>0.05).

Cronbach’s alpha for the 14-item scale was 0.79, indicating good internal consistency reliability. This was not improved by the deletion of any item from the scale. For the three multi-item scales, alpha values varied from 0.52 to 0.62 (Table 5).

The test-retest reliability assessment was based on 53 parent-caregivers whose children’s oral condition had not changed between the two administrations of questionnaire. The ICC was 0.83, indicating substantial to perfect agreement. For the three subscales, the ICC varied from 0.69 to 0.84. For the financial burden subscale, the ICC was 0.59.

**Discussion**

The Brazilian version of the Family Impact Scale for the Portuguese language also exhibited good psychometric properties, with acceptable validity and reliability. The total FIS score is computed by summing all the item scores. As there were 14 items, the final score varied from 0 to 56. In this study, the total score ranged from 0 to 40, indicating that the measure was sensitive to variations in family impact.
Discriminant validity revealed that the malocclusion group achieved higher scores on the overall scale and subscales (except for the PE subscale) than the caries group. However, this result was not statistically significant and was similar to findings in the Canadian study [Locker et al., 2002]. For the Chinese version of FIS, discriminant validity also revealed a higher score for the malocclusion group than caries group; in this case, however, the difference was statistically significant (p<0.05) [McGrath et al., 2008]. Since treatment for children’s oral conditions is decided by parents, orthodontic treatment is often an aesthetic treatment of high cost [Marques et al., 2006]. In fact, the financial burden proved greater for the malocclusion group than the dental caries group. On the other hand, dental caries may be the cause of many problems, such as pain, discomfort and difficulty in eating [Barrettó et al., 2004]. This was likely the reason for the dental caries group to achieve a higher score on the parental emotions subscale.

Construct validity with global ratings and FIS revealed a stronger association between overall wellbeing and the scale/subscales scores in a number of studies [Locker et al., 2002; McGrath et al., 2008]. This result suggests that the global rating of overall wellbeing may be closer to the construct of oral health-related quality of life than the global rating of oral health [McGrath et al., 2008]. The financial burden subscale was not associated with the global indicators in the present study. In Canada, this subscale was associated with global indicators and, in China, the item was only associated with the overall wellbeing rating [Locker et al., 2002; McGrath et al., 2008]. The authors of the Chinese study suggest that the weak correlation occurred because this subscale is assessed by a single item [McGrath et al., 2008]. They also recommend that the overall score be used as a primary outcome measure, as there is stronger support for its validity than for the subscales alone.

The assessment of internal consistency was determined by a Cronbach’s alpha of 0.79, indicating good reliability. Test-retest reliability was demonstrated by an ICC of 0.83, indicating nearly perfect agreement between the parents-caregivers who answered the instrument on both occasions. An ICC of 0.5 or above is considered acceptable reliability [Cronbach, 1951; Nunnally and Bernstein, 1994]. Similar results were obtained in the Canadian and Chinese studies [Locker et al., 2002; McGrath et al., 2008]. In a New Zealand study, the FIS was administered to a sample of parents of young children following dental treatment under general anaesthesia [Malden et al., 2008]. To assess test-retest reliability, the first questionnaire was filled out by parents either before treatment or while the child was undergoing treatment. The follow-up questionnaire was filled out three weeks later by the same parent-caregiver who answered the first questionnaire and reported that the child’s oral health did not change between the two administrations of the questionnaire. Cronbach’s alpha was 0.88, which is similar to that of the present study [Malden et al., 2008]. The managing of the DK answers (i.e., recode to zero score) does not compromise the psychometric properties and avoids the loss of valuable data, which would otherwise occur if these items were deleted [Marshman et al., 2007].

Conclusion

The Brazilian version of the FIS exhibited adequate properties regarding the reliability and validity of the construct. It can be recommended as a parameter for evaluating family impact caused by oral conditions in Brazilian children between 11 and 14 years of age.

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References


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