Journal section: Community and Preventive Dentistry
Publication Types: Research

doi:10.4317/medoral.16.e430
http://dx.doi.org/doi:10.4317/medoral.16.e430

Validation of the $CPQ_{8-10ESP}$ in Mexican School children in urban areas

Fátima-del Carmen Aguilar-Díaz [1], María-Esther Irigoyen-Camacho [2]

[1] Student of the Master Program in Medical and Dental Science, Public Health National Autonomous University of Mexico
[2] Health Care Department, Metropolitan Autonomous University of Mexico

Correspondence:
La Corona 18 A,
Col Industrial CP 07800,
Gustavo A Madero,
Distrito Federal, México
fatimaguilar@gmail.com

Aguilar-Díaz FC, Irigoyen-Camacho ME. Validation of the CPQ 8-10ESP in Mexican School children in urban areas. Med Oral Patol Oral Cir Bucal. 2011 May 1;16 (3):e430-5.
http://www.medicinaoral.com/medoralfree01/v16i3/medoralv16i3p430.pdf

Received: 01/03/2010
Accepted: 29/05/2010

Article Number: 16915 http://www.medicinaoral.com/

eMail: medicina@medicinaoral.com
Indexed in:
Science Citation Index Expanded
Journal Citation Reports
Index Medicus, MEDLINE, PubMed
Scopus, Embase and Emcare
Indice Médico Español

Abstract

The current indicators used to gather information on oral health in children are basically clinical indexes that register mainly dental caries, periodontal disease, and malocclusion. These indexes should be complemented with emotional and social aspects related to the individual experience and perception of oral health status. In order to obtain this information, valid instruments capable of evaluating the impact of oral health as it relates to the quality of life (OHRQoL) are required. The objective of the Child Perceptions Questionnaire (CPQ_{8-10}) is to assess OHRQoL in children aged eight to ten years. CPQ_{8-10} consists of 25 questions divided into four domains: oral symptoms, functional limitation, emotional well-being, and social well-being.

Objective: The aim of this study was to validate the translated Spanish version of the Child Perceptions Questionnaire ($CPQ_{8-10ESP}$) in use with Mexican urban children.

Material and Methods: Three hundred fifteen students in Mexico City aged eight- to ten-years-old participated in this study. The $CPQ_{8-10ESP}$ questionnaire was self-administered in the classroom. Clinical data about caries and malocclusion were obtained. To assess test-retest reliability, the questionnaire was reapplied to a subgroup of children.

Results: Cronbach's alpha reliability coefficient was 0.89 for the total $CPQ_{8-10ESP}$ scale. The intraclass correlation coefficient was 0.67; a statistically significant difference was found in the $CPQ_{8-10ESP}$ mean score between children with caries and malocclusion; a significant correlation between general well-being ratings with all domains was found ($p<0.001$). General perception of oral health was associated with both oral symptoms ($p=0.049$) and emotional well-being ($p=0.022$) domains, as well as with the total scale ($p=0.015$).

Conclusions: The $CPQ_{8-10ESP}$ version showed good validity and reliability for use with Mexican schoolchildren from urban areas.

Key words: *Quality of life, oral health, children, Spanish, psychometric properties.*

Introduction

The current indicators used to gather information on oral health in children are basically clinical indexes related to caries, periodontal disease, and presence of malocclusion. These measure only the presence and severity of illness, and give scarce consideration to the functionality of the oral cavity as a whole, or to the impact of the symptoms on the patients' quality of life. The clinical indexes used to establish the presence and severity of pathological conditions should be complemented with indicators of social and emotional aspects related to the individual experience and subjective perception of changes in the patients' physical, mental, and social health (1).

In order to obtain this information, valid and reliable instruments capable of evaluating the impact of oral health on the quality of life in a specific population are required. It is necessary first to validate these instruments in the group for which their use is intended.

In recent years some instruments have been developed to evaluate oral health-related quality of life (OHRQoL) in children. In 2002, Jokovic et al. (2) developed the Child Perceptions Questionnaire (CPQ), which is one of the first instruments used to evaluate OHRQoL in children. In addition to the CPQ, there is a Parent's Perceptions Questionnaire (PPQ) (3) and a Family Impact Scale (FIS) (4), which compound a battery of instruments that provide information at different levels and perspectives for OHRQoL in children.

The CPQ has two versions. One is the CPQ11-14 for children from 11 to 14 years of age; the other, which is the CPQ_{8-10} (5), is for children aged 8 to 10 years of age. Both aim to evaluate the impact of oral and orofacial conditions in children at a functional, emotional, and social level.

The Child Perceptions Questionnaire 8-10 contains 29 questions. The first two relate to demographic information; the next two pertain to global items; and the remaining twenty-five are divided into four domains: oral symptoms (OS), functional limitation (FL), emotional well-being (EW), and social well-being (SW). The questionnaire registers problems occurring during a prior four-week period. The responses are recorded in a Likert scale from 0 to 4, where 0= never; 1= once or twice; 2= sometimes; 3= often; and 4= every day or almost every day. The maximum score is 100, and the minimum is 0. For the global question concerning the general perception of oral health, the possible responses are 0= very good, 1= good, 2= OK, 3= poor. Regarding the second global question: How much does oral health affect daily living? the scale is this: 0= not at all, 1= a little bit, 2= some, 3= a lot.

Additional instruments have been developed to evaluate OHRQoL in children (6-9). However, these instruments have been created in English. Several non-Anglo-Saxon countries have performed the translation and adaptation of these questionnaires into their own languages in order to use them in a reliable way within their populations, after ensuring that adequate internal consistency, as well as satisfactory psychometric properties, have been retained in the translations (10-13). This approach is a good alternative since it saves time and resources, and it works better than using the multiple indices aiming to evaluate OHRQoL (13). At this time, the validity and reliability of CPQ_{8-10} has been tested in Northern Ireland and in Australia. It has also been translated into Portuguese for application in Brazilian groups (14); and it has been translated into Danish (15).

Spanish is the official language in 21 countries of the world. However, until recently, no valid instruments existed in Spanish that fulfilled the characteristics required to measure quality of life in Spanish-speaking children. Because dental caries and other oral disorders are prevalent in many Latin American Spanish-speaking countries, adequate instruments are needed to assess the OHRQoL of these populations. The aim of this study was to assess the validity and reliability of the translated Spanish version of the Child Perceptions Questionnaire ($CPQ_{8-10ESP}$) among Mexican urban children.

Material and Methods

Translation-adaptation

This validation study was conducted in two public elementary schools with students from lower-to-middle socioeconomic status in southern Mexico City. The participants were students 8 to 10 years of age. Children's participation was voluntary, and a parent's informed consent was obtained for each child before the study commenced.

The original questionnaire, CPQ_{8-10}, was translated from English to Spanish, attempting to retain a faithful translation of the original English version. Then an independent translator, who was not a participant in the study and knew nothing about the English version of the CPQ_{8-10}, created a back translation to the original English. This back translation was compared with the original English one in order to evaluate the literal, conceptual, and semantic similarities. Once the Spanish translation's literal equivalence to the original version was verified, it was next reviewed by an expert panel. A consensus was reached to modify some words that could be confusing to Mexican children aged 8- to 10-years-old.

Concepts that children did not understand and questions that might confuse them were identified through focal groups. Necessary changes were made based on this information, preserving the semantic equivalence, thus making the instrument adequate and understandable for self-administration in this age group.

The $CPQ_{8-10ESP}$ was self-administered in the classroom.

The children were instructed to read it carefully, not to talk to anyone while answering the questionnaire, and to choose what they felt was the most appropriate response. The questionnaire was reapplied 8 to 25 days later to a subgroup of children to assess the test-retest reliability.

The first version was used in a pilot group comprising 21 8- to 10-year-old children. The instructions were read and explained to the children. In addition, they were asked to consult the test administrator if they had any questions or if they encountered a word or concept they did not understand. The most difficult concepts to understand were these: "ulcers", "frustrated", and "angry". Once the questionnaire was completed and the children´s questions were answered, they were asked to write the words ulcers, frustrated, and angry, and then find a synonym for each one of them.

In order to improve internal consistency, changes were again made in both the vocabulary and syntax of the questions. The instrument was administered again, and the results obtained with the modified version were superior to those obtained with the first Spanish version of the questionnaire.

To evaluate discriminatory validity, oral inspection was conducted on a subgroup of children, and clinical data was collected using the indexes recommended by the World Health Organization (WHO). The decayed, missing, and filled primary and permanent tooth surfaces (dmfs, DMFS) indices were used, and the Dental Aesthetic Index (DAI) was applied for the evaluation of malocclusion. The DAI assesses dental appearance, based on 10 intraoral measurements, classifying individuals in one of four possible categories of severity. Clinical examination was conducted in the classroom using a mouth mirror No 5, a WHO-type probe with artificial lighting, and utilizing infection control barriers. A pedodontist carried out the clinical measurements, with prior standardization for the dental caries index and malocclusion. Kappa value obtained for the diagnosis of caries at tooth surface level was 0.88; for the malocclusion classification in the various categories, according to DAI criteria, it was 0.91.

Statistical analysis

To assess the internal consistency of the $CPQ_{8-10ESP}$ total scale and the values of each domain, the reliability coefficient of Cronbach's alpha was used. An intraclass correlation coefficient (ICC) was used to assess test-retest reliability. To detect the correlation between the total $CPQ_{8-10ESP}$ score and its domains, Spearman's rank correlation (r*) test was performed. Non-parametric tests, Mann Whitney or Kruskal-Wallis, were used to identify whether children experiencing a high impact on their quality of life had a greater deterioration in their oral health. Statistically significant test results were set at a level of $p \leq 0.05$. Statistical analysis was carried out with SPSS software (version 13, SPSS Inc., Chicago).

This project was approved by the National Autonomous University of Mexico, School of Dentistry, Postgraduate Unit Research Committee. The committee reviewed all content of the protocol, including the ethical aspects.

Results

Three hundred and fifteen students in Mexico City, aged 8- to 10-years-old, participated in this study. The mean age was 8.8 (SD 0.7) years old; 50.5% were girls and 49.5% were boys. The $CPQ_{8-10ESP}$ mean score was 16.42 (SD 14.7).

In relation to the global questions, the results showed that a similar percentage of children thought their mouth was in "very good" or "good" condition, 25.8% and 24.8%, respectively. More than a third of the children (36.1%) considered that their mouth was in "regular" condition, and 12.9% of the children perceived that their mouth was in "bad" shape. On questions regarding pain or discomfort, 45.2% of the children indicated that their mouth did not produce any discomfort in their daily lifes; 28.2% said their mouth produced little discomfort; 19.5% said their mouth produced some discomfort; and 7.1% reported that their mouth bothered them a lot in their everyday life activities.

Internal consistency

Internal consistency (Cronbach's alpha) coefficients for the different domains in the first adaptation were as follows: OS 0.68, FL 0.62, EW 0.53, and SW 0.29; while in the second adaptation, the values were higher: OS 0.71, FL 0.74, EW 0.86, and SW 0.72. The best internal consistency measure was achieved in the second adaptation of the questionnaire with 0.89 for the total $CPQ_{8-10ESP}$ scale. Thus, the internal consistency of this second version was deemed adequate for children who were 8- ,9-, and 10-years-old (Cronbach's alpha value >0.85).

Test-retest reliability

The $CPQ_{8-10ESP}$ test-retested assessment was carried out for 162 children, of which 50% were girls. The second test application was done 8 to 25 days after the first one. The test-retest reliability for each of the four domains and for the $CPQ_{8-10ESP}$ total scale was acceptable for all domains except for the emotional well-being domain (Table 1). Test-retest reliability was also evaluated by dividing the studied population into two groups according to age: 8-year-olds and 9- to 10-year-olds. It was noted that the lowest ICC values were obtained among 8-year-old children (0.535), whereas 9- to 10-year-olds' intraclass reliability was higher (0.777) for the total scale.

Moreover, the amount of time that elapsed between questionnaire applications affected the reliability coefficient. It was observed that ICC decreased as the amount of time increased between the first and second

Table 1. General test-retest reliability (ICC*) and according to age, time of reapplication of the CPQ8-10ESP in a group of children in Mexico City.

		CPQ 8-10ESP	Oral symptoms	Functional limitation	Emotional well-being	Social well-being
AGE	n =162	0.666	0.641	0.670	0.555	0.661
	8 (n=75)	0.535	0.421	0.476	0.494	0.681
	9-10 (n= 87)	0.777	0.772	0.803	0.614	0.649
DAYS*	8 (n =49)	0.900	0.706	0.832	0.794	0.943
	15 (n =36)	0.772	0.600	0.689	0.621	0.831
	>15 (n = 77)	0.463	0.637	0.559	0.310	0.464

*ICC=Intraclass correlation coefficient, *Elapsed between applications.

Table 2. Average value of CPQ8-10ESP according to the degree of malocclusion* in a group of schoolchildren in Mexico City.

	Low			Moderate			Severe			
	Median	Mean	SD	Median	Mean	SD	Median	Mean	SD	P**
CPQ 8-10ESP	4	6.39	12.6	6	10.93	12.7	17	21.03	18.8	0.000
Oral symptoms	1	2.22	3.0	4	3.37	2.5	4	5.9	4.4	0.001
Functional limitation	0	0.83	1.4	0	1.63	2.6	2	3.83	4.7	0.008
Emotional well-being	0	0.70	1.2	1	2.44	2.7	3	4.75	5.1	0.002
Social well-being	0	2.65	8.3	1	3.48	6.9	5	6.72	7.3	0.001

*Dental Aesthetic Index **Kruskal-Wallis.

applications. The coefficients obtained when the questionnaire was conducted again, after more than 15 days, were low, particularly in the emotional well-being domain (ICC=0.310).

Construct validity

A positive correlation was found between the $CPQ_{8-10ESP}$ total scale and the global questions related to oral health ($r^* = 0.212$, $p < 0.015$) and general well-being ($r^* = 0.431$, $p<0.001$).

General well-being was associated with all $CPQ_{8-10ESP}$ domains, (OS $r^* = 0.424$, FL $r^* = 0.368$, EW $r^* = 0.370$, SW: $r^* = 0.155$, $p<0.001$), while the general perception of oral health was associated only to with oral symptoms ($r^*=0.173$, $p=0.049$) and emotional well-being ($r^*=0.20$, $p=0.022$) domains.

Discriminant validity

Significant associations were found among the overall $CPQ_{8-10ESP}$ score and the EW domain and the dental caries index. The mean dmfs+DMFS of the children was 4.5 (SD 7.6). For primary dentition it was dmfs=3.4 (SD=2.2), and for permanent it was DMFS=1.1, (SD 6.1). The main component was decayed teeth (mean=7.19, SD=5.8), followed by filled teeth (mean=2.82, SD=5.2) and lost teeth (mean=0.98, SD=2.5). It was detected that children who do not present caries (dmfs and DMFS=0) tend to report lower scores in the overall scale and in each domain, compared to children who have had caries experience, whether they had cavities, or filled or lost teeth.

In addition, children with three or more caries lesions, or filled or lost tooth surfaces in either permanent or deciduous teeth (dmfs + DMFS ≥3) reported higher scores in $CPQ_{8-10ESP}$ total scale and in every domain than did children with a lower number of affected tooth surfaces. These differences were significant in the overall scale (<3 surfaces group median was 3.5, >3

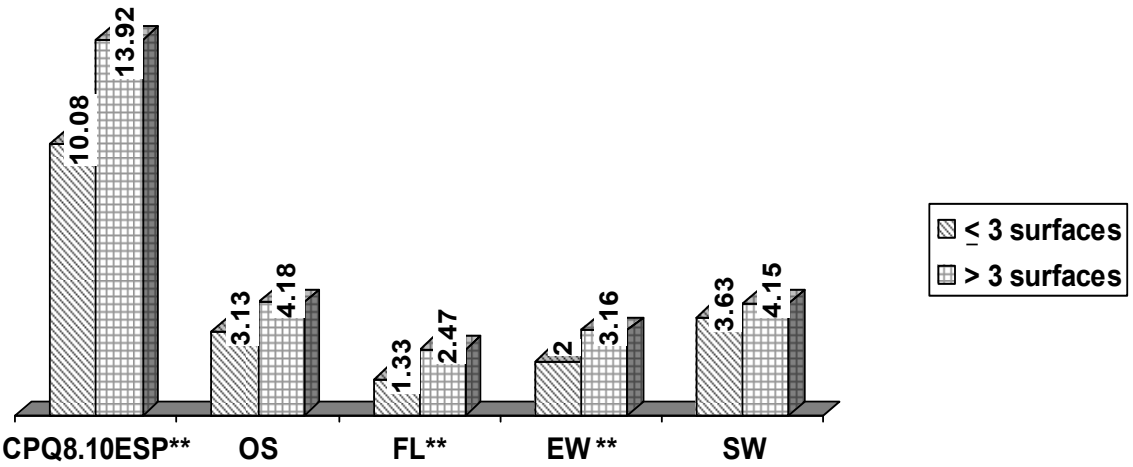

Fig. 1. Average value of the CPQ8-10ESP according to the number of surfaces* affected in a group of schoolchildren in Mexico City.
*DMFS+dmfs, **Mann Whitney test p<0.05. Oral sympomts(OS),Functional limitation(FL),Emotional well-being (EW),Social well-being(SW).

surfaces group median was 8, p=0.023), as well as in the functional limitation (median: <3 surfaces group= 0, >3 surfaces group= 1, p=0.046) and emotional well-being (median: <3 surfaces group= 0, >3 surfaces group= 2, p=0.007) domains (Fig. 1).

In addition, for the presence of malocclusion, significant differences were found in the $CPQ_{8\text{-}10ESP}$ overall score and in every domain between groups that had been classified according to severity of malocclusion. Children with severe malocclusion anomalies reported higher scores (p<0.001), (Table 2).

Discussion

The $CPQ_{8\text{-}10ESP}$ version evaluated presented good validity and reliability. The systematic process followed in the adaptation facilitated the equivalence of the adapted version to the original version. During the initial adjustment phase, we were able to work with focal groups, which allowed assessment of the understanding of the content of the questions by the children, and these focal groups contributed comments that greatly improved the adaptation process.

The psychometric properties of $CPQ_{8\text{-}10ESP}$ were very similar to those obtained in the original version. The internal consistency of the Spanish version is similar to that reported by Jokovic et al. (5) in the original English version; it is also similar to the reported in other studies from different countries that evaluated the validity of this instrument (15).

Since the test-retest reliability has not been evaluated in all the translations and validations of this instrument, our results can be compared only to those that have been reported by the authors of the original questionnaire and by one translation made in Brazil. The values obtained in this study are similar to those reported in the original questionnaire, and they are lower than the results obtained in the Portuguese version adapted for Brazilian children (14).

The results in this study suggest that the test-retest reliability is low for Mexican 8-year-old children. In general, few studies have evaluated the response stability of self-administered instruments in children of this age. More studies are needed to identify causes of this result. For example, the reading comprehension skill of 8-year-old children in Mexico for health-related concepts is unknown. To evaluate quality-of-life-related health, the perceptions of parents or children revealed through interviews are generally used when evaluating this age group. However, these evaluations are not sufficient because they may be strongly influenced by the extent to which the health conditions are a burden to the parents. A basic requirement of instruments that evaluate quality of life is that they be self-administered (16).

Moreover, the decline in test-retest reliability as time between applications increases is worth noting. The domain components that showed less stability were emotional and social well-being. It is possible that changes in the children's overall emotional state when they answered the second questionnaire were influenced by other aspects of their emotional relationships that impacted how they evaluated situations, thus altering their perceptions of the degree of impact that their oral health had on quality of life.

Regarding construct validity in this study, as well as in the original, low correlations were observed in the

four domains and in the two global questions. There was a significant correlation between all the domains with the perception of general well-being ($p<0.001$). However, the general perception of oral health did not obtain a significant correlation with the FL and SW domains. This lack of correlation may be associated with the difficulty many children experience in trying to interpret the concepts of excellent, very good, regular, or poor in relation to their mouth. However, using the specific questions about the oral cavity it was possible to detect that deterioration in their oral health had an impact on their quality of life. Likewise, the results of the CPQ_{11-14} applied among Danish children showed low correlations between the global perception of oral health and the different domains of the instrument, in children aged 11 to 14, but not in the group of 8- to 10-year olds (15). Similarly, other groups of children have shown an acceptable correlation between the CPQ domains and the overall perception of their oral health (17).

The discriminant validity, as in other validations of this instrument, was low. Differences were observed among those children who had 3 or more surfaces affected by caries, particularly in relation to functional limitation, emotional well-being, and the overall scale. This instrument shows good discriminatory capacity with respect to the presence of malocclusion, it was observed that quality of life is most affected as the degree of malocclusion increases. It is important to encourage the dentist to consider not only the clinical aspects of the oral condition but also the impact of this condition in the general well-being of the child. Additional research is needed regarding the discriminant validity of this version in studying other oral pathologies, such as fluorosis and craniofacial disorders.

Conclusions

The $CPQ_{8-10ESP}$ version has good validity and reliability for use in Mexican schoolchildren from urban areas and good discriminant validity for malocclusions; however, it has low discriminatory power regarding the presence of caries. It would be useful to widen the study of the test-retest reliability of this instrument, particularly when administered in young age groups. In general, the $CPQ_{8-10ESP}$ version showed qualities that make it an adequate instrument for the evaluation of oral health-related quality of life among Spanish-speaking children.

References

References with links to Crossref - DOI

1. Gherunpong S, Tsakos G, Sheiham A. A sociodental approach to assessing dental needs of children: concept and models. Int J Paediatr Dent. 2006;16:81-8.
2. Jokovic A, Locker D, Stephens M, Kenny D, Tompson B, Guyatt G. Validity and reliability of a questionnaire for measuring child oral-health-related quality of life. J Dent Res. 2002;81:459-63.
3. Jokovic A, Locker D, Stephens M, Kenny D, Tompson B, Guyatt G. Measuring parental perceptions of child oral health-related quality of life. J Public Health Dent. 2003;63:67-72.
4. Locker D, Jokovic A, Stephens M, Kenny D, Tompson B, Guyatt G. Family impact of child oral and oro-facial conditions. Community Dent Oral Epidemiol. 2002;30:438-48.
5. Jokovic A, Locker D, Tompson B, Guyatt G. Questionnaire for measuring oral health-related quality of life in eight- to ten-year-old children. Pediatr Dent. 2004;26:512-8.
6. Gherunpong S, Sheiham A, Tsakos G. A sociodental approach to assessing children's oral health needs: integrating an oral health-related quality of life (OHRQoL) measure into oral health service planning. Bull World Health Organ. 2006;84:36-42.
7. Yusuf H, Gherunpong S, Sheiham A, Tsakos G. Validation of an English version of the Child-OIDP index, an oral health-related quality of life measure for children. Health Qual Life Outcomes. 2006;4:38.
8. Broder HL, McGrath C, Cisneros GJ. Questionnaire development: face validity and item impact testing of the Child Oral Health Impact Profile. Community Dent Oral Epidemiol. 2007;35 Suppl 1:8-19.
9. Pahel BT, Rozier RG, Slade GD. Parental perceptions of children's oral health: the Early Childhood Oral Health Impact Scale (ECOHIS). Health Qual Life Outcomes. 2007;5:6.
10. Tubert-Jeannin S, Pegon-Machat E, Gremeau-Richard C, Lecuyer MM, Tsakos G. Validation of a French version of the Child-OIDP index. Eur J Oral Sci. 2005;113:355-62.
11. Goursand D, Paiva SM, Zarzar PM, Ramos-Jorge ML, Cornacchia GM, Pordeus IA, et al. Cross-cultural adaptation of the Child Perceptions Questionnaire 11-14 (CPQ11-14) for the Brazilian Portuguese language. Health Qual Life Outcomes. 2008;6:2.
12. Brown A, Al-Khayal Z. Validity and reliability of the Arabic translation of the child oral-health-related quality of life questionnaire (CPQ11-14) in Saudi Arabia. Int J Paediatr Dent. 2006;16:405-11.
13. Cortés-Martinicorena FJ, Rosel-Gallardo E, Artazcoz-Osés J, Bravo M, Tsakos G. Adaptation and validation for Spain of the Child-Oral Impact on Daily Performance (C-OIDP) for use with adolescents. Med Oral Patol Oral Cir Bucal. 2010;15:e106-11.
14. Barbosa TS, Tureli MC, Gavião MB. Validity and reliability of the Child Perceptions Questionnaires applied in Brazilian children. BMC Oral Health. 2009;9:13.
15. Wogelius P, Gjørup H, Haubek D, Lopez R, Poulsen S. Development of Danish version of child oral-health-related quality of life questionnaires (CPQ8-10 and CPQ11-14). BMC Oral Health. 2009;9:11.
16. Rutishauser C, Sawyer SM, Bowes G. Quality-of-life assessment in children and adolescents with asthma. Eur Respir J. 1998;12:486-94.
17. Do LG, Spencer AJ. Evaluation of oral health-related quality of life questionnaires in a general child population. Community Dent Health. 2008;25:205-10.