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The child oral health impact profile: current status and future directions

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The development of valid and reliable instruments to assess children's health-related quality of life (QoL) is at a relatively early stage although the field is expanding rapidly (1). In a recent review of paediatric QoL instruments, Davis et al. identified 14 generic and 25 condition-specific QoL instruments (2). They documented several conceptual domains common to most of these measures, including emotional, social and physical health and well-being, and noted that existing questionnaires usually assessed difficulty or negative impacts with limited attention to the positive aspects of life and happiness. However, many theoretical and methodological issues remain to be addressed for measuring children's health-related QoL generally, including evaluation of the conceptual frameworks guiding QoL assessment and the psychometric properties of the most widely used measures.

Methods to assess oral health-related OHRQoL among children is at an even earlier stage with few valid and reliable multidimensional instruments to evaluate the effects of oral health conditions on functional, social and psychological well-being. Jokovic and colleagues (3–8) have laid the foundation for much of the literature on children's OHRQoL with the Child Perceptions Questionnaire (CPQ). This questionnaire consists of four domains: oral symptoms, functional limitations, emotional well-being and social well-being, and, as with other QoL measures, assesses the frequency and impact of oral health problems in these domains. Much of the work on the CPQ has been conducted in Canada. Several other investigators have developed instruments to assess OHRQoL among school-age children (9).

Gherunpong et al. (10–12) adapted the Oral Impacts on Daily Performance scale for children (Child-OIDP). This scale has been used with Thai and French 11- to 12-year-old children and assessed impact on eight areas: eating, speaking, cleaning, sleeping, emotion, smiling, study and social contacts (13, 14). Preliminary data showed that this scale was valid and reliable in these populations. Meanwhile, other investigators have developed questionnaires to be completed by parents and caregivers to evaluate OHRQoL of their pre-school-age children (15, 16). More work is needed to demonstrate the psychometric properties and utility of all of these scales, particularly in other cultures.

Despite the growing literature, there is still a paucity of data on OHRQoL among children. Much of the literature in this area has been devoted to the development and testing of new scales among convenience samples. There is almost no information on more representative clinical populations or community samples to assess the impact of oral problems on children. Needless to say, there are no longitudinal studies assessing the effects of treat-

ment on OHRQoL or changes over time. With the exception of the papers in the issue (see further discussion below), there are no studies of disadvantaged populations that would be at the greatest risk of QoL impacts because of higher prevalence of dental conditions and limited access to dental care.

Contributions of the COHIP

The papers in this special issue describe the development and the validity and reliability testing of the Child Oral Health Impact Profile (COHIP) that has made several contributions to the literature on OHRQoL among children. First, as is the trend in all QoL measures, the COHIP was multidimensional and evaluated those aspects of health described very early by the World Health Organization as not just being the absence of disease, but social, psychological and functional well-being. The COHIP incorporated dimensions common to most adult measure of health-related QoL and other OHRQoL measures developed for children, including Oral Symptoms, Functional Well-being, Social-Emotional Well-being, School Environment and Self-Image. The development of these subscales was supported by the results presented in the papers that address the validity and reliability of the COHIP.

Second, the reports in this issue demonstrate that the COHIP is readable and acceptable to a variety of children and carers. It was translated into Spanish and French and seemed to perform well in these languages. It was relatively brief and could be completed fairly quickly with a reading level of grade 3.5, making it accessible to a wide audience.

Third, the questionnaire has been used in a low-income community sample. This was an important contribution, as relatively little is known about OHRQoL among disadvantaged children. It was noteworthy that the participants in the community sample had the highest scores on the COHIP indicating better perceived QoL among these children.

A fourth strength is the fact that the questionnaire has been developed and tested among children with variety of clinical conditions. Specifically, the COHIP appears capable of discriminating between groups based on their experience of dental decay and perceptions about appearance. These represent the predominant forms of disease and anatomic variation (respectively) that account for the vast majority of dental services provided to children. Hence, there is real practical value in developing an instrument that is relevant for this population.

Finally, the COHIP has incorporated items that measure the positive aspects of oral health. This was an advance that goes beyond most other questionnaires that assess OHRQoL among children. That feature, coupled with the fact that the COHIP queries both parents and children, creates opportunities to investigate theoretical questions about perceived health that is not addressed in QoL research among adults, where views usually are recorded only from respondents. The paper in this issue examining concordance between children and parents in their perceptions of health provides a good illustration of how we can obtain new insights into OHRQoL and the factors that influence it.

Current Status of the COHIP

The papers presented in this issue report on the development and the validity and reliability of the COHIP. The preliminary evidence (17) suggested that the COHIP demonstrated acceptable validity and reliability. The total COHIP scores were more stable than the subscales in terms of internal reliability, and were more consistently correlated with clinical indicators and global health ratings than the subscale scores. These results indicated that more refinement of the subscales would be needed before they could stand independently of the total scores.

Other important issues that Broder and Wilson-Genderson addressed in their analysis of the validity and reliability of the COHIP were ceiling and floor effects of the total scale and subscales. There appeared to be some ceiling effects for the Social Functioning and School subscales. However, the overall COHIP showed fewer ceiling and floor effects with relatively good dispersion of scores among the three clinical and community based groups studied.

The paper on concordance between children and carers on the COHIP (18) addressed another critical issue when investigating children's health – whether and when to use proxy measures of health status. It has been commonly accepted to assess the perceptions of primary carers about children's experiences. Carers are well positioned to report information about some objective aspects of children's conditions, such as medication adherence or school absences, subjective reports of their child's

social functioning and well-being, as well as impacts on family functioning. As shown by Wilson-Genderson et al., perceptions of children and carers did not always coincide. Their findings agreed with much of the literature on proxy measures that have shown that proxy reports were poorly correlated with self-report, and that the concordance depended on sex, age and type of problem (19). In this study, craniofacial patients were more likely to rate OHRQoL higher than they were to agree with their carers' ratings. In contrast, paediatric and orthodontic patients were more likely to either agree with or rate their OHRQoL lower than their carers' ratings.

The preliminary data on concurrent validity were encouraging and supported the notion that the COHIP is measuring social and psychological well-being. The COHIP subscales had higher correlations with the criterion psychosocial scales (20) than with the clinical indicators of oral health and the global oral health rating (17). Although the sample in this study was a small sample of convenience which limited generalizability, the study did show that the COHIP had good concurrent validity.

Future directions

The early evidence has indicated that the COHIP has demonstrated acceptable validity and reliability. More refinement is needed on the reliability and the ceiling/floor effects of some of the subscales which may require additional item analysis and subscale assessment. Going forward, more needs to be done to assess the COHIP in more representative clinical and community-based samples. The ultimate goal is to establish the sensitivity and specificity of the COHIP in epidemiological and clinical trials. Finally, the authors of the COHIP need to investigate and evaluate what are clinically meaningful differences between populations and oral health conditions as well as clinically meaningful changes in the COHIP for the patient over time. These include the effect of developmental stage on measuring children's QoL, the role of proxy reports, such as carers' evaluations, in QoL instruments and the importance of including children with special needs in assessing children's QoL and the associated complexities. There are additional challenges that confront this emerging area of research and it is the purpose of this article to discuss these issues and outline areas for future research. We address three broad areas.

Opportunities for new research using the COHIP

It seems almost certain that there will be a demand for a shorter version of the COHIP. The current instrument is lengthy, and it requires that both parents and children record responses, two features that probably will be impossible to accommodate in some study settings. Yet, as clinicians, policy-makers and other researchers learn about perceived oral health in childhood, it is inevitable that they will want to include at least some aspects of this construct in other studies that themselves use lengthy questionnaires. There is often a tension between the need to limit the length of questionnaires, and hence respondent burden, while capitalizing on an opportunity in an existing study to learn more about a construct such as children's OHRQoL. Yet, the history of questionnaires about perceived health suggests that it will probably take many years of additional research before a shortened version of the COHIP can be developed and evaluated. For example, it has taken decades for shortened versions of the SF-36 to be developed, and the search for yet-shorter and simpler versions of such questionnaires persists. When a valid and reliable brief set of questions has been developed, the question will arise as to whether and how children's OHRQoL should be monitored through population surveillance or during their clinical dental care.

Positive items

One central question that needs to be addressed as the COHIP is used more broadly concerns the conceptual and statistical benefits that arise from explicit questioning positive aspects of oral health among children. Intuitively, it is appealing to believe that assessment of such positive dimensions will yield data that are more informative than simply quantifying the extent to which children are *not disadvantaged* in their oral health. However, there are numerous psychometric and statistical issues that need to be researched in order to test that belief, including the extent to which positive and negative experiences are recognized consistently by people who do and do not have disease, and the extent to which recorded responses are orthogonal. An equally important question is the extent to which information about positive and negative dimensions of oral health 'makes a difference' in the inferences that are drawn by clinicians, public health authorities and policy-makers. Potentially, these users of information may need guidance to

interpret the data and draw inferences. For example, what clinical and/or public health interpretations should be made if a given intervention has mixed effects, that is, producing better outcomes with respect to positive dimensions of health, but worse outcomes regarding negative dimensions.

Sensitivity and specificity in epidemiological studies and clinical trials

The papers presented here offer strong evidence for the validity and reliability of the COHIP and the ability of the scale to differentiate among groups presenting with different clinical conditions. The next step in this process is to evaluate the scale in the context of larger epidemiological studies and clinical trials to assess the sensitivity and specificity of the COHIP. This effort would require large representative samples that include a substantial array of oral health conditions and severities. Using the COHIP as outcome measures in the context of clinical trials also would require preliminary work on precision of the scale to detect differences over time that are attributable to the intervention being evaluated. Given the array of trials possible, the effect sizes could be large or small. The ability of the COHIP to perform effectively in the context of clinical trials needs further assessment.

Conclusion

The papers presented in this issue provide a collective overview of the development, reliability and validity of the COHIP and represent a strong start for a new instrument to assess OHRQoL among children.

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