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ORIGINAL ARTICLE

Agreement Between Reports of Parents and Children About Children's Oral Health-Related Quality of Life

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Abstract

Objective: To assess agreement between reports of parents and children about children's oral health-related quality of life (OHRQoL). **Material and Methods:** A total of 50 pairs of preschool-aged children, aged 5-6 years and their parents, who sought dental care at the Faculty of Dentistry of the Federal University of Amazonas, answered the Brazilian version of the Scale of Oral Health Outcomes for 5-year-old children (SOHO-5). SOHO-5 was completed through face-to-face independent interviews. A specific instrument containing information about demographics and socioeconomic conditions of children and their families was also applied to parents. Children's oral examinations were performed for the diagnosis of dental caries (dmft). The agreement between total and items scores was evaluated using the means comparison and the correlation analysis, calculated by the Intraclass Correlation Coefficient (ICC). **Results:** There was a significant difference between the means of parent-child reports in total scores (p=0.0028) and items associated with difficulty speaking (p=0.038) and difficulty playing (p=0.0034). Children reported worse OHRQoL than their caregivers, suggesting different perceptions between them. The ICC for the total score of parent-child reports was 0.44 (95% CI, 0.02-0.68). Higher SOHO-5 scores were found in children with dental caries experience. **Conclusion:** Moderate agreement was observed, suggesting that the reports of parents should be complementary to those of preschool children about the OHRQoL, allowing the clinician to make the best treatment decision, according to the different views and expectations of both.

Keywords: Quality of Life; Oral Health; Children; Parents; Perception.

Introduction

The broad definition of health, not only restricted to the absence of oral diseases or susceptibility, but that takes into consideration both function and oral-related physical, psychological and social well-being, incorporating issues such as socioeconomic, environmental and behavioral factors about the individual / collective health of the population, has led to the urgent need for reflection by the Dentists and health system managers that general and oral health and quality of life are closely related [1]. Such concept refers to oral health evaluation through methods that include both objective and subjective clinical aspects concerning to the impact of health / disease conditions on an individual's physical and psychosocial activities. Therefore, over the last two decades, several studies have been conducted [1-6] focusing on Oral Health-Related Quality of Life (OHRQoL), a complex and multidimensional indicator that evaluates the physical and emotional well-being of each individual, as well satisfaction and anxiety related to oral health services.

The presence of oral disorders can negatively affect OHRQoL of both children and their families, not only economically but also psychologically, often leading to an oral condition of complete tooth destruction and pain, compromising chewing, promoting appetite and weight loss, growth deficit, cognitive delay, phonation difficulties, changes in sleep patterns, decreased school performance, and low self-esteem [2,3].

There are numerous instruments used to measure OHRQoL in children [4,5]; however, there are few instruments specifically used for children aged 6 years and under, among them, the Early Childhood Oral Health Impact Scale (ECOHIS), based on secondary reports of parents, which may express a reality distinct of that perceived by children [4], and the Scale of Oral Health Outcomes for 5-year-old children – SOHO-5, which uses self-reports from 5-year-olds and their parents to assess the child's oral condition, as there is strong evidence that 5-to-6-year-olds can validly and reliably report about their own OHRQoL [3-7]. Both instruments have been validated in Brazil to assess the impact of oral diseases on OHRQoL in preschoolers [6,8-10].

The parents' perception of their children's oral problems is essential for dental service seeking and successful implementation of oral health programs. Some studies have evaluated the agreement between reports of OHRQoL of parents and school-age children, indicating poor agreement and suggesting that parents' knowledge about their children's OHRQoL is limited [1,11,12]. However, there are few studies evaluating such agreement in children under 7 years of age [7,8]. The importance of this assessment is to determine whether parents can be considered as respondents in the child's place and whether secondary reports represent the child's reality.

Studies on OHRQoL allow evaluating the effect of symptoms, functional, psychological, and social limitations, and pain experience caused by oral diseases on the well-being and self-esteem of children and their families. Thus, investigating the agreement between reports of young children and their parents becomes of fundamental importance, since it allows knowing the reflection of the oral health condition on the children's quality of life from the perception and vision of both, and the

generation of possible emotional impacts on their families in order to contribute to health promotion, implementation of public policies in conjunction with society and improvement of quality of life.

Material and Methods

Study Design and Sample

This is an observational cross-sectional study conducted at the School of Dentistry of the Federal University of Amazonas.

All pairs of 5-year-old and 6-year-old children and their parents (PPP) who sought dental care at the Faculty of Dentistry, Federal University of Amazonas in 2017 were invited to participate in the study, provided that all inclusion and exclusion criteria were met. The study included children of both genders aged 5 and 6 years, who had no systemic diseases or cognitive impairment and who agreed to participate in the study. The sample size was calculated using the R software (R Foundation for Statistical Computing, Vienna, Austria) employing the intraclass correlation coefficient (ICC). The minimum number of 49 pairs was estimated, with ICC of 0.8 (excellent agreement) compared to ICC of 0.6 (null hypothesis). Type I error was set at 0.05 and test power at 0.8 (type II error of 0.2).

Non-clinical Data Collection

In order to analyze the demographic and socioeconomic conditions of children and their families, a specific questionnaire was used, addressing data such as gender and age of children, parents' schooling, occupation and age, family agglomeration, homeownership and monthly household income, always under the supervision of a researcher, who explained how questionnaire should be completed, being available to clear any doubts [13].

To assess children's and parents' self-perception of the OHRQoL of children participating in this study, as well as the impact of children's oral health on their family's quality of life, the Brazilian version of the Scale of Oral Health Outcomes for 5-year-old children was used (SOHO-5). SOHO-5 considers the experience of oral impacts throughout their lives through their self-report (SOHO-5c) and secondary reports from their parents (SOHO-5p). The instrument is structurally composed of 14 items contained in both versions, 07 items for each version, and 06 of these are common in both versions in terms of content. SOHO-5 was applied through face-to-face interviews with children in the dental office, away from their parents, in order to avoid their interference, while the parents' version was applied in the waiting room, while awaiting the dental treatment of their children, by a previously calibrated interviewer who did not have access to the oral clinical examination (blinding). In order to assess agreement between reports, only the six common items were analyzed, which are: "difficulty eating", "difficulty speaking", "difficulty playing", "difficulty sleeping", "avoid smiling due to pain" and "avoid smiling due to teeth appearance". Children's version answers followed a 3-point Likert scale (no = 0; a little = 1; a lot = 2). Parents' version answers followed a 5-point Likert scale (not at all = 0; slightly = 1; more or less = 2; fairly = 3; very much = 4) and were regrouped into 3-

point responses (not at all = 0; a little / more or less = 1; fairly / very much = 2) in order to allow comparison between the scores of both versions [7,8].

The total score for each SOHO-5 version was calculated from the sum of answer points. Thus, the total score of the children's version ranged from 0 to 12, and the parent's version also from 0 to 12. Regarding the scale interpretation, higher scores indicate worse OHRQoL.

Clinical Examination

Clinical oral examination of children was performed in the Children's Dental Clinic discipline, Faculty of Dentistry, Federal University of Amazonas, on the same day of the application of the SOHO-5 instrument by a previously calibrated examiner in a dental chair under light reflector, drying with syringe using PPE (personal protective equipment), tongue depressors and WHO probes (Golgran Indústria e Comércio de Instrumental Odontológico Ltda., São Paulo, SP, Brazil).

Dental caries was assessed according to WHO criteria [14] and calculated in terms of decayed primary teeth, with an indication for extraction due to caries or filling (dmft). The information obtained was recorded by an assistant on previously prepared individual clinical records. Dmft was categorized according to the presence or absence of caries experience based on previously described scores: dmft = 0 (no caries experience); dmft ≥0 (caries experience) [12]. For intra-examiner calibration, 12 children were examined twice, respecting a one-week interval. The agreement values between the pairs of examinations were obtained through the Kappa test, considering the categorical variable "oral health condition". All Kappa coefficients were higher than 0.80.

Statistical Analysis

Statistical analysis of data was performed using the Stata software (Stata Statistical Software, MP 14.0, Stata Corp., College Station, USA). Initially, sociodemographic data, caries experience, and the means of total and SOHO-5 items scores were descriptively analyzed. Children with caries experience were compared to those with no caries experience regarding OHRQoL evaluated by the SOHO-5 instrument. Subsequently, the nonparametric Mann Whitney test and the paired t-test were used to compare variables, analyze the difference in SOHO-5 scores between caries experience categories and discriminative validity (the difference between children without caries experience and those with caries experience) of each questionnaire in relation to dental caries, using 5% significance level.

The parent-child agreement was assessed by comparing mean scores and also by calculating the ICC for total and items scores. The agreement level determined by the ICC was categorized as poor (<0.20), weak (0.20–0.40), moderate (0.41–0.60), substantial or strong (0.61–0.80) and excellent (0.81–1.0) [7,8,15].

The means of directional differences were calculated by subtracting the child's score from the parent's score and represent an indicator of systematic bias. Directional differences were then

compared to the null hypothesis (zero difference) using paired t-tests to determine their statistical significance. In order to evaluate the magnitude (d) of the systematic bias, the mean of each difference was divided by its respective standard deviation (SD), being considered small when d≤0.2; moderate (d=0.3 to 0.7) or large (d≥0.8). Mean absolute differences represent an agreement indicator, and their magnitudes were evaluated when related to the maximum scores obtained [1,8].

Ethical Aspects

This study was approved by the Research Ethics Committee of the Federal University of Amazonas under number 57639516.9.0000.5020. Parents and / or legal guardians were informed about the purpose and the methodology to be applied and signed an informed consent form.

Results

Of the 51 pairs of parents and children invited to participate in the study, 50 agreed and completed the Brazilian version of SOHO-5, and no questionnaire was excluded from the analysis due to incomplete information. Most questionnaires were completed by mothers (76%). The sample consisted primarily of male children (54%) with a mean age of 5.4 years, whose parents had a family income of up to 2 minimum wages (US$ 530.00) (68%) and 12.6 years of schooling.

Regarding caries experience, 18 children (36%) had dmft = 0 (no caries experience), and 32 children (64%) had caries lesion. Family income (p = 0.028) and parental schooling (p = 0.029) had a significant influence on the presence of dental caries in the children investigated.

Children reported worse OHRQoL than their parents, as indicated by a total mean score of 2.90 for children versus 1.62 for parents. Children's scores were also higher than those of parents in all items (Table 1).

Table 1. Mean total and SOHO-5 item scores in parent-child pairs.

SOHO-5	Parents Mean (SD)	Children Mean (SD)	p-value
Total Scores	1.62 (2.38)	2.90 (2.68)	0.0028*
Difficulty Eating	0.46 (0.64)	0.52 (0.73)	0.61
Difficulty Speaking	0.18 (0.48)	0.42 (0.64)	0.038*
Difficulty Playing	0.14 (0.35)	0.50 (0.76)	0.0034*
Difficulty Sleeping	0.36 (0.63)	0.64 (0.83)	0.051
Avoid Smiling (Due to Pain)	0.22 (0.54)	0.44 (0.70)	0.062
Avoid Smiling (Due to Teeth Appearance)	0.26 (0.63)	0.38 (0.72)	0.18

*Significant correlation (p <0.05); Mann-Whitney test.

However, regarding item scores, the mean directional difference was not significant for parent-child pairs (Table 2), demonstrating the absence of systematic bias in parents' reports. The mean directional differences for items in parent-child pairs were small and ranged from 0.06 in the "difficulty eating" item to 0.36 in the "difficulty playing" item.

The mean absolute differences for items ranged from 0.07 to 0.43, with the highest value attributed to the "difficulty playing" item, representing from 3.5% to 21.5% the maximum scores for each item.

Table 2. Absolute mean differences for total and SOHO-5 item scores in parent-child pairs.

SOHO-5	Parent-Child Pairs Directional Differences*			
	Mean (SD)	p***	d§	Absolute Differences** Mean (SD)
Difficulty Eating (0-2)	0.06 (0.90)	0.625	0.1	0.07 (1.0)
Difficulty Speaking (0-2)	0.24 (0.99)	0.219	0.2	0.30 (1.0)
Difficulty Playing (0-2)	0.36 (1.80)	0.320	0.2	0.43 (1.0)
Difficulty Sleeping (0-2)	0.28 (1.30)	0.124	0.2	0.28 (1.0)
Avoid Smiling (Due to Pain) (0-2)	0.22 (0.90)	0.230	0.2	0.26 (1.0)
Avoid Smiling (Due to Teeth Appearance) (0-2)	0.12 (0.70)	0.167	0.2	0.19 (1.0)

*Differences between parents' scores, taking into account the direction of differences (bias indicator); **Differences between parents' scores, regardless of direction of differences (agreement indicator); ***p<0.05 (paired t-test); §Magnitude calculated by dividing the mean directional difference by the respective SD.

Table 3 also suggested the tendency of parents to underestimate the impact of their children's OHRQoL, as total SOHO-5 scores were lower than those reported by their children by 52.0%, higher by 26.0% and equal by 22.0%, respectively.

Table 3. Distribution of directional differences for total and SOHO-5 item scores in parent-child pairs.

SOHO-5	p>c Scores (%)	p=c Scores (%)	p<c Scores (%)
Total Scores	26.0	22.0	52.0
Difficulty Eating	24.0	52.0	24.0
Difficulty Speaking	10.0	62.0	28.0
Difficulty Playing	10.0	56.0	34.0
Difficulty Sleeping	18.0	50.0	32.0
Avoid Smiling (Due to Pain)	10.0	66.0	24.0
Avoid Smiling (Due to Teeth Appearance)	8.0	78.0	14.0

The ICC for the total score was 0.44 (95% CI 0.02; 0.68), and among items, it ranged from 0.10 (difficulty speaking) to 0.72 (avoid smiling due to teeth appearance) (Table 4).

Table 4. Correlation between parents and children, considering total and SOHO-5 item scores.

SOHO-5	Parents x Children ICC (CI 95%)
Total Scores	0.44 (0.02; 0.68)
Difficulty Eating	0.47 (0.07; 0.70)
Difficulty Speaking	0.10 (-0.83; 0.41)
Difficulty Playing	0.14 (-0.94; 0.37)
Difficulty Sleeping	0.42 (0.02; 0.84)
Avoid Smiling (Due to Pain)	0.44 (0.33; 0.57)
Avoid Smiling (Due to Teeth Appearance)	0.72 (0.52; 0.84)

Table 5 shows the distribution of answers to different SOHO-5 items. "Difficulty sleeping", "Difficulty playing" and "Difficulty eating" were the most frequently reported items in the children's version, while "Avoid smiling (due to teeth appearance)", "Difficulty sleeping" and "difficulty eating" were the most reported by parents. Of all participants, about 66% of children reported some oral impact, while in the parent version, this percentage was 61%.

Table 5. Oral impacts of 5-6-year-old children: Children and parents SOHO-5 reports (n = 50).

Impact	N (%)	Little N (%)	A lot N (%)
Child's Version			
Difficulty Eating	19 (38.0)	12 (24.0)	19 (38.0)
Difficulty Drinking	31 (62.0)	14 (28.0)	5 (10.0)
Difficulty Speaking	33 (66.0)	13 (26.0)	4 (8.0)
Difficulty Playing	17 (34.0)	12 (24.0)	21 (42.0)
Difficulty Sleeping	21 (42.0)	9 (18.0)	20 (40.0)
Avoid Smiling (Due to Pain)	34 (68.0)	10 (20.0)	6 (12.0)
Avoid Smiling (Due to Teeth Appearance)	38 (76.0)	5 (10.0)	7 (14.0)
		Little/Moderate	Fairly/Very much
Parents' Version			
Difficulty Eating	19 (38.0)	11 (22.0)	20 (40.0)
Difficulty Speaking	43 (86.0)	5 (10.0)	2 (4.0)
Difficulty Playing	43 (86.0)	7 (14.0)	0 (0.0)
Difficulty Sleeping	14 (28.0)	18 (36.0)	18 (36.0)
Avoid Smiling (Due to Pain)	42 (84.0)	5 (10.0)	3 (6.0)
Avoid Smiling (Due to Teeth Appearance)	8 (16.0)	12 (24.0)	30 (60.0)
Affects Self-Esteem	39 (78.0)	8 (16.0)	3 (6.0)

Table 6 shows the differences in total SOHO-5 scores between groups regarding dental caries experience. Data suggest worse OHRQoL for the group with caries experience, both in the parent's and children's versions.

Table 6. Mean total SOHO-5 scores according to dental caries experience.

Variables	Without Caries Experience Mean (SD)	Caries Experience Mean (SD)	p-value*
SOHO-5c t	1.90 (1.30)	6.84 (4.93)	0.012
SOHO-5p t	1.11 (1.45)	7.32 (10.07)	0.030

*Significant correlation (p <0.05); Mann-Whitney test.

Discussion

When assessing the presence of dental caries in the primary dentition, it was observed that 64% of children had caries lesion, and of these, 56% had dmft between 1 and 5 and 8% had dmft ≥ 6, corroborating other studies performed in preschool Brazilian children [16,17], where high caries prevalence (63.8% and 54.1%, respectively) were also found in this age group.

At the age of 5 years, an Amazonian child has, on average, 2.88 teeth with caries experience, with a predominance of the decayed component, which accounts for approximately 80% of this index [18]. This finding was different from that found in another study [19] in a random sample of 1,296 preschool children in Hong Kong (China), where the prevalence of early childhood caries was 19.9%. The variation in prevalence in surveys can be explained by differences in sample size and, above all, by the socioeconomic and cultural characteristics of locations in which surveys were performed [3].

In the present study, low schooling (p = 0.029) and parental income (p = 0.028) significantly contributed to the increased prevalence of dental caries in their children. These data are in agreement with previous studies [16,20,21], which showed that oral health is still not a priority in

the family of people with low income and schooling, becoming a public health problem, requiring preventive policies and programs aimed at promoting health, always directed to the needs of the population. In less favored communities, parents have less education and / or information regarding the prevention of oral disorders, such as diet, brushing, the first visit to the dentist and daily fluoride use; thus, a higher prevalence of caries disease and worse quality of life are observed [17]. Therefore, socioeconomic factors should always be investigated as they constitute strong predictors of oral diseases in children [16].

Higher average total SOHO-5c scores expressed that children in this study tended to classify their OHRQoL as more compromised than their parents, and a significant difference was found among parent-child pairs ($p = 0.0028$). Similar results were found in research conducted with young children [7,8,22], when comparing the total SOHO-5 scores (parents and children's version), observing that the children's reports differed from those of their parents, tending to overestimate the impacts on their OHRQoL. Discrepancies between reports of parents and their children may denote different perspectives and also loss of perception of parents about their children's daily lives [11]. This fact can be justified because parents do not stay full time with their children, sometimes because they are at work, sometimes because children go to school or daycare [15]. Children are able to share their perceptions about their OHRQoL, not depending solely on their parents' reports [3]. Thus, whenever possible, the report of the whole family on their children's OHRQoL should be obtained, considering that the perceptions of each family member are valuable, complementary and guide the clinician to make the best treatment decision according to different views and expectations [8,11]. Although parents' reports may be incomplete due to a lack of knowledge about certain experiences, it would still provide useful information [11].

Parents' report on their children's health will depend on their own well-being, their involvement in treatment and their responsibility to the child's daily care, while the child's would be a better representation of the immediate effects of the disease and treatment. Parents and children base their perceptions of quality of life on different information, and as such assessment would be comprehensive, both perspectives need to be taken into account [11,23].

Regarding the SOHO-5 items, parents' reports were significantly different from those of their children on the "difficulty speaking" and "difficulty playing" items, corroborating findings of a systematic review [24], which showed that the child-parent agreement is domain-dependent, being lower in those that reflect the child's social and emotional aspects. Scientific evidence suggests a lower degree of agreement in items for which children and their parents have access to different information (e.g., the relationship between pairs and school activities), as well as those with more abstract than concrete references, such as pain and emotions [11].

About 76% of SOHO-5p questionnaires were completed by mothers. This percentage reflects cultural and historical issues that have organized family functions over time, where mothers are still primarily responsible for the education and health of their children, and the father has financial responsibility. The mother figure, always near their children, proves that mothers play an important

role in their education, especially in the incorporation of habits. Mothers can be considered reliable and direct correspondents of their children [7,8,25], who have a greater understanding about their children's oral health when compared to fathers; even so, the child's self-report should be explored in order to ratify and adequate dental treatment needs.

The interpretation of absolute differences is extremely difficult because there are no general parameters defined for this, but they were related to the maximum scores obtained [1,7,8]. The values of differences in the items found in this study corresponded to 3.5-21% of the maximum scores and were lower than those found by Brazilian authors [8], which may be explained by the fact that not every 5-6-year-old child age has the same level of cognitive development [3]. A child's perception of his/her oral health is influenced by age, cognitive, and emotional development, as well as by the social context in which he/she is inserted [22].

Regarding total scores, the correlation between reports of parent-child pairs was moderate, partially differing from other studies that used the SOHO-5 instrument for the first time after its validation in Brazil, in which the agreement observed between reports of mothers vs. children was excellent [8], but between reports of fathers vs. children, agreement was moderate [7]. When analyzing the level of agreement (ICC) of the different items, individually, they varied from weak to substantial, and the best agreement (ICC = 0.72) was observed in the "avoid smiling due to teeth appearance" item [8]. This finding may be attributed to the growing aesthetic concern of parents, motivated by media and society, who end up by excessively worrying about the appearance of their children's front teeth, possibly by malicious comments from school and neighborhood peers, denoting, in some cases, bullying [26]. There are no studies in the literature relating to aesthetic commitment to quality of life in primary teeth, although preschool children attribute behavioral characteristics to other children based on their appearance [27].

From the clinical point of view, our results suggest that if a child does not want or cannot answer, for various reasons, about his/her OHRQoL, parents may be secondary responders [8,28]. However, whenever possible, the report of the whole family on their OHRQoL should be obtained, considering that the perceptions of each family member are useful for an effective treatment decision, always considering their different views and expectations [7,8,11].

The presence of oral problems influences the worsening of the OHRQoL of children and their families [2,3,15]. Such statement would explain the higher average SOHO-5c and SOHO-5p scores observed in children with caries experience when compared to those without the disease. Previous studies [2,3,9,12,13,29,30] have demonstrated that the oral health status of preschoolers had a significant impact on the OHRQoL of children and parents, highlighting that parents' knowledge about the oral health of children, such as the presence of caries lesions, would be a detrimental determinant on the OHRQoL of preschoolers and their families. This negative impact of dental caries on OHRQoL can be explained by the fact that most items of the SOHO-5 instrument address functional limitations, most often related to such dental disease [15]. The relevance of the social impact of dental caries disease influences the quality of life of family members through loss of

working days by parents, expenses with dental care, changes in sleep patterns and restlessness [6]. Unlike our findings, a study conducted with 121 pairs of 5-year-old children and their parents in the municipality of Diamantina (Brazil), demonstrated the inability of SOHO-5c to discriminate children with and without dental caries, since at this age, abstract thinking, construction of self-image, and the understanding of basic health concepts have not yet been developed, nor the ability to remember past events, which would start to occur from the age of 6 [11,22].

The cross-sectional design of this study is among limitations, making it impossible to establish a cause-effect relationship. Another limitation is the fact that our sample was selected from those who came to seek dental treatment in a school clinic, which may probably be related to higher SOHO-5 values, different from the general population. Another point that deserves attention would be the low income of most of the families investigated, which, although reflecting a large part of the Brazilian population [7,8,11], may also affect health and confuse OHRQoL reports, in addition to the possibility of biases of information when parents completed the questionnaire. However, the methodological rigor and preventive measures, such as the use of a validated instrument and the examiner's calibration assure reliability to findings.

The results of the present study allow us understanding the importance of evaluating the perception of young children [31] and their parents about OHRQoL, both of which should be complementary [28], which may assist in the development of interventions designed to promote oral health, as well as encouraging changes in the behavior of preschool children and their families through the implementation of educational measures and programs, such as encouraging oral hygiene and non-cariogenic diet.

Conclusion

There was a moderate agreement between the answers of children and their parents to the SOHO-5 instrument, demonstrating the importance of reports of children and their families as complementary when assessing the OHRQoL of preschoolers, as they may reflect different perspectives.

Authors' Contributions: SAH and CRP designed the study, performed the data collection, data analysis and interpretation, wrote the manuscript and reviewed the manuscript. AOAF and POM performed the data collection, data analysis and interpretation. RPZF performed data interpretation and drafted the manuscript. All authors declare that they contributed to critical review of intellectual content and approval of the final version to be published.

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