



Impact of Dental Treatment on the Perception of Children and Parents on Oral Health-Related Quality of Life

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Abstract

Objective: To evaluate the perception and agreement between of child and parent's reports about oral health-related quality of life (OHRQoL) of children aged 8-10 who were submitted to dental treatment and whose caregivers were (Group 1) or were not (Group 2) submitted to dental treatment. **Material and Methods:** Dental caries experience and child (Child Perceptions Questionnaire - CPQ₈₋₁₀) and parent's (Parental-Caregiver Perceptions Questionnaire - P-CPQ) perceptions of OHRQoL were before and after the dental treatment. The collected data were analyzed using the BioEstat 5.3 and SPSS 18.0 statistical packages, considering $\alpha = 0.05$. The Wilcoxon and Mann-Whitney tests, respectively, were used to verify the difference in mean DMFT / dmft indexes and CPQ₈₋₁₀ scores before and after treatment in each group. **Results:** In Group 2, there was a significant increase in mean DMFT after treatment. Both groups presented lower values in the total CPQ₈₋₁₀ score after treatment. In pre-treatment, it was observed more positive perception of OHRQoL for parents than for children in both groups. In contrast, in post-treatment, children reported better OHRQoL than parents in both groups. In Group 1, there was significant agreement between children and parents at pre and post-treatment, while in Group 2 significant agreement was observed only at post-treatment. **Conclusion:** Children presented a more positive perception of OHRQoL at post-treatment, as well as when compared to those parents at this time. There was greater agreement between children and caregivers who accepted to undergo dental treatment.

Keywords: Child; Quality of Life; Questionnaires; Oral Health.

Introduction

Oral-health related quality of life is a multidimensional measure that indicates the extent to which the individual's routine is affected by oral conditions [1]. Similarly to adults, children are also affected by various oral diseases / disorders that may compromise their physical and psychosocial functioning [2]. Considering the southeastern region of Brazil, 37.8% of 5-year-old children [3] and 48% of 12-year-old children [4] already had dental caries experience. Of the 407 schoolchildren aged 9-12 years enrolled in the public school network of Nova Friburgo, Brazil (seven urban and three rural schools), 1/3 presented need for orthodontic treatment [5]. In this context, the assessment of the impact of oral conditions on the child's daily life is important, not only due to functional and psychosocial aspects, but also for the impairment in the development and achievements of these individuals.

In order to evaluate the children's perception of the impact of oral conditions on their physical and psychosocial functioning, measures that consider the cognitive development of each age group were developed for children aged 8-10 (Child Perceptions Questionnaires - CPQ₈₋₁₀) and aged 11-14 years (CPQ₁₁₋₁₄) [7]. CPQ has been used in several countries with different cultures, including Brazil, to evaluate children with different oral diseases / disorders [8,9]. Considering that parents are mainly responsible for children's health, the evaluation of their perception about OHRQoL is important as reported by [10]. In this sense, the Parental-Caregiver Perceptions Questionnaire (P-CPQ) was developed [11] and validated for Portuguese language [12] for use in parents / guardians.

Perceptions of health and quality of life are determined not only by the nature and severity of the disease, but also by individual and environmental characteristics [13]. A previous study evaluated the differences in the perception of OHRQoL as a function of the socioeconomic level, and a higher impairment of this construct was found in children aged 11-14 years of low socioeconomic status [14]. Other studies have suggested the influence of psychological factors, such as self-esteem [15] and anxiety and depression symptoms in the children's OHRQoL perception [16]. Dental treatment may also influence children's OHRQoL perception. Some researchers have found an improvement in the OHRQoL perception of schoolchildren after being submitted to atraumatic restorative treatment (ART), particularly in the functional aspects [17]. The literature shows that children submitted to ART and dental extraction had a more positive perception of their OHRQoL than children submitted to ART alone or oral hygiene instructions [18]. Another study found improvement in the perception of children and parents / guardians on the child's OHRQoL following dental treatment, mainly curative (71.4%) [19]. However, in these studies, only the child was submitted to treatment, and there are no studies that have evaluated the children and parents / guardians' perception about the child's OHRQoL and agreement between them, when parents / guardians are also submitted to dental treatment.

Thus, the present study aimed to evaluate the perception and agreement between of child and parent's reports about OHRQoL of children aged 8-10 who were submitted to dental treatment

in a Basic Family Health Unit (UBSF) and whose caregivers were or were not submitted to dental treatment.

Material and Methods

Study Design and Sample

This is a clinical trial composed of a convenience sample of children and parents / guardians.

Sampling

Children aged 8-10 years and their parents were selected from the reserve register of children waiting for dental treatment at UBSF in the city of Uberlândia, MG. The sample size was calculated considering test power of 80% to detect a clinically significant difference of 4 points between scores of groups 1 and 2 (described later), 95% confidence interval and standard deviation of 11.1 of the absolute difference between CPQ₁₁₋₁₄ and P-CPQ scores applied to children and parents [20]. The sample was composed of 70 individuals, 35 for each group.

Procedures

Children were clinically examined by the same trained examiner regarding dental caries experience in deciduous and permanent dentitions - DMFT / dmft indexes and presence of malocclusions [21]. Clinical examination was performed before and after six months of dental treatment.

Division of Groups

Children submitted to dental treatment were divided into two groups according to the treatment or not of parents. Group 1 consisted of children whose parents accepted to undergo dental treatment. Group 2 consisted of children submitted to dental treatment only. Dental treatment for both children and parents consisted of preventive and curative procedures: prophylaxis, restoration, exodontia or endodontia, and a combination of these.

Socio-Demographic Evaluation

Before dental treatment of children, parents responded a questionnaire about socio-demographic data, considering the child's age, age of parents / guardians, degree of kinship, parental schooling and family income.

OHRQoL Evaluation

The Brazilian versions of CPQ₈₋₁₀ [8] and the P-CPQ [12], respectively, were used to assess children and parents' perceptions about the child's OHRQoL. CPQ₈₋₁₀ and P-CPQ are composed of 29 and 35 items that evaluate the frequency of impacts of the child's oral diseases / alterations in four health domains: oral symptoms, functional limitations, emotional well-being and social well-being.

Response options range from 0 (never) to 4 points (every day or almost every day). In the P-CPQ, there is also the "I do not know" response alternative (score 5). In these questionnaires, there are still two questions about the general oral health and well-being perception, with response options ranging from 0 to 3 points for CPQ₈₋₁₀ and 0 to 4 points for P-CPQ. The higher the score, the greater the impact of the oral condition on the child's quality of life.

Questionnaires were applied before and after six months of dental treatment (after 6 months).

Statistical Analysis

The collected data were analyzed using the BioEstat 5.3 (Mamirauá, Belém, PA, Brazil) and SPSS 18.0 (SPSS Inc., Chicago, USA) statistical packages, considering $\alpha = 0.05$. Descriptive statistics consisted of mean, standard deviation and percentage. Bivariate analysis of data was performed using the Chi-square test. By means of the Shapiro-Wilk normality test, deviation from the normal distribution of data was detected, and thus non-parametric tests were used.

The Wilcoxon and Mann-Whitney tests, respectively, were used to verify the difference in mean DMFT / dmft indexes and CPQ₈₋₁₀ scores before and after treatment in each group. The magnitude of the difference in each group was calculated by the effect size (ES), by dividing the mean of the difference (mean pre-treatment – mean post-treatment) by the pre-treatment standard deviation: 0.2 small, 0.5 moderate and 0.8 large magnitude [22].

The agreement between parent and child's reports was evaluated through comparative analysis and correlation between CPQ₈₋₁₀ and P-CPQ scores (totaling 23 similar items). In the comparison analysis, the mean of the difference (mean P-CPQ – mean CPQ₈₋₁₀) and its magnitude were verified by means of the Mann-Whitney test and ES calculation, respectively. In the correlation analysis, the intraclass correlation coefficient (ICC) was calculated to verify the agreement between CPQ₈₋₁₀ and P-CPQ scores: <0.2 poor; 0.21-0.40 weak; 0.41-0.60 moderate; 0.61-0.80 substantial; 0.81-1.0 excellent to perfect agreement [23].

Ethical Aspects

This research was approved by the Ethics Research Committee of the Federal University of Uberlândia under Protocol No. 038/12.

Results

Table 1 shows the sample characteristics according to group. Groups were matched for age, sex and malocclusion. Approximately half of parents in Group 1 (48.6%) had complete high school, compared with 8.6% in Group 2 ($p < 0.05$). The monthly income of half of the sample in Group 1 was 3 to 4 minimum wages, while 54.3% of Group 2 reported receiving only 1 minimum wage per month. The mother was the most frequent parent during dental treatment (77.1%). Restorative treatments were performed in 57.1% of children from Group 1 and 62.9% from Group 2.

Table 1. Sociodemographic and clinical characteristics according to the groups.

Variables	Group 1 (Child and Parent Dental Treatment)	Group 2 (Child Dental Treatment Only)
N	35	35
Age (Mean±SD)	9.0±0.9	9.0±0.9
Sex	N (%)	N (%)
Male	20 (57.1)	20 (57.1)
Female	15 (42.9)	15 (42.9)
Malocclusion [n(%)]		
None	22 (62.9)	24 (68.6)
Mild	8 (22.9)	8 (22.9)
Moderate	5 (14.3)	3 (8.6)
Caregiver's Education [n(%)]		
Incomplete Elementary/Middle School	9 (25.7)	19 (54.3)
Complete Elementary/Middle School	2 (5.7)	3 (8.6)
Incomplete High School	7 (20.0)	10 (28.6)
Complete High School	17 (48.6)*	3 (8.6)*
Monthly Income		
1 Minimum Wage	13 (37.1)	19 (54.3)
2 Minimum Wages	6 (17.1)	10 (28.6)
3 Minimum Wages	10 (28.6)	4 (11.4)
4 Minimum Wages	6 (17.1)	2 (5.7)
Caregiver		
Mother	27 (77.1)	-
Father	4 (11.4)	-
Grandma	2 (5.7)	-
Aunt	2 (5.7)	-
Child Dental Treatment		
Prophylaxis	11 (31.4)	6 (17.1)
Restoration	20 (57.1)	22 (62.9)
Tooth Extraction + Restoration	1 (2.9)	0 (0.0)
Endodontics + Restoration	3 (8.6)	5 (14.3)
Tooth Extraction + Endodontics + Restoration	0 (0.0)	2 (5.7)

SD = Standard Deviation; *p<0.05 (Chi-square test).

The mean (SD) of the DMFT / dmft index for each group before and after treatment can be seen in Table 2. There was a significant increase in mean DMFT after treatment in Group 2 (1.7 vs 2.1, p<0.01). While Group 2 presented, on average, 2.1 decayed and filled permanent teeth after treatment, Group 1 presented, on average, 1.1 (p <0.05).

Both groups presented lower values in the total CPQ₈₋₁₀ score after treatment, except for the emotional and social well-being domains in Group 2 (Table 3). The magnitude varied from small to moderate for both groups, being moderate for the total score (ES = 0.5) and oral symptoms (ES = 0.7) in Group 1 and only for oral symptoms in Group 2 (ES = 0.5).

Table 2. Mean (SD) of DMFT and dmft before and after dental treatment for each group.

Groups	Pre-Treatment	Post-Treatment
Group 1		
DMFT	1.0±1.3	1.1±1.3 [†]
dmft	1.9±2.2	1.5±1.9
Group 2		
DMFT	1.7±1.7*	2.1±2.0* [†]
dmft	2.8±2.3	2.7±2.7

SD = Standard Deviation; DMFT = Sum of Decayed, Missing, and Filled Teeth in the Permanent Dentition; dmft = Sum of decayed, missing, and filled teeth in the Primary Dentition; *p<0.01 (difference between columns/before and after dental treatment for each group; Wilcoxon test); [†]p<0.01 (difference between lines/between groups at each moment; Mann-Whitney test).

Table 3. Mean of the difference in CPQ₈₋₁₀ scores before and after dental treatment for each group.

Groups	Pre-Treatment	Post-Treatment	Mean of the Difference ^a	ES ^b
Group 1				
CPQ ₈₋₁₀ Total	15.8±15.1***	7.6±8.2***	8.2	0.5
Oral Symptoms	6.6±4.3***	3.4±2.7***	3.2	0.7
Functional Limitations	2.8±3.3***	1.5±1.9***	1.3	0.4
Emotional Well-Being	3.9±5.7**	1.4±2.7**	2.5	0.4
Social Well-Being	2.6±3.9**	1.4±2.9**	1.2	0.3
Group 2				
CPQ ₈₋₁₀ Total	18.0±15.1**	12.7±15.4**	5.3	0.4
Oral Symptoms	7.6±4.7**	5.4±4.8**	2.2	0.5
Functional Limitations	3.6±4.0*	2.3±4.2*	1.3	0.3
Emotional Well-Being	3.3±4.2	2.6±4.0	0.7	0.2
Social Well-Being	3.5±4.7	2.3±4.2	1.1	0.4

CPQ = Child Perceptions Questionnaire; ^aMean of the difference = (mean pre-treatment – mean post-treatment); ^bES = effect size (mean of the difference/pre-treatment standard deviation); *p<0.05; **p<0.01; ***p<0.001 (difference in the CPQ₈₋₁₀ scores before and after dental treatment for each group; Wilcoxon test).

Table 4 shows the results of the comparison analysis between CPQ₈₋₁₀ and P-CPQ scores before and after treatment for each group. In Group 1, it was observed that in pre-treatment, the OHRQoL perception was more positive for parents than for children. This difference was significant only for the oral symptoms domain, presenting small magnitude (ES = 0.4). In contrast, in post-treatment, children reported better OHRQoL than parents, being significant for the total scale and for oral symptoms and social well-being domains. These differences varied from small (total score and oral symptoms) to moderate magnitude (social well-being). In Group 2, children presented a more positive OHRQoL perception than parents before dental treatment, which is significantly in the social well-being domain (ES = 0.4). This more positive perception of children remained in the post-treatment, being significant for the total scale and social well-being domain, both of small magnitude.

Table 5 illustrates the agreement between CPQ₈₋₁₀ and P-CPQ scores before and after dental treatment for each group. In Group 1 at pre-treatment, there was significant agreement between total scale scores and all domains, except for oral symptoms of CPQ₈₋₁₀ and P-CPQ. Agreements were substantial, except for social well-being, which was moderate (ICC = 0.43). In post-treatment, Group 1 presented agreement in the total scale scores and all domains of CPQ₈₋₁₀ and P-CPQ,

ranging from substantial (oral symptoms and social well-being) to excellent / perfect (total scale, functional limitations and emotional well-being). In Group 2, there was no significant agreement between the CPQ₈₋₁₀ and P-CPQ scores in pre-treatment, while in post-treatment, there was moderate agreement between CPQ₈₋₁₀ and P-CPQ scores, except for the emotional well-being and social well-being domains.

Table 4. Comparison in the means of the difference of CPQ₈₋₁₀ and P-CPQ scores before and after dental treatment for each group.

Groups	Pre-Treatment				Post-Treatment			
	Mean (SD) P-CPQ	Mean (SD) CPQ ₈₋₁₀	Mean of the difference (SD) ^a	ES ^b	Mean (SD) P-CPQ	Mean (SD) CPQ ₈₋₁₀	Mean of the difference (SD) ^a	ES ^b
Group 1								
Total Scale	11.1 (11.0)	14.6 (14.0)	-3.5 (17.7)	-0.2	11.1 (11.0)	6.6 (7.2)	4.5 (10.6)*	0.4
OS	3.8 (2.8)	5.5 (3.5)	-1.7 (4.0)*	-0.4	3.8 (2.8)	2.6 (2.4)	1.2 (2.9)*	0.4
FL	2.3 (3.0)	2.8 (3.3)	-0.5 (4.2)	-0.1	2.3 (3.0)	1.5 (1.9)	0.8 (2.8)	0.3
EWB	1.7 (2.1)	3.9 (5.7)	-2.2 (6.5)	-0.3	1.7 (2.1)	1.4 (2.7)	0.3 (3.4)	0.1
SWB	3.4 (4.9)	2.5 (3.7)	0.9 (5.9)	0.1	3.4 (4.9)	1.2 (2.5)	2.2 (4.8)**	0.5
Group 2								
Total Scale	18.1 (11.6)	16.0 (14.1)	2.1 (11.6)	0.2	14.6 (14.3)	11.3 (14.3)	3.3 (7.8)*	0.4
OS	5.9 (2.4)	5.8 (3.8)	0.1 (3.9)	0.0	5.0 (2.9)	4.2 (3.8)	0.7 (3.0)	0.2
FL	3.8 (4.2)	3.6 (4.0)	0.1 (3.6)	0.0	3.4 (4.5)	2.3 (4.2)	1.0 (3.2)	0.3
EWB	2.9 (2.8)	3.3 (4.2)	-0.4 (3.3)	-0.1	2.2 (3.2)	2.6 (4.0)	-0.4 (2.3)	-0.2
SWB	5.5 (5.6)	3.3 (4.4)	2.2 (5.8)*	0.4	4.1 (6.1)	2.2 (3.8)	1.9 (4.3)*	0.4

CPQ = Child Perceptions Questionnaire; P-CPQ = Parental-Caregiver Perceptions Questionnaire; OS = Oral Symptoms; FL = Functional Limitations; EWB = Emotional Well-Being; SWB = Social Well-Being; SD = Standard Deviation; ^aMean of the difference (mean P-CPQ – mean CPQ₈₋₁₀); ^bES = Effect Size (mean of the difference/pre-treatment standard deviation); *p<0.05; **p<0.01 (difference between P-CPQ and CPQ₈₋₁₀ scores at each moment for each group; Mann-Whitney test).

Table 5. Correlation between CPQ₈₋₁₀ and P-CPQ scores before and after dental treatment for each group.

Groups	Pre-Treatment		Post-Treatment	
	ICC	(95% CI)	ICC	(95% CI)
Group 1				
Total Scale	0.74**	(0.50–0.87)	0.90***	(0.81–0.95)
Oral Symptoms	0.40	(-0.17–0.69)	0.74**	(0.48–0.86)
Functional Limitations	0.76***	(0.53–0.88)	0.82***	(0.66–0.91)
Emotional Well-Being	0.73***	(0.47–0.86)	0.88***	(0.76–0.93)
Social Well-Being	0.43*	(-0.11–0.71)	0.75***	(0.51–0.87)
Group 2				
Total Scale	0.01	(-0.93–0.50)	0.44*	(-0.09–0.71)
Oral Symptoms	0.24	(-0.49–0.50)	0.46*	(-0.04–0.72)
Functional Limitations	0.22	(-0.52–0.60)	0.50*	(0.02–0.74)
Emotional Well-Being	-0.40	(-1.75–0.29)	0.01	(-0.93–0.50)
Social Well-Being	0.12	(-0.72–0.55)	0.28	(-0.40–0.63)

CPQ = Child Perceptions Questionnaire; P-CPQ = Parental-Caregiver Perceptions Questionnaire; ICC = Intraclass Correlation Coefficient; CI = Confidence Interval; *p<0.05; **p<0.01; ***p<0.001.

Discussion

Although other studies have evaluated the perception of children and / or parents on the OHRQoL of children undergoing dental treatment [17-19], this is the first study to evaluate the

perception and agreement between children and parents when parents are also submitted to dental treatment.

In the present study, mean DMFT differed between groups 1 and 2 after dental treatment, with the latter presenting higher caries experience, even when compared to pre-treatment. These results can be explained considering that, in Group 2, parents chose not to receive dental treatment and also did not accompany their children to the consultation, thus, only children received instructions for oral hygiene, not receiving reinforcement and support needed to maintain the daily habit at home. Some authors verified that the greater participation of parents in oral health care was associated with higher daily frequency of tooth brushing (of children and parents) and greater number of visits of the child to the dentist [24]. In the present study, adherence to dental treatment by parents may have been influenced by the schooling level, in which approximately half of those in Group 1 had complete high school, while 54.3% of group 2 had complete elementary school. In another study, it was found that mothers with higher schooling level were more likely to attend dental appointments [25].

Children from both groups had a more positive OHRQoL perception after dental treatment. However, the magnitude of the difference reached maximum value of 0.7, reflecting moderate change [22]. This means that changes were not detected in a way, which can be justified by the small dental caries experience shown by a maximum of three or four teeth in Groups 1 and 2, respectively. The changes in the OHRQoL of children are dependent on the experience of the disease and the treatment performed [26], and a small magnitude improvement was found in the OHRQoL of both children who did not present caries and children with caries increment after the curative-preventive treatment used. Similarly, in the present study, Groups 1 and 2, even showing stability and worsening in oral health status, respectively, reported improvement in OHRQoL after treatment. However, they differed regarding modified health aspects, while Group 1 presented significant improvement in all health domains, group 2 showed improvements only in the oral and functional aspects. The effective participation of parents, both in accompanying their children to consultations and in the accomplishment of the dental treatment itself, may have influenced in a more positive and multidimensional way the perception of health of children from Group 1. Some authors found differences in the perception of the child's OHRQoL as a function of type of treatment performed, children undergoing ART and dental extraction and who only received oral instructions reported more significant improvement than children who were only submitted to ART [18]. In the present study, restoration was the most frequently performed treatment in both groups and all children received oral hygiene instructions. However, the sample number did not allow dividing the groups according to the type of treatment performed, and new studies, including control group, are necessary to better understand the impact of the type of treatment on the child's OHRQoL perception.

Previous studies have shown the importance of assessing the perception of parents on OHRQoL as complementary information to the child's report [10], since their perceptions influence

decisions and choices about the child's health and treatment [27]. In the present study, in pre-treatment, children from Group 1 and Group 2 under and overestimated, respectively, the impact of oral conditions on oral symptoms and emotional well-being of children. The small but significant magnitude in these domains reflects the fact that children in this age group have low stability in the OHRQoL perception, not only because childhood is a period of several changes in psychosocial awareness [7], but because the dental and facial characteristics change rapidly [28]. After dental treatment, children in both groups reported a more positive OHRQoL perception compared to parents. In Group 1, the magnitude varied from small for oral symptoms to moderate for social well-being, and in Group 2 the magnitude was small for social well-being. Previous studies have found higher frequency of "I do not know" responses reported by parents for items related to the child's sociability [12,29]. However, this does not diminish the importance of parents' report for research on child health. Although the information obtained from parents is incomplete due to the lack of knowledge about certain experiences, especially regarding activities and relationships that occur outside the family environment, their perception is important to complement information obtained from the child [20,29].

In the correlation analysis, there was moderate to substantial agreement in pre-treatment between parents and children from Group 1, except for oral symptoms, which may be explained by the influence of age-related experiences such as dental eruption and exfoliation [30], which favor the greater sensitivity of children in this age group [31]. On the other hand, Group 2 showed no significant correlation between parents and children. After dental treatment, the magnitude of the agreement between parents and children from Group 1 ranged from substantial to excellent, while Group 2 showed significant agreement only for oral symptoms and functional limitations of moderate magnitude. Self-efficacy has been considered as health behavior determinant, especially in relation to oral health [24]. In the present context, parents' self-efficacy would consist of actions related to the oral health needs of the child, verified by the follow-up to dental appointments and by the option to be submitted to dental treatment, which may have favored their perception closer to the reality of children from Group 1. The existence of multiple realities only confirms the importance of obtaining the report of both parents and children in studies on the evaluation of children's well-being and quality of life. Valuable information can be omitted in the exclusion of one or the other, so these should be seen as complementary.

This study presented preliminary results on the agreement between parents and children about the OHRQoL of children undergoing dental treatment together with parents. Therefore, further studies are needed to confirm these findings, considering the limitations of the present study. Children were not randomized into intervention and control groups, and the inclusion of the latter would allow a comparison of changes of scores between groups over time. Although the sample size calculated was sufficient for the study proposal, it was not enough to compare the different types of dental treatment. The inclusion of subjects with greater disease severity could favor the findings of more significant changes and of greater magnitude after dental treatment.

Conclusion

The choice of parents for dental treatment seems to be related to the higher schooling level. The follow-up to the child's dental appointments may have favored the maintenance of the oral health status and the more positive perception of the child's OHRQoL after dental treatment. In addition, the effective participation of parents during child's treatment and option for own treatment can be related to the greater agreement among them on the child's OHRQoL, reinforcing the importance of obtaining the report of both in health studies.

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