Impact of dental caries severity and activity on oral health-related quality of life among children aged 8-11 years

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Abstract: Caries disease can lead to strong impact in terms of pain and suffering, to functional impairment, and to negative effects on quality of life. Studies have demonstrated that the impact on quality of life increases with dental caries severity, and few studies have assessed the relationship between caries activity and children's oral health-related quality of life (OHRQoL). This cross-sectional study aimed to assess the impact of dental caries severity and activity on the OHRQoL of schoolchildren. The study was conducted with a sample of children aged 8 to 11 years from Pelotas, southern Brazil. Children answered the Child Perceptions Questionnaire 8–10, and socioeconomic data were collected. Children's dental caries (Kappa value of 0.95), PUFA, traumatic dental injuries, and malocclusion were examined. The Mann-Whitney, Kruskal-Wallis, and Poisson regression tests were performed. A total of 119 children were included. Children with initial (mean ratio (MR) of 1.92; 95% confidence interval (95% CI) of 1.05–3.48), moderate (MR: 2.66; 95%CI: 1.44–4.90), and severe carious lesions (MR: 2.65; 95%CI: 1.46–4.79) had a greater impact on OHRQoL compared with those without carious lesions (p = 0 .047). Children with active carious lesions exhibited a greater impact on OHRQoL (MR:1.53 and 95%CI: 1.11–2.11) when compared to those without active lesions (p = 0.019). The findings demonstrate an association between dental caries severity and activity and the OHRQoL of school-aged children.

Keywords: Child;. Quality of Life; Dental Caries; Observational Study.

Introduction

Dental caries is still a major oral health problem in most industrialized countries[1] and its estimated global prevalence in primary and permanent teeth in children is 46.2% and 53.8%, respectively, according to a systematic review.[2] It is also the most prevalent oral disease in several Asian and Latin American countries, but it appears to be less common and less severe in most African countries.[1] In Brazil, at the age of 5 years, 53.4% of the children have dental caries in the primary dentition and, at the age of 12 years, 56.5% have the same condition in permanent dentition, as pointed out by the 2010 national survey.[3] The dental caries prevalence in schoolchildren aged 8 to12 years is 32.4% in Pelotas[4] and 37.2% in a sample of children aged 8 to10 years in Belo Horizonte.[5]

Furthermore, caries disease can lead to a strong impact in terms of pain and suffering, to functional impairment, and to negative effects on quality of life.[6] Studies relating oral health-related quality of life (OHRQoL) and dental caries suggest that caries experience, presence of untreated dental caries, and absence of teeth due to dental caries negatively influence the OHRQoL of schoolchildren.[7-11]

Most studies on dental caries do not make a distinction in terms of lesion severity. Few studies have demonstrated that the impact on OHRQoL increases with dental caries severity. A study has revealed that adolescents with a higher degree of caries (greater DMFT/dmft index) experienced a greater negative impact on their OHRQoL when compared to those with lower dental caries experience (lower DMFT/dmft index).[12] Other studies with preschool children have analyzed dental caries severity through the extent of the carious lesions and have shown that the presence of initial lesions is not considered a significant predictor of impaired OHRQoL.[13-15] Despite being an important issue, no study has evaluated dental caries severity, considering dental caries stages (initial, moderate, and severe) and the impact of caries on the OHRQoL of schoolchildren.

Caries activity is an important indicator that provides information about the prognosis and the best current management options for non-cavitated lesions,[16] and few studies have assessed the relationship between caries activity and children's OHRQoL.[17,18]

As dental caries remains the most prevalent chronic disease in childhood[19] and given the new minimal intervention dentistry approach,[20] this study aimed to assess the impact of dental caries severity and activity on the OHRQoL of schoolchildren that sought dental treatment at the public outpatient clinic of a dental school. It is important to emphasize that this is one of the few studies aimed at assessing the relationship between dental caries severity and activity and OHRQoL of schoolchildren using methods for classification of dental caries stages and activity . The null hypothesis states that the impact on OHRQoL increases with dental caries severity in schoolchildren and among children with active carious lesions.

Methods

This observational study was carried out at the pediatric outpatient clinic of the Dental School of the Federal University of Pelotas (UFPel). The data were collected between July 2019 and February 2020 following the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines.[21]

The project was submitted to the Research Ethics Committee of the Dental School at UFPel and approved under protocol no. 3.282.962. Parents or legal guardians were informed about the research objectives and were free to consent or not to the participation of their children in the study. The children were included in the study only after their parents or legal guardians signed the Informed Consent Form and after the children gave their assent.

Children aged 8 to 11 years who sought or were referred for care at the pediatric outpatient clinic of the Dental School/UFPel and/or were screened at the pediatric outpatient clinic and were residing in Pelotas were considered eligible for the present study.

Children who wore fixed dental appliances and had systemic problems or disability that would lead to difficulties in understanding the guidelines and questions in the questionnaire were excluded. Children with a history of missed appointments at the pediatric outpatient clinic (two missed appointments in six months) or missed appointments after two scheduling attempts were also excluded. Children with behavioral problems in the initial appointment, specifically those classified as exhibiting "generalized protest" or "more intense protest" according to the Brazilian version of the VENHAM Scale (BvVBRS),[22] were also excluded and referred for behavioral adaptation at the pediatric outpatient clinic.

Statistical power was calculated based on observed values, comparing the means obtained in the group of caries-free children (mean of 6.11 and standard deviation of 4.34) with the mean CPQ score obtained by children with severe caries (mean of 15.04 and standard deviation of 12.21). A two-tailed test was used to determine whether the two means were different from one another , whereas the statistical power to identify a significant

difference in OHRQoL was estimated at 93%. The OpenEpi®[23] statistical package version 3.0121 was used to calculate statistical power.

The interviewers received a three-hour theoretical training in the instruments that would be used in the research. After giving their consent, the children answered the questionnaires to assess their OHRQoL. Socioeconomic data, child's age (in years) and sex, number of siblings (dichotomized into 0 or 1 sibling and 2 or more siblings) and caregiver's educational level (in years and dichotomized into 0 to 8 years and more than 8 years) were also collected from legal guardians during anamnesis.

The OHRQoL assessment instrument used was the Portuguese version of the Child Perceptions Questionnaire 8-10 (CPQ8-10)[24] and has four domains: oral symptoms, functional limitations, emotional well-being, and social well-being. Questions included in this questionnaire refer only to the frequency of events in the last month. The oral symptoms domain contains five questions, as do the functional limitations and emotional well-being domains, while the social well-being domain has 10 questions, totaling 25 questions. Items have five Likert-type response options and the possible answers: "Never = 0"; "Once or twice = 1"; "Sometimes" = 2; "Several times = 3"; and "Every day or almost every day = 4". The minimum score is zero and the maximum is 100. A high score indicates a more negative impact on OHRQoL.

The questionnaire was applied by trained interviewers before the clinical examination and separately from the parents to prevent interference or embarrassment during its application.

The clinical examination was performed by a single trained and calibrated examiner following the World Health Organization's biosafety standards.[25] The examiner received theoretical training on how to perform the examination according to the International Caries Detection and Assessment System (ICDAS) criteria,[26] which were discussed using clinical cases. For calibration, 10 children in the same age group as the children included in the study were evaluated by the examiner and by a gold standard examiner (MSA). The weighted kappa coefficient obtained was 0.95.

The children were examined in a dental chair under artificial lighting, using a plane dental mirror, clinical tweezers, and a probe, and under relative isolation after professional brushing performed with a toothbrush and fluoride toothpaste. The examiner performed the examination using the ICDAS.[26] After the evaluation, the children were classified into four groups according to dental caries stage: 1) caries-free children (ICDAS score 0); 2) children with at least one initial carious lesion (ICDAS scores 1 and 2); 3) children with at least one moderate carious lesion, but no cavitated dentin lesion (ICDAS scores 3 and 4); and 4) children with at least one severe carious lesion (with cavitated dentin) (ICDAS scores 5 and 6).[26] The worst dental caries condition was considered in the statistical analysis and each child was classified based on the most advanced dental caries stage.

This system also allows evaluating caries activity. When dental caries involved only the enamel, the enamel was classified as active carious lesion when it presented opacity, whitish/yellowish color, loss of shine, and roughness on light probing, usually in a plaque stagnation area. The enamel was classified as inactive carious lesions when it was whitish, brownish, or darkened, but with shiny, hard, and smooth appearance on probing, and external regions of plaque accumulation. When lesions involved the dentin, the dentin with soft tissue in the background on probing was classified as active, while inactive lesions were those with a shiny and hard aspect at the bottom.[16] Presence of caries activity was considered when children presented at least one surface classified as active lesion, regardless of whether the lesion was in the enamel and/or in the dentin. Absence of caries activity, on the other hand, was considered when children did not have caries or caries activity.

The PUFA index was developed to assess the severity of oral conditions resulting from untreated dental caries. This index records the presence of severely decayed permanent/deciduous teeth with visible pulp involvement (P/p), ulceration caused by tooth fragments (U/u), fistula (F/f), and abscess (A/a).[27] This index was dichotomized into absent (PUFA/pufa = 0) or present (PUFA/pufa > 0).

Data on the absence or presence of dental trauma were also collected and classified according to the O'Brien criteria, a system that classifies the type of tissue involved in trauma (enamel, dentin, and pulp).[28] This variable was dichotomized into 1: absent and 2) present. Occlusion was assessed following the dental aesthetic index (DAI),[25] which allows classifying malocclusion into categories, according to the level of need for orthodontic treatment: DAI ≤ 25 when occlusion is normal or there is minor malocclusion that does not require treatment; 26≤ DAI ≤ 30 when elective treatment is advised; 31≤ DAI ≤ 35 for cases in which treatment is highly desirable; and DAI ≥ 36 when treatment is mandatory.[29] For this study, this variable was dichotomized into: 1) absent (DA I≤ 25) and 2) present (DAI > 25). For pufa/PUFA, dental trauma, and malocclusion, only theoretical training in possible conditions and criteria was carried out.

Data analysis was performed using the STATA 14.0 statistical software. The OHRQoL outcome was not normally distributed when assessed by the Shapiro-Wilk test. The association between outcome and independent variables was analyzed using the Mann-Whitney test for dichotomous variables and the Kruskal-Wallis test was employed for variables with more than two categories. The significance level was set at 0.5%. Poisson regression with robust variance was used to test the association of OHRQoL with caries severity and activity; other independent variables (child's age and sex, number of siblings, family income, caregiver's educational level, dental trauma, and malocclusion) were used for adjustment. Independent variables, except for the main variable (dental caries severity or activity), child's age and sex, which were maintained regardless of the P value, and those who obtained p ≤ 0.250 in the crude analysis were included in the adjusted analysis. The main outcome (OHRQoL) was used as the count variable and the mean ratio was obtained. The 95% confidence interval was calculated.

Results

From a total of 122 children invited to participate, 119 children were included. Two children were excluded: one for missing appointments and one

for having possibly moved to another city. There was one refusal to participate. Table 1 shows the sample characterization and presents the OHRQoL mean value and standard deviation in relation to the independent variables. The prevalence of dental caries in the evaluated children was 92.44%. Regarding the dental caries stage, 39.5% of the children had severe carious lesions, 34.45% had initial carious lesions, and 18.49% had moderate lesions (Table 1).

The highest means were among children with moderate and severe injuries, without statistical significance. PUFA was present in 5.88% of the sample and there was no statistically significant difference in relation to the mean OHRQoL values. Statistically significant difference was observed between caries activity and OHRQoL. Those with caries activity had a mean of 14.78 and standard deviation (SD) of 11.53, while those who did not have carious lesions or had inactive carious lesions had a mean of 9.47 (SD 7.14) (P=0.019). Sociodemographic characteristics were not associated with differences in mean CPQ scores and the presence of dental trauma and malocclusion were not associated with impaired OHRQoL (Table 1).

Table 2 shows the mean of the total scores and CPQ-8-10 scores per domain according to the different dental caries severity stages. Difference was observed between caries severity groups regarding the oral symptoms domain (p=0.047). After adjusting the regression analysis, the total scores and scores for the oral symptoms and social well-being domains showed association with dental caries severity stages (Table 3).

Regarding the total CPQ8-10 score, children classified as having initial, moderate, and severe carious lesions had a greater impact on OHRQoL compared to those without carious lesions: mean ratio (MR) of 1.92 and 95% confidence interval (95% CI) of 1.05–3.48; MR of 2.66 and 95% CI of 1.44–4.90; and MR of 2.65 and 95% CI of 1.46–4.79, respectively (Table 3).

In the oral symptoms domain, progressive increase was observed in the impact of OHRQoL as carious lesions severity increased. Children with severe carious lesions had the highest mean impact in this domain compared to those without carious

Table 1. Characterization of the sample in relation to demographic, socioeconomic and oral health aspects and the association in relation to oral health-related quality of life (OHRQoL). Pelotas, RS, Brazil (n = 119).

Variable	AF (n)	RF (%)	Total Score CPQ8-10		
			Mean	(SD)	p-value*
Age					0.588
8	19	15.97	13.47	12.60	
9	37	31.09	14.40	10.70	
10	29	24.37	11.31	9.36	
11	34	28.57	11.21	9.12	
Sex					0.491
Female	63	52.94	11.51	8.62	
Male	56	47.06	13.92	11.85	
Number of siblings					0,24
0 or 1	67	56.78	11.32	8.77	
2 or more	51	43.22	14.12	11.86	
Family income (R$)					0.691
0,00–1200,00	41	35.04	13.80	11.13	
1201,00–000,00	39	33.33	12.78	11.01	
2001,00–5000,00	37	31.62	11.47	8.83	
Caregiver schooling					0.060
0–8 years	49	41.53	13.91	9.18	
> 8 years	69	58.47	11.83	11.09	
Caries severity (ICDAS)					0.054
Without caries	9	7.56	6.11	4.34	
Initial	41	34.45	10.28	7.17	
Moderate	22	18.49	14.90	10.97	
Severe	47	39.50	15.04	12.21	
Caries activity					**0.019***
Absent	47	39.50	9.47	7.14	
Present	72	60.50	14.78	11.53	
PUFA>0					0.685
Absent	112	94.12	12.62	10.44	
Present	7	5.88	13.28	8.94	
Dental trauma					0.577
Without dental trauma	98	86.73	12.42	9.78	
With dental trauma	15	13.27	14.27	11.40	
Malocclusion					0.898
Without malocclusion	85	71.43	12.97	11.14	
With malocclusion	34	28.57	11.94	8.19	

AF: absolute frequency; RF: relative frequency (%); (SD): standard deviation; R$: Reais; CPQ8-10: Child Perceptions Questionnaire 8-10. *Mann-Whitney test for dichotomous variables and Kruskal Wallis test for variables of more than 2 categories sex, age, number of siblings and caregiver education; ᵉModel adjusted for sex, age, number of siblings, family income and malocclusion. *p < 0.05.

Table 2. Mean and Standard Deviation of the total and domain scores of the Child Perceptions Questionnaire according to the different stages of dental caries severity. Pelotas, RS, Brazil (n = 119).

Variable	N° of itens	Variation minimun and maximun	Without caries	Initial caries	Moderate caries	Severe caries	p-value*
			Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	
Total score CPQ8–10	25	0-100	6.11 (4.34)	10.28 (7.17)	14.90 (10.97)	15.04 (12.21)	0.054
Domains							
Oral symptoms	5	0-20	4 (2.91)	5.09 (3.12)	6.9 (3.27)	6.51 (3.71)	0.047*
Functional limitations	5	0-20	1 (1.73)	2.02 (2.1)	3.72 (4.66)	2.82 (3.12)	0.138
Emotional well-being	5	0-20	0.77 (0.97)	1.78 (2.43)	2.45 (4.05)	2.61 (4.09)	0.797
Social well-being	10	0-40	0.33 (1)	1.51 (2.45)	1.15 (2.28)	2.87 (4.73)	0.474

SD: standard deviation; CPQ8-10: Child Perceptions Questionnaire 8-10; *Kruskal Wallis test

Table 3. Adjusted Poisson Regression models with robust variance of the association between caries severity according to the International Caries Detection and Assessment System (ICDAS) simplified in relation to oral health-related quality of life (OHRQOL), total score and by domains (oral symptoms, functional limitation, emotional well-being and social well-being). Pelotas, RS, Brazil (n = 119).

Variable	MR	Total score CPQ8-10[a]*	MR	Oral symptoms[b]*	MR	Functional limitation[c]	MR	Emocional well-being[d]	MR	Social well-being[e]*
		95%CI		95%CI		95%CI		95%CI		95%CI
ICDAS										
Without caries	1.00		1.00		1.00		1.00		1.00	
Initial	1.92	1.05-3.48	2.98	1.26-7.02	2.08	0.63-6.84	2.86	1.01-8.09	7.09	1.15-43.82
Moderate	2.66	1.44-4.90	3.18	1.40-7.24	3.55	1.05-12.00	3.64	1.08-12.27	5.58	0.78-39.76
Severe	2.65	1.46-4.79	4.30	1.92-9.64	2.75	0.85-8.88	3.42	1.18-9.87	12.42	1.93-79.71

[a]Model adjusted for sex, age and number of siblings; [b]Model adjusted for sex, age, family income, caregiver education, trauma, malocclusion; [c]Model adjusted for sex and age; [d]Model adjusted for sex, age, number of siblings and caregiver education; [e]Model adjusted for sex, age, number of siblings, family income and malocclusion. *p < 0.05.

lesions (MR of 4.30; 95% CI of 1.92–9.64). In the social well-being domain, a greater impact was observed for children classified as having initial carious lesions and severe carious lesions compared to children without carious lesions (MR of 7.09 and 95% CI of 1.15–43.82 and MR of 12.42 and 95% CI of 1.93–79.71, respectively).

Table 4 shows the adjusted regression in relation to OHRQoL and domains in relation to dental caries activity. The results show association between caries activity in relation to the total scores and also in the functional limitations domain. A higher mean ratio was obtained for the group with caries activity in relation to those without caries activity, both for the total OHRQoL score (MR of 1.53 and 95% CI

of 1.11–2.11) and for the functional limitations domain (MR of 1.68 and 95% CI of 1.09–2.57).

Discussion

This study evaluated the impact of dental caries severity and activity on the OHRQoL of school-aged children. The main finding of this study was that the extent of dental caries, as well as the presence of active lesions negatively affected the OHRQoL of children, even after adjustment for demographic, socioeconomic, and oral health variables.

It is known that various oral health problems can negatively affect OHRQoL,[27] but dental caries has been reported as the oral injury that most affects

Table 4. Adjusted Poisson Regression models with robust variance of the association between caries activity according to the International Caries Detection and Assessment System (ICDAS) simplified in relation to oral health-related quality of life (OHRQOL), total score and by domains (oral symptoms, functional limitation, emotional well-being and social well-being). Pelotas, RS, Brazil (n = 119).

Variable	MR	Total score CPQ8-10[a]* 95%CI	MR	Oral symptoms[b] 95%CI	MR	Functional limitation[c]* 95%CI	MR	Emocional well-being[d] 95%CI	MR	Social well-being[e] 95%CI
Caries activity										
Absent	1.00		1.00		1.00		1.00		1.00	
Present	1.53	1.11-2.11	1.19	0.93-1.52	1.68	1.09-2.57	1.65	0.94-2.90	1.73	0.79-3.78

[a]Model adjusted for sex, age and number of siblings; [b]Model adjusted for sex, age, family income, caregiver education, trauma, malocclusion; [c]Model adjusted for sex and age; [d]Model adjusted for sex, age, number of siblings and caregiver education; [e]Model adjusted for sex, age, number of siblings, family income and malocclusion

*p<0.05

the OHRQoL of children and adolescents.[11,31] Several studies have demonstrated this association,[6-13,29] but some studies have not found any relationship between dental caries and OHRQoL.[33,34]

These divergent findings may be related to the different forms of data collection and analysis in relation to dental caries described in the literature. Most studies use the WHO criteria – the decayed, missing, and filled teeth index. As the WHO criteria assess caries experience, including past and treated lesions, these lesions may no longer have an impact on OHRQoL at the time of data collection. Thus, studies have started to analyze only the carious component to verify the relationship with OHRQoL, as it identifies dental caries in need of treatment.[8,9,12,15,35] However, the decayed component of the WHO criteria only assesses cavitated lesions, regardless of whether they are active or not, or their extent.

This is one of the few studies that uses the ICDAS criteria to assess caries severity and activity in a sample of school-aged children. This criterion allows analyzing whether non-cavitated or initial-stage lesions would have any impact on OHRQoL, which is still a gap in the literature. The data obtained in this study show that children with carious lesions at any stage (initial, moderate, or severe) had a greater impact than did caries-free children for the total CPQ score, with a higher mean ratio for the more advanced stages. This finding differs in part from other results published in different studies, given that initial lesions were not associated with an impact on the OHRQoL of the assessed children.[13–15,36,37] Some studies have

shown that initial injuries may not have a negative impact on the OHRQoL of children because they are not noticeable; therefore, they do not cause concern or functional impacts, as observed in moderate and severe injuries.[14,36,38] In this study, children had already been registered at the outpatient clinic; therefore, there may have been some interference in this perception because the diagnosis of initial lesions was probably made at the time of the initial examination to allow access of the children to oral health care.

Regarding caries activity, a greater impact was also observed on the total OHRQoL score among those who had active lesions. Ramos-Jorge et al. (2014)[17] assessed the impact of different caries activity stages on the quality of life of preschoolers and their families. Those authors showed that both active and untreated inactive severe carious lesions were associated with a negative impact on the OHRQoL of preschool children and their families.[17] Note that the study by Ramos-Jorge et al.[17] was the only one found in the literature that assessed the caries activity and OHRQoL in preschool-aged children, unlike the age group of the present study.

In addition, many studies use the PUFA/pufa index to measure the clinical consequence of untreated carious lesions, which is generally underinvestigated, as it has a low prevalence in the population.[9,39] In the present study, PUFA/pufa was present in less than 6% of the sample and all those children who presented at least one PUFA/pufa indicator were in the severe caries group (data not shown). This finding allows us to conclude that when it is not possible to use the ICDAS index, as it requires vigorous drying, clean

teeth, and longer examination time, the PUFA/pufa index can complement the WHO criteria when assessing more severe untreated caries stages, as it is an easy and safe index that does not require additional equipment.[40] However, it is important to highlight that it may not be enough to identify moderate stages that also have an impact on OHRQoL, as shown in the present study.

Poor oral health can affect children's diet, smile, speech, and socialization, and when such activities are impaired, their quality of life is affected.[39] The items included in the CPQ combine information about the oral health status of children and the value attributed to this status, assessing both their clinical status and well-being.[42] Thus, it is important to analyze each domain independently to identify in which one of them this injury causes the strongest impacts. The present study shows interesting findings for the oral symptoms and social well-being domains.

Regarding severity, there was an association between oral symptoms and social well-being domains of the CPQ8-10. When caries activity was analyzed, it was associated with the functional limitation domain. Probably, the association between caries activity and functional limitation is linked to the fact that more than 90% of active lesions are classified as moderate and severe carious lesions (data not shown) that can affect the masticatory function;[10,35] in addition, active injuries are more likely to cause discomfort and lead to sleeping, eating, and chewing impairments, issues that belong to the functional limitations domain.

Also regarding dental caries severity and its impact on the OHRQoL of children, the findings of the present study are in line with the data reported in previous studies,[10,12,35,43] in which the oral symptoms domain always showed the highest CPQ score. Other studies have indicated that pain in the teeth/mouth is one of the factors responsible for the negative impact on the OHRQoL of those evaluated.[10,35] It was verified in this study that the more severe the dental caries, the greater the perceived impact. This is an expected finding because it is known that the greater the dental caries severity, the more pain can be perceived, with greater likelihood of the presence of lesions such as fistula and abscess,

as well as larger lesions in which food can get trapped, resulting in bad breath. A qualitative study interviewed children aged 5–15 years with the aim of analyzing how they describe the impact of dental caries on their lives. The study showed that the main impact was pain, which also influenced education and socialization.[44]

In this study, it was also demonstrated that the social well-being domain was significantly associated with dental caries severity. CPQ8-10 assesses children's perception of how poor oral health affects their physical and psychosocial development.[40] Having an oral appearance that differs from what is accepted as normal by society, often considered unsatisfactory, can generate embarrassment and even lower the self-esteem of those who do not fit into the standards, given that appearance is a fundamental factor for socialization. One study showed that 12-year-olds reported substantial impacts on the social well-being domain,[45] corroborating the findings of the present study. Note also that the presence of dental carious lesions can influence the way children perceive themselves, which can be detrimental to their social development.

This study has some limitations. First, the sample included children from a 100% free pediatric dental clinic where participants seek, most of the times, curative treatments for, dental caries. Therefore, the findings reported in this study should be viewed with caution. Furthermore, the families treated at the clinic have their own characteristics, so the findings are not representative of the general population. Another limitation of this study is the lack of calibration for some indices used in the research. The authors suggest that further studies be performed to gather more evidence about the subject.

The use of OHRQoL measurement instruments validated for the Brazilian pediatric population is a strength of this study. Likewise, this is one of the few studies that evaluated the relationship between dental caries severity and activity and OHRQoL in children aged 8–11 years. Moreover, the findings of this study may contribute to clinical decision-making regarding the treatment of schoolchildren and the establishment of priorities for the improvement of public oral health care.

Conclusions

This study demonstrated an association between dental caries severity and activity and the OHRQoL of school-aged children. Children who had carious lesions at any stage and active lesions had a greater negative impact on OHRQoL when compared to caries-free children and to those who had inactive carious lesions.

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