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Religiosity is associated with caregivers' perception of preschool children's dental health

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Abstract: The aim of the study was to investigate the association between psychosocial factors and perception of caregivers about the dental health of their preschool children. A cross-sectional analysis was performed with 146 caregiver-child dyads attended at Pediatric Dentistry school clinics in Goiânia, Midwest Brazil. Data were collected through a structured interview and a questionnaire with the caregivers and the children's dental records. The study outcome was caregivers' perception of children's dental health (positive or negative). The independent psychosocial variables were religiosity (Duke University Religion Index - DUREL) and Sense of Coherence (Antonovsky's SOC-13 scale). Sociodemographic data and oral health-related variables were also collected as covariates. Bivariate analysis (Pearson's chi-square, T-test, and Mann-Whitney) and Poisson regression with robust variance were performed. The prevalence of negative perception was 54.8%. In bivariate analysis, negative perception was associated with caries experience and report of dental pain at any time in the child's life. In the adjusted regression model, prevalence of caregivers with negative perception of their children's dental health was 1.38 times higher in the group with low organizational religiosity (PR = 1.38; 95%CI 1.05–1.81) and 2.35 times higher in the group of children with high caries experience (PR = 2.35; 95%CI 1.54–3.60). In conclusion, religiosity was associated with caregivers' perception of dental health of their preschool children undergoing treatment in specialized dental clinics, regardless of their caries experience.

Keywords: Parents; Caregivers; Perception; Oral Health; Child, Preschool.

Introduction

The oral health status of young children is influenced by biological, sociodemographic, and psychosocial factors. During infancy, family care plays a fundamental role in the child's health, including oral health.[1]

Self-perception of health is a subjective predictor for disease, physical disability, biological or lifestyle health risks, morbidity, and mortality.[2] Patients' perception of oral health provides an expanded clinical scenario to the dentist, allowing better decision making and, consequently, a greater probability of treatment success.[3]

Several factors can affect how individuals perceive their health and that of their family members. Studies analyzing parental or caregivers' perception of the oral health of young children as outcome variables are scarce.[4-9] Parents and caregivers from poor sociodemographic conditions tend to perceive their children's dental health negatively.[5-7,9] Previous studies have also shown an association with the parents' marital status,[8] family quality of life,[5] the child's caries experience,[4,6,8] and oral health-related habits.[9] The influence of psychosocial factors, however, has not been reported.

Considering the evidence regarding the effect of psychosocial variables on health[10] and oral health,[11] models that include this dimension may be helpful for a more comprehensive understanding of the aspects related to parents and caregivers' perception of children's oral health. Another aspect not yet explored in previous studies is caregivers' dental anxiety. This variable has been associated with higher levels of parent distress regarding the perception of their child's oral health-related quality of life[12] and dental caries status.[13] Sense of coherence (SOC) and religiosity are psychosocial factors of increasing interest among researchers in the health field. SOC is an individual's ability to overcome stressful events and, consequently, maintain health.[14] Religiosity involves personal and institutional aspects[15,16] that can positively influence mental health and improve disease-related coping strategies.[16] High maternal SOC is associated with better oral health outcomes in young children and adolescents.[17,18] In addition, caregiver participation in religious activities is associated with lower caries rates in preschoolers.[19] These psychosocial factors can influence self-perception of health[20,21] and may be related to caregivers' perception of their children's oral health.

Investigating the caregivers perception of children's oral health can help understand subjective health indicators that influence the oral health status of young children. In addition, for patients undergoing dental treatment, the results can contribute to the treatment plan and decision making of dental staff.

The aim of the present study was to investigate the association between psychosocial factors and caregivers perception about the dental health of their preschool children. Considering the findings from previous studies on other health outcomes and populations, and the characteristics of the study setting, we expected a high prevalence of negative perception and an association between this outcome and more negative psychosocial indicators.

Methodology

Ethics approval

The present study was conducted in agreement with the Declaration of Helsinki and Resolution 466/12 of the National Health Council (CNS), according to protocol No. 2,518,291 of the Research Ethics Committee of the Federal University of Goiás (UFG). All participating caregivers signed an informed consent form.

Study design, setting, and participants

This cross-sectional study followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines.[22] The database of a broader study was used for the analysis. The study population was parents or caregivers and their children aged 4 to 6 years attending two pediatric dentistry school clinics in Goiânia, Goiás, Brazil, from March 2018 to December 2019. Children with neurological or cognitive disorders were excluded.

The sample size for comparing proportions was calculated based on the outcome "children's behavior in the dental clinic" for the purpose of the broader study. The minimum estimated sample was 144 mother-child dyads, recruited using convenience sampling. A post-hoc power analysis of the sample was conducted for comparisons between groups based on the outcome "caregivers' perception of their children's dental health". Results showed that the study had a power of 34.4% to detect differences between groups concerning Organizational Religiosity and nearly 100.0% concerning caries experience.

Data collection, instruments, and study variables

Two researchers collected data through individual interviews and a self-applied questionnaire with caregivers in clinic waiting rooms and searched

the child's dental chart. The researchers were previously trained. A pilot study was conducted with nine children and their caregivers to assess the instruments' applicability.

The interview questions were based on seventeen structured items developed and reviewed by the research team and evaluated by three researchers with expertise in health questionnaires. The caregiver variables were their relationship to the child, age, sex, education level, family income, previous negative dental experience, and perception of the child's dental health. The child variables were dental pain at any time in life and frequency of dental visits.

After the interviews, a questionnaire was applied to caregivers, including three scales validated in Brazil to measure dental anxiety, religiosity, and SOC. The researchers provided individual explanations on how to answer the questionnaire. The Corah Dental Anxiety Scale (DAS)[23,24] has four questions with five response options and scores ranging from 5 to 20. The higher the score, the higher the respondent's anxiety level. The Portuguese version showed good internal consistency (Cronbach's alpha = 0.83).[25]

The Duke University Religion Index (DUREL)[26,27] has five questions about three religious domains related to health outcomes: organizational religiosity (OR), which refers to attending churches or religious meetings, non-organizational religiosity (NOR), which refers to individual dedication to religious activities, and intrinsic religiosity (IR), which refers to the internalization of religiosity and its importance in the individual's life. The minimum-maximum scores of OR and NOR were 1-6 and of IR was 3–15. For this scale, a lower score indicates greater religiosity. The scale adapted to Portuguese for the Brazilian population showed good internal consistency (Cronbach's alpha ranging from 0.73 for the total scale to 0.76 for the intrinsic subscale).[27]

The short version Sense of Coherence (SOC) questionnaire proposed by Antonovsky (SOC-13) was applied.[14,18] The scale has 7-point Likert-type response options, and the score is calculated by the sum of item responses, with some items having reversed scoring and total score ranging from 13 to 91. Cronbach alpha of internal consistency for the entire scale was 0.81 for the Brazilian population.[18]

Other children's data (age, sex, birth order, and dental caries experience) were obtained from dental charts filled out by the dentists who treated them in the dental clinics. Caries experience was based on the presence of any of the following conditions registered by the dentists at the initial consultations, without previous calibration: decayed (presence of untreaded cavitated lesions or temporary restorations), missing (teeth extracted due to caries), and filled teeth (presence of permanent restorations).

Data analysis

A descriptive data analysis was initially performed. The outcome "caregiver perception of child's dental health" was obtained through the question "How do you currently rate the dental health of your child?". It was categorized into positive ("very good" and "good") and negative ("neither good nor bad, bad, and very bad"), based on previous studies.[4,5-9] Other variables, except age, with more than two categories were dichotomized to facilitate interpretation of the results. The cut-off point for caregivers' education was 12 years of schooling, which in Brazil comprises the primary and secondary school. Family income was based on Brazil's minimum wage at the time of data collection and the cut-off was 3, following the national criteria for social programs.

The Kolmogorov-Smirnov normality test was used for numerical variables, and only the SOC data had a normal distribution ($p = 0.250$). The variables with a non-normal distribution were dichotomized into high and low, using the median as the cut-off point. The scores ranged from 1 to 6 (median = 2) for the OR and NOR subscales, 3 to 11 (median = 3) for the IR, and 4 to 18 (median = 8) for the DAS. The number of teeth with caries experience ranged from 0 to 20 teeth (median = 6).

Bivariate associations between the outcome (negative perception), the independent explanatory variables (religiosity and SOC of caregivers), and confounding variables related to children and their caregivers (sociodemographic and clinical) were assessed. Confounders were chosen based on the literature, since previous studies have shown their association with the variables studied. Pearson's

chi-square test, T-test, and Mann-Whitney test were performed at a significance level of 5%. Then, multiple regression models were constructed using Poisson regression with robust variance, providing prevalence ratios (PR) and 95% confidence intervals (CI). The variables that had a $p < 0.25$ in the unadjusted analysis were included in the multivariate regression. Family income was included regardless of its statistical significance, based on its relevance in previous studies. Finally, variables with $p < 0.05$ in the adjusted model were considered significant. The goodness of fit of the final model was assessed with the omnibus test (likelihood ratio Chi–square). All statistical analyses were done with IBM SPSS Statistics Base software, version 21.0.

Results

After a refusal rate of 2% and the exclusion of participants due to the lack of dental records (n = 2), a total of 146 caregiver–child dyads were included in the analysis.

Caregiver perception of children's dental health was distributed into very bad (13.7%), bad (17.8%), neither good nor bad (23.3%), good (34.9%), and very good (10.3%). When dichotomized, the negative perception (54.8%) was higher than the positive perception (45.2%).

The respondents were mainly biological or adoptive mothers, aged between 18 and 63 years, highly educated, and with low income. The SOC had an average score of 58.7 (SD = 10.7). Religiosity was high in all domains of the DUREL: OR (56.8%), NOR (66.4%), and IR (56.8%) (Table 1). The differences in religiosity between the groups with negative and positive perceptions were not significant.

Most children were male, with 5 or 6 years of age, and not the family's firstborn child. The majority had a high caries experience, and most experienced dental pain at least once in their lives and consulted a dentist at least once a year (Table 2).

Caregiver perception of the children's dental health was associated with children's dental health variables: more caregivers with negative perception was found for children with high caries experience and with history of dental pain (Table 2).

In the Poisson unadjusted model, caries experience and dental pain were associated with perception (Table 3). After adjustment, perception was associated with caries experience and religiosity. Compared to those with higher religiosity, caregivers with lower religiosity had a 1.38 higher prevalence of negative perception of their children's dental health. Those whose children had a higher caries experience showed a 2.35 higher prevalence of negative perception than caregivers of children with lower caries experience. The model was significant ($p = 0.006$), and the final adjusted model had a Pearson's Chi–square of 0.463, indicating under–dispersion of the data.

Discussion

An association was found between religiosity and caregivers' perception about the dental health of their preschool children. The findings of this study expand the knowledge about the psychosocial aspects of parents/caregivers related to children's oral health, indicating that these aspects, in addition to objective factors such as caries and socioeconomic status, affect the perception of caregivers.[4,5,7–9]

Of the three dimensions of religiosity, only OR was significantly associated with the outcome. Caregivers with a lower OR had a 38% higher chance of perceiving their children's dental health as negative when compared to caregivers with a higher OR. It is important to highlight that religiosity may not have a direct influence on caregivers' perceptions but play a role as possible mediators, so further studies designed for mediation analysis should be performed.

These results corroborate previous studies on self–perception of general and oral health.[16,28] More religious people can perceive their health status more positively.[16,28,29] There is evidence of an association between greater parental religiosity and lower caries scores in preschoolers[19] and higher oral health–related quality of life in adolescents.[30] However, the influence of religiosity on caregivers' perception of their children's oral health has not been investigated in previous studies. Higher religiosity in adolescence was also associated with more frequent visits to the dentist for check–ups and higher perceived

Table 1. Frequency distribution and bivariate analysis of the association between caregivers' perception of children's dental health and the caregivers–related independent variables (n = 146).

Variables	% (n)	Caregiver perception		p–value**
		Negative	Positive	
		% (95%CI)*	% (95%CI)*	
		n = 80	n = 66	
Age (years)	33.5	33.0	34.0	0.431
Relationship with the child				0.230
Other than mother	11.6 (n=17)	41.2 (15.1–67.3)	58.8 (32.7–84.9)	
Biological / adoptive mother	88.4 (n=129)	56.6 (47.9–65.3)	43.4 (34.7–52.1)	
Education				0.070
Low	33.6 (n=49)	65.3 (51.5–79.1)	34.7 (20.9–48.5)	
High	66.4 (n=97)	49.5 (39.4–59.6)	50.5 (40.4–60.6)	
Family income (minimum wages)				0.378
Low (≤ 3)	74.3 (n=107)	57.0 (47.5–66.5)	43.0 (33.5–52.5)	
High (> 3)	25.3 (n=37)	48.6 (31.8–65.5)	51.4 (34.5–68.3)	
Did not answer	1.4 (n=2)			
Previous negative dental experience				0.663
Yes	34.5 (n=50)	52.0 (37.7–66.3)	48.0 (33.7–62.3)	
No	65.5 (n=95)	55.8 (45.6–66.0)	44.2 (34.0–54.4)	
Did not answer	0.7 (n=1)			
Dental anxiety				0.652
High	52.1 (n=76)	56.6 (45.2–68.0)	43.4 (32.0–54.8)	
Low	47.9 (n=70)	52.9 (40.9–64.9)	47.1 (35.2–59.1)	
Sense of Coherence (SOC)	58.7 (SD: 10.7)	58.4 (SD: 11.3)	59.1 (SD: 10.0)	0.692
Organizational Religiosity (OR)				0.133
Low	43.2 (n=63)	61.9 (49.6–74.2)	38.1 (25.8–50.4)	
High	56.8 (n=83)	49.4 (38.4–60.4)	50.6 (39.6–61.6)	
Non–Organizational Religiosity (NOR)				0.958
Low	33.6 (n=49)	33.8 (40.7–69.5)	33.3 (30.5–59.3)	
High	66.4 (n=97)	91.3 (44.6–54.7)	84.8 (35.3–55.5)	
Intrinsic Religiosity (IR)				0.129
Low	43.2 (n=63)	47.6 (34.9–60.3)	52.4 (39.7–65.1)	
High	56.8 (n=83)	60.2 (49.5–71.1)	39.8 (29.0–50.5)	

*Except for age and SOC, which shows mean (SD). **Mann–Whitney (caregiver's age), T–test (SOC), and Pearson's chi–square (all other variables). SD: Standard deviation; 95%CI: 95% confidence interval.

importance of dental health care.[31] The impact of religiosity on health outcomes can be explained by the fact that religious people have a higher motivation for health–promoting behaviors, are more likely to follow recommendations, and adopt lifestyles that directly impact health status, in addition to social support from the religious community for maintaining these habits.[28]

Dental anxiety and SOC of caregivers were not associated with the outcome. However, previous

Table 2. Frequency distribution and bivariate analysis of the association between caregivers' perception of children's dental health and children–related independent variables (n = 146).

Variable	%(n)	Caregiver perception		p–value*
		Negative	Positive	
		% (95%CI)	% (95%CI)	
		n = 80	n = 66	
Age (years)				0.755
4	48.6 (n=71)	56.3 (44.5–68.2)	43.7 (31.8–55.5)	
5	28.8 (n=42)	50.0 (34.2–65.8)	50.0 (34.2–65.8)	
6	22.6 (n=33)	57.6 (39.8–75.4)	42.4 (24.6–60.2)	
Sex				0.562
Male	53.4 (n=78)	52.6 (41.2–63.9)	47.4 (36.1–58.8)	
Female	46.6 (n=68)	57.4 (45.3–69.4)	42.6 (30.6–54.7)	
Birth order				0.302
Second or older	56.2 (n=82)	58.5 (47.7–69.4)	41.5 (30.6–52.4)	
First child	43.8 (n=64)	50.0 (37.4–62.6)	50.0 (37.4–62.6)	
Frequency of dental visits (interval)				0.906
Low frequency (> 1 year)	47.9 (n=70)	54.3 (42.3–66.3)	45.7 (33.8–57.7)	
High frequency (≤ 1 year)	52.1 (n=76)	55.3 (43.8–66.7)	44.7 (33.3–56.2)	
Caries experience				< 0.001
High (≥ 6 teeth)	52.7 (n=77)	76.6 (66.9–86.3)	23.4 (13.7–33.0)	
Low (< 6 teeth)	47.3 (n=69)	30.4 (19.3–41.6)	69.6 (58.4–80.7)	
Dental pain ever in life				< 0.001
Yes	58.2 (n=85)	67.1 (56.9–77.3)	32.9 (22.7–43.1)	
No	41.1 (n=60)	36.7 (24.1–49.2)	63.3 (50.8–75.9)	
Did not answer	0.7 (n=1)			

*Pearson's chi–square. 95%CI: 95% confidence interval.

studies in other populations showed that SOC scores were related to self–perception of dental[32] and general health status.[20,33] Parental dental anxiety has been linked to caries experience of young children.[13,34,35] Still, no study has assessed the impact of dental anxiety of parents or caregivers on their perception of children's oral health.

Among the analyzed covariates, only children's caries experience was associated with caregivers' perception, which agrees with previous studies conducted in preschoolers.[4,6,8] These results suggest that parents or caregivers have a good perception of their children's dental health and can identify the presence of caries, assessing the condition as unhealthy. This has implications for epidemiological surveys on oral health. For example, when a clinical oral examination is not possible, the caregiver's perception could be used as a surrogate indicator of the child's clinical condition and dental treatment needs.

This study had some limitations. First, as a cross–sectional study, inference on causality, such as assuming that greater religiosity leads to a more positive perception, is impossible. Second, as the study population was children seen in specialized dental clinics, a high prevalence of negative parental perception was expected, limiting the external validity of the results. In addition, data on the child's caries experience were obtained from dental records that can be subject to recording bias. Finally, the sample

Table 3. Poisson regression analysis of the association between negative caregivers' perception of children's dental health and independent variables (n = 143*).

Independent variables	Unadjusted model	p-value***	Adjusted model**	p-value***
	PR (95%CI)		PR (95%CI)	
Caregiver variables				
Relationship with the child				
Biological / adoptive mother	0.73 (0.40–1.31)	0.289		
A person other than mother	1			
Education				
Low	1.32 (0.99–1.76)	0.058	1.18 (0.90–1.55)	0.226
High	1		1	
Family income				
Low income	1.17 (0.81–1.70)	0.400	0.80 (0.57–1.14)	0.214
High income	1		1	
Organizational religiosity				
Low	1.25 (0.94–1.70)	0.129	1.38 (1.05–1.81)	0.021
High	1		1	
Intrinsic religiosity				
Low	0.79 (0.58–1.08)	0.140	0.80 (0.59–1.06)	0.123
High	1		1	
Child variables				
Caries experience				
High (≥ 6 teeth)	2.52 (1.73–3.67)	< 0.001	2.35 (1.54–3.60)	< 0.001
Low (<6 teeth)	1		1	
Dental pain ever in life				
Yes	1.83 (1.27–2.63)	0.001	1.24 (0.86–1.79)	0.244
No	1		1	

*Three cases with missing responses were excluded. **Model adjusted for the variables with $p < 0.25$ in the bivariate analysis and family income. ***Wald test. PR: prevalence ratio; 95%CI: 95% confidence interval.

size might not have been sufficiently large to detect differences between groups in the other psychosocial variables investigated.

As a strength, the study assessed relevant psychosocial factors related to public health, such as SOC and religiosity. In addition, validated scales and indices were used. A pilot study was carried out, and the data were analyzed by multiple regression, providing an overall original and relevant analysis for future research on this topic.

The present study results suggest that caregivers' perception of children's dental health is influenced by psychosocial factors and the children's dental condition. These associations reinforce the importance of expanding the scope of investigations, with the inclusion of subjective indicators and non-clinical factors for a more comprehensive understanding of the aspects related to the oral health of young children. Future studies should include homogeneous samples of preschoolers randomly selected from the general population to confirm and clarify the observed associations, especially the role of religiosity as a protective factor for oral health.

Conclusion

In this group of children undergoing treatment in specialized dental clinics, lower religiosity was associated with a negative perception of caregivers about their preschool children's dental health, regardless of sociodemographic and oral health factors. In addition, the children's high caries experience was also independently associated with a negative perception of caregivers.

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