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The effect of socioeconomic aspects and dental history on pediatric patients' dental anxiety

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Abstract: This study aimed to characterize the profile of dental anxiety in pediatric patients, identifying the effect exerted by socioeconomic factors using dental data. A cross-sectional study design with a sample of 120 children aged 7–12 years old was used. Data relating to anxiety levels prior to dental care, socioeconomic aspects (family income, education level, child's school type), and child's dental history (previous dental appointments, previous treatment, caries experience) were collected. Additionally, participants completed the Brazilian version of the Children's Fear Survey Schedule- Dental Subscale (B-CFSS-DS) to assess dental anxiety. Descriptive analyses, chi-squared (X^2) tests, and Mann-Whitney U tests were performed, with a significance level of 5%. A total of 51 boys (42.5%) and 69 girls (57.5%) were included. There was no significant difference in dental anxiety between them. However, younger children had higher mean B-CFSS-DS scores (p = 0.036, Mann-Whitney). A higher prevalence of dental anxiety was found in participants from low-income families (p = 0.012, X^2) and in patients who did not receive endodontic treatment (p=0.034, X^2). Higher mean B-CFSS-DS scores were also observed in participants who did not receive endodontic treatment (p=0.001, Mann-Whitney) compared with those that did receive endodontic treatment. No relationship was found between education level, patient school type, first dental appointment, caries experience, and dental anxiety data. Younger children presented a profile of greater dental anxiety. Socioeconomic factors and dental data exerted some effect on dental anxiety, where children from low-income families and those not subjected to endodontic treatment displayed higher rates of dental anxiety.

Keywords: Dental Anxiety; Child; Pediatric Dentistry; Socioeconomic Factors.

Introduction

The term "dental anxiety" is often used as a blanket term to describe all the different types of dental fears and phobias.[1] This disorder has been recognized as a potential behavioral management problem.[2] Despite the evolution of pediatric dentistry, preventing or intercepting dental fear or anxiety at the outset remains a challenge.[3] Identifying high levels of anxiety is important for everyone involved in pediatric dental care.[4] This

is important so that the staff can anticipate negative behaviors and reactions and minimize the need for further measures to be implemented to make the dental treatment less problematic.[5]

Among the psychometric methods available for assessing dental anxiety and fear in children and adolescents, the Children's Fear Survey Schedule-Dental Subscale (CFSS-DS) is the most widely used.[6] This scale was developed by Scherer and Nakamura[7] and modified by Cuthbert and Malamed.[8] It has been validated by several countries, including Sweden,[9] Greece,[10] China,[11] Italy,[12] Saudi Arabia,[4] and Brazil.[13]

Dental anxiety is not considered to be stable,[14] since some factors may influence it over time, such as behavior during dental treatment and some components of dental history, including dental caries experience and types of previous dental treatments received.[14, 15] Dental anxiety can create a vicious cycle in which avoidance and delay of the dental visit can deteriorate oral health, leading to a greater need for complex treatments rather than for prevention appointments.[16] Although the relationship between dental caries and dental anxiety is controversial,[17] some authors have reported a positive association between them,[18, 19] primarily when permanent teeth are involved.[17] However, these observed associations have previously considered the severity or the extent of lesions involved.[20]

Other factors may be related to dental anxiety in children, such as appointment history.[14] The types of dental treatments carried out during previous dental visits play a significant role in childrens' dental anxiety levels.[14] Children who previously underwent invasive procedures, such as extraction, show significantly higher levels of dental anxiety compared to those without these experiences. Greater levels of dental anxiety have also been reported in children who did not have regular dental visits compared to those who had regular dental visits.[21] The first dental appointment appears to influence childrens' dental anxiety levels, as children who have already had their first dental visit often present less dental anxiety.[19] Previous studies have indicated that socioeconomic status could be a determinant factor for dental anxiety, as children in the lowest socioeconomic groups presented higher levels of dental anxiety.[22]

Although the relationship between dental anxiety and these factors has been reported in many regions globally, these associations remain unclear among Brazilian pediatric patients. Thus, the present study aims to observe the dental anxiety profile and identify the effect exerted by socioeconomic and dental data factors in a group of Brazilian pediatric patients aged 7–12 years old who sought dental care.

Methodology

A cross-sectional study design was used and was guided by the checklist developed by Strengthening the Reporting of Observational Studies in Epidemiology (STROBE).[23] The study was approved (3.135.486) by the Research Ethics Committee of the Clementino Fraga Filho Hospital of the Universidade Federal do Rio de Janeiro (UFRJ). Pediatric patients and guardians received information about the research and its purpose, and upon acceptance, signed assent and consent forms.

Sample definition

The sample size was determined based on the prevalence of dental fear in clinical settings presented by Cademartori et al.[13] The minimum sample size estimated was calculated assuming set parameters: a confidence level of 95%; a dental fear/anxiety prevalence of 32% based on B-CFSS-DS scores;[13] a margin of error of 3%; and the sample population of 128. As the study was conducted via interviews, an additional parameter regarding non-responses was not included. A minimum sample size of 113 individuals was estimated.

All the enrolled participants were selected from February to December 2019 from the Pediatric Dentistry Clinic of the Dental School at the UFRJ, Brazil. The eligibility criteria included pediatric patients of both sexes, aged 7–12 years, who were not cognitively or systemically compromised, and whose guardians were accompanying them at the time of the research.

Sociodemographic and socioeconomic data

Before starting the interview, each participants' guardian answered a questionnaire to collect sociodemographic data, such as address, sex, age,

and socioeconomic data, such as family income (≤ 3/> 3 Brazilian minimum wage [BMW]), education level (< 9 Years or ≥ 9 years of study), and child's school type (public/private). Family income was categorized based on the BMW, which corresponds to approximately 246 USD/month. Family incomes less than or equal to 3 minimum wages were characterized as low income (Brasil, 2019).[24]

Pediatric patients dental anxiety assessment using the CFSS-DS

Before dental care, in order to capture accurate dental anxiety levels based on the environment inside the clinic, each child answered the questionnaire, which was carried out by a single interviewer (CSA). This was done to avoid variations in the questions asked. The interviewer was not in dental care attire and did not identify himself as a dentist to avoid influencing the participants' responses.

The CFSS-DS is a dental-specific measure that assesses fear and anxiety using 15 dental-related situations and treatments ('Dentists'; 'Doctors'; 'Injections'; 'Having someone examine your mouth'; 'Having to open your mouth'; 'Having a stranger touch you'; 'Having somebody look at you'; 'The dentist drilling'; 'The sight of the dentist drilling'; 'The noise of the dentist drilling'; 'Having somebody put instruments in your mouth'; 'Choking'; 'Having to go to the hospital'; 'People in white uniforms'; 'Having the nurse clean your teeth').[25] The scores were measured on a five-point scale of fear (1 = not afraid, 2 = very little afraid, 3 = a little afraid, 4 = quite afraid, and 5 = very afraid). The sum of all response scores can range from 15 to 75.[8] The Brazilian version of CFSS-DS (B-CFSS-DS) was used, and the presence of dental anxiety was assumed to be confirmed when scores equal to or greater than 33 were presented.[13]

Participants' dental data

Three aspects were integrated into the collection of participants' dental data: their history of dental appointments, previous dental procedures received, and caries experience. The history of dental appointments was assessed using the information provided by the guardian. Guardians were asked whether the current visit was the child's first dental appointment, regardless of whether it was at the Clinic of the Dental School or at another service. The answer options were yes or no.

When the answer to the question was "no" a follow-up question was asked regarding which dental procedures the child had already received (extraction, endodontic treatment, filling, prophylaxis/fluorine). As these procedures could have been carried out in other dental offices, there was no possibility of obtaining this data. Therefore, the guardian also provided this information.

Caries experience was evaluated through clinical examination by a trained operator, under a dental chair reflector, using single-use tongue depressors. The decayed, missed, and filled teeth (dmft) index for primary teeth and, DMFT for permanent teeth based on World Health Organization (WHO) criteria (WHO, 2013)[26] were used to register the caries experience. However, the experience of caries was categorized as the presence or absence of caries lesions, missed tooth by caries or some restoration, instead of the total value of the index.

Statistical analysis

Statistical analysis was performed using the IBM SPSS® software, version 21.0 (SPSS Inc, Chicago, USA). Descriptive statistics were used to express each result as a mean, median, and standard deviation (SD). To optimize the analysis, the median of the participants' age was obtained by dividing them into two age groups (7–9 and 10–12 years old). The normality of data was assessed using the Shapiro-Wilk test. However, normality was not verified, so analysis proceeded using non-parametric statistics.

Dental anxiety was assessed based on whether or not participants' B-CFSS-DS scores were equal to or greater than 33. Chi-squared (X^2) tests were used to identify the relationships between dental anxiety and family income (Low income /> 3 BMW); guardians' education level (< 9 Years/ ≥ 9 Years); child's school type (Public/Private); history of dental appointments (No/Yes); previous treatment (Extraction; Endodontic treatment; Filling; Prophylaxis/fluorine: No/Yes) and caries experience (No/Yes). To analyze the

distribution of dental anxiety scores among these variables, the Mann-Whitney U test was used. The level of significance was set at 5%.

Results

The sample of the study comprised 120 pediatric patients, with a median age of 9 years old (9 ± 1.49). The mean of B-CFSS-DS scores of the sample was 30.1 ± 9.2, with a range of 15 to 62. Out of all participants, 39.2% (n = 47) presented with dental anxiety based on their B-CFSS-DS scores. The distribution of participants across the study variables is shown in Table 1.

Table 2 shows the results of the analysis between the study variables and the presence or absence of dental anxiety. There was a statistically significant association between dental anxiety and family income ($p = 0.012$, X^2 test) and patients who had not received endodontic treatment ($p = 0.034$, X^2 test).

The B-CFSS-DS scores per item and total scores were compared between sexes and age groups. Boys had a higher mean score for the item "Doctors", while girls had a higher mean score for the item "Having a stranger touch you" ($p < 0.05$, Mann-Whitney U). Children aged 7–9 years presented higher mean scores overall, and for items such as "Dentists", "Having someone examine your mouth", "Having somebody put instruments in your mouth", and "Having the nurse clean your teeth" ($p < 0.05$, Mann-Whitney U). These results are presented in Table 3.

Regarding the distribution of B-CFSS-DS scores among the socioeconomic assessment items, family income was not considered significant, although it came close ($p = 0.052$, Mann-Whitney U). Guardian education level and child's school type did not influence B-CFSS-DS scores ($p > 0.05$, Mann-Whitney U). These results are presented in Table 4.

Regarding dental data, higher dental anxiety scores were found in patients who did not receive endodontic treatment ($p = 0.001$, Mann-Whitney U). No significant relationship was found between B-CFSS-DS scores and a history of dental appointments or caries experience ($p > 0.05$, Mann-Whitney U). These results are presented in Table 5.

Discussion

This study evaluated dental anxiety in pediatric patients aged 7–12 and aimed to identify the effect exerted by socioeconomic and dental data. Although other dental anxiety surveys have previously been conducted in Brazil, this is the first study using the B-CFSS-DS following its validation by Cademartori et al.[13]

Table 1. Distribution of participants between the variables.

Variable	Total n (%)
Sex	
Girl	69 (57.5)
Boy	51 (42.5)
Age (years)	
7–-9	75 (62.5)
10–-12	45 (37.5)
Family income	
Low income	96 (80.0)
> 3 BMW	24 (20.0)
Guardian's education level (years)	
< 9	35 (29.2)
≥ 9	85 (70.8)
School type	
Public	71 (59.2)
Private	49 (40.8)
History of previous dental appointment	
No	105 (87.5)
Yes	15 (12.5)
Previous treatment	
Extraction	
No	73 (60.8)
Yes	47 (39.2)
Endodontic treatment	
No	102 (85.0)
Yes	18 (15.0)
Filling	
No	53 (44.2)
Yes	67 (55.8)
Prophylaxis/fluorine	
No	34 (28.3)
Yes	86 (71.7)
Caries experience	
No	53 (44.2)
Yes	67 (55.8)
Total	120 (100)

BMW: Brazilian minimum wage.

Table 2. Identification of dental anxiety between the study variables.

Variable	Anxiety (B-CFSS-DS)		p-value*
	Absence	Presence	
	n (%)	n (%)	
Sex			
Girl	41 (56.2)	28 (59.6)	0.712
Boy	32 (43.8)	19 (40.4)	
Age (years)			
7–-9	42 (57.5)	33 (70.2)	0.161
10–-12	31 (42.5)	14 (29.8)	
Family income			
Low income	53 (72.6)	43 (91.5)	0.012
> 3 BMW	20 (27.4)	4 (8.5)	
Guardian's education level (Years)			
< 9	21 (28.8)	14 (29.8)	0.904
≥ 9	52 (71.2)	33 (70.2)	
School type			
Public	41 (56.2)	30 (63.8)	0.404
Private	32 (43.8)	17 (36.2)	
History of previous dental appointment			
Previous treatment			
No	66 (90.4)	39 (83.0)	0.229
Yes	7 (9.6)	8 (17.0)	
Extraction			
No	46 (63.0)	27 (57.4)	0.542
Yes	27 (37.0)	20 (42.6)	
Endodontic treatment			
No	58 (79.5)	44 (93.6)	0.034
Yes	15 (20.5)	3 (6.4)	
Filling			
No	34 (46.6)	19 (40.4)	0.508
Yes	39 (53.4)	28 (59.6)	
Prophylaxis/ fluorine			
No	18 (24.7)	16 (34.0)	0.265
Yes	55 (75.3)	31 (66.0)	
Caries experience			
No	36 (49.3)	17 (36.2)	0.157
Yes	37 (50.7)	30 (63.8)	
Total	73 (100)	47 (100)	120

*X^2 test, results significant at 5% level in bold. B-CFSS-DS: Brazilian version of the Children's Fear Survey Schedule- Dental Subscale; BMW: Brazilian minimum wage.

Table 3. Mean and standard deviation of each questionnaire item's score and total scores of the B-CFFS-DS according to gender and age.

Variable	Sex			Age		p-value*	Total
	Girls	Boys		7-9 years	10-12 years		
	Mean ± SD	Mean ± SD	p-value*	Mean ± SD	Mean ± SD		Mean ± SD
CFSS-DS Items							
Item 1	1.99 ± 1.3	1.80 ± 1.2	0.459	2.12 ± 1.4	1.56 ± 0.9	0.028	1.91 ± 1.2
Item 2	1.83 ± 1.3	2.47 ± 1.6	0.013	2.29 ± 1.5	1.78 ± 1.1	0.090	2.10 ± 1.4
Item 3	3.00 ± 1.6	2.92 ± 1.7	0.818	3.08 ± 1.7	2.78 ± 1.5	0.417	2.97 ± 1.6
Item 4	1.32 ± 0.8	1.61 ± 1.1	0.125	1.63 ± 1.1	1.13 ± 0.4	**0.004**	1.44 ± 0.9
Item 5	1.41 ± 1.0	1.33 ± 0.9	0.876	1.41 ± 1.0	1.31 ± 0.9	0.371	1.38 ± 0.9
Item 6	3.29 ± 1.6	2.51 ± 1.6	**0.008**	2.95 ± 1.7	2.98 ± 1.5	0.797	2.96 ± 1.6
Item 7	2.38 ± 1.4	2.06 ± 1.3	0.185	2.25 ± 1.4	2.22 ± 1.2	0.685	2.24 ± 1.3
Item 8	1.65 ± 1.2	1.53 ± 1.0	0.785	1.75 ± 1.3	1.36 ± 0.8	0.105	1.60 ± 1.1
Item 9	1.36 ± 0.8	1.33 ± 0.8	0.626	1.44 ± 0.9	1.20 ± 0.5	0.148	1.35 ± 0.8
Item 10	1.58 ± 1.0	1.35 ± 0.6	0.407	1.49 ± 0.9	1.47 ± 0.8	0.963	1.48 ± 0.8
Item 11	2.06 ± 1.3	2.33 ± 1.5	0.382	2.45 ± 1.6	1.71 ± 1.0	**0.024**	2.18 ± 1.4
Item 12	2.83 ± 1.5	3.00 ± 1.5	0.472	2.92 ± 1.6	2.87 ± 1.5	0.889	2.90 ± 1.5
Item 13	2.49 ± 1.6	2.67 ± 1.5	0.436	2.65 ± 1.7	2.42 ± 1.3	0.681	2.57 ± 1.5
Item 14	1.68 ± 1.3	1.76 ± 1.3	0.521	1.84 ± 1.4	1.51 ± 1.1	0.244	1.72 ± 1.3
Item 15	1.26 ± 0.7	1.43 ± 1.1	0.758	1.45 ± 1.0	1.13 ± 0.7	**0.015**	1.33 ± 0.9
B-CFSS-DS scores	30.10 ± 9.2	30.12 ± 9.4	0.926	31.72 ± 9.9	27.42 ± 7.3	**0.036**	30.11 ± 9.2

*Mann-Whitney U test; results significant at 5% level in bold; B-CFSS-DS: Brazilian version of the Children's Fear Survey Schedule- Dental Subscale; SD: Standard deviation; Item 1: 'Dentists'; Item 2: 'Doctors'; Item 3: 'Injections'; Item 4: 'Having someone examine your mouth'; Item 5: 'Having to open your mouth'; Item 6: 'Having a stranger touch you'; Item 7: 'Having somebody look at you'; Item 8: 'The dentist drilling'; Item 9: 'The sight of the dentist drilling'; Item 10: 'The noise of the dentist drilling'; Item 11: 'Having somebody put instruments in your mouth'; Item 12: 'Choking'; Item 13: 'Having to go to the hospital'; Item: 14: 'People in white uniforms'; Item 15: 'Having the nurse clean your teeth'.

Table 4. Socioeconomic data comparisons according to B-CFSS-DS scores.

Socioeconomic variables	n	%	B-CFSS-DS			p-value*
			Median	Mean	SD	
Family income						
Low income	96	80.0	30.8	30.84	9.5	0.052
> 3 BMW	24	20.0	27.2	27.17	7.8	
Guardian's education level (years)						
< 9	35	29,2	30.0	29.03	8.7	0.516
≥ 9	85	70,8	30.0	30.55	9.5	
School type						
Public	71	59.2	30.0	29.99	8.5	0.744
Private	49	40.8	30.3	30.29	10.4	
Total	120	100	30.0	30.11	9.2	

*Mann-Whitney U test, $p < 0.05$; B-CFSS-DS: Brazilian version of the Children's Fear Survey Schedule- Dental Subscale.; SD: standard deviation; BMW: Brazilian minimum wage.

In several previous surveys that used the CFSS-DS to assess dental anxiety, results were expressed as scores, with a cut-off point used to define the presence of anxiety. Most studies used the level of ≤ 38 as a cut-off point for dental anxiety definition.[27] In Brazil, the cut-off point recommended for use with the B-CFSS-DS is ≥ 33.[13] Based on this, the prevalence of anxiety in the selected sample was determined to be 39.2%. As different instruments are used to evaluate dental anxiety, only results from studies that used the CFSS-DS were considered comparable with the current results.

Table 5. Dental data comparisons according to B-CFSS-DS scores.

Dental data variables	n	%	B-CFSS-DS			p-value*
			Median	Mean	SD	
History of previous dental appointment						
No	105	87.5	29.0	30.03	9.6	0.418
Yes	15	12.5	34.0	30.67	6.9	
Previous treatment						
Extraction						
No	73	60.8	30.0	29.89	9.0	0.761
Yes	47	39.2	30.0	30.45	9.7	
Endodontic treatment						
No	102	85.0	31.0	31.24	9.2	0.001
Yes	18	15.0	21.0	23.72	6.9	
Filling						
No	53	44.2	30.0	29.13	8.8	0.405
Yes	67	55.8	30.0	30.88	9.6	
Prophylaxis/ fluorine						
No	34	28.3	31.5	30.53	8.3	0.479
Yes	86	71.7	29.0	29.94	9.6	
Caries experience						
No	53	44.2	27.0	28.79	8.4	0.216
Yes	67	55.8	31.0	31.15	9.8	
Total	120	100	30.0	30.11	9.2	

*Mann-Whitney U test, $p < 0.05$. B-CFSS-DS: Brazilian version of the Children's Fear Survey Schedule- Dental Subscale; SD: standard deviation.

A systematic review identified that prevalence rates in other countries ranged from 10–21.2%.[27] In Brazil, the prevalence has previously been reported as between 32–33%.[13] The use of a lower cut-off point to identify anxious children when using the B-CFSS-DS may contribute to this higher prevalence. However, as there was no consensus regarding the appropriate cut-off point between previous studies, the value considered appropriate for the Brazilian sample was used. Differences in factors, such as sex, age, country of origin, and the cut-off point used for identification of dental anxiety in each study may contribute to the variations seen in reported prevalences. [27]

The mean CFSS-DS scores in other countries ranged from 21.0 in China[11] to 34.2 in the United States.[28] The mean score of the CFSS–DS in the present study was 30.1, similar to the results found in Italy (30.8)[12] and with another study from Brazil (29.3).[13] The large variations between different countries and small variations between applications in the same country reinforce the idea that culture could be responsible for the different values.

In the present study, the B-CFSS-DS was used to determine dental anxiety while the child was in the clinical setting. Previous studies, including the study that validated the B-CFSS-DS,[13,20] have applied the instrument outside of the clinic setting, such as in a waiting room. This change was made in the present study due to the possibility that dental anxiety is milder during the waiting period, where there is a lack of experimentation in the care environment. Thus, it was assumed that evaluation outside of the clinical environment would be a possible mitigation for the dental anxiety presented. Greater fidelity was assumed when dental anxiety was evaluated at the place of care.

Previous studies have observed higher dental anxiety scores in girls,[11] thought to be due to their tendency to show their feelings, unlike boys who may deny their fear.[15,29] However, no statistically significant difference in total score between sexes was found in the present study, as well as in another.[10] However, the comparison of CFSS-DS mean scores on each item showed that boys had a higher mean score for the item "Doctors", while the girls had higher mean scores for the "Having

a stranger touch you". This could be explained by the difference in perceptions and sensitivity between boys and girls regarding the situations.

The younger age group had significantly higher anxiety total scores, which has been found in previous studies.[12] Furthermore, the younger age group had higher mean scores for the items "Dentists", "Having someone examine your mouth", "Having somebody put instruments in your mouth", and "Having the nurse clean your teeth". It has been reported that dental anxiety may decrease with age.[30] This is thought to be due to cognitive ability development, which provides children with adequate coping styles and increases their ability to understand the explanations given by their dentists, thereby reducing their dental anxiety.[20,31]

Pediatric patients from low-income families presented higher dental anxiety levels, which has been previously reported by Dogan et al.[22] This suggests that socioeconomic status could be a determiner of dental anxiety. It has been previously suggested that guardian educational level may be involved with a child's dental anxiety.[32] However, this was not observed in the present results. It is important to consider that other factors, such as culture or parental anxiety, may have influenced this result.[22]

Another socioeconomic aspect that was analyzed was the type of school the child attended. No significant difference was observed between the occurrence of anxiety in participants from public or private schools. This is different from the results of previous studies, where participants from public schools displayed higher levels of dental anxiety scores compared to participants from private schools.[15]

Regarding the dental data collected, no significant difference in dental anxiety was found between whether a child was attending their first dental appointment or not. This result is different from a previous study that found a protective effect of previous visits on dental anxiety.[20] Another previous study observed that mean anxiety scores were higher in children who had never gone to the dentist.[33] These results could be explained by the fact that a lack of previous experience can generate incorrect thoughts regarding dental procedures.[15] Therefore, previous experience can help to deconstruct a negative expectation that may generate dental anxiety.

Three previous studies[15,20,33] reported similar results regarding previous experience and anxiety, despite using different age groups and methods. However, those results are different from the results of the present study. This divergence can be explained by the sample used in the present study, with the majority of children having previous dental experience. This may be due to the fact that the study was conducted in a dental care setting, where children receive dental care.

One of the common limitations of questionnaire studies is recall bias.[15] There is a possibility that the guardians may not have accurately recalled which previous treatments the child had received. Therefore, the inclusion of this question is a limitation of the research. However, as there were participants who received treatment in other dental offices, where access to dental history was not possible, this question was included in order to standardize the data.

Even though it is has been reported in the literature that invasive treatments, such as extraction, may influence dental anxiety,[14] this was not observed in the present study or in the study by Alshohain et al.[15] Furthermore, despite it being widely reported among patients that the high-speed dental handpiece is a cause of dental anxiety, this scores relating to this item were not significant. Moreover, the filling itself was not associated with anxiety, nor where prophylaxis or fluorine. This may be explained by the variation in the degree of invasiveness between different restorative techniques and the atraumatic restorative methods used.[15]

Endodontic treatment had an effect on dental anxiety levels. A higher prevalence of dental anxiety was observed in patients who had not received endodontic treatment. Although this relationship was significant, it needs to be interpreted with caution. The performance of minimally invasive dentistry procedures has increased, which minimizes the chance of pulp exposure. Thus, there is a lower demand for invasive procedures, such as endodontic treatment. This is reflected in the small proportion of patients in the sample who had received such treatment. Despite this, these results corroborate those of a previous study, which encouraged endodontic treatment when necessary as it was not found to be associated with greater negative behavior or anxiety.[34]

The present study found that anxiety scores were directly proportional to the severity of caries experience,[17, 21] suggesting a relationship between them.[5] Although the literature is inconclusive in trying to justify this relationship, it has been suggested that there may be a connection between oral health behavior, such as cariogenic diet and poor hygiene habits, with the attitudes of anxious children, such as avoiding dental treatment. [17] This connection is thought to be a possible explanation for the more severe caries experiences reported by anxious children.[17] However, as only the presence or absence of a caries experience was evaluated, not the severity, this may have influenced the results of the present study, where no positive association between caries experience and dental anxiety levels was found.

Based on dmft evaluation, teeth that had already undergone caries treatment were considered to have caries experience, not just teeth that were still cavitated. Although the results of this study found no influence of previous treatments on levels of anxiety, previous literature reports that a child has less anxiety when they have already had a dental experience.[19] This is thought to be because they know the context of the experience, eliminating negative thoughts about dentistry.[19] This may have contributed to the lack of correlation between caries experience and anxiety since some of the patients included as having caries experience had already undergone treatment. Therefore, future studies may want to consider decayed, non-treated teeth.

Different results can be found in studies of this kind due to the design, methods of sampling, questionnaire applications, setting, and cultural and socioeconomic variations.[27] As Brazil is a country with a wide range of territoriality, and large sociocultural variations can be found. Thus, the data found in this research should not be generalized. However, it may serve as encouragement for other studies. Since dental anxiety is multifactorial and causes many behavioral problems in children, it needs to be thoroughly studied to optimize pediatric dental care.

Conclusion

Regarding the dental anxiety profile of the sample, no difference was found in the prevalence of dental anxiety between boys and girls. However, younger children presented higher levels of dental anxiety. Particular socioeconomic factors and dental data exerted some effects on dental anxiety. Children from low-income families and those who had not been subjected to endodontic treatment presented higher rates of dental anxiety.

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