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Original Article

Anxiety in Children submitted to Dental Appointment

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Abstract

Objective: To determine anxiety in children undergoing dental treatment and to evaluate associated factors. **Material and Methods:** The sample consisted of 48 children during dental appointment in dental clinics of the Franciscano University Center, 48 caregivers, and 46 dentistry students. The modified Venham Picture Test was used to determine anxiety of children during dental appointment, before and after treatment. For determining anxiety related to dental care among caregivers, the modified Corah's dental anxiety scale was used. The Lipp's stress symptoms inventory for adults was applied to determine the stress level of dentistry students. In addition, the individual characteristics of participants were recorded to determine their association with the presence of anxiety. **Results:** Anxiety was observed in 60.4% of children, and it was related to invasive dental procedures ($p = 0.021$), history of dental pain ($p = 0.002$), presence of bruxism ($p = 0.028$), anxious caregivers ($p = 0.023$), and stress of the dental student that conducted the appointment ($p = 0.005$). **Conclusion:** Overall, the majority of pediatric patients showed anxiety, which was directly related to misbehavior during dental care. Moreover, anxiety was related to individual characteristics of children and was influenced by the anxiety level of caregivers, as well as the emotional state of dentistry students during the dental appointment.

Keywords: Dental anxiety, Pediatric dentistry, Child behavior, Child Psychology.

Introduction

Due to anxiety to dental treatment, patients often avoid visiting the dentist until the moment they feel pain or discomfort. In this perspective, anxiety or dental phobia can lead not only to poor oral health and tooth loss, but also to the feeling of shame and inferiority [1,2].

The beginning of the feeling of fear and anxiety to dental treatment can be associated with individual vulnerability and traumatic experiences in previous dental treatments. Individual psychological aspects, environmental factors, anxiety of parents, high DMFT index, first contact with the dentist and frequency often act as factors predisposing to anxiety related to dental treatment [3-8]. Thus, Dentistry professionals must find ways to reduce exposures to stimuli that trigger anxiety and turn the treatment into a positive experience [9]. This reinforces the need for the dentist to know their patients, understand the individual characteristics of children, interact and communicate and create a satisfactory professional-patient relationship. This is essential for establishing a bond of trust, and makes it possible to control the degree of the patient's anxiety, which brings benefits not only for the patient, who will feel more safe and supported in the treatment situation, but also for the dentist, who will rely on a calmer and more relaxed patient, facilitating the procedure.

Considering the relevance of the theme, this study aimed to determine anxiety in children undergoing dental treatment and identify associated factors, so that a correct intervention can be performed according to the patient's degree and etiology of anxiety.

Material and Methods

The research project of this observational study was approved by the Research Ethics Committee of the Franciscano University Center, as regulation of research involving human beings (Protocol 1246 / 359.2011.2). It is noteworthy that, before applying the tests, the importance and objectives of the study were explained to participants and volunteers, and if they agreed to participate in the study, they were asked signed the free and informed consent form.

The convenience sample was composed of children under dental treatment at the dental clinics of the Franciscano University Center / Santa Maria - RS, during the months of March and April 2012 with the following inclusion criteria: age between 4 and 8 years, no delay in cognitive development, birth defects, neurological and / or psychological disorders already diagnosed or treated and absence of special needs. Caregivers and Dentistry students of the 3rd and 6th semesters were also invited to participate. The Dentistry course of the Franciscano University Center treats approximately 200 children per semester, especially those of low socioeconomic level.

To determine the presence of anxiety in children, the modified *Venham Picture Test* (VPT) was applied prior to the dental appointment in the waiting room while waiting for the dental service separated from adults, so they would not influence the child's response, being accompanied only by the researcher [10]. The test was reapplied after the consultation. The test consists of eight cards with two images each, which were presented to all children in a size corresponding to an A4 sheet,

colored in their original number of order (1 to 8) with drawings in female gender for girls and in male gender for boys. Each card contains an anxious and other non-anxious child and, before them, the children were encouraged to choose the figures that most reflected their emotions at the moment with the question 'I want you to show me what boy (girl) looks the most like what you're feeling before going to the dentist' before dental treatment and 'I want you to show me what boy (girl) looks the most like what you're feeling now that you already went to the dentist' after treatment. If the child chose for anxious figure, he / she received score 1, if the child chose the non-anxious, he / she received score 0. The sum of the values of each card determines the test value being 0 (less anxious) and 8 (more anxious).

To determine anxiety in parents or guardians of children, the Modified Corah's Dental Anxiety Scale (MDAS) was applied in the waiting room, and the participant was instructed to answer in relation to himself, while the child was answering the VPT. The test consists of five objective questions. Each response corresponds to a score. Anxiety is determined by the sum of scores: up to 15 is no anxiety; between 16 and 18, anxious; and greater than 19, very anxious [9].

Those responsible for accompanying children were asked about reports of dental pain, medical history, previous dental treatment, dental trauma history and diagnosis of bruxism in order to correlate with anxiety identified in children. The medical history of children was classified as relevant and irrelevant. Patients with relevant medical history were those who are under medication regularly, or more frequent visits to medical offices and hospitals, while patients with irrelevant medical history were healthy children who do not attend hospitals and regular medical offices. The dental history of child patient was also classified into two categories: relevant for children who were going to the dentist for the first time or children with previous negative experience and not relevant for children who had gone to the dentist before with no history of negative experience [11].

Dentistry students who attended children were evaluated by the "Lipp Stress Symptoms Inventory" (LSSI), which is a validated and standardized test for the Brazilian population and aims to identify characteristic stress situations, allowing diagnosing stress in adults and the phase in which the person is (alarm, resistance, near exhaustion and exhaustion) [12].

During the consultation, the child's behavior was observed, being classified as unchanged the child who cooperated with the service and changed the child who had a behavior change, for example, crying.

The age of children, their caregivers and dentistry students in the program, as well as caregiver's kinship and the type of procedure performed in consultation were also collected and all data were recorded on a specific form for further evaluation.

For the analysis of results, child anxiety was determined by the sum of VPT cards, and children who scored greater than 0 were classified as anxious, either if the score regards the answer to the test applied before or after the dental appointment. The group of caregivers was divided into individuals without anxiety, anxious and very anxious according to the indication of the MDAS test. Dentistry students had their tests corrected by a psychologist, who defined which have shown

symptoms of stress, being identified with stress and evaluated according to the stress degree. The results found were correlated with children's anxiety.

Data were statistically analyzed with the help of the Statistical Package for Social Sciences statistical software (SPSS 18.0), considering a 5% significance level. To evaluate the association of anxiety determined by VPT with age, the Student's t test was used. The association with other variables was analyzed by Chi-square statistical test and Fisher's exact test.

Children with high degree of anxiety compromising dental treatment were referred for specialized treatment and students who had stress indicators were alerted about the diagnosis and its risks.

Results

Overall, 48 children, 18 females and 30 males with mean age of 7.1 ± 1.1 years participated in this study. In addition, 48 caregivers were also included, 6 males and 42 females mean age of 37.7 ± 10.8 years. In relation to dentistry students, 46 students participated: 9 males and 37 females with mean age of 21.3 ± 1.6 years.

The average age of children with anxiety was 7.2 ± 1.2 years and children without anxiety was 7.4 ± 1 with no difference between groups ($p = 0.410$).

Table 1 shows the sample description and the variables analyzed. Table 2 shows the association of results.

Table 1. Distribution of children (n = 48), their caregivers (n = 48) and dentistry students that participated (n = 46) and the variables studied. Santa Maria, RS. 2013.

Variables	n	%
Anxiety of children		
Absent	19	39.6
Present	29	60.4
Gender		
Male	30	62.5
Female	18	37.5
Relevant dental experience		
Yes	12	25.0
No	36	75.0
Report of dental trauma		
Yes	16	33.3
No	32	66.7
Appointment with invasive treatment		
Yes	14	29.2
No	34	70.8
History of dental pain		
Yes	26	54.2
No	22	45.8
Diagnosis of Bruxism		
Yes	22	45.8
No	26	54.2
Behavior during treatment		
Unchanged	30	62.5

Changed	18	37.5
Relevant medical experience		
Yes	8	16.7
No	40	83.3
Caregiver's MDAS		
No anxious	33	68.8
Anxious	8	16.7
Very anxious	7	14.6
Caregiver's kinship		
Mother	33	68.8
Others	15	31.3
Caregiver's gender		
Male	6	12.5
Female	42	87.5
Student's LSSI		
No stress	24	52.1
Resistance	22	47.9

Table 2. Factors associated with the presence of anxiety in children (n = 48). Santa Maria, RS, 2013.

Variables	Anxiety		p-value
	Absent n (%)	Present n (%)	
Gender			
Male	10 (33.3%)	20 (66.7%)	0.201*
Female	9 (50%)	9 (50%)	
Relevant dental experience			
Yes	3 (25.0%)	9 (75.0%)	0.199*
No	16 (44.4%)	20 (55.6%)	
Report of dental trauma			
Yes	5 (31.3%)	11 (68.8%)	0.303*
No	14 (43.8%)	18 (56.3%)	
Appointment with invasive treatment			
Yes	2 (14.3%)	12 (85.7%)	0.021*
No	17 (50.0%)	17 (50.0%)	
History of dental pain			
Yes	5 (19.2%)	21 (80.8%)	0.002*
No	14 (63.6%)	8 (36.4%)	
Diagnosis of Bruxism			
Yes	5 (22.7%)	17 (77.3%)	0.028*
No	14 (53.8%)	12 (46.2%)	
Behavior during treatment			
Unchanged	16 (53.3%)	14 (46.7%)	0.012*
Changed	3 (16.7%)	15 (83.3%)	
Relevant medical experience			
Yes	5 (62.5%)	3 (37.5%)	0.146*
No	14 (35.0%)	26 (65.0%)	
Caregiver's MDAS			
No anxious	17 (51.5%)	16 (48.5%)	0.023**
Anxious	0 (0%)	8 (100.0%)	
Very anxious	2 (28.6%)	5 (71.4%)	
Caregiver's kinship			
Mother	12 (36.4%)	21 (63.6%)	0.358*
Others	7 (46.7%)	8 (53.3%)	

Caregiver's gender			
Male	2 (33.3%)	4 (66.7%)	0.554*
Female	17 (40.5%)	25 (59.5%)	
Student's LSSI			
No stress	14 (58.3%)	10 (41.7%)	0.005*
Resistance	4 (18.2%)	18 (81.8%)	

* Fisher's exact test; ** Chi-square test.

Discussion

This study sought to determine anxiety in children during dental appointment in dental clinics of the Franciscano University Center and associated factors, and it was observed that the percentage of anxiety to dental treatment is high (60%). The importance of this type of study is because the occurrence of dental anxiety is seen as universally present in human societies, and most often in childhood. Anxiety is described as an adaptive phenomenon, and if there is no intervention by the dentist, it can become a disorder in adult life of children, compromising their quality of life and oral health.

Specifying a single cause for the individual's behavior is not possible as it is multi-determined [13]. In this study, some aspects were investigated, which could be related to anxiety in children, adopting a methodology with application of a validated assessment tool (VPT) to check anxiety before and after dental treatment [11,14]. However, the fact that the children's behavior is multi-determined is a study limitation, and anxiety may be influenced by factors that were not mentioned in the survey. Another limitation is the difficulty of distinguishing fear from anxiety in young children [15]. Fear is an emotional state, where the child, when expressing it, can put into practice a way to ask for help, as he is able to identify what is causing this feeling [13]. Anxiety is a vague and unpleasant feeling of fear, apprehension, characterized by tension or discomfort derived from the anticipation of hazard of something unknown or strange [16].

Among the child-related factors, age and sex can influence the perception of fear and anxiety [17]. There is a decreasing trend of anxiety and improvement in behavior with advancing age [18-20]. The fact suggests that, as children develop in all aspects (physical, cognitive, emotional and social), they acquire a greater ability to cooperate during dental treatment, demonstrating their emotions in other ways and not through non-cooperation [21]. However, in this study, age and sex of children were not associated with childhood anxiety to dental treatment, according to results found in other studies [7,21,22].

When considering the type of procedure performed, it was found that children undergoing invasive treatment were relatively more anxious than those undergoing clinical examination or maintenance (85.7% versus 50.0%, $p = 0.021$). Another study showed that children who underwent dental treatment under anesthesia felt more fear than those who did not undergo anesthesia [23].

In this context, it is worth highlighting the association of anxiety with pain, or, more anxious children had reported dental pain [24]. This statement was confirmed, considering the fact that 80.8% of anxious children reported having felt dental pain, then, it is accepted that the fear of

pain from an uncomfortable experience in the past is a strong factor to cause dental anxiety and is responsible for most cases of patients who avoid dental treatment. In contrast, relationship between anxiety and traumatic events, as well as dental and medical history was not found, which may be explained by the fact that children with past medical and hospital experience have presented passive cooperators behavior during dental treatment [25].

In relation to children with bruxism, association was found with the presence of anxiety ($p = 0.028$). This finding is in agreement with literature, which points out that anxiety, among other factors, predisposes to bruxism [26].

Another point to be discussed concerns the children's behavior during the dental appointment, because results have shown that anxious children tend to have worse behavior during treatment, as 83.3% of anxious children in this study had no collaborative behavior. However, it is noteworthy that not all non-cooperation behavior is a fear condition and not all fearful children are not cooperative [27].

It is also noteworthy that most caregivers were not anxious (68.8%). However, according to literature, all children accompanied by anxious parents / guardians had anxiety and 71.4% of children accompanied by very anxious guardians were also anxious and that no relationship of influence on anxiety of children with the mother or another family member as companion was not observed ($p = 0.358$) [6-8]. These data confirm that the negative experiences to dental treatment are often passed on to the child in an indirect way through parents, siblings and friends who report dental treatment always associated with processes involving pain [28]. Adult emotions are also visible to the children through facial expression, which will regulate their social behavior under the emotion expressed by those who care.

When the patient is a child, in addition to all the stress generated by the working condition, there is also the professional-patient relationship, which should be established. Based on the above, this study also evaluated the stress of dental students, identifying that 47% ($n = 22$) of students had symptoms of stress and of these, 81.8% ($n = 18$) had anxious pediatric patients. The dentistry student, like the professional, is subject to many factors that are potentially stressful. The literature reports that the stress levels experienced by students negatively influence the quality of learning and execution of work, regardless of cognitive and technical skills of these students [29,30]. For this reason, the dentist cannot forget to watch his own behavior and be aware not only of the technical aspects of dental practice, but also the effects of this practice on the patient's behaviors, parents / guardians and himself (15lat).

Anxious children need to be diagnosed early and referred for appropriate treatment and remission of symptoms. But we cannot forget that each child is a unique individual who lives differently their experiences with conditions to overcome difficulties during maturation. Thus, the availability of instruments with adequate psychometric properties becomes relevant, and it should be pointed out that the VPT was efficient, whereas studies in different cultures have shown similar results.

Conclusions

- 1) In general, most pediatric patients presented high anxiety levels, a fact that was directly related to the non-collaborative behavior during dental care and consultation with invasive treatment;
- 2) Individual aspects of children were related to their anxiety levels, such as history of dental pain and bruxism;
- 3) The presence of anxiety in parents / guardians as well as symptoms of stress in some dentistry students were associated with patient's anxiety, which exposes the vulnerability of the child patient in relation to the adult behavior.

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