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Original Article

Anxiety in the Pediatric Dental Clinic: Use of Informative and Aversive Behavior Management Techniques

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Abstract

Objectives: To measure dental anxiety in children, determine its association with behavior exhibited during treatment and evaluate the use of informative and aversive behavior management techniques. **Material and Methods:** A cross-sectional study was carried out with 51 children aged 6-12 years submitted to restorative dental procedures at the pediatric dental clinic of the Franciscano University Center (Brazil) between May and December 2013. Anxiety was measured using the Venham Picture Test and behavior during treatment was analyzed using the Frankl Behavior Scale. Variables were submitted to descriptive statistics. The chi-square test was used to determine associations between anxiety and categorical variables, considering associations with p-value $p \leq 0.05$ to be statistically significant. **Results:** Twelve children (23.5%) exhibited anxiety prior to dental procedure. Anxiety was not significantly associated with age ($p=0.669$), gender ($p=0.478$), behavior during treatment ($p=0.915$) or behavioral management techniques ($p=0.701$). Moreover, no significant association was found between changes in the level of anxiety after procedure and the behavior management techniques used during treatment ($p=0.828$). **Conclusion:** A high percentage of children exhibited dental anxiety. However, anxiety prior to dental procedure was not associated with any of the variables analyzed and no association was found between changes in the level of anxiety after procedure and the informative or aversive behavior management techniques used during treatment.

Keywords: Anxiety; Psychology; Child; Pediatric Dentistry.

Introduction

The prevalence of anxiety can be considered high in Pediatric Dentistry and it is appropriate for dentists to implement strategies for the control of child behavior, favoring the establishment of good dentist-patient relationship and success of the proposed clinical procedures. The construction of this relationship is not merely a technical procedure involves knowledge about the child and treating this as a unique individual and entitled to respect for their particularities [1,2].

Many children attend the dental office with fear and distorted and preconceived ideas about what can happen in the query. Bring, several times a subjective fear, which comes from dental stories parent or same goal, by experience already experienced in medical or dental office [3]. The construction of this relationship is not merely a technical procedure and involves knowledge about the child and his treatment as a unique individual that should be respected for his particularities [1,2].

Many children attend the dental office with fear and distorted and preconceived ideas about what can happen in the consultation. Several times they present a subjective fear, which comes from dental stories of their parents or by their previous experiences in medical or dental office [3].

Fear is associated with the child's behavior at query time. It manifests in the form of anxiety, introspection, run, cry and / or agitation [4]. Still, the situation of dental treatment is often related to anxiety and stress [5]. There are physiological stimuli, for example, pain, and psychological aspects involved in dental treatment, which can be assessed by patients as potentially threatening to their well-being. The stress experienced by the patient increases their fear and perception of pain, decreasing their ability to collaborate with the treatment [6].

Thus, the management of children's behavior is an important part of pediatric dental practice. To this end, the use of pharmacological techniques is common in some countries [7]. However in Brazil, for successful treatment, pediatric dentists use a variety of non-pharmacological child behavior techniques before using pharmacological techniques. Therefore, knowledge of psychology and child behavior management techniques are essential for the dentist to establish a relationship of harmony and safety with patient and his family, minimizing fear and anxiety and hence stress on Pediatric dental care [8-10].

Anxiety is an emotional state with a physiological and psychological component, which is part of the normal spectrum of human experience [11], and driving performance. It becomes pathological when it is disproportional to the situation that triggers, or when there is a specific object that route [11-13]. It becomes pathological when it is disproportional to the situation that triggers it, or when there is no specific object to guide it [11-13].

Pediatric Dentistry has developed significantly in recent decades with regard to biological and technological knowledge. However, despite all the new techniques and resources available to the dental professionals, largely of care still exists an unpleasant sensation related to dental experience, which is reflected by the expectation of the patient's pain. in the majority of dental sessions, there is

still an unpleasant sensation related to dental experience, which is reflected by the patient's pain expectation.

In this context, the aims of the present study were to measure dental anxiety in children, to determine its association with behavior exhibited during treatment and to evaluate the use of informative and aversive behavior management techniques.

Material and Methods

Subjects and Study Design

This is a quantitative, cross-section and exploratory study conducted with children aged 6-12 years, treated at Children's Dental Clinic - Franciscano University Center in Santa Maria / RS / Brazil from May to November 2013.

To be included in the study, the child should require at least one restorative dental procedure, with local anesthesia. As for the exclusion of patients, the following criteria were considered: patients with delayed cognitive development, birth defects, neurological and/or psychological problems already diagnosed or treated and children who did not live with the biological family.

Sample size calculation was based on the following parameters: confidence level of 95%, prevalence of anxiety due to dental appointment among children aged 6-12 years of 55.33% [14] and margin of error of 5%. This calculation determined a minimum sample size of 51 children.

All the children were accompanied by parents / guardian for dental care. The level of children's anxiety was assessed before and after their implementation, through a projective test with self-analysis from human figure drawings. The level of children's anxiety was assessed before and after implementation through a projective test with self-analysis from the drawings of human figures, the Venham Picture Test (VPT) [15]. The VPT consists of eight pairs of pictures of children showing various emotional states, which were presented to children before and after the completion of the dental procedure in a corresponding size at half A4 sheet, colored and with drawings in females for girls and in males for boys, also considering their race. Each card contained 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 time. If they chose the anxious figure received the value 1, if they chose the anxious child did not receive the value 0. The sum of values of each card ordered the test value and the representative value of zero not anxious child and 8 the most anxious. If they chose the anxious figure, they would score 1, if they chose the not anxious child, they would score 0. The sum of the values of each card determined the test value, in which score zero was representative of not anxious child and 8 the most anxious child.

The patients' performance evaluation was recorded during the dental procedure and reported after the session: definitely negative, negative, positive and definitely positive, according to table of the Frankl Behavioral Scale [16]. During the dental appointment, when there was variability in the behavior exhibited by the patient, the worst behavior exhibited was considered for classification.

During the execution of the dental procedure, the type of non-pharmacological behavioral management technique used for child care was also recorded. These were classified as informative (talk-show-do, distraction, positive reinforcement and modeling) or aversive (voice control, physical restraint, outbound threat of responsible, outgoing request the responsible and hand over his mouth).

Data were collected by three blinded examiners, an operator who carried out the restorative dental procedure, an examiner who applied VPT in children and another examiner who classified the behavioral management techniques used and the patient's behavior according to the Frankl scale [16] during procedure. Prior to data collection, examiners have gone through a process of training and calibration in order to study the diagnostic criteria and enable assessment of diagnostic reproducibility, and the intra-examiner agreement for assessment of behavioral management techniques and patient's behavior during the kappa was equal to one. A pilot study was conducted with 10% of the total sample involving children that do not participate in the sampling plan to assess the feasibility of the proposed methodology. It was observed that such a proposal was achievable without the need for adjustments.

Study Variables

Anxiety was considered dependent variable of this study (measured by Test Come Picture) in patients before and after the restorative dental procedure. The following were considered independent variables: age and sex of the child's behavior (a) patient during dental care and behavioral management techniques used for its realization. Child's age and sex, patient's behavior during dental care and behavioral management techniques used for its implementation.

Regarding variable patient's behavior during dental care, for performing the chi-square test was considered as negative behavior definitely negative and the negative and was classified as positive, definitely positive and positive. As the variable age, it was categorized as below the median of 100 months and above this. to perform the chi-square test, definitely negative and negative behaviors were considered as negative behavior and definitely positive and positive were classified as positive. Variable age was categorized as below the median of 100 months above it.

Statistical Analysis

After the description of variables, the chi-square test was used to assess the association between anxiety and categorical variables, the analysis was performed with Stata 9.0 software, considering statistically significant associations with $p \leq 0.05$.

Ethical Aspects

The study design was submitted to the Ethics Research Committee on Human Beings of the Franciscano University Center and endorsed under number 206 296.

Results

The average age of children in the study was 101 months and the median was 100 months. In relation to sex, 30 boys (mean age of 98.67 months) and 34 girls (mean age of 104.55 months) were included.

Table 1 shows the distribution of the 51 children included in the survey, compared to anxiety prior to completion of the dental procedure, behavior during procedure and behavioral management techniques used.

Table 1. Distribution of children in relation to anxiety prior to completion of the dental procedure, behavior during procedure and behavioral management techniques used during dental care.

Variables	n	%
Anxiety prior to dental procedure		
Present	12	23.5
No present	39	76.5
Behavior during dental procedure		
Positive definitely	2	3.9
Positive	6	11.8
Negative	38	74.5
Negative definitely	3	9.8
Behavioral management techniques		
Informative	36	69.2
Aversive	15	30.8

As for informational behavioral management techniques, talk-show-how was performed in 48 (94.1%) children, positive reinforcement in 32 (62.7%), distraction in 30 (58.8%) and modeling 4 (7.8%) patients. In relation to aversive techniques, in 14 (27.5%) children, voice control technique was used, physical containment was used in 5 (9.8%), the output of the charge on threat to 5 (9.8%) and the output of the charge request in 3 (5.9%) patients. Hand over the mouth technique was not used in any child.

Table 2 shows that there was no association between anxiety prior to completion of the dental procedure and age, sex, the child's behavior during dental care and behavioral management techniques used.

Table 2. Association between anxiety prior to completion of the dental procedure and independent variables studied.

	Previous Anxiety				p-value*
	Absent		Present		
	n	%	n	%	
Age					0.669
Below the median of 100 months	20	74.1	7	25.9	
Above the median of 100 months	19	79.2	5	20.8	
Gender					0.478
Male	24	80.0	6	20.0	
Female	15	71.4	6	28.6	
Behavior during dental procedure					0.915
Positive	6	75.0	2	25.0	
Negative	33	76.7	10	23.3	
Behavioral management techniques					0.701
Informative	27	75.0	9	25.0	
Aversive	12	80.0	3	20.0	

*Chi-square test

Comparing anxiety before and after the dental procedure, it was found that 11 (21.6%) children had decreased anxiety, 28 (54.9%) remained at the same level of anxiety and 12 (23.5 %) increased anxiety.

Table 3. Association between variation in the level of anxiety before and after the completion of the dental procedure and behavioral management techniques used during dental care.

Behavioral Management Techniques	Anxiety variation						p-value*
	Decreased		Unchanged		Increased		
	n	%	n	%	n	%	
Informative	7	19.4	20	55.6	9	25.0	
Aversive	4	26.4	8	53.3	3	20.3	

*Chi-square test

Discussion

Anxiety related to dental treatment has been widely studied, as this situation appears to be potentially anxiogenic for patients and can compromise the adequate conduction of procedures [2-5,7,8,11]. For patients, especially children, clinical aspects such as completion of anesthesia, as well as aspects related to the dentist's behavior can generate anxiety and avoidance responses to treatment [18]. As for the dentist often observe a professional whose training was focused on the development of technical skills and clinical knowledge, but has difficulty in managing the behavior of their patients [17,18]. It has been observed that the dentist's training is often focused on the development of technical skills and clinical knowledge, but shows difficulty in managing the behavior of patients [17,18].

In Pediatric Dentistry, the situation worsens to the extent that the use of aversive techniques for children during dental procedures has always been much criticized [1,18,19], which justifies conducting research focused on the analysis of impact of the use of these techniques in patients.

In this study, anxiety prior to restorative dental procedure was present in 23.5% of children, far below results found in other studies [14,20,21], which may be related to the fact that children included in the survey belong an age group where they already have a higher understanding of what is explained to them [20,22], which may facilitate the understanding of the completion of the dental procedure. which may be related to the fact that children included in the survey belong to an age group already showing a higher understanding of what is explained to them [20,22], which may facilitate the understanding about the performance of the dental procedure.

The behavior during dental consultation according to the behavioral scale of Franklin et al. (1962) (16), 15.7% of children had positive behavior and 84.3% negative behavior. In this research, the most extreme behavior of the patient has always been considered for classification, which may be related to the time of anesthesia, time, although this data has not been collected, observed by researchers to presence of tears often at this stage of procedure. which can be related to the time of anesthesia that, although these data have not been collected, investigators often observed the presence of tears at this stage of the procedure. Previous research [21] has shown the moment of

greatest anxiety at the time of anesthesia, and researchers reported that the greatest influence is not associated with the technique, but rather to instruments used, which cause discomfort and fear in patients.

The use of informative behavioral management techniques, this survey was predominant, given that talk-show-do, positive reinforcement, distraction and modeling techniques have proven to be effective for controlling anxiety in most cases, and aversive techniques were used in only 30.8% of patients. Hand over the mouth technique was not used in any child, as this is only indicated in children who have extreme negative behavior, "when the dentist puts his hand over the child's mouth and speaks softly, near the child's ear to, the child stops crying and screaming and listen" [19] in cases where other behavioral management techniques were not effective [23].

There was no association between anxiety before dental care, sex and age of patients. Regarding gender, other studies have shown similar results [14,24]. Regarding age, in stunted research there was a higher chance of having dental anxiety among younger children. Regarding age, previous studies have shown higher likelihood of dental anxiety among younger children [20,22] certainly due to their lower understanding of dental procedures and immaturity.

In this work, there was no association between child's behavior during dental care and prior anxiety. These data suggest that anxious patients are not always those with worse behavior [18]. Remember that anxiety and children's behavior may be related to the fact that they have objective fear related to previous experiences in the dental office, and the subjective fear, which comes from experiences told by other people that can lead to increased anxiety during a dental appointment [21,24,26,27]. Therefore, it is noteworthy that when it comes to child patient, regardless of anxiety indicators, the use of techniques that minimize stress should be considered, which allow developing a good relationship between professionals and patients [4].

Regarding the use of behavioral management techniques, no association with anxiety prior to dental appointment has been verified. This means that the more anxious patient before the procedure is not always invariably subjected to more aversive management techniques, which means that more anxious patient before the procedure will not always necessarily be submitted to more aversive management techniques. This reinforces the fact that the application of VPT to predict both behavior during dental care and the need for using aversive techniques has not proven effective. There are no other studies in literature evaluating anxiety associated with child patient and behavioral management technique.

The association between changes in the anxiety level of patients and behavioral management techniques used during dental procedure was not observed in this study. These results have shown that the use of aversive management techniques does not necessarily increase child's anxiety.

Regarding behavioral management techniques in pediatric dentistry, informational techniques are more accepted by parents compared to aversive and pharmacological techniques [19] and has a good efficacy for the reduction of anxiety in children [18]. However, there are specific indications for each technique, which depends on the age and systemic condition of patients,

presented by this behavior during dental care, among others, and the use of aversive management techniques is often necessary [1].

It is therefore crucial that parents / guardians are informed about the embodiment why the use and implications of each behavioral management technique, especially aversive, used in their children [19]. It is therefore crucial that parents / guardians are informed about dental procedure, why techniques are used and implications of each behavioral management technique, especially aversive techniques used in children so that they can be calm and confident during procedures and establish a harmonious relationship with the professional taking care of their oral health.

The fact that the technique of hand over the mouth had not been used can be considered a study limitation, not allowing the results to include this type of management. So one can not talk about what this technical question in relation to the level of patient anxiety. So, it could not be concluded what this technique causes in relation to the level of patient anxiety. In addition, due to the sample size, it was also not possible to assess the association of each management technique with anxiety reported by patients.

Finally, for the dentist keep the oral health of their patients, they need to evaluate them in regular consultations to this end, and the development of a good dentist-patient relationship is crucial, ensuring that the patient and parents/guardians attend consultations and follow the guidelines transmitted by professionals with minimum anxiety [1,17-19]. Children who have high frequency of behaviors that hinder the dentist's performance should receive special attention, being submitted to planned treatment sessions, using management techniques that minimize anxiety and encourage positive behaviors [1]. Therefore, it is essential to have a care for the training of professionals, as the best way to act by the anxiety displayed by their patients, seeking to establish bonds of trust and provide them calm during the execution of the procedures. Therefore, it is essential to focus the training of professionals more to the level of anxiety shown by their patients, seeking to establish relationships of trust to keep them calm during the performance of dental procedures.

Conclusions

- 1) The percentage of children with anxiety related to dental treatment was significant;
- 2) There was no association between anxiety before the dental procedure with age, gender, behavior during care and behavioral management techniques used;
- 3) There was no correlation between variation in the level of anxiety before and after procedure and information or aversive behavioral management techniques.

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