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Original Article

Child's Behavior and its Relationship with the Level of Maternal-Child Anxiety During Dental Care

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Abstract

Objective: To evaluate the association between child's behavior and level of maternal and child anxiety during dental care. **Material and Methods:** The sample consisted of 100 children aged 6-11 years of both gender, scheduled for the first dental appointment at the dental clinic in a private school of Salvador, Brazil. The emotional reactions of patients were evaluated before the dental visit through the Venham Picture Test (VPT) instrument of anxiety evaluation. Mothers completed a specific questionnaire (Corah anxiety scale) to assess their anxiety about dental treatment. During dental care, prophylaxis and clinical examination by DMF-T and dmf-t indexes were performed. The child's behavior during the dental treatment was evaluated by the Frankl's Behavior Rating Scale. Fisher's exact test and chi-square were used to evaluate the association between variables ($\alpha = 5\%$). **Results:** It was observed that 24.0% of children presented anxiety according to VPT. There was a significant association between level of anxiety and pain and dental caries as the main dental complaint ($p < 0.001$), and between child's behavior and variables maternal anxiety ($p = 0.01$) and childhood anxiety ($p < 0.001$). **Conclusion:** It could be concluded that there was a positive association between child's non-cooperative behavior during dental care and maternal and child anxiety.

Keywords: Dental Anxiety; Pediatric Dentistry; Child Behavior.

Introduction

Among the most observed feelings in the dental office, the most worrying are fear and anxiety, because these feelings trigger different types of behavior that interfere in the professional-patient relationship and in the construction of the trust relationship [1].

In dental treatment, experiences and influences suffered by the child are quite significant for the positive or negative response to treatment. Factors such as previous medical history, parents' behavior with their fears and anxieties, number of siblings, history of toothache, absence of dental experience or the young age are decisive factors in the establishment of fear, anxiety and attitudes of the child patient in the dental office [2-6].

In addition, the association between dental anxiety and history of pain of odontogenic origin is based on the idea that this condition requires invasive procedures for its repair. Dental extractions are defined as the major cause of dental anxiety, and can be explained by the fear of applying anesthesia and tooth loss [7,8]. The presence, severity or extent of dental caries alone is not related to anxiety [5], but pain caused by the carious process and its treatment, even with minimally invasive approaches, has a positive association [7,9].

The literature confirms the existence of a correlation between anxiety and maternal fear with child's behavior in the dental office [8-11]. Negative experiences to dental treatment are transmitted to children in an indirect way through parents, siblings and friends who report the care always associated with processes involving pain [12]. Parents are in direct contact with their children and have a strong influence on their opinion regarding dentistry and, therefore, their behavior during clinical care [8-11]. The presence of the mother and maternal dental anxiety negatively affect the behavior of children aged 7-13 years during primary tooth extraction [13].

The use of instruments, focused on playful activities, before dental care, has achieved highly significant results in reducing anxiety [14]. In addition, therapies such as music therapy, aromatherapy and chromotherapy have increasingly been applied for prevention and treatment of childhood anxiety [15-18]. Children who require specialized behavioral management techniques can be identified by non-verbal activities prior to dental consultation, such as freehand drawing [19].

Thus, the success of dental care is in the way the pediatric dentistry deals with emotional issues, the degree of knowledge about fear and anxiety, and the interpretation of the child's behavior [15-18]. In this context, the aim of this study was to evaluate the association between child's behavior and level of prior maternal and child's anxiety during dental care.

Material and Methods

Ethical Aspects

This research was approved by the Ethics Research Committee of the "Instituto Mantenedor do Ensino" accredited to the National Health Council under protocol 4097/2013. Parents and guardians who agreed to voluntarily participate in the study after having clarified about the purpose of the study signed the Informed Consent Form.

Data Collection

This cross-sectional study included the first 100 children of both sexes aged 6-11 years scheduled in the months of February, March and April 2015 for dental care for the first time at the Pediatric Dentistry Clinic of the Faculty of Technology and Sciences - Salvador, Brazil. Children who presented some neurological impairment, patients with special needs, who were unable to understand the study purpose or those who did not accept the methodology used were excluded from the study. All children were individually approached by the researcher in charge.

For data collection, a previously elaborated and standardized instrument was used to record data on child's identification, medical and dental history, oral health and feeding habits health and main complaint.

The emotional reactions of the child patient were evaluated before the dental care through the Venham Picture Test (VPT) evaluation instrument. VPT measures infant anxiety during dental treatment and is an instrument in which a set of figures is used, among which the child being treated chooses the one that most identifies with him/her at the moment of treatment [20]. Children are presented with eight pairs of figures of a child, which express various reactions and, before them, children are encouraged to choose the figures that most reflect their emotions. The choice of the anxious image was classified as score one and the non-anxious image as score zero. The final sum of the eight images identifies the level of anxiety. The values of scores were grouped and divided into three levels: low (scores 0-3); moderate (scores 4-5) and high (scores 6-8) [20].

To assess maternal anxiety, the Corah Dental Anxiety Scale validated for Portuguese was applied [21]. It is a formal instrument for assessing and quantifying manifestations of dental anxiety. The scale consists of a simple, objective and easy-to-apply questionnaire that measures dental anxiety through 4 questions with 5 alternatives. The answers range from one to five, in which alternative one represents tranquility and fifth is the highest degree of anxiety. The questionnaire includes questions about how the person feels about going to the dentist, in the waiting room, dental chair and after being anesthetized. For the purpose of interpretation of the degree of anxiety, individuals whose sum of answers is up to 4 points are considered not anxious; between 5 to 8 points, low anxiety level; between 9 to 12 points, moderate anxiety level; and greater than 13 points, high anxiety level [21].

The dental care itself was carried out in a well-lit dental office, with air conditioning, dental chair, reflector, micromotor and low rotation tip. During clinical examination, the following instruments were used: dental mirror # 5, explorer probe with blunt tip (WHO), clinical clamp and Robinson autoclaved brush in individual packaging.

Clinical evaluation was performed by a calibrated examiner (Kappa = 0.79) for the DMF-T caries index for permanent teeth [22], and dmf-t index for deciduous teeth [23]. This dental index has the objective of accounting decayed, missing and filled (restored) teeth.

During dental care, the child was evaluated regarding his /her behavior through the Frankl scale [24] composed of four behavioral categories: (VI) definitely positive; (III) positive; (II) negative; (I) definitely negative (Table 1).

Table 1. Behavior classification according to Frankl.

Type of behavior	Characteristics
Frankl I (definitely negative behavior)	The child refuses to be treated, presents forced crying, expressing fear or any other characteristic of negativism, being the worst behavior possible.
Frankl II (negative behavior)	The patient is reluctant to accept treatment, does not cooperate, the child becomes sulky or withdrawn and there is evidence of a negative but not a constant attitude.
Frankl III (positive behavior)	When acceptance of treatment occurs, but the child is cautious, is willing to cooperate with the dentist, but may sometimes complain, but follows the instructions and presents a rather reserved attitude.
Frankl IV (definitely positive behavior)	When the child is completely cooperative, has good communication with the dentist, is interested in dental procedures, laughs and smiles and appreciates the situation

Statistical Analysis

Statistical Package for Social Sciences (v18.0) was used to analyze data. The nonparametric Kruskal-Wallis test was used to verify if there was difference between the mean age and VPT categories. To verify if the observed frequencies were associated, the Chi-Square test was used. Fisher's exact test was used to verify association between the type of behavior presented by the child during dental care and its relationship with maternal anxiety (Corah Dental Anxiety Scale) and child anxiety (VPT), adopting significance level of 5% ($p < 0.05\%$).

Results

Table 2 shows the characterization of the sample composed of 100 children, of whom 54 were female and 46 were male. In relation to age, it is possible to observe a greater distribution of children aged 6-8 years (56%).

Table 2. Sample distribution according to age and gender.

Variables	Categories	N	%
Age (years)	6	30	30.0
	7	16	16.0
	8	10	10.0
	9	18	18.0
	10	13	13.0
	11	13	13.0
	Total	100	100.0
Gender	Female	54	54.0
	Male	46	46.0
	Total	100	100.0

Table 3 shows the means and standard deviation of age for the VPT test results. Greater distribution of the sample classified as low anxiety was observed (76%), and there was no statistically significant difference in the mean age among the categories presented ($p > 0.05$).

Table 3. Sample distribution according to child's anxiety by VPT and mean age.

VPT	N	Mean	Standard deviation	Median	Minimum	Maximum	p-value*
Low	76	7.97	1.87	7.5	6	11	
Moderate	20	8.45	1.67	8.5	6	11	0.522
High	4	8.00	1.16	8.0	7	9	

N=number of individuals; *Kruskall-Wallis test.

The distribution of children in relation to the level of anxiety measured by VPT and variables gender, main complaint and first consultation are presented in Table 4. Significant association was detected in relation to the main complaint and the VPT result ($p < 0.05$), so that of the 44% of individuals who sought the service for prevention, 42% had low anxiety. On the other hand, among individuals with moderate and high anxiety by VPT, the main complaint was pain and caries.

Table 4. Sample distribution according to the VPT test and variables gender, main complaint and first consultation.

Variables	Categories	VPT			Total	p-value*
		Low N (%)	Intermediate N (%)	High N (%)	N (%)	
Gender	Female	42 (42.0)	10 (10.0)	2 (2.0)	54 (54.0)	0.927
	Male	34 (34.0)	10 (10.0)	2 (2.0)	46 (46.0)	
	Total	76 (76.0)	20 (20.0)	4 (4.0)	100 (100.0)	
First consultation	Yes	60 (60.0)	16 (16.0)	4 (4.0)	80 (80.0)	0.899
	No	16 (16.0)	4 (4.0)	0 (0.0)	20 (20.0)	
	Total	76 (76.0)	20 (20.0)	4 (4.0)	100(100.0)	
Main complaint	Pain	15 (15.0)	9 (9.0)	2 (2.0)	26 (26.0)	<0.001
	Caries	19 (19.0)	9 (9.0)	2 (2.0)	30 (30.0)	
	Prevention	42 (42.0)	2 (2.0)	0 (0.0)	44 (44.0)	
	Total	76 (76.0)	20 (20.0)	4 (4.0)	100 (100.0)	

N=Number of individuals; *Chi-Square Test.

The type of behavior presented by children during dental care (Frankl Behavioral Scale) is presented in Table 5, as well as its relationship with maternal anxiety (Corah Dental Anxiety Scale) and child anxiety (VPT). Significant association was detected between the child's behavior and variables maternal and child anxiety ($p < 0.05$). Among individuals with cooperative behavior, there was a higher frequency of non-anxious mothers (49.0%) and non-anxious children (67.0%).

Table 5. Sample distribution according to child's behavior during dental care and prior maternal and child dental anxiety.

Variables	Categories	Behavior (Frankl Behavioral Scale)		Total	p-value*
		Not Cooperative (I and II) N (%)	Cooperative (III and IV) N (%)	N (%)	
Maternal anxiety (Corah scale)	Not anxious	9 (9.0)	49 (49.0)	58 (58.0)	0.01
	Low	12 (12.0)	16 (16.0)	28 (28.0)	
	High	6 (6.0)	8 (8.0)	14 (14.0)	
	Total	27 (27.0)	73 (73.0)	100 (100.0)	
Child's anxiety (VPT)	Low	9 (9.0)	67 (67.0)	76 (76.0)	< 0.001
	Moderate	14 (14.0)	6 (6.0)	20 (20.0)	
	High	4 (4.0)	0 (0.0)	4 (4.0)	
	Total	27 (27.0)	73 (73.0)	100 (100.0)	

N=Number of individuals; *Fisher's exact test.

Discussion

One of the difficulties found by dentists during dental care is the fear that some patients show in relation to procedures performed or not in the dental office. The first reaction of a child to dental care may facilitate or impair its course and quality. However, these reactions are closely linked with the level of anxiety previously developed by the child [25].

In the present study, prevalence of 24% of anxious children (moderate and high VPT) was observed, similar to results of previous studies that found anxiety level of 21.1% [4] and 30.0% [12] of children. On the other hand, some authors [26,27] have shown that fear and anxiety are a reality commonly found in visits to dentists, being present in more than 80% of children surveyed. These divergent results can be attributed to differences in the age range studied (nine to seventeen years) and to the different evaluation instruments used in the study.

Previous research revealed prevalence of anxiety in more than half of the sample (52.17%) and pre-school children aged 3-6 years were more likely to have anxiety in the dental practice than children aged 7-12 years [11]. Children aged 3-6 years are 11.8 times more likely to have fear than those older than seven years of age [28]. Although some studies report a positive association of dental anxiety in young children [8,11,29], in another study older children are more anxious [30].

In the present study, it was not possible to verify differences in relation to the mean age, but in view of the divergent results found in literature, these differences can be justified by the fact that younger children are more immature and are more apprehensive about the unknown and can develop greater anxiety than older children. Older children, on the other hand, may have greater ability to control fear and anxiety, avoiding these feelings. However, it must be taken into account that older children may also have been exposed to unpleasant dental or similar experiences and thus have internalized these feelings of fear and anxiety, becoming more fearful and apprehensive.

The prevalence of similar anxiety among boys and girls through VPT was also observed in the sample investigated. On the other hand, some authors found higher prevalence of anxiety in girls [26,30], which is justified because girls are more likely to express their feelings and fears than boys.

Regarding the first dental consultation, similar results were observed in the anxiety levels recorded by VPT. Although anxiety is expected in any new situation, such as the first dental consultation [25], the first time at the dentist did not prove to be a relevant factor for the triggering of anxiety in these children.

The presence of pain has always been associated with elevated anxiety level or the triggering of fear [2,10,13,28]. Fear may also be associated with the absence of dental treatment and oral health deterioration [10]. In this study, it was possible to observe that all children with high VPT had as main complaint pain or caries, whereas of the 44% of children who sought the service for prevention, 42% had low VPT. Children with negative experience and relevant dental history are 31.67 times more likely to develop anxiety than children who never had toothache [28]. In a previous study, children with high anxiety, who had experienced toothache and presented non-cooperative behavior during previous medical experiences, were more likely to exhibit non-cooperative behavior during

their first dental visit [2]. Therefore, it is important to invest in measures of oral health promotion, in guidance to parents about the importance of teeth in childhood and their maintenance for the health of the child.

In addition, performing dental procedures usually presupposes the use of anesthesia, which is considered the most stressful procedure of dental treatment [29]. Studies have shown that children with previous dental treatment experience with the use of anesthesia were more fearful than children who had been treated without anesthesia [11,29].

Another important factor to be highlighted is the relationship between fear and anxiety of parents and the fear and anxiety of their children [8,10,30]. Maternal anxiety may be a major factor influencing child's anxiety in dental practice, which would lead the child to behave negatively [10].

Cooperative and non-cooperative behavior during dental care was observed in 49.0% and 9.0%, respectively, of children with non-anxious mothers. The simple presence of mother and maternal dental anxiety negatively affect the behavior of children [13]. Therefore, it is important to clarify and guide parents about the child's oral health and the influence of their feelings on the child's feelings. This is because they are in direct contact with the patient, exerting a strong influence on their opinion regarding dentistry and, consequently, their behavior during dental care.

Regarding the child's behavior, this study verified that 73.0% of children presented cooperative behavior, 67.0% with low anxiety through VPT and 18.0% of children with intermediate and high anxiety through VPT were not cooperative. In this sense, less anxious children tend to accept more easily the performance of the dental procedure, thus allowing the treatment success. Therefore, the level of anxiety found in this research is directly related to behavior at the time of the procedure. Some authors found a relationship between anxiety and the child's behavior, showing that more anxious individuals presented a more negative behavior during dental care [11].

One of the limitations of the present study involves the convenience sample of children at a school clinic and behavioral observation only at the initial consultation without performing more invasive procedures using anesthesia, which could influence the child's behavior. Therefore, further studies should be carried out in the area in order to more deeply investigate this behavioral relationship with the different types of procedures performed and a greater association with factors for the triggering of both anxiety and objective and subjective fear.

The present study showed that the child's behavior is directly linked to the level of anxiety and fear. Therefore, the use of distraction and relaxation sessions in the waiting room with playful activities could be an alternative to make the treatment less tense and more acceptable.

In addition, the use of a playful environment and behavioral management techniques in school clinics and private dental offices could contribute to the preparation of these patients in accepting dental treatment, thus facilitating the execution of dental procedures.

Conclusion

There was a positive association between the child's non-cooperative behavior during dental care and the feeling of childhood and maternal anxiety. In addition, a positive association was found between child's anxiety and previous feeling of pain and dental caries.

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