

ORIGINAL ARTICLE

Dental anxiety and behavioral problems: A study of prevalence and related factors among a group of Iranian children aged 6-12

Abstract

Purpose: The aims of this study were to assess the prevalence and also some related demographic and dental factors of dental anxiety and behavioral problems in school-aged children. **Subjects and Methods:** A total of 150 children of 6-12 years old were selected according to the inclusion criteria. Prior to the dental visit, the mothers were asked to answer a questionnaire of dental and demographic background and a Corah dental anxiety scale (CDAS). At the same time, a faces version of the modified child dental anxiety scale (MCDAS) was completed by the child. Next, the child was guided to the operating room. According to the treatment plan, local anesthesia solution was injected and the child's cooperative behaviors were quantified based on the Frankle index duration the injection stage. Analysis of Variance and Linear regression models were used for the statistical analysis. **Results:** The mean scores of the child's dental anxiety and cooperative behavior were 20.81 (± 6.97) and 3.04 (± 0.86), respectively. Forty four children (29.33%) had severe dental anxiety. Child's age and regular dental visit are predictive factors for the child's dental anxiety ($P < 0.05$). Dental behavioral problems had been identified in 43 children (28.67%). Unpleasant previous dental experience is an important factor affecting the child's cooperative behaviors ($P < 0.05$). **Conclusion:** High prevalence of severe dental anxiety may be seen in early years of school. It seems that general factors such as family factors have less impact on behavior of school aged children in a dental visit.

Key words

Children, cooperative behavior, dental anxiety, predictive factor, prevalence

Introduction

Children's dental anxiety is a natural developing emotion expected duo to meeting unfamiliar adults,

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strange sounds, and tastes, having to lie down and even pain.^[1] Several personal, familial and environmental elements affect the severity of child's dental fears.^[2-4] After the age 6, children acquire abilities in adjustments, independence and self-control.^[5] However, some children have severe dental anxiety resulting in interruption of the dental treatment process. This anxiety possibly continues to adulthood.^[6,7]

Surveys from different areas of the world show that the prevalence of dental anxiety in children and adolescents varies from about 5% to nearly 20%.^[8-21]

The purpose of this study was to assess the prevalence of dental anxiety and behavioral problems and to investigate some associated demographic and dental background variables in a group of Iranian school-aged children.

Subjects and Methods

This cross-sectional investigation was approved by ethics committee of Zahedan University of Medical Sciences and involved 150 children among 6-12 years old registered at the pediatric clinic of Zahedan Dental School, in 2011. Children who did not need dental procedure using the local anesthesia and children with systemic disease, psychological disorder, and developmental problems were excluded from this study. The mothers had diploma and higher educational level. Prior dental visit, at the waiting room, the mothers were asked to answer a consent form and a two sectioned questionnaire. The first section of the questionnaire gathered information about the dental and demographic background of the child and family. The second section of the questionnaire had a Corah dental anxiety scale (CDAS).^[22] At the same time, a faces version of the modified child dental anxiety scale (MCDAS)^[23,24] was completed by the child, supervised by the dental assistance.

Next, the child was guided to the operating room. Examination was performed and required radiographies were obtained. According to the treatment plan, local anesthesia solution was injected and the child's cooperative behaviors were quantified based on the Frankle index^[25] duration the injection stage. All of the dental procedures were performed by a pediatric specialist.

Descriptive statistics were produced and data analysis was performed using the Statistical Package for the Social Sciences-15 statistical Emperor Software. Analysis of variance and linear regression models were used for the statistical analysis. All statistical levels were made at 0.05.

Findings

A total number of 150 children, 66 boys and 84 girls were participated in this study. Most of the children were 6-7 years old (40.67%) [Table 1]. The mean scores of the child's dental anxiety and cooperative behavior during the local anesthesia injection were 20.81 (± 6.97) and 3.04 (± 0.86), respectively [Table 2].

According to the self-report measurement of anxiety (MCDAS), 44 children (29.3%) had severe dental anxiety and a high prevalence of severe dental anxiety was observed among children 6-7 years. The scores for each eight items of MCDAS showed

"injections" had the highest rank with the 47% of the children answering "score 5." The items scoring next highest were "dental extraction" and "visiting the strangers," 46% and 27%, respectively.

Results of simple regression analysis for the child's dental anxiety have been shown in Table 3. The results of multiple regression analysis show that the child's age (*P* value: 0.006; beta coefficient: -1.032) and regular dental visit (*P* value: 0.045; beta coefficient: 2.273) are predictive factor for the child's dental anxiety.

Table 1: Distribution of children in age groups in the study

Child's age group	N (%)
6-7 years old	61 (40.67)
7-8 years old	37 (24.67)
8-9 years old	19 (12.67)
9-10 years old	17 (11.33)
10-11 years old	9 (6)
11-12 years old	7 (4.67)

Table 2: Prevalence of dental anxiety and behavioral problems in children aged 6-12 years old

Classification	N (%)
Child's dental anxiety	
No anxiety (score under 20)	67 (44.66)
Mild to moderate anxiety (score equal to 20 up to 26)	39 (26)
Severe anxiety (score equal to and more than 26)	44 (29.33)
Child's cooperative behavior	
1	6 (4)
2	34 (22.67)
3	54 (36)
4	56 (37.33)

Table 3: Results of simple linear regression analysis for dental and demographic related factors for children's dental anxiety

Independent var.	Beta coefficient	P value
Cooperative behavior score	6.563138448	<0.001
Child age	-1.044870354	0.006
Regular recall dental visit	2.326579481	0.04
Mother education	-2.170592705	0.06
Child sexuality	-1.833333333	0.11
Mother anxiety	-0.168574103	0.21
Child age at first appointment	-1.394906743	0.22
Familial emotional problems	4.224489796	0.3
Dental experiences of family members	1.859259259	0.33
First dental experience of child	1.123015873	0.47
Experience of harmful accident	-1.590277778	0.59
First child	-0.558298029	0.63
Number of family children	0.370967742	0.81
Father age	-0.327125506	0.85
Experience of prior hospitalization	-0.214906832	0.87
Mother age	0.184205625	0.87
Father education	0.180464779	0.88

Dental behavioral problems (rating I and II of Frankle index) had been identified in 43 children (28.67%). Results of simple regression analysis for the child's cooperative behavior have been shown in Table 4. According to multiple regression analysis, child's prior dental experiences (*P* value: 0.07; odds ratio: 2.650) and dental anxiety (*P* value: <0.001; odds ratio: 1.170) are important factors affecting children behavior in a dental visit.

Discussion

Dental anxiety is one of the reasons why children avoid going to the dentist or express behavioral problems during a dental visit. If the child behavior problems are duo to general behavior and personality or related to fear of dental environment is an important issue in pediatric dentistry. There is a thin line in diagnosing between these two conditions.^[1] A set of potential factors causes dental anxiety and behavioral problems. One of the most important factors in dental anxiety is the child's age. In children 3-6 years old, dental anxiety is as part of general anxiety.^[2] When the child's age increases, changes in cognitive and socio-emotional characteristics, responsibilities, assimilating real, and self-control are acquired. Fear of separation from the parents, fear of strange situations and person, fear of bodily harm and general anxiety are reduced.^[5] These abilities prepare the 6 years old children to enter the social environment such as school. It is expected that children older than 6 show little behavioral management problems in a dental

visit. Our results showed that there is a high level of dental anxiety and behavior problems in school aged children. The prevalence of severe dental anxiety in children was 29.3% that is much higher than the findings in the same age children in Sweden (2.6%),^[9] and Denmark (5.7%),^[5] but is corresponded to the results obtained in Taiwanese children (28.3%)^[18] and children from lower socio-economic families in Norway (19.5%).^[10]

Comparison between age groups showed that the prevalence of severe dental anxiety in 6-7 years old children is higher than other age groups. High level of anxiety in early years of school has been shown in many studies.^[8] No statistically significant difference in the prevalence of severe dental anxiety was found between boys and girls. This was consistent with Klingberg findings.^[9] It is suggested that a study with a larger sample size and equal numbers of girls and boys in each age groups would be performed.

Irregular recall appointment was found as one of the most important predictive factors for severe dental anxiety in children. A total of 60% of children did not have regular recall dental visits. Irregular dental visits increases experience of pain and more treatment needs. The majority of studied children need a tooth extraction. Because of complicated treatment needs and awareness about the dental problems, children in this study showed a high level of dental anxiety. Bedi,^[8] Skaret,^[12] Raciene,^[16] Lee,^[18] and Oliveira^[21] also emphasized on the importance of regular dental visits.

Parental dental anxiety, especially mothers, is another factor affects a child's dental anxiety. Females show more anxiety in comparison to men.^[19] Influence of maternal anxiety on dental anxiety of children aged preschool^[26] and after 6^[9,18] has been shown in previous studies. In Results of this study, no significant relationship between maternal dental anxiety and child's dental anxiety was found. It could be due to differences in methodology. Children completed the questionnaire under the supervision of dental assistant independent of their mother.

Cooperative behavior of the children during the injection of local anesthetic solution was also assessed. Injection of local anesthetic solution is one of the most anxiety-producing stimuli in the dental operator. According to findings, high dental anxiety and previous negative dental experiences are important factors in predicting clinical behavior. Familial problems and

Table 4: Results of simple linear regression analysis for dental and demographic related factors for children's cooperative behavior

Independent var.	Odds ratio	P value
Child experience at the first dental visit	2.48558	0.05
Mother education	0.47361	0.06
Child age	0.77227	0.06
Regular dental visit	1.62262	0.2
Child dental anxiety	1.17	<0.001
Experience of harmful accident	0.38462	0.25
Mother anxiety	0.9523	0.27
Child sexuality	0.76037	0.45
Child age at the first dental visit	1.21857	0.58
Dental experience of familial members	0.78351	0.67
Father age	0.86201	0.78
Father education	0.92092	0.82
Number of family children	1.11039	0.83
First child	1.07163	0.85
Mother age	0.98824	0.97
Experience of prior hospitalization	1.0061	0.99
Familial emotional problems	6.6808	1

acquired dental fear from familial members are less important in compare to child's dental experience and dental condition. Raddal,^[10] Lee,^[18] and Skaret^[12] were also emphasized the importance of dental factors. They said that dental anxiety is a situational anxiety. However, in findings by Gustufson,^[17] adolescent behavior problems in dental visits have been found as a part of more general behavior problems. Results about the behavioral problems showed Behavioral differences between boys and girls are reduced from age 6 as in the study by Peretz also found.^[13]

It should be kept in mind that dental anxiety and behavioral problems of children during dental visits are influenced by several factors. In a cross-sectional study, causal relationship between a variable and a number of influential factors cannot be accurately assessed. One error is sampling error (selection bias). Children aged 6-12 years have more independence in decision-making. Some of them can avoid visiting the dentist duo to high anxiety and the reported prevalence of high dental anxiety could be lower than the actual prevalence. The studied children were a group of Iranian population; so the results cannot be generalized to other children with different cultures and socioeconomic conditions.

The other error occurs in the collection of information (information bias). It is duo to the parental anxiety or child's shaming in responding the questionnaire. Children may also express more anxiety because of awareness of dental problem.

According to the importance of dentally factors affecting anxiety and cooperative behavior of children in a dental visit, it is expected that informing the parents about the regular visits since birth, can improve a child's oral health-care and reduce the treatment needs of the children. Reduction of the negative dental experience in children prevent dental anxiety be increased in older ages.

Conclusion

High prevalence of severe dental anxiety may be seen in early years of school. It seems that general factors such as family factors have less impact on behavior of school aged children in a dental visit.

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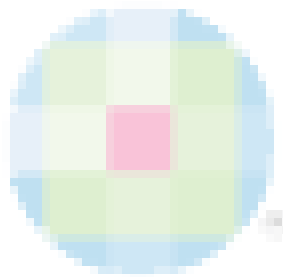
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