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Dental Fear of Children and Its Relationship with Caries Experience

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Objectives The aim of this study was to assess dental fear and its relationship with demographic information and dental caries experience in 6 to 12-year-old children residing in Urmia city in 2020.
Methods In this cross-sectional study, 185 children referred to the Pediatrics Department of Alborz Dental Clinic were included. The Children's Fear Survey Schedule-Dental Subscale (CFSS-DS) was used to evaluate dental fear experience of children. Demographic characteristics including sex, gender, parents' educational level and birth order were also recorded. Intraoral examination was performed by a pedodontist, and dental caries experience was recorded based on the DMFT index. The data were analyzed by the Chi-square and logistic regression test using SPSS version 16.0.
Results Of 185 children, 83 were boys and 102 were girls; 136 participants had no dental fear while 49 had dental fear. The prevalence of dental fear was 26.48%. There were significant correlations between children's age (P=0.006) and birth order (P= 0.007) with their dental fear. But there was no significant correlation between gender or father's educational level with dental fear experience (P=0.812), or dmft/DMFT index (P=0.128). Also, dental injection (71%) and drilling (49%) followed by the noise of drilling (45%) caused the highest mean fear among children.
Conclusion The findings of the present study suggest that dental fear experience is probably not correlated with caries experience in 6 to 12-year-old children.
Keywords Child; Dental Anxiety; Dental Caries

Introduction

Dental fear in children is a common problem worldwide. Fear from the dental environment causes the child to react negatively to dental treatments or to have a negative memory of dental care receipt, and therefore creates problems for both the patient and the dentist.[1-3] Evidence shows that fear of dental treatment can continue to adolescence and lead to avoidant and aggressive behaviors in the dental office.[4] Therefore, identifying children who are afraid of dental treatment, and adopting special measures for them is the key to success for any dental clinician treating pediatric patients.[5, 6] Many factors can affect dental fear in a child, including the child's personality, history of pain during dental treatments, parents' fear of dental environment, age, and gender.[4, 7] According to a previous study, girls were more afraid of dental environments than boys, and the prevalence of dental fear was inversely correlated with age.[8] The prevalence of dental fear is reported to be between 3% and 43% .[8] Variations in prevalence rates can be attributed to several factors, including cultural and social differences in different societies. In African populations, for example, children do not have the right to express their stress and fear of a stimulus, but the European and American cultures easily allow the children to do so.[2] Various studies have also shown that in eight European countries, up to 30% of 3-year-olds and more than 20% of 2-year-olds are afraid of dental visits, indicating that dental fear is common in children and requires serious attention.[9, 10]

Various tools have been proposed to measure and assess the children's fear of dental environments. The Children's Fear Survey Schedule-Dental Subscale (CFSS-DS) is one of the world's most popular psychometric scales, first designed and introduced in 1982 to assess the children's fear of dental environments. The validity and reliability of this tool have been reported to be very good.[8, 10] This tool is used to determine the level of stress and fear in children during dental treatments and is also used for screening of children with stress to adopt specific behavioral control measures for them.[8] A previous study showed higher efficacy of CFSS-DS compared with other scales such as the Venham Picture Test Scale and the Dental Anxiety Test Scale.[11] In a study conducted in 2018, Safari et al. evaluated the validity and reliability of the CFSS-DS in children aged 8, 12 and 15 years. They reported a Cronbach's alpha of 0.861 indicating optimal reliability of the questionnaire. They also reported optimal validity of this tool.[27]

Various studies have reported the relationship of dental fear and oral health status and, more importantly, dental caries.[12, 13] Dental fear is associated with a reduction in oral hygiene and also occurrence of avoidant behaviors in dental offices and leads to a lower level of oral health.[12] Therefore, considering the importance of fear and anxiety control in pediatric dentistry, the aim of the present study was to evaluate the association of dental fear and caries experience in 6 to 12-year-old children.

Methods and Materials

The protocol of this descriptive cross-sectional study was approved by the ethical committee of Urmia University of Medical Sciences (Code: IR.UMSU.REC.1399.238). A total of 185 children aged 6 to 12 years referred to dental

clinics and offices in Urmia in 2020 were included in the study based on the inclusion criteria. The sample size was calculated using the Cochrane formula and according to a previous study[14] with 95% confidence interval, 0.05 standard error, and 31.1% dental fear prevalence.

The inclusion criteria were age between 6 to 12 years, complete physical and mental health, and having a history of dental treatment and open records in the clinics of Urmia city. The exclusion criteria were mental and physical disorders, acute pain, and abscess due to dental caries.

The CFSS-DS was administered among the participants. The questionnaire composed of 12 items; each item had four choices evaluating dental fear during different procedures.

The first part of the questionnaire included demographic information including gender, age, number of children in the family, occupation and level of education of the parents, and the child's order in the family. In the next step, the CFSS-DS questions (15 questions) were asked from children. The questions were in simple Persian, and to ensure the reliability of the examiner, 5-minute breaks were considered between the interviews. Each question had 5 answer choices. The total score could range from 15 and 75; scores above 38 indicated the presence of dental fear.[13]

Intraoral examination of children was performed by two examiners (a pediatric dentist and a dental student who was trained under the supervision of the pediatric dentist) who were separately calibrated, and the findings were evaluated for consistency. After filling out the questionnaire, intraoral examination with a scaled periodontal probe (Fattah Teb Puya Co, Tehram, Iran) and a dental mirror (Atria, Seul, South Korea) was performed under light, and presence/absence of dental caries was recorded based on the decayed, missed, and filled teeth (dmft/DMFT) index.

Statistical analysis of the data was performed using SPSS version 23.0. Qualitative descriptive findings were expressed as frequency and percentage. Quantitative descriptive findings were expressed as mean and standard deviation. The normal distribution of quantitative variables was assessed by the Kolmogorov-Smirnov test. The logistic regression and Chi-square tests were used to analyze the relationship between the DMFT/dmft score and gender, age, number of children in the family, and stress during dental treatment. The Spearman's correlation coefficient was used for non-parametric, and the Pearson's correlation coefficient was used for parametric data. The Chi Square test was used to assess the relationship between stress during treatment and gender, age, and number of children in the family. The level of statistical significance was set at 0.05.

Results

A total of 185 children (26 boys and 23 girls with a mean age of 8.77 ± 0.12 years) participated in this study. The prevalence of dental fear in the present study was 26.48% according to CFSS-DS dental fear threshold (>38). The most common causes of dental fear were injections (71%) and drilling (49%) followed by the noise of drilling (45%). The demographic findings of the patients according to their dental fear are illustrated in Table 1.

Table 1- Demographic findings of the patients participated in the study

Parameters	Presence of dental fear (%)	Absence of dental fear	P value
Gender			
Male	26 (14.1)	57 (30.8)	0.128[b]
Female	23 (12.3)	79 (42.7)	
Child's order			
1st	22 (11.9)	61 (32.9)	
2nd	19 (10.2)	53 (28.6)	0.007[c]
3rd	7 (3.7)	19 (10.2)	
4th	1 (0.5)	3 (1.6)	
Father's level of education			
Uneducated	1 (0.5)	1 (0.5)	
Under high-school diploma	21 (11.3)	9 (4.8)	
High school diploma and higher	36 (19.4)	18 (9.7)	0.812 [c]
Bachelor's	52 (28.1)	8 (4.3)	
Master's	18 (9.7)	6 (3.2)	
PhD	8 (4.3)	7 (3.7)	
Mother's level of education			
Uneducated	N/A	N/A	
Under high-school diploma	17 (9.1)	7 (3.7)	
High school diploma and higher	44 (23.7)	18 (9.7)	0.044 [c]
Bachelor's	53 (28.6)	17 (9.1)	
Master's	17 (9.1)	5 (3.2)	
PhD	5 (2.7)	1 (0.5)	
Age	8.11 ± 1.32	9.87 ± 0.18	0.006[a]
dmft/DMFT	4.12 ± 2.01	3.87 ± 1.41	0.256[a]

[a]. Logistic regression, [b]. Fisher's Exact test. [c.] Chi-Square test.

According to the findings illustrated in Table 1, there were significant correlations between dental fear and the child's order in the family (P=0.007), mother's educational level (P=0.044), and age (P=0.006). A total of 49 children (26.48 %) had dental fear (CFSS-DS > 38).

As shown in Table 1, by an increase in the child's order in the family, dental fear significantly decreased (P=0.007). Dental fear in children whose mothers had high-school diploma was significantly higher (P=0.044). Also, the age of children with dental fear was significantly higher than the age of children without fear (P=0.006). But there was no significant difference in the prevalence of dental fear based on gender, father's level of education, and dmft/DMFT index score (P>0.05).

Discussion

Dental fear is a rarely eventful but important intraoperative event during dental procedures of children and adolescents.[3] As mentioned earlier, dental fear can be influenced by the culture. This study assessed dental fear and its relationship with demographic information and dental caries experience in 6 to 12-year-old children residing in Urmia city in 2020.

The prevalence of dental fear highly depends on the children's age, order in the family, mother's educational level, and caries experience. Thus, the present study evaluated the prevalence of dental fear and its relationship with caries experience and demographic information. The results showed that the prevalence of dental fear in children was 26.48%. The prevalence of dental fear in other studies has been reported between 12.5% and 46% [14, 15, 18, 19, 20]; the prevalence of dental fear in the present study was in the same range.

In the present study, older children had higher prevalence of dental fear. Child's age is one of the factors that has a significant effect on dental fear and anxiety of children.[28] Also, it has been confirmed that younger children are more anxious than older children in dental office setting.[21, 23, 29, 30] It is believed that dental fear is due to the fear of unknown in young children. The child's cognitive ability develops with age, thus, leading to greater awareness and understanding.[28] Likewise, dental fear and anxiety are more common at younger ages and decrease with age. In contrast, some other reports found no difference in the severity of dental anxiety and fear between different age groups.[20, 31-33] Interestingly, some other reports concluded that dental anxiety and fear increased with age.[19, 34] This can be explained by the effect of some other factors such as previous painful dental experiences.[28]

In the present study, there was no difference in dental fear prevalence according to gender. Evidence regarding differences in dental anxiety and fear between girls and boys is conflicting. Most researchers reported higher levels of dental anxiety and fear in girls.[15, 18, 22, 23, 29, 30, 35] Conversely, some other studies reported no difference between males and females in terms of dental anxiety and fear.[14, 19-21, 33, 36, 37] In contrast, in a limited number of studies, it was reported that dental anxiety and fear were more common in boys.[38] These observations can be attributed to various factors, such as the cultural background of the study population, the structure of the anxiety scale used, actual differences in the level of anxiety between males and females, fear of patients to admit their anxiety, or a combination of these factors.[28]

In the present study, children whose mothers had an educational level higher than high-school diploma reported higher dental fear while there was no difference according to father's educational level. The level of education of the parents, and the social class of the child's family are among the factors that affect the level of dental anxiety and fear of children.[22, 39] Children from low socioeconomic classes and those with parents with low level of education are more likely to suffer from dental anxiety and fear. This may be due to the low socioeconomic class and social level of families and poor awareness in this regard.[28] On the other hand, higher level of education was reported to be associated with severe dental anxiety. One explanation is that children of higher-income families can more easily access information about dental procedures.[28] Some other studies reported a very weak association with these factors[40, 41], or no association between anxiety and dental fear and parental education.[42, 43]

The results of the present study showed that there was no relationship between dental fear and dmft/DMFT index score, which was consistent with the results of Son et al,[14] but in contrast to the results of Oba et al,[19] Kakkar et al,[23] and Prathima et al. [21] This discrepancy can therefore be attributed to the cumulative assessment of the dmft/DMFT index. Perhaps if the D, M, and F components of the dmft/DMFT index had been examined separately, the results could be interpreted more accurately.

The results of the present study showed that there was no relationship between dental fear and dmft. Evidence shows that level of dental anxiety and fear is directly correlated with the number of children in the family.[39, 44, 22] This is especially true for preschool children from larger families with three siblings or more.[39] This could be due to the fact that children with more siblings may be exposed to information about their sibling's dental treatments, or they may observe siblings during dental treatment who have anxious behavior. [28] Conversely, a study by Aminabadi et al. [45] showed that children who were the only child in the family had higher level of dental anxiety and fear than children with siblings. According to the order of birth, they found that in children with siblings, the first child had higher level of dental fear and anxiety.[45, 46] In another study, it was shown that dental fear was not correlated with the number of children in the family.[14]

This study had some limitations including its retrospective

design which limited the assessment of the role of environmental factors in dental fear of children, Also, small sample size was another limitation of this study. Preventive approaches are recommended in dental offices and clinics in order to lower the level of dental fear.

Conclusion

Dental fear prevalence among 6 to 12-year-old children in Urmia City was reported to be high. There was no correlation between dental fear and caries experience in children; whereas, mother's educational level and children's age were correlated with dental fear.

Conflict of Interest

No Conflict of Interest Declared■

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