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Dental Anxiety: The Prevalence and Related Factors among 7-14-year-old Children in Yazd, Iran

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Abstract

Background: Dental anxiety/fear in children is a main reason for the problems in their behavior management and avoiding dental care. This study aimed to evaluate the prevalence and level of dental anxiety/fear in Iranian children and adolescents as well as its related factors.

Methods: 330 children aged 7-14 participated in this study and answered the questionnaire of Children's Fear Schedule-Dental Subscale (CFSS-DS). Data were analyzed using Chi-square and Split-half tests.

Results: Dental anxiety prevalence was 20.6% in 7-11 year-olds and 11% in 12-14 year-olds (P=0.001). This value was 17.6% in girls and 14% in boys (P=0.01). Mean of the anxiety score was 29.3 - 7.6 in boys and 31.4 - 7.6 in girls (P=0.015). Prevalence of dental anxiety was 19.7% in the participants without previous dental experience and 8.6% in those with this experience (P=0.001). The mean anxiety score was 31.3 - 7.6 in children without previous dental experience and 28.6 - 7.3 in those with previous experience (P=0.002). The concomitant factors significantly related to high dental anxiety were injection and choking sensation.

Conclusions: Dental anxiety is more in girls and children without previous dental experience, and it decreases with increasing age. Injection and choking sensation are related to high dental anxiety.

Key Words: Child, Dental Anxiety, Pediatric Dentistry.

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1- INTRODUCTION

Anxiety is a psychological reaction to unwanted accidents (1). It can be a response acquired from the previous experience of the individuals and/or their relatives and friends. Dental fear and dental anxiety, which are often used interchangeably, are one of the most important factors interfering with dental treatments (2). Based on the literature, there is a strong relationship between dental anxiety and pain perception or pain tolerance (3, 4) . It is shown that anxiety lowers the pain threshold. On the other hand, pain may lead to more anxiety (5). The prevalence of dental anxiety is influenced by aspects beyond etiological factors; clinical variables as well as socioeconomic, psychological, ethnic and cultural causes have all been associated with the incidence of it (6).

Treatment of patients with dental anxiety often requires spending more time in the dental office (1). Also the stress experienced by the patients increases their perception of painfulness. Besides, these patients miss their appointments three times more than other patients (7). Dental treatment of highly anxious patients, especially children, poses much stress to the dentist and correlates with the success rate of the treatment. In addition, dental anxiety of the patients leads to avoidance of seeking dental care.

Dental anxiety and the patient's fear of dentistry have consequences for the patient which can cause poor oral hygiene, along with the occurrence of problems such as pain, abscesses, loss of primary and permanent teeth and malocclusion (8).

Moreover, successful management of dental fear in children prevents its progress into adulthood (9). One study in 2018 found that there is a direct relationship between Dental fear and decayed permanent teeth and an inverse relationship with restored permanent teeth (9). Consequently, dental anxiety is not only harmful for dental health in children but also if continued throughout life and left untreated, it can continue to affect oral, systemic and psychological health (6).

Therefore, it is the dentist's responsibility to identify these patients and analyze their anxiety level in order to help them prevent further dental problems (9, 10).

In the study by BM Grisolia et al, overall the prevalence of dental anxiety was 23.9% (11). Also more preschoolers (36.5%) had experienced dental anxiety, followed by schoolchildren (25.8%) and adolescents (11). While many studies have reported a higher prevalence in girls (12-18), some have found no difference between genders (19-22).

There are three general methods to measure the fear and anxiety of patients which include self-reports, behavioral methods, and physiological methods. In self-reports, the child or the parent reports the anxiety level using psychological indices. Children's Fear Survey Schedule-Dental Subscale (CFSS-DS) which is the modified version of Fear Survey Schedule-For Children (FSS-FC) has been widely used in pediatric dentistry research. CFSS-DS is a reliable and valid index which is appropriate for group evaluation (12). This scale contains 15 questions, and each question assesses a different aspect of dental treatment including a) invasive procedures e.g. injection and cavity preparation, b) fear of possible threats such as choking or strangers, and c) fear of less invasive procedures like a simple dental examination (23).

Since the information about dental anxiety in Iran was mostly scattered based on multiple factors such as culture or geographical area (24), this study aimed at evaluating the prevalence of dental anxiety and its related factors using CFSS-DS among 7-14 year-old children in the dental setting of Yazd city.

2- MATERIALS AND METHODS

This was a descriptive-analytic cross-sectional study conducted in Yazd, Iran. The study was approved by the ethical committee of Shahid Sadoughi University of Medical Sciences (ID: 2209) and informed consent for reviewing the data of the patients was obtained. After conducting a pilot study on 40 children attending Yazd dental school, 330 samples at 7-14 years of age (165 children were 7-11 years old (80 boys, 85 girls), and 165 children were 12-14 years old (85 boys, 80 girls)) from Yazd elementary and middle schools were selected using cluster sampling. We decided that each middle/elementary school in Yazd represents a cluster and randomly selected one elementary and one middle school. The 7-14 year olds were included, and regarding the schools there was no specific inclusion criteria and any school had the chance to be selected. The only exclusion criterion was the disinclination of children. After receiving the parental consent and explaining the CFSS-DS questionnaire to children, they (children) were asked to complete the questionnaires. To evaluate the reliability of the instrument, the questions were completed by 100 of the participants (children and adolescents) on two separate occasions, 2 weeks apart. The Intraclass Correlation Coefficient (ICC) was also estimated as 0.69. Cronbach's alpha was 86% for the whole group of 330 children and 78% for the group of 100 children who answered the questionnaire in the pilot phase.

CFSS-DS is a Likert type, 5 pointed scale in which the anxiety level is scored as follows: not afraid = 1; a little afraid = 2; fairly afraid = 3; quite afraid = 4; very afraid = 5 (**Table 1**). The total score ranges between 15 and 75. Scores less than or equal to 25 represent a mild anxiety, while the scores between 26 and 37 are described as a moderate anxiety level, and the cutoff score for CFSS-DS is determined as ≥38 that means a high anxiety level. Reliability and validity of the Persian version of CFSS-DS have been previously verified by Ghasempoor et al (15). Moreover, Javadinejad et al. has shown that there is a significant correlation between the Persian version of CFSS-DS and MCDAS (25).

The prevalence of anxiety, mean anxiety score, relationship with age, gender, previous dental experience, and different aspects of dental treatment which are mentioned in CFSS-DS (**Table 1**), were measured using Chi-square test through SPSS 18 software (SPSS Inc., Chicago, USA). P-values less than 0.05 were considered significant.

3- RESULTS

Three hundred and thirty children participated in this study among whom 165 children were 7-11 years old (80 boys, 85 girls), and 165 were 12-14 years old (85 boys, 80 girls). The prevalence of different anxiety levels as well as mean anxiety scores among the participants based on the age group is shown in **Table 2**. A significant difference was observed between the two age groups regarding their anxiety level (P=0.001).

Dental anxiety prevalence was 20.6% in 7-11 year-olds and 11% in 12-14 year-olds (P=0.001). This value was significantly higher in girls (17.6%) than in boys (14%) (P=0.01). Moreover, the prevalence of dental anxiety was 19.7% among the participants without previous dental experience which was significantly more than that among those with this experience (8.6%) (P=0.001).

The mean score of anxiety was 29.3±7.6 in boys and 31.4± 7.6 in girls; and this difference was statistically significant (P=0.015). Besides, the anxiety mean score was significantly higher in children without previous dental experience (31.3± 7.6) than in children with this experience (28.6± 7.3) (P=0.002).

Results of Chi-square analysis for dental related factors for children's dental anxiety are shown in **Table 3**.

Table-1: The CFSS-DS Items

Dentists
Doctors
Injections
Having somebody examine your mouth
Having to open your mouth
Having a stranger touch you
Having somebody look at you
The dentist drilling
The sight of the dentist drilling
The noise of the dentist drilling
Having somebody put instruments in your mouth
Choking
Having to go to the hospital
People in white uniform
Having the dentist clean your teeth

* CFSS-DS: Children's Fear Schedule-Dental Subscale

Table-2: Frequency distribution of different anxiety levels by age (n=330)

Age (years old)	Mild anxiety N (%)	Moderate anxiety N (%)	High anxiety N (%)	Mean anxiety score (SD)
7-11	42 (25.5)	89 (53.9)	34(20.6)	33.6 (7.3)
12-14	73 (43.9)	74 (45.1)	18(11)	27.0 (6.6)
Total	115 (34.7)	163 (49.5)	52(15.8)	30.3 (7.7)

Table-3: Chi-square analysis of the factors related to children's dental anxiety among 7-14-year-old children (n=330)

CFSS-DS Item	High anxiety (%)	Mean anxiety score(SD)	P-value
Injection	63%	4.67 (0.63)	0.001
Choking	58%	4.29 (0.99)	0.001
Having somebody examine your mouth	39%	1.87 (0.84)	>0.05

* CFSS-DS: Children's Fear Schedule-Dental Subscale

4- DISCUSSION

Dental anxiety in children is a potential source of health threatening dental problems, and it may lead to an avoidance of seeking dental care or disruptive behaviors during dental treatment. Therefore, it is necessary to identify the anxious child as early as possible to prevent this process by means of proper behavior management techniques (23).

The reasons for choosing two age groups of children and adolescents included the following:

Children at the age of 6-12 years old are in the stage of formal thinking in terms of

cognitive changes, but at the age of 12 years old until late adolescence, they acquire the extremely sophisticated intellectual ability as well as abstract thinking. Abstract thinking allows the adolescent to deal with academic and professional problems, and this helps them cope with everyday problems and stressful situations. However, because of emotional changes in this period of time the overall reaction of these children is not completely predictable (23). In addition, the studies examining the prevalence of dental anxiety among children aged 12-15 years old aren't enough to determine the type of treatment strategy or change the treatment process according to the level of anxiety (26). Therefore, in this study the participants were divided into two age groups of 7-11 and 12-14 year-old children and these two groups were compared to evaluate the effect of age on the prevalence of dental anxiety.

The purposes of this descriptive cross-sectional study were to assess the prevalence and level of dental anxiety among 7-14 year-old school children and to evaluate the relationship of age, gender, previous dental experience and other relating factors to dental anxiety.

Since the participants were asked to answer questionnaires in school, they could be surveyed in groups and therefore a faster collection was possible. In addition, even dentally anxious children who avoid dental treatment answered the questions because they had to attend the school (27). While these points represent the advantages of the present study, there were also some limitations regarding the sample size and technique. It is strongly suggested that a more heterogeneous population with various socioeconomic statuses be selected and then the generalizability of results will be higher. The prevalence of dental anxiety and its concomitant factors has not been well studied in Iranian children and the few available data is related to two studies investigating 6-12 year-old children from southern Iran using Corah Dental Anxiety Scale (CDAS) and Modified Child Dental Anxiety Scale (MCDAS) (16) and 3-6 year-old children from northern Iran using CFSS-DS, SDQ, Chora and Spielberger questionnaires (15). However, their results cannot be generalized to the entire country since they were conducted in some regions with special climates and different cultures. The prevalence of high dental anxiety was 15.8% in the present study which is lower than other reports from Iran, e.g., 29.33% in southern Iran (16) and 21.8% in Northern Iran (15). However, this prevalence was higher than the reported prevalence by Klingberg et al. (9%) (12). Possible explanations for this difference are cultural and climate varieties as well as using different scales for measuring the anxiety level. The CFSS-DS mean scores in the present study (30.3) were similar to those (30.6) of a previous study in the Singapore (17); however, They were higher than those reported in USA (28.7) (28) Finland (22.1) (29), Sweden (23.1) (30), and Netherlands (23.2), (18) (in the approximately same age groups), while lower than those in Canada (for Chinese children, 31.9),(20) China (35.7), (21) and northern Iran (32.15)(15). However, considering the clinical relevance, many of these numbers are within the moderate range of anxiety.

In this study, dental anxiety was observed more frequently in girls than in boys. This finding is consistent with most of the previously conducted studies (10, 12-18, 31-36). However, in most of these studies, the age of the target groups was not similar to that if the present study, and their samples were mostly adolescents and adults. Additionally, it is noteworthy that among the above mentioned research studies, Lee et al. (10) was the only study which utilized CFSS-DS to assess the anxiety level.

Regarding the previous dental experience, we observed that the prevalence of dental anxiety was significantly higher among the participants without this experience which is compatible with the report of Murray et al. (37, 38). In contrast, Brukiene et al. observed that the anxiety level of the patients increased after dental treatment (33, 34). And in another study no relationship was found between dental anxiety and the past dental treatment experience among 3-8-year-old children (6). A significant relationship was observed between age and dental anxiety, and the dental anxiety was higher in 7-11-year-old children (20.6%) than in 12-14-year-old children (11%). Furthermore, a review study reports that the prevalence of dental anxiety is rather similar among 3- to 18-year-olds worldwide (11).

Furthermore, our findings are compatible with most of the previous epidemiological studies included in the review study by Kingberg et al. (12) as well as the studies by Ghandehari Motlagh et al,(6) Saeid Baghi et al,(39) Murray et al,(37) Brukiene et al,(33) Locker et al, (34)and Humphris et al(40) which demonstrated that dental fear scores decreased with increasing age. However, it should be mentioned that the indices used in these studies were DAS and MDAS which do not include as many dental treatment aspects as does CFSS-DS.

We found that the most stressful aspects of the dental treatment are injection, choking sensation, and dentist drilling (41, 42). This finding confirms the result of several previous studies from other countries and cultures (9, 17, 18, 27, 43, 44). Oba et al. (22) also asserted that “Injection”, “choking”, and “Having somebody put instruments in your mouth” were the most stressful aspects of dental treatment mentioned in their questionnaires. In addition, a survey conducted by Mehran et al. reported that the physical appearance of the syringe plays an important role in reducing the anxiety and pain of injection among children (44).

5- CONCLUSION

In essence, our results which can be of considerable importance for pediatric dentists revealed that the anxiety level of girls is higher than boys and higher levels of anxiety are seen among younger children; this means that the anxiety level decreases by increasing age. The anxiety level of children without any past dental experience was more than those with such experience. Injection and choking sensation were significantly correlated with dental anxiety in children.

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