Longitudinal changes in the prevalence of dental fear and anxiety in 9–12-year-old children in clinical setting in Bosnia and Herzegovina

Elmedin Bajrić*, Amila Zukanović, Nina Marković, Amra Arslanagić, Selma Zukić, Lajla Hasić-Branković
Faculty of Dentistry with Clinics, University of Sarajevo, Sarajevo, Bosnia and Herzegovina

ABSTRACT

Introduction: Dental fear and anxiety (DFA) is a ubiquitous entity among dental patients in terms of their prevalence and incidence. It is among the major clinical problems in dentistry. In addition, the differences in DFA prevalence were present concerning the age and gender of patients and over time, but with some opposite reports. The aim of this study is to examine the prevalence of DFA presence in children concerning their age, gender, and over time.

Methods: The survey sample comprised 200 of 9–12-year-old children. The DFA presence was determined twice by the modified version of the CFSS-DS scale (CFSS-DS-mod scale) during a 6-months long period between the first and the subsequent dental appointment due to the need for restorative dental treatment. The scale was applied before the restorative treatment started on both occasions.

Results: The prevalence of DFA was 17.5% in the study sample and decreased over time. It was slightly higher in girls.

Conclusions: The DFA prevalence in 9–12-year-old children is decreasing over time. Latent manifestations of DFA presence should be considered for evaluation in the future.

Keywords: Children; dental fear and anxiety; the prevalence

INTRODUCTION

Dental fear and anxiety (DFA) is a ubiquitous entity among patients. The prevalence and the incidence of DFA are generally among the three biggest clinical problems in dentistry. The first two most common entities are caries and periodontal diseases, with a prevalence of around 46% within the population. DFA has a causal consequential relationship with these oral diseases. The data on the prevalence and frequency of DFA, modern dentistry seems to have a major problem in overcoming DFA, regardless of whether it is in the field of oral disease monitoring and controlling or therapy, outcomes, and treatment prognosis (1–4).

DFA affects all age and sex population groups and occurs from an early age. It shows higher prevalence and incidence in early childhood. The data show that around a quarter of children and adolescents expressed DFA, where prevalence thereafter declined over time, as pediatric patients become older, through adulthood to older age (3,4). Studies of DFA expression concerning sex showed conflicting results. Some authors have shown that there is no significant gender difference in DFA expression in different age groups, although others in this context found that DFA is more common in females (4). Changes in DFA prevalence over time are related to the patient’s age, intellectual, cognitive, emotional, and other characteristics, in a way when patients become older they develop coping methods with stressful dental situations which enable them not to manifest DFA presence anymore (5).

There are various ways to measure the presence of DFA in children. Besides observing patient behavior and physiological parameters and signs of patient reactions in the dental office, psychometric scales are most commonly used. The reason for this is the fact that they are easy to implement for the patients, and they do not methodologically interfere with the evaluation of DFA presence as well. The Children’s Fear Survey Schedule-Dental Subscale (CFSS-DS) is the most commonly used instrument for the evaluation of DFA presence in children and adolescents so far. The use of the Modified Version of the CFSS-DS Scale (CFSS-DS-Mod Scale) in children aged 9–12 years has recently been reported and has been shown to have good normative values. This scale has been used in clinical dental office settings (4,6).

The study was designed to examine the presence of DFA in children aged 9–12 concerning their age and gender, as well as changes in the prevalence of DFA over time.
The study aimed to examine the longitudinal changes in the prevalence of DFA in 9–12-year-old children.

METHODS
The study was designed as controlled, longitudinal, clinical, epidemiological research, approved by the Ethics Committee of the Faculty of Dentistry, University of Sarajevo (7).

Subjects in the study were randomly selected patients aged 9–12 years, who visited the Clinic/Department of Pediatric and Preventive Dentistry, Faculty of Dentistry, University of Sarajevo.

The age range was chosen based on their cognitive development and the way they perceive DFA as well as the way of managing dental stressors and the expression of behavioral problems in the dental office (8,9).

To avoid selection bias, patients with psychological or psychiatric illnesses were excluded from the study, as well as patients with dental emergencies, as determined by pre-treatment history and clinical examination of the patient.

Furthermore, to avoid treatment bias, it is important to point out that all respondents were aware of the purpose of the visit to the dentist, and that all actions and interventions related to this study were performed in the same space for all respondents.

Respondents and their parents were introduced to the purpose and content of the research. Parents were asked to fill out and sign an informed consent to participate. Children were additionally required participation consent. The sample consisted of 200 subjects of both sexes, as established by calculating the sample size at the 95% confidence interval.

Subjects were children who, according to a previously established treatment plan, needed to come to the dental office at least twice for the treatment of carious dentinal lesion of medium depth (ICDAS score 5) (10). This type of intervention is a medium-strength dental stressor, which itself could be a factor in the development of DFA (8).

In the first visit, before the treatment, the 9–12-year-old respondents independently answered questions from the CFSS-DS-mod scale. This scale consists of 17 questions on subjects independently answered questions from the CFSS-DS-mod scale between the children's version of the CFSS-DS-mod scale test and sample retest. After a 6-month period, DFA prevalence in the retest sample decreased to 8.20%.

The prevalence of DFA of 17.5% was determined in the test sample, which included the subclinical presence of DFA in subjects with the cutoff score of 37.

No statistically significant differences were found in the subjects of the test group regarding their age, or their gender. However, in the retest group, differences were found concerning gender, where girls had higher scores (Wilcoxon signed-rank test, Z = −1.984, p = 0.047).

Table 5 shows the descriptive values of the results on the children's version of the CFSS-DS mode scale test and sample retest. After a 6-month period, DFA prevalence in the retest sample decreased to 8.20%.

Examination of statistically significant differences using the Wilcoxon signed-rank test on the CFSS-DS-mode scale compared to the elapsed time of 6 months showed that they existed (Z = −3.465, p = 0.001). The values of the results have decreased over time. Furthermore, using the Wilcoxon signed rank test showed that statistically significant decrease in the results on the children's version of the CFSS-DS-mod scale between the test and retest groups over time occurred in 12 years old (Z = 2.107, p = 0.035) and male subjects (Z = −2.206, p = 0.027) and subjects as well (Z = −2.238, p = 0.025).

DISCUSSION
In studies published by other authors in the past 40 years on subjects aged 3–18 years, the average prevalence of DFA was 23.9%, measured using three types of psychometric scales, where the subclinical presence of DFA was not considered (4).

Younger respondents showed a stronger DFA presence. Furthermore, gender differences were not dominant, but in some studies, females were singled out in terms of a stronger DFA presence (4).

The results of this study correspond to the above, except in the absence of age differences in the presence of DFA in the subjects.
It should be underlined, in addition to the manifest, the latent presence of DFA was also considered in our study. Our study further showed that the prevalence of DFA presence and average scores obtained on the CFSS-DS-mod scale decreased significantly over time. Several longitudinal studies have been conducted, where the prevalence of DFA presence also decreased over time (12-14). Oosterink et al. conducted research examining the prevalence of different fears in a population-based study that provides a logical sequence of possible explanations for the character of DFA over time (3). Observing the course of DFA prevalence over time, the authors showed that the prevalence is highest in youth, then there is a decrease in prevalence, with the appearance of a second maximum around 50 years of age, which is finally followed by a second decline in DFA prevalence toward older age groups. The decline in DFA prevalence can be explained by cognitive and emotional development, through the formation and application of ways to deal with dental stressors in the dental office (5).

This decline in the prevalence could also be explained by the theory of latent inhibition (15). The theory was based on the following model: When a person (patient, child) had contact with a dental stressor, there was a great potential for the development of DFA, whose intensity and expression differed on an individual basis. In the cases where new dental treatments occurred afterward, which tended to avoid exposure to the same or similar stress factors or to decrease their intensity, the strength, and severity of the DFA appearance also decreased over time (16-18). The mechanism was similar to Pavlov’s conditioned learning mechanism, and could also be used in patients who had not yet experienced DFA appearance because it was avoided exposure to dental stressors (15). On the contrary, other findings showed a slight increase in DFA prevalence over time in younger children, where coping mechanisms were not yet fully established (16-18).

Although psychometric scales were most commonly used for the evaluation of DFA presence, they still have their limitations. One of the most obvious is the fact that they are means for a subjective way of evaluation of observed phenomena. Thus, their normative values should be determined and improved with other kinds of evaluation of...
the DFA presence. Nevertheless, the CFSS-DS-mod scale showed good normative values accordingly, although there is always a need for improvements (6,11).

Children and adolescents with DFA presence could interfere with the conduction of planned dental treatments due to the expression of behavior problems in the dental office. There are various ways for managing their behavior based on the fact of controlling the expected or experienced dental pain. Pain control management in dentistry is crucial nowadays and results in reducing and/or decreasing the expression of the presence of DFA in dental patients. Pharmacological ways can lead to conscious sedation methods, as a form of successful pain and behavior control management in certain categories of patients with DFA presence (19,20).

COVID-19 pandemics brought new perspectives to every aspect of human life and into dental practice as well. Children and adolescents with the DFA presence were especially endangered with the fact that usual dental treatments were not undertaken for a longer time during this period. The well-known vicious circle of not solving the problems in oral health in persons who have DFA can only lead to the intensifying of DFA itself and consequent worsening of oral health. Furthermore, new COVID-19 protocols in dental offices did not especially consider the DFA phenomenon in the patients, but consequently added new possible stressful factors in the dental office. These facts should be seriously considered in the future in a way to satisfy the health safety of the patients with the need to decrease the DFA presence (21).

CONCLUSIONS
There is no difference in the presence of DFA in the relation to age in subjects aged 9–12 years, although girls show a slightly higher presence of DFA.

DFA is present in a significant number of pediatric subjects and its prevalence declines over time. Reducing the prevalence of DFA in children may be related to their emotional and cognitive development.

The DFA presence examination should also consider subclinical manifestations. The pediatric patients with the DFA presence should be considered in the future not only to improve the management of this phenomenon in the dental office but also to systematically deal with the risks of causing oral health problems in the first place.

CONFLICT OF INTERESTS
The authors declare no competing interest, neither interest of any other kind.

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REFERENCES