

Dental Anxiety and its Association with Behavioral Factors in Children

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ABSTRACT: Background: Dental anxiety is a condition that causes a decrease in population addressability to the dentist with adverse consequences for long-term oral health. Assessment of behavioral factors that correlate with dental anxiety is important for accurate evaluation of dental fear. Its diagnosis in childhood is important for establishing therapeutic management strategies to reduce anxiety and promote oral health. **Objective:** To determine the prevalence of dental anxiety in a group of Romanian schoolchildren, and assess its correlation with behavioral factors. **Methods:** This cross-sectional survey included a number of 650 schoolchildren attending public schools, randomly chosen. Data were collected from September 2013 to October 2013. 485 children aged 6–12 years responded the questionnaires and were included in the study (248 female, 237 male). Each subject was asked to independently complete a questionnaire including Dental Anxiety Scale (DAS) and other questions about children behavior towards dental health education and practice. Children having a score of 13 and above were included in the anxious group while those scoring under 13 were placed in the non anxious group. The data collected was processed and analyzed using the SPSS statistical software. **Results:** The overall prevalence of dental anxiety was 22.68% amongst subjects included in the study. No significant differences in dental anxiety scores between boys and girls were found in this study. Dental anxiety scores decreased with increasing age. Dental anxiety correlated positively with chewing gum use and sweet consumption frequency and negatively with age and dental health education. **Conclusions:** Prevalence of dental anxiety in the 6–12 year old children of this study was 22.68%. Factors like chewing gum use, sweet consumption frequency, age and dental health education were correlated with dental anxiety.

KEYWORDS: dental anxiety, prevalence, dental health education, sweet consumption, dental anxiety scale, statistical analysis.

Introduction

Dental anxiety is a form of anxiety that occurs when the patient is presenting to the dentist or just with the anticipation of dental treatment experience[1]. It is considered by some researchers as a type of trait anxiety correlated with personality type, and by others specific and distinct and not necessarily associated with trait anxiety[2,3]. According to Locker and Liddell[4], 50% of people surveyed about dental anxiety reported they had acquired it in childhood, and family history of dental anxiety was a predictive factor of child onset. Child onset dental anxiety is more severe than adult onset dental anxiety, and it is usually correlated with fear of stimuli associated with invasive procedures like extractions and restorations[1,5]. Severity of child dental anxiety is influenced by personal, family factors[6,7,8]. Thus, childhood dental anxiety was correlated with factors related to personality (personality nervous, vulnerable, sensitive patients)[1], socioeconomic factors (reduced use of health

services[9], parents abroad[10]) and genetic factors [11] (proopiomelanocortin gene). Severe dental anxiety disrupts the process of dental treatment and can continue into adulthood [12,13]. Surveys in different parts of the world showed that the prevalence of dental anxiety in children and adolescents ranges from about 5% to about 24% [13-24].

The purpose of this study was to evaluate the prevalence of dental anxiety and investigate the association with behavior and demographic variables related to a group of Romanian children of school age.

Method

The study was approved by the Committee of Ethics and Academic and Scientific Deontology of the University of Medicine and Pharmacy of Craiova (protocol No 26/ 31.01 2013) and by Dolj County Public Health Department. Participation to this study was voluntary and all participants and their parents/legal guardians provided informed consent.

Study design

The study with a cross-sectional design was conducted in Craiova, Romania, a city from South West of the country, from September 2013 to October 2013, in four primary schools. Schools were selected for their broad variety of children of different social and cultural backgrounds, and they can be considered representative for Romanian population of school age. The children were 6 to 12 years old.

The boards of the schools were asked for permission to perform the study. Letters explaining the nature of the study along with consent forms and questionnaires were sent to participating children and their caregivers through their schools. Participation of the children was fully voluntary. The children were asked to fill the questionnaire in their classrooms. The questionnaires contained questions about demographic variables, behavioral factors and Corah Dental Anxiety Scale in Romanian language.

Measuring dental anxiety

Dental anxiety in children was measured using the Dental Anxiety Scale, which is a scale developed in 1969 by Norman Corah and validated in 1978 [25]. DAS questionnaire was translated into Romanian by Lupu and Zanc [26]. Participants answered four questions, each question having five choice possibilities. The questions asked about various situations associated with the dental office, like waiting for dental session in the next day, sitting in the waiting room, sitting in dental chair and waiting for tooth drilling or tooth scaling. The multiple choice items were scored 1, 2, 3, 4 and 5, with 1 meaning no anxiety and 5 representing the maximum level of anxiety possibly felt in a specific dental situation. The total score of the Dental Anxiety Scale ranges from 4 to 20 and anxiety ratings are 4 to 8 no anxiety, 9 to 12 moderate anxiety, 13 to 15 high anxiety and 16 to 20 severe anxiety [25]. A second questionnaire including 25 assessment questions about demographic (age, sex, grade) and behavioral factors and procedures associated with dental care (dental visits, oral hygiene habits, oral hygiene education, sweets consumption) was distributed to the participants of the study.

Children from first to four grades were included in the study. The investigators explained the nature of the study to the students in their classrooms as well as the questionnaires before the beginning of the study, and also explained the dental procedures unknown for

some children. Each participant was asked to independently complete the Dental Anxiety Scale questionnaire and the demographic and behavioral questionnaire. Children having a score lower than 13 were included in the group non-anxious while those scoring 13 and above were placed in the anxious group.

Statistical analysis

The data were analyzed using SPSS software for Windows (SPSS version 17.0, SPSS Inc, Chicago, USA). Descriptive statistics, non-parametric statistics (Pearson chi square) were performed. Regression models were done with the independent variable like age, gender, dental hygiene education, sweet consumption, dental hygiene habits, dental visits and the dependent variable was dental anxiety level measured with Dental Anxiety Scale. For multiple logistic regression analysis, the dependent variable dental anxiety was dichotomized in 0 = non anxious ($DAS \leq 13$) and 1 = anxious ($DAS > 13$). The level of significance was set to < 0.05 . Odds ratio was calculated for all the variables with 95% confidence intervals.

Results

The study included a total of 485 children aged 6–12 years (8.266 ± 1.33), 248 (51.13%) female and 237 male (48.87%). Out of the 650 questionnaires distributed to children, only 485 were returned (a total response rate of 74.65%). There was a reasonable spread by age, but the age groups more represented were 8-9 and 10-11 years old (27.63% and 23.51% respectively). Since all respondents provided completed answers to the questionnaire, the response rate was 100% for all the 485 schoolchildren included in the analysis.

Mean DAS value was 8.88 ± 3.913 , and the number of children who experienced dental anxiety was 110 (22.68%). Dental anxiety frequency by gender and age was analyzed. No significant differences in anxiety scores between boys and girls were found in this study.

Frequency of dental anxiety is reduced with age: from 8.66% at 6-7 years old to 3.29% at 10-11 years old. Differences in anxiety frequency between boys and girls were not significant ($p=0.481$). Children with two or more brothers were less prone to be anxious. An important ratio (almost half) from children who did not went to dentist before 7 years old ($p=0.003$) or who did not done dental check-ups before the study ($p=0.023$) were anxious. Reason for dental visits was especially for pain in anxious group

($p=0.021$). Chewing gum use was more frequent in anxious group ($p=0.001$). Anxious children sweet consumption was frequent, but especially with meals ($p=0.021$). In opposition with non-anxious children, anxious children believed that sweets affected teeth by frequency ($p=0.029$), and less by quantity ($p=0.009$).

We analyzed the association between dental anxiety and socio-demographic variables based to the ranges of the DAS total score. A significant association was found between DAS and child's age ($p=0.001$), dental anxiety was correlated negatively with age. The increase in age was associated with decreasing of dental anxiety.

Dental anxiety was positively correlated with lack of dental visits ($p=0.007$). Dental oral hygiene education in dental office, dental visits before 7 years old and use of dental floss were negatively correlated with dental anxiety ($p=0.046$, respectively $p=0.015$ and $p=0.005$).

The regression model with the independent variables being gender, tooth brushing habits, dental visit frequency, oral hygiene education and sweet consumption showed that none of these variables was a significant predictor of DAS in children.

Discussion

The study represents an attempt to analyze the prevalence of dental anxiety and association between behavioral factors and dental anxiety in a group of Romanian children 6-12 aged years old. Literature review shows a large amount of articles published about dental anxiety in different populations, but for Romanian children population are only a few [21]. In this study, Corah Dental Anxiety Scale was used to appreciate dental anxiety level since this was translated and validated in Romanian and is appropriate to use for large groups, having only 4 items. Also, it contains exemplifications of situations in which Romanian children could find themselves (anticipation dental visit, sitting in waiting room, sitting in dental chair and waiting for drilling or for scaling). Prevalence of dental anxiety was 22.68%, similar with prevalence in other countries [20,27]. Romanian children are different from the dental anxiety indicators showed by other countries children in a smaller extent (CDAS 9.49 between 13 to 14 years old in Israel [17], 9.8 between 11 to 14 years old in Italy [28], 9.91 in 12 to 15 years old in Lithuania [14]).

In the current study, the association between the child's dental anxiety and age indicates that

anxiety tends to decrease as children get older. This finding supports the work of Chapman & Kirby [3], who have suggested that fear reaches a maximum at about 11 years of age and then declines towards adolescence. A dental anxiety level almost similar for boys and girls in this study resembles to other studies on Romanian children, and compared to foreign studies, suggests that cultural differences are important in analyzing dental anxiety [21,23,24].

Dental anxiety is correlated with a variety of behavioral factors. Age of children when they were introduced to dentist was important in establishing an anxious or non/anxious behavior towards dental setting [27]. A smaller age was correlated with a decreased percentage of anxious children. Also, the children who never visited a dentist before the study were more anxious. Pain was principal reason for dental visits in anxious group.

Anxious children are more consummators of chewing gum comparative to non anxious children. According to Sasaki-Otomaru [29], chewing gum improves the levels of anxiety. Anxious children also consume a lot of sweets, with a high frequency per day, similar with children from other countries [30]. Asked about sweets influence on teeth, they answered that sweets affected teeth by frequency but not by quantity.

It is very important for dentists to identify children with dental anxiety in order to apply appropriate management techniques in pediatric age lowest possible.

Conclusions

Data showed the prevalence of dental anxiety in the 6–12-year old Romanian children. Dental anxiety scores decreased with increasing age. Dental anxiety was positively correlated with chewing gum use, sweet consumption frequency and low dental health education.

Acknowledgments

The study was approved by the Committee of Ethics and Academic and Scientific Deontology of the University of Medicine and Pharmacy of Craiova (protocol No 26/ 31.01 2013) and by Dolj County Public Health Department. All participants and their parents/legal guardians provided written informed consent.

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