ORIGINAL RESEARCH

Assessment of dental anxiety and the prevalence of dental caries in a group of 6-9 years old children.

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Abstract

Children`s dental anxiety is responsible for increasing dental health problems, as patients avoid seeking treatment. The aim of our study was to evaluate the level of dental anxiety and its correlation with dental health status in a group of children aged between 6-9 years.

Material and Methods. Our study included 56 children: first, they completed a questionnaire and then the decay-missing-filled teeth index was measured (DMFT).

Results. From a total of 59 children, 29 children had dental anxiety (51.78%) and the prevalence of caries was 69%. The mean and SD for the DMFT index was 1.76+/- 1.54 (2.04 +/- 1.98 for boys and 1.69 +/- 1.72 for girls, with p= 0.0391, p<0.05).

In conclusion, the level of dental anxiety can be reduced by frequent visits to the dental office. A favorable personal experience might help children increasing their confidence for dental treatment. There was a significant negative association between the value of filled teeth and the level of child`s anxiety.

Keywords: dental anxiety, caries, pediatric dentistry, oral health

Introduction

The dental anxiety was defined as a fear towards dentist and dental treatment, being considered the main reason why patients of different ages avoid the visit to the dental office. Dental fear in children has a multifactorial etiology and is related to the child`s age, gender and personality, presence of other general fears, a history of painful dental experiences or the negative influence of the parental dental fear. Its prevalence was reported to range between 3% to 43% in different populations, girls and younger children being more affected [1].

Childhood fears were reported to have a tendency to decrease in time, but not in a linear manner, as peak fear scores might be noticed at different ages. For example, in children over 8 years of age, social fears or the fear of injury are mostly encountered and this could explain why the level of dental fear of these children is higher during the first visit to a dental office. It was shown that dental anxiety experienced in childhood usually persists into adolescence and it might determine the patients to avoid treatment and neglect their oral health. Therefore, it is of great importance for dental health professional to identify children who have dental fear, in order to apply appropriate

management and clinical techniques at the earliest age possible [2,3]. Self-reported scales are considered to be the most reliable methods to assess anxiety in children, but despite the great number of methods available, none of them is considered ideal or suitable to evaluate children`s dental anxiety worldwide [4-6]. In the attempt to overcome all the shortcomings of previously used scales, Abeer A-Namankany et al [7] introduced a new dental anxiety scale suitable for children and adolescents, known as Abeer Children Dental Anxiety Scale (ACDAS). This was proven to be useful in both clinical and nonclinical settings and it was considered that ACDAS fulfills the required criteria as a gold standard dental anxiety scale for children.

The correlation between the level of dental fear and decay, missed or filled teeth is presented differently by specialists; some reported that children with many decayed teeth had reduced levels of dental anxiety [8], and others showed that children with more dental lesions had higher levels of dental fear. This difference is probably due to the previous dental experience of the children in the different samples [9]. The aim of this cross-sectional study was to assess the level of dental anxiety in a group of young children and to

correlate it with their dental health status, evaluated according to World Health Organization`s criteria of decay-missing-filled teeth index.

Material and methods

The study was conducted during the spring semester of 2019 in a group of 63 children of 6-9 years old (25 boys and 38 girls) from a primary school located in Târgu Mureș. The ethical approval for this investigation has been previously obtained from the Ethics Committee of our university (Nr. 274/21.11.2018). A written consent was signed by the parents or legal representatives and children were also asked if they agree to participate to this study. Children were randomly selected and included in the study if they agreed to listen to the examiner and answer to all the questions. We excluded from the study the children whose parents did not approve their enrollment in the investigation and for which we could not perform all ACDAS evaluations or children with had received dental treatment before due to complications of dental caries. The dental part of ACDAS score (Table 1) was applied, which includes 13 questions with 3 possible answers, based on a Likert scale using faces, as follows: 1-relaxed, not scared, 2-neutral, feeling OK, 3-scared or feeling anxious. The same examiner (R.V.) conducted this part of the study, so there was no need for inter-observer calibration. Each child was asked to indicate the face that best represented her/his response to the questions and the answer was recorded as 1, 2 or 3 (range 13-39) and a score < 26 indicated that the child was not experiencing anxiety.

Table 1. Dental part of ACDAS scores (Dr. Abeer Al-Namankany scale, 2012)

How do you feel about:	Happy (score 1)	OK (score 2)	Scared (score 3)
Sitting in the waiting room?			
A dentist wearing a mask on his face?			
Laying flat on the dental chair?			
A dentist checking your teeth with a mirror?			
Having a strange taste in your mouth? (from filling material or gloves)			
Having a "pinch" feeling in your gum?			
The feeling of numbness (fat lip or tongue)?			
A dentist cleaning your teeth by buzzy electric arm that is spraying water?			
The sounds that you hear at the dentist?			
The smell at the dentist?			
Having a tooth taken off?			
Wearing a small rubbery mask on your nose to breath special gas to help you feel comfortable during treatment?			
Having a "pinch" feeling on the back of your hand?			

The dental control examinations were conducted in the Integrated Center of Dental Medicine of our faculty by the same examiner (MM) who was unaware of the results of the questionnaire survey at the time of examination. The diagnostic criteria used for caries were the same as those published by the WHO [10]. All decay-missing-filling teeth and surfaces (DMFT and DMFS) were registered in the young permanent teeth expected to be present at these age interval, namely the upper and lower front teeth and first molars.

The statistical analysis was performed using GraphPad Prism 7 for Windows (GraphPad Software, California, USA). The categorical variables were expressed as absolute numbers and percentages and the continuous variables as mean and standard deviation. All statistical

tests were chosen after applying the Kolmogorov-Smirnov normality test. For independent data showing Gaussian distribution, t test assuming equal or unequal variances was chosen based on the F test. The level of statistical significance was set at $p < 0.05$.

Results

From the initial study group, 7 children were withdrawn as we could not have complete data and therefore the evaluation was made on 56 children (38 girls and 22 boys). The distribution of the study group according to age and sex is presented in Table 2. The mean age of the study group was 8.4 years (range 6.4-9.6) and children between 8-10 years old represented 50% of the study group. The results of ACDAS score are presented in Table 3, in which we considered that a value of 26 points is the cut-off point for dental anxiety. The unpaired t test Welch corrected indicated a value of $p = 0.0434$ ($p < 0.05$).

Table 2. Characteristics and distribution of the study group

Years of age	Girls N (%)	Boys N (%)	Total N (%)
6.1-7.0	6 (10.71%)	4 (7.14%)	10 (17.85%)
7.1-8.0	11 (19.65%)	7 (12.5 %)	18 (32.15%)
8.1-9.0	8 (14.28%)	6 (10.72%)	14 (25%)
9.1-10.0	9 (16.08%)	5 (8.92 %)	14 (25%)
Total	34 (60.72%)	22 (39.28)	56 (100%)

Table 3. ACDAS scores in the study group according to age.

Age interval	ACDAS score Mean +/- SD
8-9 years old	27.55 +/- 1.54
6-7 years old	28.3 +/- 1.18
P value	0.0425*

*Statistically significant differences ($p < 0.05$).

The statistical analyze of data correlating the mean and Standard Deviation of ACDAS scores in the study group according to age shows significant differences, as older children have lower values, which could be explained by more experience of this age group with dental clinic environment, the fact that they understood it was just a control visit, or previous good experience during dental treatment appointments all these contributing to lower scores of dental anxiety ($p = 0.0425$, $p < 0.05$). Overall, 27 children (48.21%) were under the cut-off point of anxiety, meaning that they did not have fear of anxiety related to dental treatment, compared to 29 children (51.78%) who were considered anxious.

The prevalence of dental caries in the study group was 69%, with a mean and Standard deviation (SD) for the DMFT index of 1.76+/-1.54; the mean and SD values of each component were as follows: D = 1.69 +/- 1.75, M = 0.04 +/- 0.25, F = 1.14 +/- 0.63. According to gender, the mean and SD value of DMFT recorded for the boys were 2.04 +/-1.98 and for girls it was 1.69 +/- 1.72, which is statistically significant ($p = 0.0391$). The prevalence of dental caries in the young permanent teeth of children enrolled in the study group is presented in Table 4.

Table 4. The prevalence of dental caries and DMFT components in the study group

Age	Decay component	Missing component	Filled component	Mean +/- SD of DMFT
6.1 – 7.0	0.60 +/- 0.02	0.0 +/- 0.0	0.51 +/- 0.22	0.41 +/- 0.03
7.1 – 8.0	0.93 +/- 0.41	0.02 +/- 0.13	0.90 +/- 0.35	0.72 +/- 0.63
8.1 – 9.0	1.52 +/- 1,29	0.04 +/- 0.21	1.23 +/- 0.74	1.28 +/- 0.90
9.1 – 10.0	2.64 +/- 1.85	0.05 +/- 0.58	1.10 +/- 0.59	1.92 +/- 1.21
Total	1.69 +/- 1.75	0.04 +/- 0.25	1.14 +/- 0.63	1.76 +/- 1.54

We compared the DMFT values and ACDAS scores in the study group and we could not find a correlation between dental caries and dental anxiety. However, there was a statistically significant negative association between the value filled teeth (F component) and the level of child`s anxiety, meaning that children with more filled teeth had less dental fear.

Discussions

Dental anxiety is a common problem which develops mostly in childhood and adolescence, with almost half of children reporting low to moderate and 10-20% high levels of dental anxiety. It is associated with different specific factors, such as needles, injections, drilling or just the dental setting [11]. This emotional disturbance has important implications for both child and dental team, as in children with high levels of dental anxiety there is an increasing number of decayed, missing and filled teeth compared to non-anxious young patients.

Furthermore, the treatment of dentally anxious children is time consuming and demanding for the clinician, factors that lead to referral of these patients to secondary dental care services [12-14]. Dental caries prevalence is a problem recognized by many specialists and researchers, proved by the great number of studies with this topic. According to data from WHO, caries prevalence has decreased in European Union countries during the last 35 years, which could be attributed to constant use of preventive measures and awareness of population on the importance of oral hygiene maintenance measures. However, in countries with a lower economic level, the prevalence of dental caries among 12-year-old children is still high.

The amount of increasing evidence that shows the positive correlation between dental anxiety and poor oral health, it is important to identify children with dental fears or phobias from an early stage, in order to reduce the impact of these emotional disturbances on the population.

Several methods of assessing child`s dental anxiety have been developed and three directions are commonly used: first, the direct observation of the child's physiological state in the dental context (by dental personnel and/or researchers), second, the completion of a questionnaire by the parent as a measure of how anxious the child is, and third, the use of self-reported scales completed by the child [15-17].

Our study showed that 48.21 % of the children did not express dental anxiety, meaning that in these cases there is a reduced risk for development of emotional disturbances towards dental treatment in the future. However, these figures are much lower than those reported by Boka et al [1] who found that 84.6% of 12 years old children do not suffer from dental fear. It is important to underline that some of the anxious children are cooperative during dental treatment and therefore, other factors such as achiness or aggressiveness might influence the way the child expresses the dental anxiety [18].

According to our results, when dental fear was compared with the prevalence of caries in young permanent teeth, we found no statistically significant correlations; however, when comparing ACDAS scores with each component of DMFT we found that children with a high F (filled teeth) component had lower anxiety scores, below 26 points, meaning that they did not experience anxiety towards dental team or clinic environment. This is in agreement with previous studies, which confirmed that children who had visited the dental office several times and experienced

dental treatment before have a lower degree of dental anxiety [19-21].

Conclusions

Children`s dental anxiety is influenced by the own experience with the dental team members and frequency of treatments, as children with more fillings proved to be less anxious. Therefore, in order to reduce the prevalence of dental caries in children, further research is needed to study this relationship and to find proper solutions for increasing the confidence of children towards frequent control or treatment visits to the dental office.

Conflict of interest: None declared.

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