

Prevalence of Dental Fear Among Vilnius Pupils Aged 12 to 15 Years. Determining Factors.

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SUMMARY

Studies aimed at evaluating the incidence of dental fear among adolescents in the city of Vilnius on the basis of the CDAS (Corah Dental Anxiety Scale), DFS (Dental Fear Survey) and DBS (Dental Beliefs scale) scales and establishing the determining factors of this phenomenon. The research involved 557 pupils aged between 12 and 15 years from 9 different Vilnius schools, who have had experience at a dentist's office. The survey found that CDAS was 9.91 (S.D. 3.03) among the pupils of Vilnius, nearly equal to the CDAS among adolescents of similar age in other countries. A correlation was found between CDAS, DFS, DBS and dental experience. As regards a relation between these indicators and dental decay, a correlation was established between DBS and dental decay ($r = .158^{**}$), but there is no statistically significant relation with other dental fear indicators.

Key words: prevalence, dental fear, adolescence, trusts in dentists.

INTRODUCTION

Dental fear among children is an issue of great concern to both dentists' [1] and their patients' parents. Daily dental practice is often accompanied by stress, as dentists are restrained by a limited period of time for individual treatment, accurate diagnosis, pain and discomfort caused by dental diseases, patients being late or missing an appointment as well as communication problems when dealing with difficult patients.

Dental patients cause a lot of stress to dentists, which persists even after the working hours. This is particularly true about children's dentists, whose patients bring about a great many stressful situations due to their age and behaviour patterns. Among them is dental fear, which is common to children of different age and takes different forms.

Dental fear in children has been recognised as a problem in patient management for many years. The effects of this fear have been shown to persist into adulthood, which can lead to dental avoidance. E. Skaret's study in Norway [2] indicated, that even few painful or unpleasant treatment experiences in childhood could lead to dental avoidance in the future. Dental avoidance in turn eventually may result in poorer oral health [3].

De Yough A., Muris P., Schoenmakers N. and Ter Horst G [4] found that about 40 percent of people in modern society suffer from anxiety prior to a visit to the dentist, with 20 percent experiencing great fear

and 5 percent avoiding dental treatment because of dental fear.

Fear is an individual's emotional response to a perceived threat or danger. It is based on self-protection, has a defensive character and brings about physiologic changes, primarily involving tachycardia, profuse perspiration, muscle tension, gastrointestinal upset etc.

Within the classification system of fears, dental fear falls into the category of specific fears. In 1985, Milgrom [5] classified dental fears into groups according to a system known as the Seattle system:

- I. Conditioned fear of specific painful or unpleasant stimuli (drills, needles, sounds, smells etc.)
- II. Anxiety about somatic reactions during treatment (allergic reactions, fainting, panic attacks, death).
- III. Patients with other complicating trait anxiety or phobic symptoms.
- IV. Distrust of dental personnel.

This classification shows that dental fear is a polyetiological phenomenon that is caused not only by pain experienced during dental treatment, but also by personal qualities and the way of communication between a patient and the medical staff.

Dental fear is often attributed to traumatic dental experience in childhood [6,7], in particular when painful treatment is related to loss of control [8].

Childhood is an important stage of life when a child is getting familiar with the outer world and is forming an attitude towards the surrounding environment and its phenomena, including dental treatment. Dentists face a most difficult task of forming a positive attitude towards dental procedures in children so that they could avoid complicated and costly dental treatment in the future [9].

Origins of children's dental fears may be divided into three main categories:

- 1) personal factors (age, general fears and anxiety, temperament etc.),

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2) external factors (parents with dental fears, family social status, upbringing etc.)

3) dental factors (pain, behaviour of dental staff) [5].

This classification resembles the Seattle system, but, unlike the latter, it indicates age, parents' dental fear and upbringing among the factors determining dental fear.

As dental fear may result in poorer oral health, which, in its turn, may cause physical, psychological and financial problems, it is essential to distinguish the reasons for avoidance of the necessary dental treatment. It is important that dentists are able to assess dental anxiety in child patients as early as possible. They may identify patients who are in special need with regards to their fear.

Scholarly articles on dental fear most often deal with its causes, its relation to fears of a general character, personal qualities, socio-economic status and the like. It has not been established, however, whether there is a relation between dental fears and dental problems in children. A study carried out by D. van Waaijen et al. [10] showed a significant though weak relation of dental fear and the number of experienced extractions and no relation with the number of experienced fillings.

The present study examined dental fears and its determining factors among adolescents in Vilnius, Lithuania for the first time ever. Among other things, the study aimed at finding a relation between dental fear and dental condition. As dental fear is determined by a number of factors, three scales, i.e. CDAS (Corah Dental Anxiety Scale), DFS (Dental Fear Survey) and DBS (Dental Beliefs Scale), were used to assess the degree of fear, most unpleasant procedures and patients' trust in the dentist.

MATERIAL AND METHODS

The study involved 557 pupils aged 12 to 15, including 145 twelve-year olds, 146 thirteen-year olds, 138 fourteen-year olds and 128 fifteen-year olds (mean age 13.43 +/- 1.23). Surveys were collected at ten secondary schools of Vilnius chosen by means of random selection (one school refused to participate in the study). The respondents were sixth- to ninth- form pupils, who had undergone dental treatment at least once. The class was chosen as the unit of cluster selection.

Some 260 of respondents were male and 297 female. The predominant nationality was Lithuanian (70.9 percent), followed by Russian (17.2 percent), Polish (11 percent) and other (0.9 percent).

The respondents filled an anonymous questionnaires and upon the assent of the pupils and their parents had their dental condition examined. Researchers examined the pupils' oral cavity in natural light and established DMFS and OHI-S (Oral Hygiene Indices-Simplified) under G. Greene- J. Vermillion. The results were included in the questionnaires filled.

Pupils filled in questionnaires during lessons under the supervision of a researcher, who explained the purpose of the survey and ensured confidentiality before the procedure. Pupils were expected not to consult each other and keep silent. The project was co-

ordinated with Vilnius University, the Department of Education of Vilnius city as well as with each school, its pupils and their parents.

QUESTIONNAIRE

The questionnaire consists of a few parts. The first part contains questions about age, gender, and school, form and nationality, while the second part comprises Corah Dental Anxiety Scale (CDAS). This is the most commonly used measure of dental anxiety [11]. This 4-item test which measures dental anxiety on a scale from 4 (non) to 20 (extreme), is considered to be a simple and coarse, but valid and reliable instrument. CDAS consists of four questions, by answering which the respondent indicates his/her subjective reactions to certain situations at a dentist's office (table No.1).

The third part contains another dental fear scale, i.e. Dental Fear Survey (DFS), which gives 24 items with the scores ranging from 1 (none) to 5 (extreme). The DFS test may be separated into 3 sub-dimensions. The first is related to patterns of dental avoidance and anticipatory anxiety (behavioural), the second concerns felt physiological arousal during dental treatment (arousal). The third is related to fear associated with specific dental stimuli (situation) (Kleinknecht et al., 1984) [12]. Scores range from 24 to 120.

The fourth part of the questionnaire contains questions about experiences at a dentist's office, the purpose of the latest visit to the dentist and medical institution.

Table 1. Corah Dental Anxiety Scale (CDAS).

1. If you had to go to the dentist tomorrow, how would you feel about it?

- A. *I would look forward to it as a reasonably enjoyable experience.*
- B. *I wouldn't care one way or the other.*
- C. *I would be a little uneasy about it.*
- D. *I would be afraid that it would be unpleasant and painful.*

2. When you are waiting in the dentist's office for your turn in the chair, how do you feel?

- A. *Relaxed.*
- B. *A little uneasy.*
- C. *Tense.*
- D. *Anxious.*
- E. *So anxious that I sometimes break out in a sweat or almost feel physically sick.*

3. When you are in the dentist's chair waiting while he gets his drill ready to begin working on your teeth, how do you feel?

Same alternatives as number 20.

4. You are in the dentist's chair to have your teeth cleaned. While you are waiting and the dentist is getting out the instruments, which he will use to scrape your teeth around the gums, how do you feel?

Same alternatives as number 2.

Table 2. Dental beliefs scale (DBS).

I believe dentists do not like it when patients ask questions.
 Dentists help but they always seem busy, which makes me feel guilty
 Dentists do not give sufficient explanation about what they are doing when working on my teeth
 I feel that dentists do not listen to what I am saying
 I am concerned that the dentist will do what he wants and not really listen to me
 Dental professionals say things to make me feel guilty about the way I care for my teeth.
 I feel I can not trust dentists' words about my anxiety
 I feel concerned that dentists will not take my worries (fears) about dentistry seriously.
 I am concerned that dentists might not be skilled enough to deal with my fears or dental problems.
 If I were to indicate that it hurts, I think that the dentist would be reluctant to stop and try to correct the problem.
 When I am in the chair I do not feel like I can stop the appointment for a rest if I feel the need.
 I feel uncomfortable asking questions.
 Being overwhelmed by the amount of work needed (all the bad news) could be enough to keep me from beginning or completing treatment.

ANSWERS: 1.Never 2. A little 3. Somewhat 4. Often 5.Nearly always

Trust in the dentist was estimated using a widely accepted Dental Beliefs Scale (DBS) [9].

DBS evaluated patient beliefs about security, intimidation and social functioning in relating with dentists (table No. 2). Scores ranged from 14 (high trust) to 60 (low trust).

RESULTS AND DISCUSSION

T-Test showed that the mean score of dental fear was 9.91 (S.D. 3.03) under CDAS and 50.14 (S.D. 17.34) under DFS. The table 3 below gives an arrangement of the mean scores of CDAS and DFS in terms of age.

The table shows that younger children experience deeper fear, with both CDAS and DFS reflecting this trend. As age increases, the level of fear declines (statistically significant result $P = .001$, $r = -.137^{**}$).

Girls reported higher fear coefficient compared to boys (statistical significance is low $P = .020$, $r = .098^*$) (figure 1).

According to CDAS and DFS all study participants were divided into three groups, i.e. those experiencing low fear, (CDAS ranging from 4 to 8, DFS-from 24 to 55); moderate fear (CDAS 9 –14, DFS 56-88) and high fear (CDAS from 15 to 20, DFS-89-120) (figures 2,3).

Pupils who reported a moderate level of dental fear (CDAS) formed the largest group (statistically significant T-Test result $P = .000$, $t = 65.823$).

The most significant contributors to dental fear among adolescents were the sight of the anaesthetic needle (20.3 percent), feel of the anaesthetic needle (18.8 percent) and drill vibration (16.1 percent). As much as, 15 percent reported being filled with fear at the mere sight of the drill. Least significant contributors to dental anxiety were making an appointment with the dentist and waiting outside the dental office together with other patients, accounting for 1.8 percent and 2.4 percent respectively. The data was derived from the results of DFS.

DBS shows that the respondents have sufficient trust in their dentist (the average rate of DBS is 25.8; S.D. is 9.95), but the factors causing mistrust line up in the following order:

- When I am in the chair I do not feel I can stop the appointment for a rest if I feel the need (11.7 percent)
- If I were to indicate that it hurts, I think that the dentist would reluctant to stop and try to correct the problem (10.7 percent)
- I feel uncomfortable asking questions (8.9 percent)
- Dentists do not give sufficient explanations about

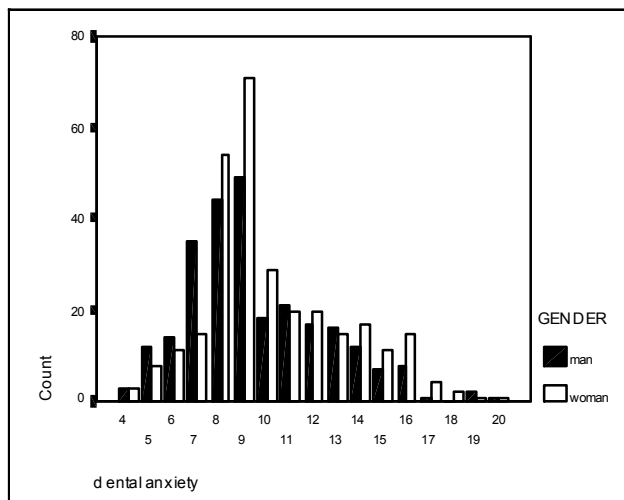


Figure 1. Dental anxiety (CDAS) dependence upon gender

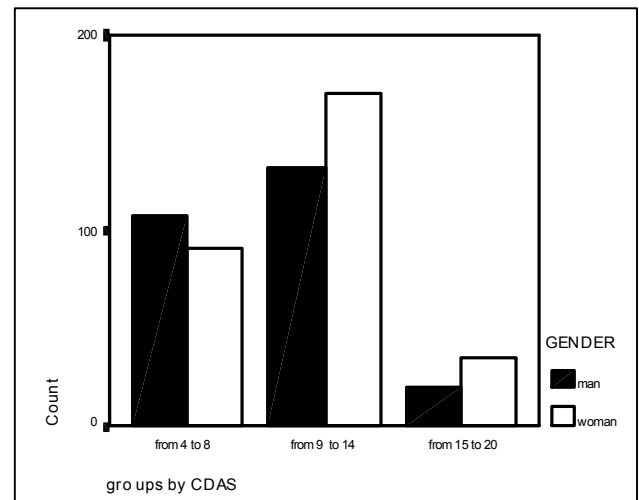


Figure 2. Groups by CDAS: low fear (4-8), moderate fear (9-14), high fear (15-20).

Table 3. Mean scores and frequencies of CDAS and DFS by age.

Age	CDAS			DFS		
	Mean	N	S.D	Mean	N	S.D
12	10.23	144	3.08	52.68	133	17.76
13	10.5	146	3.23	51.58	127	18.19
14	9.49	139	2.76	48.16	134	16.96
15	9.33	128	2.86	47.97	117	15.96
Total	9.91	557	3.03	50.14	511	17.34

what they are doing when working (6.1 percent)

- I am concerned that the dentist will do what he wants and not really listen to me (5.7 percent)

- I feel concerned that dentists will not take my worries (fears) about dentistry seriously (5.3 percent).

As much as 54 percent of respondents go to private dental clinics, 39.2 percent are treated at public clinics. Some 26.4 percent visit the same dentist as their parents, 18.4 percent are treated by the same dentist since early years and 44.5 percent give no preference to one or another dentist.

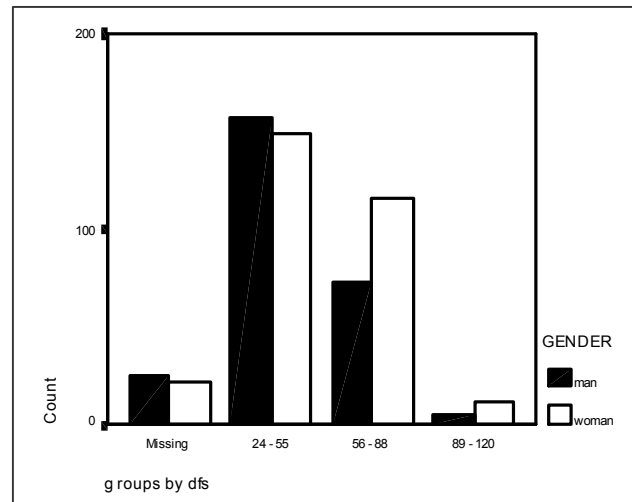
The percentage of respondents who visit the dentist when they have a toothache almost equals to those who go to the dentist upon noticing a decayed tooth and before it starts to ache (30.6 percent and 28.6 percent respectively). Some 22 percent of adolescents go to the dentist for preventive dental care. However, 16 percent of pupils do not go to the dentist until toothache cannot be soothed by medicine. As regards the purpose of the latest visit to a dental office, 32.7 percent went to the dentist for examination, 26.5 percent had their teeth treated, 24.4 percent had toothache and 9.5 percent had a tooth extraction.

As much as 50.4 percent of respondents indicated an unpleasant experience in a dentist's office, 27.9 percent found dental treatment pleasant and the remaining 21.7 percent had neither good nor bad dental experiences. Unpleasant experiences include painful drilling (25.7 percent), painful tooth extraction (19.9 percent), and painful teeth scraping (19.2 percent), the dentist's heedlessness of patients' pain (14.4%).

Some 366 out of 557 pupils, who filled in questionnaires, had their oral cavities examined in natural light. The average of DMFS and OHI were estimated at 4.63 and 0.95.

A correlation analysis showed that dental fear on CDAS and DFS depends on previous experiences and patient trust in the dentist. A correlation was established between CDAS and the latest visit to the dentist. No correlation, however, was found between dental fear and dental condition, but their was a strong relation between trust in the dentist and dental decay (see table No4).

This study, unprecedented in Lithuania, is extremely important, as it represents the first attempt to examine the causes of dental fear among adolescents in this country. If the CDAS data (9.91) about Lithuanian pupils is different from the indicators developed in other countries only to a small extent

**Figure 3.** Groups by DFS: 1. (24-55) – low fear, 2. (56-88) – moderate fear, 3. (89-120) – high fear.

(CDAS stood at 8.5 among 18-year olds in New Zealand [13]; at 9.49 among 13 to 14-year olds in Israel [14]; at 9.8 among 11 to 14 year-olds in Italy [15]; at 10.0 among 13 to 18 year-olds in Russia [16]), DBS and its relation to dental decay is worth scientific debate.

Over 50 percent of respondents are treated at private dental clinics and an equal percentage indicates unpleasant experiences at the dentist. These factors carry no statistical significance, but a relation was found between unpleasant experience and a medical institution. In view of the fact that the length of an appointment at public clinics is strictly limited, dentists have too little time to give consideration to a young patient's anxiety, which may result in patient distrust in the dentist (correlation established at $r = .152^{**}$).

Researchers looked into medical students' study programs at Lithuanian universities and found that studies on psychological methods of communication with children and adolescents have been included in the program just few years ago. Doctors' qualification improvement programmes tackle these issues very occasionally.

CONCLUSIONS

The results of the research and statistical data offer some notice on the origin of dental fear in children and some ideas on how this problem could be dealt with.

Table 4. Correlation between CDAS, DFS, DBS, dental experience and dental caries.

	DBS	CDAS	DFS	Pleasant experience	Unpleasant experience	Caries
DBS	1,000					
CDAS	,307**	1,000				
DFS	,323**	,747**	1,000			
Pleasant experience	,182**	,225**	,261**	1,000		
Unpleasant experience	-,205**	-,345**	-,368**	-,408**	1,000	
Caries	,158**	,062	,057	-,062	,025	1,000

The key proposals would be the following:

1. To include dental fear issues in medical students' study programmes and doctors' qualification improvement programmes.

2. To teach students and dentists the special methods of psychological treatment and means of communication with children

3. To promote a preventive dental treatment programme among the public,

4. To teach children and their parents the correct method of brushing teeth and healthy diet, thus helping to reduce these major factors causing dental decay.

5. To create better conditions for dentists working in public clinics, allowing them to set the length of appointments and number of patients per day when working with children.

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