

Dental anxiety and self-perceived stress in Lithuanian University of Health sciences hospital patients.

A cross-sectional study

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SUMMARY

Objectives. Dental anxiety is a serious problem that influences both mental and physical patient's health. Earlier studies have associated it with avoidance of dental visits and poor oral health. The aim of this study was to evaluate the prevalence of dental anxiety in a Lithuanian population and investigate its association with perceived stress as well as demographic factors and dental-anxiety-inducing stimuli.

Material and methods. This study was based on a face-to-face questionnaire consisting of DAS (Dental Anxiety Scale), PSS (Perceived Stress Scale) and an author questionnaire about specific dental-anxiety-inducing stimuli. Based on the questionnaires, a fear score (FS) was calculated for each respondent. Bivariate logistic regression was used to determine associations between DAS, PSS, and FS.

Results. In total 431 patients took part in the study. The mean DAS score was 9.59. Higher perceived stress was associated with age, sex, marital status, income, and weekly hours of work. A positive correlation was found between PSS and DAS scores. A positive correlation was found between FS sum and PSS score. Women had a higher average FS sum than men.

Conclusion. This study revealed that dental anxiety is still highly prevalent, as almost half of the study population had some level of dental anxiety. As this study shows that perceived stress plays a significant role in dental anxiety, dentists should take special care when working with patients that may be experiencing higher levels stress.

Key words: dental anxiety, Lithuania, stress.

INTRODUCTION

Dental anxiety is a form of anxiety that occurs when the patient is presenting to the dentist or just anticipating dental treatment (1). It is a serious problem, noticeable in various different countries (1-4). According to earlier studies conducted in Lithuania, most children of 12-15 years of age have moderate or high dental anxiety (1). Similar results have been published in other studies with adult respondents (5). Dental anxiety, which is mainly a psychological problem, is a serious condition that also influences patients' physical health. Earlier

studies have associated it with avoidance of dental visits, negative dental utilization behaviors, and poor oral health (6-8).

The etiology of dental anxiety is multifactorial and not yet fully understood. Some of the etiological factors for dental anxiety might be earlier negative dental experiences and psychological trauma (9), a greater perceived need for dental treatment (10), and parents having a dental anxiety (11). Several authors associate dental anxiety with general psychological status (8, 12), and a correlation between dental anxiety and perceived stress has been found (2). However, the relationship between dental anxiety and perceived stress has not been extensively studied yet.

The purpose of this study was to evaluate the prevalence of dental anxiety in a Lithuanian population and investigate its association with perceived stress as well as demographic factors and dental-anxiety-inducing stimuli.

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MATERIALS AND METHODS

Study sample

This cross-sectional study was carried out at the Department of Maxillofacial Surgery at the Lithuanian University of Health Sciences Hospital (LUHSH). The study sample, which consisted of 431 patients, was randomly drawn from the in-patient wards. To obtain the sample, 571 patients were asked to participate in the study; of those, 140 declined for various reasons.

A face-to-face cross-sectional data collection method was chosen for the survey. During the interview, stay-in ward patients were informed about the goals and objectives of the anonymous research before receiving a consent form to participate in the study. The survey was conducted by two researchers, KD and IB.

Permission to conduct the survey was obtained from the bioethics center at the Lithuanian University of Health Sciences. The license number of the permit is BEC-OF-354.

Questionnaire

The questionnaire consisted of four parts: demographic questions, the dental anxiety scale (DAS), an author questionnaire about dental fear inducing stimuli and the perceived stress scale (PSS). The DAS was used to assess dental anxiety. It was developed by Corah (13) as a specific measure of anxiety related to dental issues. It is one of the most widely used self-reported questionnaires of dental anxiety. The DAS consists of questions in which subjects are asked to rate their fear of four specified dental situations on a 5-point Likert scale, with possible scores ranging from 4 (no anxiety) to 20 (high anxiety). DAS scores were classified in the following way: less than 9 indicates no anxiety, 9-12 equates with low anxiety, 13-14 reflects moderate anxiety, and 15-20 denotes high anxiety. An author-developed questionnaire consisting of 34 questions, rated from 0 (no fear) to 3 (high fear) was used to assess various dental fear inducing stimuli/situations. Based on the questionnaires, a fear score (FS) was calculated for each respondent, as well as the mean FS plus standard deviation (SD) in the study population for every stimulus/situation. The perceived stress scale (PSS-10) was used to assess perceived stress, which is a measure of the degree to which situations in one's life are appraised as stressful. The PSS assesses the extent to which respondents perceive their lives as "unpredictable, uncontrollable, and overloaded" (14). The PSS is one of the most widely used stress appraisal measures; it correlates strongly with other

measures of psychosocial stress and has been shown to be associated with greater risk of poor health (3). The PSS consists of 10 questions, each with a possible answer rated on a 5-point Likert scale ranging from 0 (never) to 4 (very often). Overall scores for the PSS range from 0 to 40, with higher scores indicating higher perceived stress.

Statistical data analysis

SPSS 19.0 software was used for data analysis. The normality of parametric variable distribution was assessed using the Kolmogorov-Smirnov test. A Student's t-test was used for the independent samples of parametric variables with two average means. Independent samples of parametric variables with more than two mean values were evaluated using ANOVA. Tables of coherent values were created to describe value relationships. A chi-square (χ^2) test was used to determine value dependence. Bivariate logistic regression was used to determine associations between DAS, PSS, and FS. Values were considered statistically significant with $p < 0.05$.

RESULTS

In total, 537 patients were approached, 431 of which agreed to take part in the study. The response rate was 80.26%. The demographic statistics of all the respondents are shown in Table 1.

Dental anxiety

The mean DAS score was 9.59 ± 2.92 (mean \pm SD). Of the respondents, 56.4% had no dental anxiety. Of the 43.6% respondents who had dental anxiety, 24.4% had low dental anxiety, 14.6% had moderate dental anxiety, and 4.6% had high dental anxiety. Women were more likely than men to have a DAS score over 7.5 (OR=4.163; 95% CI 2.633-6.584; $p < 0.001$). Younger respondents ($p < 0.001$) and respondents with lower education ($p < 0.01$) had higher DAS scores ($p < 0.001$).

Perceived stress

The internal consistency of the PSS questionnaire was assessed using Cronbach's alpha coefficient (0.874). According to the median score, respondents were divided into two groups: low level of perceived stress (under 14) and high level of perceived stress (14 and more). Higher perceived stress was associated with age, sex, marital status, income, and weekly hours of work. Younger patients were more likely to have higher perceived stress (OR=0.983; 95% CI 0.970-0.996; $p = 0.008$). Women were more likely to have higher perceived stress

(OR=2.346; 95% CI 1.574-3.497; $p<0.001$) as were single respondents (OR=1.645; 95% CI 1.112-2.433; $p=0.013$). Respondents with higher income had lower levels of perceived stress (OR=0.267; 95% CI 0.154-0.461; $p<0.001$), and the same was true for respondents who worked more than 30 hours per week (OR=0.573; 95% CI 0.391-0.840; $p=0.004$). A positive correlation was found between PSS and DAS scores ($r=0.609$, $p<0.001$).

Dental anxiety stimuli/situations

The internal consistency of the PSS questionnaire was assessed using Cronbach's alpha coefficient. The mean values for all fear stimuli are shown in Table 2. The most frequently identified dental anxiety stimuli/situations were tooth removal, pain during the procedure, drilling, root canal treatment, and uncertain/high price of the procedure. "Male dentist" is more frequently identified as an anxiety stimulus than "female dentist" ($p<0.05$), although respondents seemed to be more anxious about age of the dentist ("young dentist" or "older dentist"), having an unfamiliar dentist, or the dentist's bad mood/behavior. "Private dental clinic" was identified as an anxiety stimulus less frequently than "public dental clinic" ($p<0.05$). There was a positive correlation between FS sum and level of anxiety ($r=0.5$, $p<0.001$) and a negative correlation between FS sum and age ($r=-0.159$, $p<0.001$). In addition, a positive correlation was found between FS sum and PSS score ($r=0.52$, $p<0.001$). Women had a higher average FS sum (52.8 ± 12.7) than men (45.5 ± 11.6) ($p<0.001$).

DISCUSSION

As in most of other studies on dental anxiety (1, 3, 4, 15-23), Corah's dental anxiety scale was used

Table 1. Demographic characteristics

Parameter	n / %
Male	167 / 38.7
Female	264 / 61.3
Age (year [$y \pm SD$])	36.49 \pm 15.09
Marital status	
Married	266 / 61.7
Single	165 / 38.3
Education	
Lower than university	233 / 54.1
University	198 / 45.9
Monthly income	
<290 EUR	167 / 38.7
290 EUR to 580 EUR	171 / 39.7
>580 EUR	93 / 21.6

to assess dental anxiety in this study. The mean DAS score in the study population (9.59 ± 2.92 , mean \pm SD), was comparable to DAS scores in earlier Lithuanian studies (9.91) (20), and studies from other countries such as China (9.05) (17), Brazil (9.2) (16), Romania (8.88) (1), and Italy (10.29) (24). Earlier studies found that women have higher dental anxiety than men (15, 20-22, 25) in adult populations, but not in children (1). In our study, conducted with adult respondents, a clear association between female sex and higher DAS scores can be seen as well ($p<0.001$). Consistent with the results of this study,

Table 2. Dental fear stimuli/situations

Stimuli/situations	Mean \pm SD
Physical pain	2.07 \pm 0.040
Feeling the needle injected	1.74 \pm 0.041
Insufficient anesthesia	1.81 \pm 0.047
Feeling of anesthesia	1.39 \pm 0.037
The smell of dental materials	1.34 \pm 0.038
Dental equipment noises	1.48 \pm 0.035
Feeling the vibrations of the drill	1.50 \pm 0.036
The process of tooth preparation	2.05 \pm 0.038
Tooth extraction	2.24 \pm 0.047
Having your teeth cleaned	1.52 \pm 0.041
Having your gums probed	1.22 \pm 0.051
Endodontic treatment	1.92 \pm 0.049
Having your teeth blown with air	1.35 \pm 0.036
Fear of moving the tongue during procedures	1.17 \pm 0.033
Fear of choking during procedures	1.16 \pm 0.035
Rubber dam	1.01 \pm 0.040
Suction of saliva	1.13 \pm 0.029
Lack of knowledge	1.18 \pm 0.037
Not understanding the clinical situation	1.34 \pm 0.042
Unclear/high price of dental procedures	1.87 \pm 0.045
Dissatisfaction with your oral hygiene	1.74 \pm 0.037
Fear of hearing criticism	1.37 \pm 0.034
Bad mood/behavior of the dentist	1.61 \pm 0.041
Being unable to ask a question during procedures	1.24 \pm 0.034
Being unable to stop the dentist during procedures	1.30 \pm 0.037
Appointment starting late	1.40 \pm 0.037
Longer than expected appointment	1.37 \pm 0.034
Unfamiliar dentist	1.62 \pm 0.041
Male dentist	1.28 \pm 0.035
Female dentist	1.08 \pm 0.029
Young dentist	1.35 \pm 0.038
Older dentist	1.44 \pm 0.036
Public dental clinic	1.61 \pm 0.039
Private dental clinic	1.13 \pm 0.028

earlier researchers reported that people with lower education (15, 17, 25) and younger people (15, 17, 20, 25) have higher dental anxiety. Some researchers report that there is a correlation between DAS and marital status (21), but we did not find such a correlation in this study.

The dental fear survey (DFS) (26) is often used to assess dental fear (15, 16). Only seven out of twenty questions of the DFS concern dental fear stimuli/situations. In order to assess the impact of more specific dental-fear-inducing stimuli/situations, an author-developed questionnaire comprising 34 different stimuli/situations was used in this study. This allowed for a more thorough understanding of the factors influencing dental fear. In an earlier study that took place in Lithuania (20), the most significant factors influencing dental fear were factors associated with physical pain, the sight and feel of the anesthetic needle, and drill vibration. The present study showed that factors associated with physical pain are indeed the most significant contributors to dental fear. However, it is also evident that factors related to psychological stress—such as unclear or high prices for dental procedures or the mood of the dentist—also play a significant role in dental fear.

In accordance with earlier studies, women, younger or single respondents, and respondents with lower wages reported higher levels of perceived stress (23, 27, 28). Although a recent study showed that, contrary to our findings, age might have a posi-

tive correlation with PSS scores (29), it seems that this is only true in a population of older respondents.

This study was the first in Lithuania and one of the first in the world to assess the association between dental anxiety and perceived stress. A review of the literature revealed a single study that addressed the correlation between PSS and DAS scores (23); no further studies on this association were found. Consistent with previous results, our study showed a positive correlation between DAS scores and PSS scores. Furthermore, a positive correlation has been shown with the sum of dental fear stimuli. It is evident, that people with higher perceived stress not only tend to have higher dental anxiety, but may also be agitated by more varied dental fear stimuli.

CONCLUSION

This study revealed that dental anxiety is still highly prevalent, as almost half of the study population had some level of dental anxiety. As this study shows that perceived stress plays a significant role in dental anxiety, dentists should take special care when working with patients that may be experiencing higher levels stress.

STATEMENT OF CONFLICTS OF INTEREST

The authors have no conflict of interest to report.

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