Do Even Dental Students Exhibit Dental Fear?

Branislava Vukovic, DMD, PhD Student, Department of Basic Science, Faculty of Stomatology Pancevo, University Business Academy in Novi Sad. Zarka Zrenjanina 179, 26000 Pancevo, Serbia.

Stevan Avramov, PhD, Research Associate Professor, Department of Evolutionary Biology, Institute for Biological Research "Sinisa Stankovic", University of Belgrade and Department of Basic Science, Faculty of Stomatology Pancevo, University Business Academy in Novi Sad. Zarka Zrenjanina 179, 26000 Pancevo, Serbia.

Maja Pavlovic, DMD, Assistant, Department of Prosthodontics, Faculty of Stomtaology Pancevo, University Business Academy in Novi Sad. Zarka Zrenjanina 179, 26000 Pancevo, Serbia.

Desanka Cenic-Milosevic, PhD, Professor, Department of Basic Science, Faculty of Stomatology Pancevo, University Business Academy in Novi Sad. Zarka Zrenjanina 179, 26000 Pancevo, Serbia.

Corresponding Author:

Name: Branislava Vukovic

Phone number: +381 63 728 5653

Fax number: +381 13 235 1292

E-mail address: branislava.vukovic@sfp.rs

Abstract

Objective: To assess any connection between an objective response to a pain stimulus, dental anxiety, dental fear and mental stress among dental students.

Methods: The study sample consisted of 84 dental students. An objective response to a pain stimulus was carried out using an electric pulp tester. Dental anxiety was assessed by Corah's Dental Anxiety Scale Revised (DAS-R). Dental fear was assessed by Short Dental Fear Question (SDFQ). The Bensabat General Stress Test by was used for stress level assessment.

Results: Significant negative Spearman rank correlation was obtained between values for pain sensitivity and dental fear ($r = -0.245$, $p < 0.05$). Testing the impact of general mental stress on dental anxiety and dental fear indicated significant and positive Spearman rank correlation between the following characteristics: stress caused by temperament and dental anxiety ($r = 0.288$; $p < 0.01$); stress caused by lifestyle and dental anxiety ($r = 0.259$; $p < 0.05$); stress caused by temperament and dental fear ($r = 0.436$; $p < 0.0001$); stress caused by job and dental fear ($r = 0.279$; $p < 0.05$); stress caused by lifestyle and dental fear ($r = 0.259$; $p < 0.05$).

Conclusion: Dental students exhibit an average level of general mental stress. Almost all of them have a moderate or high level of pain sensitivity and they do not feel dental anxiety or dental fear. These findings lead us to the conclusion that knowledge is one of the key factors influencing emotional experience and leading to adaptation to stressful stimuli.

Keywords: pain, dental fear, dental anxiety, mental stress

Introduction

Dentistry and dental interventions have always been associated with fear and pain, probably because once, prior to the development of modern techniques and anaesthetics, they were quite unpleasant and painful. However, despite the invention of new equipment and less unpleasant treatment techniques, dental fear still represents a serious problem affecting a significant part of population and it is considered one of the most common fears. (1)

Pain is defined as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage" by the International Association for the Study of Pain. (2) A pain stimulus normally leads to psychological and physiological response in order to protect the body. Therefore, fear reactions and uncooperative behaviour are logical and appropriate when a patient expects to experience pain or discomfort.

Fear is a normal emotional response to objects or situations, perceived as objectively threatening. As pain is a signal that the body is threatened, fear is also a signal that the ego is threatened, that is, a subject's value system. (3)

Anxiety has similar physiological and behavioural components such as fear, but not being caused by stimuli. It is usually a consequence of expectations of future events related to previous negative experiences. Anxiety disorders are often preceded by stressful life events. (4)

Stress is a state of disordered psycho-physical balance, arising from physical, mental or social threat of an individual or a person close to him. (5) Stress comes out when one cannot meet excessive demands, both personal or from the environment, which influences physical and mental health. (6)

Avoidance of dental care and a deterioration in oral health are serious consequences of dental fear.

All the above mentioned has led to an increased interest in the research in this field, so, this is the first study of this kind, in terms of comparing pain, dental anxiety, dental fear and mental stress, conducted in our country. The aim of the study was to assess if there is a connection between an objective response to a pain stimulus, dental anxiety, dental fear and mental stress among dental students.

Study Population and Methodology

The survey was conducted from January to March 2015. The participants were 84 students of Facul-

ty of Stomatology. This study was conducted in accordance with the Declaration of Helsinki. The local ethics committee approved the protocol. The participants were informed about their right to withdraw from the study at any time. Informed consent from participants was obtained. After personally filling in the questionnaire, the pain threshold was determined.

Both maxillary central incisors in the qualified subjects were isolated with cotton rolls and dried by a stream of compressed air in order to prevent any electrical contact with the adjacent teeth and gingiva. All selected teeth were free from restorations, caries and non-carious cervical lesions, with no history of trauma. Incisor teeth were chosen because they are easily accessible and are usually intact. The test was conducted with an electric pulp tester (Z 6402 Jugodent, Belgrade, Serbia) in accordance with the manufacturer's instructions. The pulp tester had a scale from 0 to 10 representing increasing voltage from 15 to 350 V, with a maximum current intensity of 1.5 mA. A drop of normal saline was used as a conducting medium. During testing, the intensity of stimulus was increased by a potentiometer until a response was evoked. By raising a hand, the participants reported when they felt painful sensation on a tested tooth. The numerical value on the scale was then noted. Sensitivity to pain was divided into 4 levels from none to severe proportionally to the scale of the potentiometer. Pain sensitivity rating were measured level 1 – no pain, level 2 – moderate pain, level 3 – high pain and level 4 – severe pain. All data were collected by one trained practitioner in order to obtain consistency of all gathered data during pain sensitivity measurement.

Dental anxiety was assessed by Corah's Dental Anxiety Scale Revised (DAS-R), (7) the most prominent and most used scale for the adults. It consists of 4 items which participants tick by using a 5-point Likert scale, from A (relaxed) to E (terrified). The first two questions relate to the anticipation of an appointed dentist visit the day after and sitting in the waiting room. The other ones relate to the anticipation of fear of a specific stimulus in a dental chair. Scoring DAS-R: A=1, B=2, C=3, D=4 and E=5. Total possible = 20. Anxiety rating were measured <9 none (level 1), 9-12 moderate anxiety (level 2), 13-14 high anxiety (level 3) and 15-20 severe anxiety (level 4).

Dental fear was assessed by the Short Dental Fear Question (SDFQ). (8) This is an instrument for a clinical practice, used for the purpose of quick screening of a frightened patient. The questionnaire contains only 1 question with 4 given answers in the form of 4-point Likert scale from A (relaxed) to D (severely frightened). Fear rating were measured level 1 – no fear, level 2 – moderate fear, level 3 – high fear and level 4 – severe fear.

The Bensabat General Stress Test was found to be an appropriate measure to assess stress level. (9) Sixty-five questions (65) were answered using a 4-point Likert scale, from A (always), B (often), C (occasionally) to E (never). This test approximately analyses vulnerability to mental stress and what causes stress: temperament, behaviour, job, emotional life or a lifestyle. Stress rating were measured level 1 – no stress, level 2 – moderate stress, level 3 – high stress and level 4 – severe stress.

The descriptive statistics and analytical statistics were carried out using the SPSS 10.0 statistical package (SPSS Inc., Chicago, IL, USA) for each of the analysed characteristics. Spearman rank correlation was used to test the association between 2 examined traits.
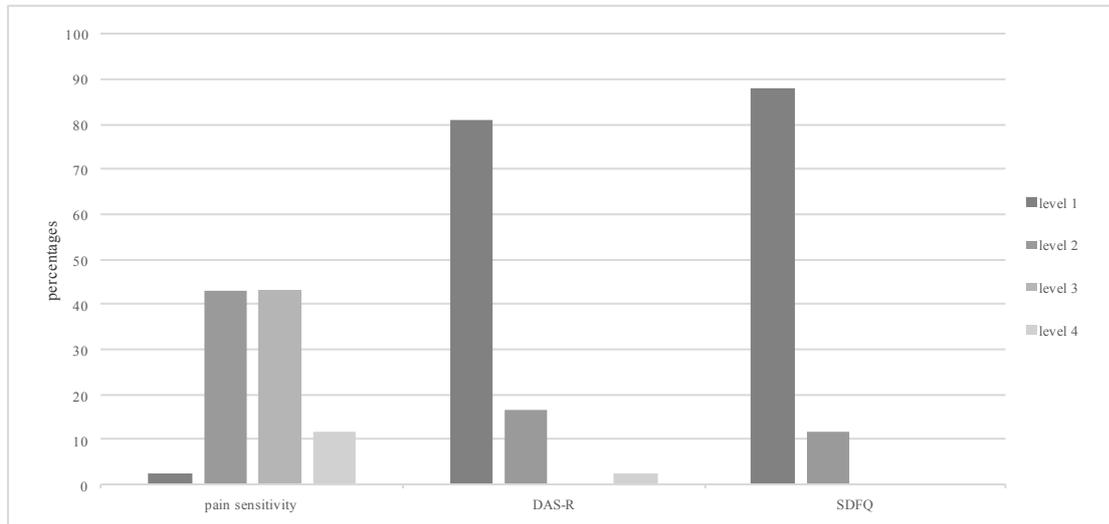
Results

This study included a total of 84 subjects, 54 (64.3%) males and 30 (35.7%) females, aged 18 to 23 years. Fisher's Exact Test was used for assessment of differences between males and females for these parameters. There were no significant differences (DAS-R p = 0.6280; SDFQ p = 0.3504; pain sensitivity p = 0.7629; vulnerability to stress p = 0.8885; stress caused by temperament p = 0.1237; stress caused by behaviour p = 0.4742; stress caused by job p = 0.0503; stress caused by emotional life p = 0.9578; stress caused by lifestyle p = 0.8730). Considering that in previous analysis of the data there were no significant differences in the parameters of males and females, results presented here refer to the summary data of both sexes.

The mean value of the test of pain sensitivity was 2.64 ± 0.72. An equal number of respondents (n = 36) shows moderate as well as high level of pain sensitivity (42.9%). Severe level was obtained for 10 participants (11.9%). Two participants were not sensitive to pain, or had low level of pain sensitivity (2.4%).
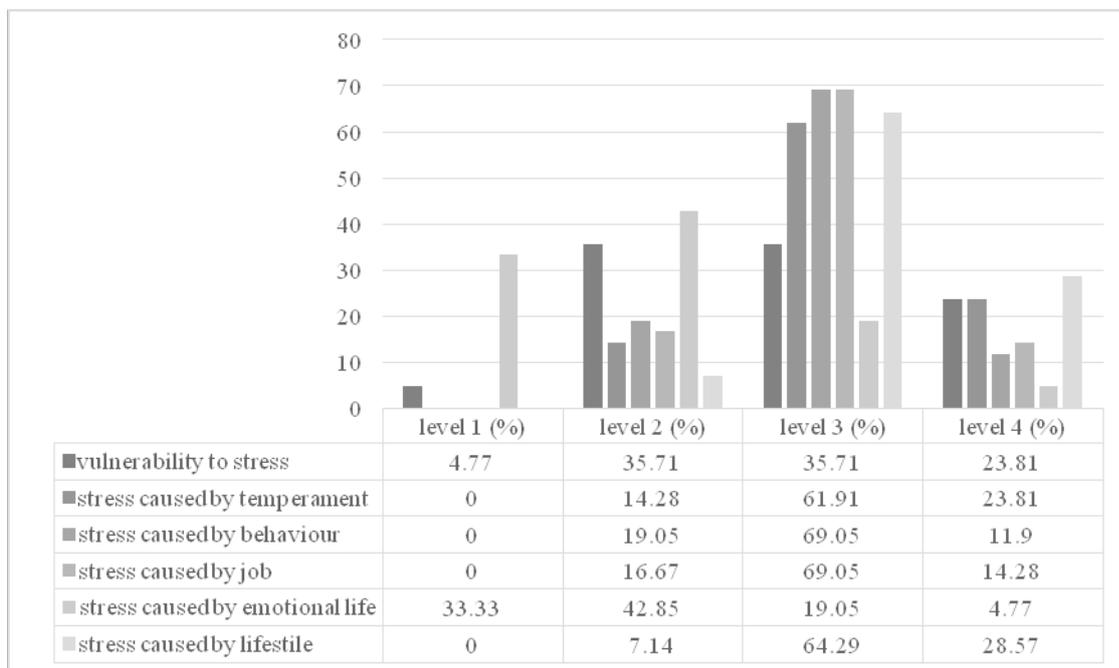
The mean value of DAS-R test was 1.24 ± 0.57. Results of DAS-R test showed that the majority of students (n = 68) were not anxious regarding dental treatment (80.9%). Moderate dental anxiety was observed in 14 subjects (16.7%). Two subjects had a dental phobia (2.4%), while no student was highly anxious.

The mean value SDFQ test was 1.12 ± 0.33. This test showed that the majority of subjects were not afraid of dental interventions (74 subjects or 88.1%). Ten subjects (11.9%) had moderate dental fear, while no one student had high or severe dental fear.

The distribution of the frequency of the pain sensitivity, dental anxiety and dental fear is shown in Figure 1.

Results of the Bensabat General Stress Test is presented in Figure 2.

	level 1 (%)	level 2 (%)	level 3 (%)	level 4 (%)
vulnerability to stress	4.77	35.71	35.71	23.81
stress caused by temperament	0	14.28	61.91	23.81
stress caused by behaviour	0	19.05	69.05	11.9
stress caused by job	0	16.67	69.05	14.28
stress caused by emotional life	33.33	42.85	19.05	4.77
stress caused by lifestile	0	7.14	64.29	28.57

The Spearman rank correlation showed that there was no significant correlation between values for pain sensitivity and dental anxiety (r = -0.131; p > 0.05).

Significant negative Spearman rank correlation was obtained between values for pain sensitivity and dental fear (r = -0.245, p < 0.05).

There was no significant Spearman rank correlation between levels of pain sensitivity and any sub-scales of the Bensabat General Stress Test (p > 0.05).

Testing the impact of general mental stress on dental anxiety and dental fear indicated significant

and positive Spearman rank correlation between the following characteristics:

- stress caused by temperament and dental anxiety (r = 0.288; p < 0.01)

- stress caused by lifestyle and dental anxiety (r = 0.259; p < 0.05)

- stress caused by temperament and dental fear (r = 0.436; p < 0.0001)

- stress caused by job and dental fear (r = 0.279; p < 0.05)

- stress caused by lifestyle and dental fear (r = 0.259; p < 0.05)

Discussion

Fear of a dental intervention is a common problem in dentistry and it is often a serious obstacle to achieve and preserve oral health due to avoidance of a dental care. (10) Using Berggren's Model of Dental Fear and Anxiety, (11) a wide range of factors significantly influencing anxious patients have been identified. That kind of a patient follows a behaviour pattern: avoiding dental care, a deterioration in oral health and more urgent dental treatment in relation to less anxious patients with less problems.

Both tests regarding a dental intervention, DAS-R and SDFQ, show absence of dental anxiety and dental fear in 80.9% and 88.1% of the sample, respectively. This is consistent with the findings of studies conducted in other countries. (12-14) However, there are some surveys in which students of dental medicine exhibit higher level of dental anxiety (7) and dental fear. (8)

Reviewing the literature, we found data about a correlation between pain sensitivity, dental fear and dental anxiety. (15-17) However, our survey showed that there was no significant correlation between the level of pain sensitivity and dental anxiety. Furthermore, we got a significant negative correlation between the level of pain sensitivity and dental fear, meaning that students do not feel dental fear although 85.7% of them have a moderate and high level of pain sensitivity. We can assume that the knowledge about the importance of regular dental care prevents them from the vicious circle of dental fear.

People having some knowledge make a better use of the energy mobilized in the stress response. They direct mental and physical activities to problem solving productively and thus, control their neuroendocrine response to stress in a better way. They pragmatically approach a problem, looking for solutions rather than just getting anxious, angry or depressed. They also have greater cognitive flexibility which is an ability to imagine and take into consideration more possible solutions or viewpoints. The sense of control to take responsibility for their feelings and responses in a stressful situation makes them more efficient and self-confident, which overall decreases neuroendocrine reactivity. (18)

In our survey, 35.7% of participants were subject to stress occasionally, and the other 35.7% were often. If we look at each individual stressor in the entire sample, we can observe that in our survey participants showed high level of predisposition to stress (temperament, behavior, job and a lifestyle, 61.9, 69.0, 69.0 and 64.3%, respectively). Available data in the literature show the existence of positive correlation between mental stress and dental anxiety (19-21) and mental stress and dental fear (22); our survey has also shown similar results. Mental stress is an individual and subjective experience and therefore what one finds stressful another does not. Beliefs, opinions, apprehension, expectations, assertiveness, self-respect, perfectionism, temperament and other personal factors combined with external events influence stress through the interaction between the stressors, the interpretation of a stressor and a perceived ability to cope with it. Most stressors we face every day are not that extreme as life events. Due to every day summation, these little troubles are considered to be more important challengers of stress than great life events. (5)

Besides theoretical and practical significance, this survey has limits because the relation of pain, dental anxiety and dental fear cannot be considered one-dimensionally. Some people might experience even a touch as painful because of fear or show greater and faster startle responses at every dentist's movement in anticipation of a painful stimulus. Others might be cooperative patients or even tolerant to pain even though they are being terrified all the time because of their personality structure, social environment, cultural norms, etc. (23)

Moreover, tooth sensitivity can be mitigated due to hypermineralized secondary and tertiary den-

tin, or pulp degenerations as consequences of earlier non-diagnosed dental trauma. Also, pulpitis or exposed dentin can contribute to greater tooth sensitivity. (24)

From all the above mentioned, we can state that our students do not exhibit dental fear although they show an average level of general mental stress and almost all of them have moderate or high level of pain sensitivity. Regarding this, measures of health education and informing the population about the significance of a regular dental visit, not only because of the prevention of dental diseases but also because of the prevention of unwanted mental states such as anxiety and fear, should be considered. This survey suggests many questions for future research.

Conclusions

Dental students exhibit an average level of general mental stress; almost all of them have a moderate or high level of pain sensitivity and they do not feel dental anxiety or dental fear, which leads us to the conclusion that knowledge is one of the key factors influencing emotional experience and leading to adaptation to stressful stimuli.

Acknowledgments

The authors thank the students for their willingness to participate in the study.

Conflict of Interests

The authors have no conflict of interest to declare.

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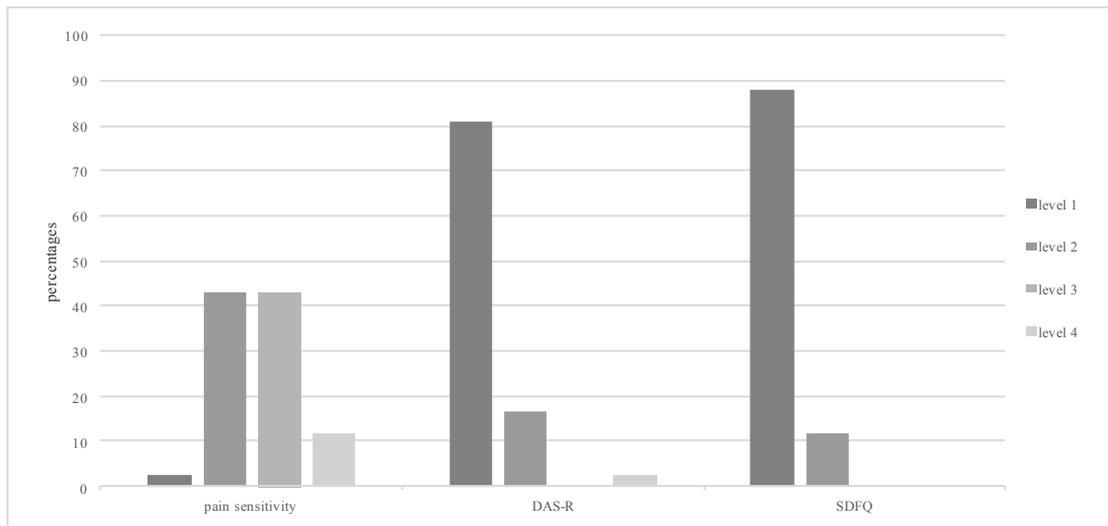
Figure legends

Figure 1. The distribution of the frequency of the pain sensitivity, dental anxiety and dental fear in 84 dental students

DAS-R – Corah's Dental Anxiety Scale Revised

SDFQ – Short Dental Fear Question

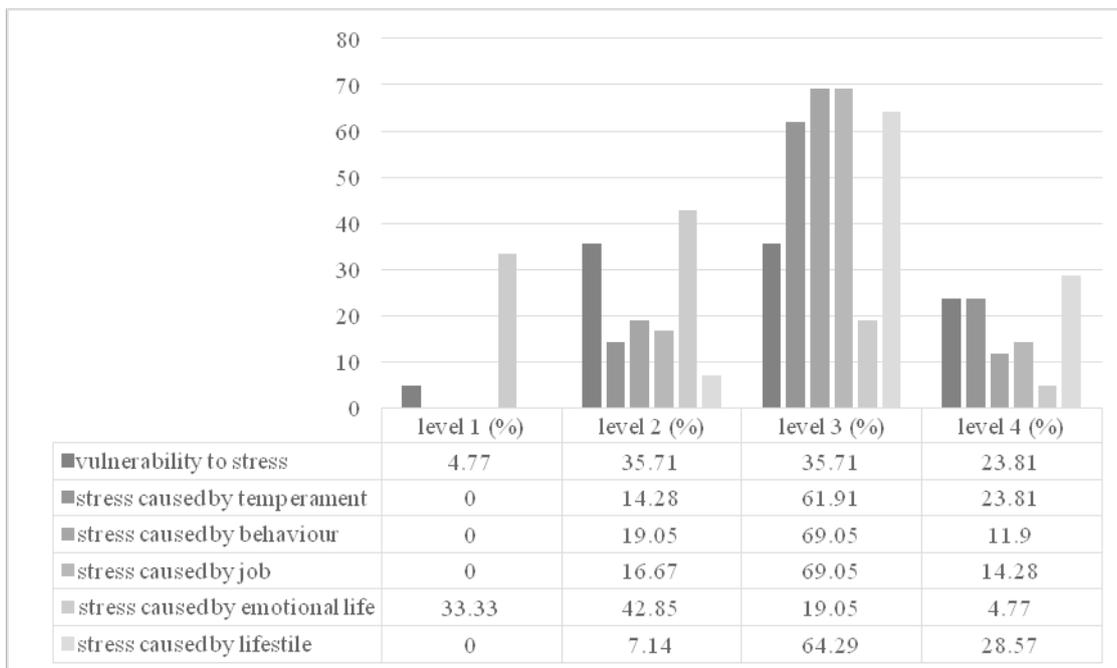|	level 1 (%)	level 2 (%)	level 3 (%)	level 4 (%)
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▪stress caused by lifestile	0	7.14	64.29	28.57

Figure 2. The distribution of the frequency of levels of the Bensabat General Stress Test in 84 dental students