

Stress and associated factors among dentists

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SUMMARY

Objective. Studies have shown that dentists are experiencing stress at work and it might have an impact on general health. Dental students have reported negative effect of stress starting in undergraduate studies period. The various predisposing factors have been identified and determined. The aim of our study was to determine and compare stress among dentists of different specializations.

Materials and Methods. A cross-sectional study was conducted in March-September 2016 among 317 dentists. 151 (48%) from public and 166 (52%) from private clinics. All participants were dental practitioners working in Kaunas, Lithuania. A modified version of Occupational stress questionnaire (Institute of Health, Helsinki, Finland, 1992) was used. Chi-square, Kolmogorov-Smirnov test Mann-Whitney U tests, Student's (t) criterion and logistic regression analysis model served for statistical analysis.

Results. Majority of dentists were women (85%) and 61.8% of all participants were general practitioners. More general practitioners and paediatric dentists specialists were working in public clinics. The most stressful factors were: restrictions, work tension, and responsibility, while least stressful were value of work, work and life satisfaction ($p < 0.05$). The intensive stress (> 3) was indicated mostly by general practitioners, pediatric dentists and periodontologists.

Conclusions. Stress is more experienced by dentists working in public clinic being as a general practitioner or having specialization of periodontologist or pediatric dentist. Dentists should be encouraged to take stress management course to cope with.

Key words: dentists, stress, specialization, health, self-assessment.

INTRODUCTION

Stress can be defined as a feeling of pressure and strain (1). In 1978 Cox defined stress as 'a stimulus, a response or the result of an interaction described in terms of some imbalance between the two, with the interaction described in terms of some imbalance between the person and the environment' (2).

Some studies have shown that dentistry is a very stressful specialty (3-5) and sometimes it can even be dangerous for the general dentist's health (6-8). It is known that stress is affecting physical/general health as lower back pain, musculoskeletal complaints, gastrointestinal disorders and headaches (9). Stress experienced by dentists even lead to suicide and the risk among dentists is higher than in

the rest of the general population (10). Pouradeli et al. in their study found out that dentists, who have less work experience are prone to feel more stress than those, who have work experience more than 10 years. Authors did not find significant correlation between stress and dentist's gender, age, workplace and working hours per week.

Stress problem is getting more and more common among dentists and it starts even in undergraduate education period. Students are experiencing stress and it is related to clinical requirements, stringent academic assessments, dealing with clinical problems (11-13). Appearing stressful situations have negative effect on postgraduates as well. However not always stress can lead to some kind of health disorders, but it also can help young doctors to gain confidence and motivation in critical situations (14).

It is not easy to indicate and determine main and predisposing risk factors causing stress among dentists. Most of those are related to financial,

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business problems, dealing with different patients, their demands and expectations, timing at work, being in a hurry because of short time (5, 15), job dissatisfaction and negative relationships between colleagues (10).

Study among Lithuanian dentists showed that 96.4% of dentists are feeling nervous, tired and anxious after work, their sleep become worst because of problems at work (16).

However, there is no recent studies exploring the stress experienced by dentists with different specializations.

The aim of our study was to determine and compare stress among dentists with different specializations.

MATERIALS AND METHODS

We conducted a cross-sectional survey in March-September 2016. The Bioetics Center of Lithuanian University of Health Sciences (LUHS) granted their approval of the ethics of the study protocol (No. BEC-OF-59).

The participants were general practitioners and dentists with specialization in endodontology, orthodontics, pediatric dentistry, periodontology, prosthodontics working in private and public clinics. A total of 380 anonymous, self-administered, written questionnaires were distributed in private (190) and public (190) clinics in Kaunas and 317 were completed: 166 (52.4%) in private and 151 (47.6%) in public. Response rate was 83.4%.

The questionnaire was based on a modified version of Occupational stress questionnaire (Institute of health, Helsinki, Finland, 1992). The first part of the questionnaire collected demographic information of the participants: age, gender, work experience, working hours a week, working place (public or private) and dental specialization. The second part consisted of 26 questions to assess stress risk factors and grouped in 3 domains: first – regulative factors (1 item social relations (2 questions)), second – perceived environment (8 items: work specificity (2 questions)); timing at work (3 questions); work strain (2 questions); restriction (1 questions) evaluation of work (2 questions) your work control (1 question); responsibility (2 questions); work climate (1 question), third – stress and satisfaction (3 items: stress and health (2 questions)); work and life satisfaction (2 questions); reaction to stress (6 questions). Internal consistency of the questionnaire assessed by Chronbach's alpha was 0.8.

Participants were asked to rate these items on five-point Likert scale. There have been five answer

alternatives for experienced stress and stress symptoms (fatigue, impatience, bad mood, nervousness, lack of tolerance): from 1-never to 5-always. Intensity of stress was dichotomized as low intensity and high based on mean values of answers. The mean value <3 was assumed as low intensity stress, while ≥ 3 as high stress.

According to age the respondents were categorized into three groups up to <30 years, 30-45 years and >45 years and dichotomized according to working hours a week <40 and ≥ 40 .

We used SPSS Statistics (Version 22.0, Armonk, NY). The interdependence of qualitative characteristics was evaluated of chi square (χ^2) criterion. The Kolmogorov-Smirnov test was used in the investigation of hypotheses about the normality of the parameter distribution. If variable distribution met the distribution normality assumption, Student's (t) criterion was applied to compare quantitative sizes of two independent groups. When the variable did not meet the distribution normality condition, a significance level was verified by nonparametric methods – Mann-Whitney U. For quantitative dependent variables when distribution was normal we used the paired test, and when the test of normality of the investigated variables was denied – Wilcoxon nonparametric test. The probability of event given certain risk factor was calculated using logistic regression analysis, including odds ratio (OR) and its confidence interval (95% CI). The difference between groups was considered as statistically significant when $p < 0.05$.

RESULTS

Table 1 shows demographic characteristics of the participants. Mean age was 38.4 years (SD 12.8) with range from 23 to 69 years. There was no difference between age groups. However, significantly more middle age (30-45) dentists were working in private clinics than those from youngest age group (<30) or older age group (>45) ($p=0.025$). More young dentists were working in public clinics (53.8%) compared with dentists belonging to middle age group (35.9%) and older group (50.9%). Work experience varied between 1 to 45 years (mean 14.6 (SD 12.4)). More participants working in public clinics indicated having weekly work load ≥ 40 hours while in private clinics more dentists were working less than 40 hours a week. Majority of respondents (85%) were women and 15% were men. There was no difference in gender ratio according to working clinic type ($p=0.284$). Majority of dentists were general practitioners (67.8%).

Table 2 shows that more general practitioners were working in public clinics while more dentists with specialization, except pediatric dentists, were working in private clinics ($p < 0.05$). The highest stress intensity with mean 4.81 (SD 0.85) was indicated by general practitioners. General practitioners (23.5%), periodontologists (7.1%) and pediatric dentists (13.3%) were considered as the most stressful groups since they indicated intensity of stress ≥ 3 .

Figure illustrates the scores of stress factors of different items. The items of restrictions, work tension, and responsibility had the highest scores, whereas least stressful were value of work, work and life satisfaction ($p < 0.05$).

Multivariate binary logistic regressive analysis revealed that being older (>45 years old), having specialization of general practitioner, periodontologist or pediatric dentist and working in public clinic were most likely to experience stress (Table 3).

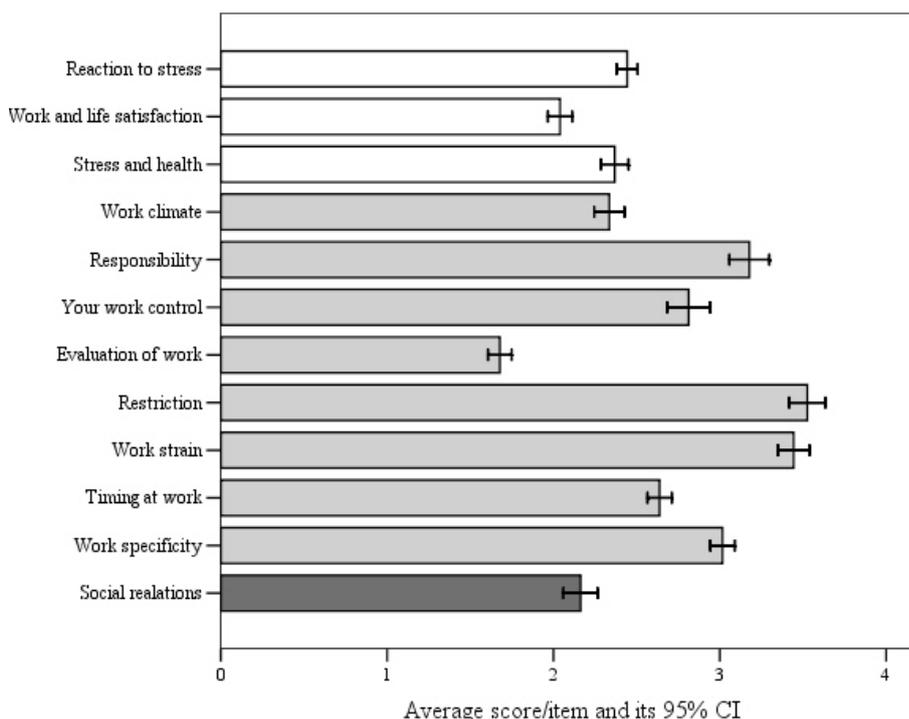


Figure. Mean items scores in the questionnaire

DISCUSSION

The findings of our study showed that dentists are experiencing stress. At higher risk are general practitioners or having specialization of periodon-

Table 1. Demographic characteristics of study participants

Charac- teristics	Age			Gender		Work place	Qualification		Working hours/ week	
	<30	30-45	>45	Male	Female		General practitioners	Specialists	<40	≥ 40
Public	64 (53.8%)	33 (35.9%)	54 (50.9%)	19 (40.4%)	132 (48.9%)	151 (47.6%)	110 (51.2%)	41 (40.2%)	71 (46.1%)	80 (49.1%)
Private	55 (46.2%)*	59 (64.1%)*	52 (49.1%)*	28 (59.6%)	138 (51.1%)	166 (52.4%)	105 (48.8%)	61 (59.8%)	83 (53.9%)	83 (50.9%)
Total	119 (37.5%)	92 (29.0%)	106 (33.4%)	47 (14.8%)	270 (85.2%)	317 (100%)	215 (67.8%)	102 (32.2%)	154 (48.6%)	163 (51.4%)

Age: $\chi^2=7.37$, $df=2$, $p=0.025$; * - $p < 0.05$. Gender: $p=0.3$. Working hours per week: $p=0.6$.

Table 2. Stress experience among dentists specialists

Qualification	Private n(%)	Public n(%)	Intensity mean (SD)	Intensity (>3). %
General practitioners	105(48.8%)	110(51.2%)	4.81(0.85)	23.5
Endodontists	15(78.9%)	4(21.1%)	2.23(0.32)	0
Periodontologists	11(78.6%)	3(21.4%)	2.54(0.38)	7.1
Prosthodontists	16(55.2%)	13(44.8%)	2.3(0.28)	0
Orthodontists	11(64.7%)	6(35.3%)	2.18(0.12)	0
Pediatric dentists	4(26.7%)	11(73.3%)	2.68(0.41)	13.3
Oral surgeons	4(50.0%)	4(50.0%)	1.85(0.46)	0
	$\chi^2=15.43$, $df=6$, $p=0.017$		$\chi^2=31.315$, $lls=7$, $p < 0.001$	$\chi^2=10.379$, $lls=7$, $p=0.168$

tologist or pediatric dentist, working at public clinic and older than 45 years. The findings of our study confirms that dentistry is psychologically and physically intensive work, with strict work timing and high dentists responsibility of their own health and health of their patients.

Stress can cause psycho emotional disorders, however the other systems of human body can also be affected in long term (heart and blood vessels, digestive system, immune system) (7, 17, 8).

Some studies have shown similar findings: strict work timing and the feeling of being late was ranked as very stressful among general dentists (18). Concentration during working hours (66%) and time pressure (65%) were ranked as the most stressful factors (5).

Results of some studies show that women were experiencing more stress than men. This finding might be explained by the fact that usually women are more sensitive (16) and probably they could be affected by environmental stress factors easier. Moreover women could feel more responsible for the family. However, some studies reported no difference in stress among men and women (19, 20). The participants of our study were mostly women (85%). Presumably they were experiencing more frequently stress.

Generally the age is correlated with work experience. However our findings showed that older respondents (>45 years) significantly ($p < 0.05$) more often indicated high stress (intensity >3), than respondents of younger age group (<35) and these results were not related to work load per week. This findings differ from the reports where older age dentists were more experienced in different situations and therefore easier cope with a stressful situations (3, 21).

The predisposing stress factors “Restriction” and “Work strain” were indicated as most stressful

Table 3. Results of multivariate binary logistic regressive analysis of stress among study participants

Evaluation questionnaire	
Characteristics	CR[95% CI] intensity >3
Age (years)	
<45	1
>45	3.085 [1.268-7.504]
Work place:	
Private clinic	1
Public clinic	10.373 [3.023-35.596]
Qualification:	
other	1
General practitioners, pediatric dentists, periodontologists	4.84 [1.09-21.498]
Constant = -5.885, $p < 0.001$. The model correctly predicts 90.5%	

by dentists, while “Social relations” and “Evaluation of work” were less causing stress. Unless dentists, who work in public clinics indicated being more at stress, those factors might be more related with the public clinic work specifics, where you have a strict timing, many patients and no possibility to plan your work according to individual patient needs.

Study among Lithuanian dentists showed that 96.4% of dentists are feeling nervous, tired and anxious after work, their sleep become worst because of problems at work (16).

There is not a lot of research about stress among different dentists specialists. In our study, respondents having professional qualification of general practitioner (23.5%), periodontologists (7.1%) or pediatric dentist (13.3%), reported high intensity of stress (>3) significantly more often than respondents with other specializations. General practitioners must be able to perform different dental treatment procedures for which they may be unprepared. Also, most of general practitioners are working in public clinics where doctors have to work under constant time pressure and work as quickly as they can to see as many patient as possible (18). Such working environment is one of the most frequent stress factor. Pediatric dentists are experiencing stress because of uncooperative child behavior. They have to work faster and more concentrated because children are not always ready to stay calm for the time, necessary to perform the procedure and overcome dental fear (17, 22, 23). The possible explanation that periodontologists are experiencing lots of stress is that in Lithuania most of the periodontologists are women and routinely performed surgical procedures might cause some additional stress at work. Other studies did not indicated periodontology as one of the most stressful specialization (14, 24). Additionally, Newton et al. did not found any differences between dental specialities (17).

In order to cope with stress more effectively, dentists should learn how to concentrate and pay attention to other things and engage in sport activities (aerobic exercise), relaxing activities (meditation, yoga) starting early as being a student (8). Moreover, mandatory subjects of studies should include: financial business management, psychology and oratory. Knowledge and experience obtained in special courses would be beneficial for young dentists in communication with different patients, gain self-confidence and deal with stressful situations (25). All of this could be useful at their work, when they will be given a lot of responsibility. Such seminars for medical practitioners

should be organized periodically to reduce stress and achieve highest quality of work.

Previous study among Lithuanian dentists showed that 96.4% of dentists are feeling nervous, tired and anxious after work, their sleep become worst because of problems at work (16). That indicates that stress among Lithuanian dentist is already known problem which is calling for the effective prevention.

STRENGTHS AND LIMITATIONS

The limitation of study is big gender difference

(man 14.8%, women 85.2% respectively), however it represents the man: women ration among Lithuanian dentists where women are dominating. Participation dentists of all specializations within dentistry is strength

CONCLUSION

Stress is more experienced by dentists working in public clinic being as a general practitioner or having specialization of periodontologist or pediatric dentist. Dentists should be encouraged to take stress management course to cope with.

REFERENCES

- Carver CS, Connor-Smith J. Personality and coping. *Annu Rev Psychol* 2010;61:679-704.
- Mackay C, Cox T, Burrows G, Lazzarini T. An inventory for the measurement of self-reported stress and arousal. *Br J Soc Clin Psychol* 1978; 17: 283-284.
- Cooper CL, Watts J, Kelly M. Job satisfaction, mental health, and job stressors among general dental practitioners in the UK. *Br Dent J* 1987; 162:77-81.
- Szabo S, Tache Y, Somogyi A. The legacy of Hans Selye and the origins of stress research: a retrospective 75 years after his landmark brief "letter" to the editor of nature. *Stress*. 2012;15:472-8.
- Pouradeli S., Shahravan A., Eskandarizdeh A., Rafie F., Hashemipour MA. Occupational Stress and Coping Behaviours Among Dentists in Kerman, Iran. *Sultan Qaboos Univ Med J* 2016; 16(3): e341-e346.
- Gorter RC, Albrecht G, Hoogstraten J, Eijkman MAJ. Measuring work stress among Dutch dentists. *International Dental Journal* 1999; 49: 144-152.
- Gorter RC, Eijkman MA, Hoogstraten J. Burnout and health among Dutch dentists. *Eur J Oral Sci* 2000; 108:261-7.
- Gosavi SS, Gosavi SY, Jawade RS. Posturedontics: Reducing the Stress in Dentistry. *World Journal of Dentistry* 2012;3(4):335-339.
- Kay EJ, Lowe JC. A survey of stress levels, self-perceived health and health related behaviours of UK dental practitioners in 2005. *Br Dent J* 2008; 204:E19.
- Newton JT, Allen CD, Coates J, Turner A, Prior J. How to reduce the stress of general dental practice: the need for research into the effectiveness of multifaceted interventions. *Br Dent J* 2006; 200(8): 437-40.
- Henzi D, Davis E, Jasinevicius R, Hendricson W. In the students' own words: what are the strengths and weaknesses of the dental school curriculum? *J Dent Educ* 2007; 71: 632-645.
- Divaris K, Barlow PJ, Chendea SA, Cheong WS, Dounis A, Dragan IF et al. The academic environment: the students' perspective. *Eur J Dent Educ* 2008; 12 Suppl 1:120-130.
- Alzahem AM, van der Molen HT, Alaujan AH, Schmidt HG, Zamakhshary MH. Stress amongst dental students: a systematic review. *Eur J Dent Educ* 2011; 15: 8-18.
- Divaris K, Lai CS, Polychronopoulou A, Eliades T, Katsaros C. Stress and burnout among Swiss dental residents. *Schweiz. Monatsschr. Zahnmed.* 2012; 122: 610-615.
- Klein J, Grosse Frie K, Blum K, et al. Burnout and perceived quality of care among German clinicians in surgery. *Int J Qual Health Care* 2010;22:525-30.
- Puriene A, Aleksejuniene J, Petrauskiene J, Balciuniene I, Janulyte V. Occupational hazards of dental profession to psychological wellbeing. *Stomatologija, Baltic Dental and Maxillofacial Journal* 2007; 9:72-78.
- Newton JT, Mistry K, Patel A et al. Stress in dental specialists: a comparison of six clinical dental specialties. *Prim Dent Care* 2002;9:100-104.
- Myers HL, Myers LB. 'It's difficult being a dentist': stress and health in the general dental practitioner. *Br Dent J* 2004;197(2):89-93.
- te Brake H, Bloemendal E, Hoogstraten J. Gender differences in burnout among Dutch dentists. *Community Dent Oral Epidemiol* 2003;31(5):321-7.
- Al-Zubair NM, Al-ak'hali MS, Ghandour IA. Stress among dentists in Yemen. *Saudi J Dent Res* 2015; 6:140-5.
- Rogers C, Malone KM. Stress in Irish dentists: Developing effective coping strategies. *J Ir Dent Assoc* 2009; 55:304-7.
- Diercke K, Ollinger I, Bermejo JL, et al. Dental fear in children and adolescents: a comparison of forms of anxiety management practised by general and paediatric dentists. *Int J Paediatr Dent* 2012;22:60-7.
- Ronneberg A, Strom K, Skaare AB, Willumsen T, Espelid I. Dentists' self-perceived stress and difficulties when performing restorative treatment in children. *Eur Arch Paediatr Dent* 2015;16(4):341-7.
- Divaris K, Polychronopoulou A, Taoufik K, Katsaros C, Eliades T. Stress and burnout in postgraduate dental education. *Eur J Dent Educ* 2012;16(1):35-42.
- Rada RE, Johnson-Leong C. Stress, burnout, anxiety and depression among dentists. *J Am Dent Assoc* 2004;135(6):788-94.

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