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Research article

RISK FACTORS OF OCCUPATIONAL BURNOUT IN DENTISTS EMPLOYED BY STATE CHILDREN'S DENTAL POLYCLINICS

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Recently occupational burnout has become more frequent among dentists. Exposure to stress is especially typical for those dentists who work with children.

We identified risk factors that caused developing occupational burnout among dentists employed by state children's dental polyclinics.

We performed comprehensive questioning with 120 dentists participating in it. They all were employed by state children's dental polyclinics in Saint Petersburg. Totally, there were 8 male participants and 112 female ones; their average age was 47.2 ± 11.34 years; average working experience as a dentist, 19.2 ± 13.6 years. The dentists filled in standardized questionnaires including Maslach Burnout Inventory (MBI), RAND SF-36 for assessing quality of life and Work Ability Index. Our study was designed as a "case – control" one. Based on the data of MBI, two groups were created: respondents with occupational burnout by two and three MBI scales (case) and respondents without any occupational burnout (control). To analyze risk factors of occupational burnout, we compared frequency of signs in the groups and calculated odds ratio and their statistical significance.

Several significant risk factors of occupational burnout were identified for this group. They included age >40 years; working experience as a dentist >10 years; presence of chronic diseases and diseases of the musculoskeletal system; impaired physical functioning, general health, and emotional role functioning, as well as the integral quality of life index. Dentists aged 40–49 years have the highest risk of occupational burnout. Working experience that is longer than 20 years creates significantly elevated risks of occupational burnout. Chronic diseases and diseases of the musculoskeletal system as well as impaired quality of life multiply risks of occupational burnout.

These research results can be used to develop activities aimed at preventing occupational burnout among dentists working with children.

Keywords: *dentist, state children's dental polyclinics, children, occupational burnout, Maslach Burnout Inventory, risk factors, quality of life, case–control study.*

Dentists are exposed to various harmful occupational factors including nervous and mental overloads that make for occupational stress development [1–6]. Occupational burnout (OB) is a possible outcome of occupational stress. The conventional model of occupational burnout includes three basic components: emotional exhaustion (EE), depersonalization (DP) and reduced personal accomplishment (RPA)[1].

Occupational burnout is rather widespread among dentists. When dentists suffer from it, it leads to their inability to accomplish work tasks and to be active in life. Instead, dentists with burnout experience apathy and are indifferent to not only occupational performance but also other life values. All this produces negative effects on their mental, physical and social functioning, their work ability (WA), professional relationships with

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[1] Maslach C., Jackson S.E. The Maslach Burnout Inventory Manual, 2nd ed. Palo Alto, CA, Consulting Psychologists Press, 1986; Maslach C., Jackson S.E., Leiter M.P. Maslach burnout inventory manual, 3rd ed. Palo Alto, California, Consulting Psychological Press, 1996.

colleagues and patients as well as their personal life [7, 8]. Age, working experience, specialization, employment (by a state or a private clinic), chronic diseases as well as such mental qualities as anxiety, sensitivity and introversion are among established risk factors of developing OB in dentists who work with adults [9–12]. Exposure to stress is rather typical for doctors with this specialty and it is especially true for those who work with children [13, 14]. In most cases, specific behavioral reactions a child tends to have and the necessity to communicate with parents result in growing emotional and mental loads a dentist has to bear. Several authors [15, 16] noted that a probability of OB was very high among dentists employed by state children's dental polyclinics. It is necessary to examine risk factors of OB in this occupational group in order to develop relevant activities aimed at timely detection and prevention of this syndrome. There are extremely few works available in scientific literature with their focus on analyzing risk factors of OB development among dentists.

Our research goal was to identify risk factors that caused developing occupational burnout among dentists employed by state children's dental polyclinics.

Materials and methods. Our research concentrated on examining risk factors causing OB development in dentists who worked in state children's dental polyclinics. We questioned 120 dentists with various specialties (children dentists, orthodontists and dental surgeons) from eight state dental polyclinics for children in Saint Petersburg. The sampling was made up of 8 men and 112 women aged from 23 to 72 years (their average age was 47.2 ± 11.34 years) with working experience in the sphere from 1 to 49 years (average working experience was 19.2 ± 13.6 years).

The participants filled in several standardized questionnaires: Maslach Burnout Inventory (MBI) developed by Maslach & Jackson [17] and adapted by N.E. Vodopyanova[2], RAND SF-36[3] survey for assessing quality of life and Work Ability Index (WAI)[4]. The questioning was anonymous; the participating dentists filled in the forms during breaks in a work shift. MBI contains 22 statements regarding feelings and emotions associated with occupational activities, relationships with colleagues and patients. It allows estimating basic OB components, namely EE, DP and RPA; the latter is sometimes called "loss of motivation". RAND SF-36 is a common instrument to measure quality of life. It contains 36 questions that create eight scales: physical functioning (PF), role physical (RP), bodily pains (BP), general health (GH), vitality (V), social functioning (SF), role emotional (RE), and mental health (MH). The survey scales give grounds for calculating the integral quality of life index. We determined whether quality of life was impaired as per each scale in the survey by comparing its value for each respondent with a relevant population standard [18]. WAI was applied to assess changes in the participants' work ability (WA).

Our study was designed as a "case – control" one. Two groups were formed based on the results produced by MBI. The first one was made of respondents who had occupational burnout by two or three MBI scales (case); the second one included respondents without any signs of OB (control). To analyze risk factors of OB, we compared frequencies of signs in the case and control groups and calculated odds ratio [19]. Qualitative signs were analyzed by using Pearson's χ^2 test. Differences were considered authentic at the significance level being $p < 0.05$. We calculated odds ratio (OR and 95 % confidence interval

[2] Vodop'yanova N.E., Starchenkova E.S. Sindrom vygoraniya: diagnostika i profilaktika [Burnout: diagnostics and prevention]. Saint Petersburg, Piter, 2008, 336 p. (in Russian).

[3] Hays R.D., Sherbourne C.D., Mazel R.M. User's Manual for Medical Outcomes Study (MOS) Core Measures of Health-Related Quality of Life. *RAND Corporation*, 1995, 168 p.

[4] Tuomi K., Ilmarinen J., Jahkola A., Katajarinne L., Tulkki A. Work Ability Index, 2nd revised ed. Helsinki, Finnish Institute of Occupational Health, 1998.

(CI)) to assess risk factors of OB development. We considered the following possible risk factors: sex, age, working experience in the sphere, specialization, existing chronic diseases, diseases of the musculoskeletal system, poorer quality of life (as per specific scales and as per the integral index as well) and lower WA.

All the data were statistically analyzed in SPSS 17.0 and MedCalc software packages.

Results and discussion. The Figure shows how the participating dentists were distributed as per OB intensity.

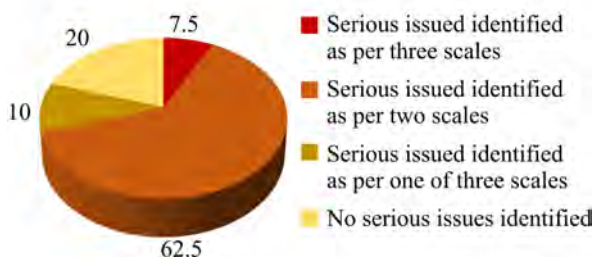

Figure. Distribution of the participating dentists as per OB intensity, %

High scores by the EE and DP scales and low scores by the RPA scale indicate occupational burnout is already developing. Three levels in its development are determined depending on the total scores. The EE scale has the following gradations: 25 scores or more means emotional exhaustion is high; 16–24 scores, average; 0–15 scores, low. The DP scale gradations are as follows: 11 scores or more, depersonalization is high; 6–10 scores, average; 0–5 scores, low. According to the RPA scale, 30 scores or lower, reduced personal accomplishment is apparent; 31–36 scores, average; 37 scores or more, low[2].

Eighty-four respondents out of 120 dentists participating in the study (70 %) had occupational burnout by two or three scales in the MBI questionnaire. Serious issues were identified by all three scales (EE, DP and RPA) in nine (7.5 %) people and 75 dentists (62.5 %) had serious issues identified by the EE and DP scales. Serious issues were identified by only one scale in 12 (10 %) respondents. We did not identify occupational burnout by any scale in 24 (20 %) respondents.

This distribution made it possible to create two groups. The first one included dentists with OB identified by two or three scales in the MBI questionnaire ("case"). The second group was made of dentists without any signs of occupational burnout ("control"). Twelve respondents who had OB identified by only one scale in the MBI questionnaire were excluded from the further analysis.

Table 1 provides profiles of the examined groups depending on risk factors of OB development.

Having analyzed the results provided in Table 1, we established that the compared groups had significant differences as per age ($p < 0.001$). Thus, 52.4 % of the respondents with occupational burnout were aged 50 years and older and another 28.4 % were aged 40–49 years; as for the respondents without occupational burnout, 66.7 % of them were younger than 40 years. Then, there were significant differences between the groups as per working experience in the sphere ($p < 0.001$): most respondents with occupational burnout (71.4 %) had been working in the sphere for more than 20 years and only 7.2 % of them had working experience shorter than 10 %. Half of the respondents without occupational burnout (50 %) had working experience shorter than 10 years and another 25 % had been working in the sphere for less than 20 years. Significant differences were also detected depending on already existing chronic diseases and diseases of the musculoskeletal system ($p < 0.05$). The overwhelming majority of the dentists with occupational burnout had chronic diseases and diseases of the musculoskeletal system, 97 % and 90 % accordingly. We did not detect these diseases in any respondent from the control group. We did not detect any significant sex-related differences or differences related to specialization between the groups.

Statistically significant differences were detected between the groups depending on lower value of indicators showing quality of life as per six out of eight SF-36 scales and the integral quality of life index ($p < 0.05$). Most dentists with occupational burnout had im-

paired PF (34.5 % against 8.3 % in the control), RP (19 % against 0 %), GH (29.8 % against 0 %), V (26.2 % against 0 %), RE (33 % against 0 %) and MH (17.9 % against 0 %). The integral quality of life index had lower values in 34.5 % of cases among the respondents from the case group whereas there were no such cases in the control one. Our assessment of work ability (WA) established that 22.6 % of the respondents with occupational burnout had moderate WA; the remaining had good and very good WA. All the respondents without occupational burnout had good or very good WA.

Table 2 provides the results produced by analyzing odds ratio for occupational burnout.

Table 1

Profiles of the examined groups depending on risk factors of OB development

Factors	Group with OB, "case"		Group without OB, "control"		(*p*)
	n	%	*n*	%	
Sex					
Male	6	7.1	2	8.3	>0.05
Female	78	92.9	22	91.7	
Age					
< 40 years	16	19.0	16	66.7	<0.001
40–49 years	24	28.6	1	4.2	
≥ 50 years	44	52.4	7	29.2	
Working experience					
< 10 years	6	7.2	12	50	<0.001
10–20 years	18	21.4	6	25	
> 20 years	60	71.4	6	25	
Specialization					
Children's dentist	56	66.7	16	66.7	0.454
Dental surgeon	10	11.9	1	4.2	
Orthodontist	18	21.4	7	29.2	
Chronic diseases					
Yes	67	97	0	-	<0.05
No	2	3	6	100	
Diseases of the musculoskeletal system					
Yes	67	90	0	0	<0.05
No	2	10	9	100	
Impaired physical functioning					
Yes	29	34.5	2	8.3	<0.05
No	58	65.5	22	91.7	
Impaired role physical					
Yes	16	19.0	0	0	<0.05
No	68	81.0	24	100	
Apparent bodily pains					
Yes	2	2.4	0	0	>0.05
No	82	97.6	24	100	
Impaired general health					
Yes	25	29.8	0	0	<0.05
No	59	70.2	24	100	
Lower vitality					
Yes	22	26.2	0	0	<0.05
No	62	73.8	24	100	
Impaired social functioning					
Yes	17	20.2	0	0	>0.05
No	67	79.8	24	100	
Impaired role emotional					
Yes	28	33.3	0	0	<0.05
No	56	66.7	24	100	

Continuation of the Table 1

Factors	Group with OB, "case"		Group without OB, "control"		(*p*)
	n	%	*n*	%	
Impaired mental health					
Yes	15	17.9	0	0	<0.05
No	69	82.1	24	100	
Lower integral quality of life index					
Yes	30	22.6	0	0	<0.05
No	54	77.4	24	100	
Work ability index					
Moderate	19	22.6	0	0	>0.05
Good and very good	65	77.4	24	100	

Table 2

Analysis of odds ratio for occupational burnout among dentists

Risk factors	Odds ratio OR (95 % CI)	Validity of differences (*p*)
Age		
≥ 50 years	6.29 (2.19–18.08)	0.006
40–49 years	24.00 (2.89–199.36)	0.0033
< 40 years	Control	–
Working experience		
> 20 years	20.00 (5.50–72.67)	< 0.0001
10–20 years	6.00 (1.56–23.07)	0.009
< 10 years	Control	–
Impaired physical functioning		
Yes	5.80 (1.27–26.41)	0.023
No	Control	–
Impaired vitality		
Yes	1.63 (0.92–2.87)	0.093
No	Control	–
Chronic diseases		
Yes	351.00 (15.17–8120.01)	0.0003
No	Control	–
Diseases of the musculoskeletal system		
Yes	158.33 (8.35–3004.01)	0.0007
No	Control	–
Impaired role physical		
Yes	11.81 (0.68–204.28)	0.0897
No	Control	–
Impaired general health		
Yes	21.00 (1.23–358.77)	0.0355
No	Control	–
Impaired role emotional		
Yes	24.72 (1.45–421.35)	0.0266
No	Control	–
Impaired mental health		
Yes	10.93 (0.63–189.61)	0.1005
No	Control	–
Lower integral quality of life index		
Yes	27.42(1.61–466.94)	0.0221
No	Control	–
Work ability		
Moderate	16.37 (0.95–280.49)	0.054
Good and very good	Control	–

Significant risk factors that could cause occupational burnout in this occupational group of doctors included age > 40 years, working experience in the sphere > 10 years, chronic diseases, diseases of the musculoskeletal system, impaired physical functioning, general health, role emotional, as well as lower integral quality of life index. Such factors as impaired vitality, role physical, mental health or moderate work ability do not have significant influence on developing occupational burnout. The results provided in Table 2 indicate that risks of occupational burnout grow with age. Dentists aged 40–49 years and those who are 50 years or older have by 24 and 6.3 times higher risks of OB accordingly than their colleagues who are younger than 40 years. Consequently, people aged 40–49 have the highest risks of OB.

Dentists with long working experience have higher risks of OB. The respondents with their working experience being 10–20 years have by 6 times higher risks of OB than their colleagues with working experience shorter than 10 years; those with working experience exceeding 20 years, have by 20 times higher risks of occupational burnout. Chronic diseases and diseases of the musculoskeletal system increase risks of OB development by 351 and 158 times accordingly.

The results produced in this "case – control" study are in general consistent with data produced by correlation analysis of risks causing OB development among dentists who work with adults. According to them, risk factors of OB development include age, working experience, specialization, chronic diseases, and dentists' psychological qualities [9–12, 20, 21]. Additional risk factors of OB detected for dentists who work with children are quality of life indicators related to physical and emotional functioning.

Therefore, our research results indicate that there are several significant risk factors causing OB among dentists working with children in state dental polyclinics. These risk factors include age older than 40 years; working experience longer than 10 years; chronic diseases; diseases of the musculoskeletal system; impaired general health, role physical and role emotional functioning as well as integral quality of life index. This study is the first to reveal significant risk factors of OB development among dentists working with children. We have established that dentists aged 40–49 years have the highest risks of OB development. Working experience exceeding 20 years also raises chances of OB development rather significantly. Existing chronic diseases and diseases of the musculoskeletal system increase chances of OB development by multiple times. Impaired quality of life indicators are another significant factor that makes for OB development in this occupational group.

Conclusion. Since occupational burnout is widely spread among dentists who work with children, it is necessary to analyze OB factors in this occupational group for developing relevant activities aimed at detecting and preventing it. The results of the present study show that OB occurs in 70 % of doctors in this occupational group. Significant risk factors that cause OB include age older than 40 years; working experience in the sphere exceeding 10 years; chronic diseases and diseases of the musculoskeletal system; impaired physical functioning, general health, role emotional functioning, as well as lower integral quality of life index.

These results make it possible not only to get better insight into factors making for OB development in dentists working with children but also to give grounds for developing a prevention program aimed at mitigating risks of occupational burnout. The detected risk factors can be used for developing relevant activities aimed at OB prevention among dentists.

It is advisable to include Maslach Burnout Inventory into periodical medical examinations since this questionnaire allows timely detection of relevant OB signs. Prevention activities should involve creating a special room in a polyclinic where dentists could get necessary relief from workloads. There should also be specific activities aimed at removal of emotional overstrain and recovery of work ability.

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Competing interests. The authors declare no competing interests.

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