Work-related stress among primary healthcare workers

Stres na radnom mestu kod medicinskog osoblja u primarnoj zdravstvenoj zaštiti

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Abstract

Background/Aim. There are data on an increased stress level in primary health care workers. The aim of this paper was to investigate the state of stress among employees in the field of primary health care in order to identify the factors that most affect stress and groups that are particularly susceptible to stress. **Methods.** The study was conducted using a sample of 95 health care workers in the field of primary health care. Data were collected through an anonymous survey consisting of two parts. The first part of the survey included questions related to the characteristics of the workplace and professional and socio-demographic characteristics of the employees. The second part of the survey was based on the Behavioral Health Concepts (BHC) stress test, which is used to estimate the adaptation to stress across four dimensions: overall assessment, quality of life assessment, symptomatology, and level of functioning. **Results.** Although the total number of respondents fell under the group of moderate stress (mean = 3.97), using descriptive statistical analysis, it was discovered that, 4.2% of the respondents had an increased level of stress. The variance analysis demonstrated that there were statistically significant differences ($p < 0.00$) between the effects of educational variables (F = 11.68), workplace (F = 14.07) and work time (F = 9.16) on overall stress. Significant interaction between variables workplace and work time was also found [F (2.72) = 3.22; $p < 0.046$]. **Conclusion.** Primary health care employees have an increased level of stress, which depends on both the working conditions and the personal characteristics of the employees**.**

Key words:
primary health care; health personnel; stress, psychological; risk factors; surveys and questionnaires; serbia.

Apstrakt

Uvod/Cilj. Postoje podaci o povišenom nivou stresa kod radnika u primarnoj zdravstvenoj zaštiti. Cilj ovog rada je bio da se istraži stanje stresa kod zaposlenih u oblasti primarne zdravstvene zaštite radi identifikacije faktora koji najviše utiču na stres, kao i identifikacije grupa koje su posebno podložne stresu. **Metode.** Istraživanje je sprovedeno na uzorku od 95 zdravstvenih radnika zaposlenih u oblasti primarne zdravstvene zaštite. Podaci su prikupljeni pomoću anonimne ankete koja se sastojala iz dva dela. Prvi deo ankete je sadržao pitanja koja se odnose na karakteristike radnog mesta i profesionalne i socio-demografske karakteristike zaposlenog. Drugi deo ankete je bio baziran na *Behavioral Health Concepts* (BHC) stres testu, koji se koristi za procenu adaptacije na stres preko četiri dimenzije: ukupna ocena, ocena kvaliteta života, simptomatologija i nivo funkcionisanja. **Rezultati.** Iako su ispitanici pripadali grupi umerenog nivoa stresa (srednja vrednost = 3,97), upotrebom deskriptivne statističke analize utvrđeno je da je kod 4,2% ispitanika postojao povišen nivo stresa. Analizom varijanse ustanovljeno je da postoje statistički značajne razlike ($p < 0.00$) između uticaja varijabli obrazovanja (F = 11.68), radnog mesta (F = 14.07) i radnog staža (F = 9.16) na ukupan stres. Takođe, pronađena je i značajna interakcija između varijabli radno mesto i radni staž [F(2,72) = 3.22; $p < 0.046$]. **Zaključak**. Zaposleni u primarnoj zdravstvenoj zaštiti imaju povišen nivo stresa, što zavisi kako od uslova rada, tako i od ličnih karakteristika zaposlenih.

Ključne reči:
zdravstvena zaštita, primarna; zdravstveno osoblje; stres, psihički; faktori rizika; ankete i upitnici; srbija.

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Introduction

So far, the published analyses of working in outpatient units in Serbia and the City of Belgrade have suggested that there is an increased workload of medical staff employed in primary health care in relation to the statutory scope of the provision of health services [1]. These data suggest that primary health care workers are exposed to stress at the workplace.

There are many consequences from chronic stress. In an individual under stress, the psychological consequences such as high levels of irritability, frustration, anxiety, aggression, nervousness, apathy, depression, disorientation, loss of self-esteem, as well as somatic consequences, such as high blood pressure, arrhythmia, and difficult breathing are the most striking. If these problems persist for a long time, they can lead to serious disorders of the digestive system, cardiovascular system, immune system, locomotor system resulting in atherosclerotic changes in the blood vessels, digestive disorders, frequent colds, malignant diseases, asthma and other long-term diseases [2–7]. Regardless of the resistance of psychic and physical constitutions to the effects of stressors, high levels of stress as well as chronic stress have a negative impact on performance [8–10].

In the literature dealing with modern theories of stress at the workplace, the integrative-process concept has been singled out as the most dominant [11]. This model takes into account external stressors, which primarily concern characteristics of work, workplace, work process and management, working atmospheres [12–13] and dispositional characteristics of an individual, of which stress resistance, the speed of overcoming stress and stress sediment are particularly significant [14]. One of the variants of this concept is the "effort-reward" model, based on the premise that breaking the reciprocity between effort invested at work and material compensation is the main cause of emotional and later health problems among employees [15]. This model can be largely applied to the analysis of stress among employees in the health sector [16]. As studies show, doctors in the United States are not satisfied with their work. Namely, as many as 78% of the respondents stated that they did not enjoy their work or that they found much less fulfillment at work than at the beginning of their career, while 68% of the respondents would not recommend medicine as a professional orientation [17].

In the medical profession, in addition to the usual stress factors at the workplace, there are specific causes of stress, such as acute conditions requiring urgent intervention, constant contact with death, serious illness or persons with physical disabilities, and an unpleasant feeling due to the inability to provide adequate assistance to a patient. It can be assumed that the risk of professional omissions and iatrogenic defects that can have drastic consequences for the health and life of patients constitutes an additional burden for health workers, especially in developing countries, where material factors and a lack of resources have a significant outcome for treatment.

Primary health care as a pillar for prevention and preservation of the nation health is an especially important part of the health system through which the functioning of state organs and the overall situation in a society is reflected. Factors that can contribute to stress among employees in the field of primary health care are, in addition to inadequate material-technical conditions for work, an insufficient number of employed professionals, long waiting periods, a demanding administration and short amount of time available for the doctor, the availability of time for a patient check-up, as well as the differences in material compensation for work in the private and public health sector [18].

In accordance with the above-mentioned, some empirical studies have confirmed that there is an increased level of stress at workplace among medical personnel in Serbia and the risk of burnout syndrome [16], and that it could be prevented, which requires more detailed research and identification of groups that are especially susceptible/exposed to stress. Personal characteristics such as gender, age, education, workplace, family and social status are potential indicators that act upon on the vulnerability of an individual in stressful situations [7], and the relationship of these indicators with the level of stress among employees in health care institutions in Serbia has not yet been thoroughly examined.

The aim of this paper was to investigate the state of stress among employees in the field of primary health care in order to identify factors that most affect stress and groups that are particularly susceptible to stress.

Methods

For the purpose of this research, the results of the survey from one of the total of 16 health centers in the territory of the City of Belgrade were analyzed (in order to protect the anonymity of the respondents, the name of the institution in which the survey had been conducted was omitted). The selected institution can be considered representative because of a number of branches in urban and suburban areas. The study was conducted on a sample of 95 subjects, which included 10 men and 85 women, the average age being 43 years. The ratio of male and female respondents was proportional to the gender representation among the employees at the selected institution where the research was conducted [16, 18]. The sample size was selected after analyzing the statistical power for the analysis of variance for the draft 3×2 (three levels of factor A with a combination of two levels of factor B at each level of factor A), using $\alpha = 0.05$, the strength f = 0.80, and for the mean expected effect $\delta = 0.4$ [19, 20]. In addition to the above assumptions, the minimum sample size should be 75 examinees. When forming the sample, the structure of subunits was balanced by variables related to the workplace (workplace and department) and by intervening variables (gender, marital status, number of children, average daily number of examinations, years of work experience). Of the above variables, in terms of statistical power analysis under factor A, years of work experience from three levels (up to 15 years, from 15 to 25 years, and over 25 years of service) were considered, while the variable workplace and other in-

tervening variables that had two levels represented factor B in individual analysis of variance.

All respondents were asked to solve an anonymous questionnaire consisting of two parts. The first part of the questionnaire consisted of questions relating to sex, education, marital status, number of children, workplace, department in which the employee performs their duties, average daily number of patients, and years of work experience. The second part of the questionnaire was based on the Behavioral Health Concepts (BHC) stress test, which is a standardized questionnaire designed using a factor analysis that reduced the initial inventory from about 400 to 27, best describing three factors: quality of life, level of functioning, and symptomatology. The assessment of quality of life consists of four sub-factors: autonomy, self-confidence, social support, and physical health. The assessment of symptomatology is described by three sub-factors: depression, somatization, and paranoia. The level of functioning in everyday life relates to issues related to misconduct (physical and verbal conflicts) and the level of social skills development (in both business and private life). The result of the BHC test is a stress barrier, ranging from 0 to 5 for each of the sub-factors, as well as for total stress. A lower numerical value describes a higher degree of stress and *vice versa*, a greater number represents a better adaptation to stress. Depending on the results, respondents were further classified into one of four categories: well-adapted, moderately shaken, highly stressed, and extremely stressed, for each of the above-mentioned dimensions. The BHC stress test has good psychometric characteristics [21], which were confirmed in Serbia through "various research with teachers in elementary and secondary school, university students, nurses, and also in Serbian post and in some sectors of Serbian army" [22].

All respondents agreed to participate in the research voluntarily. They were in advance informed about their tasks both orally and in writing. Also, they were informed that their personal data would be secret and that they would be able to leave the study at any time without any consequences. The research was approved by the Dean of the Faculty of Physical Culture and Sports Management, and in accordance with the Code of Professional Ethics of the Singidunum University, as well as with the Ethical Principles and the Code prescribed by the American Psychological Association (APA). The quantified data was processed by descriptive statistical analysis, *t*-test, hi-square (χ^2) test and analysis of variance using the software package SPSS version 22.0.

Results

The results of descriptive statistical analysis (Table 1) showed that the average respondent was under moderate stress (3.97). Also, the average respondent was characterized by subclases the quality of life (3.92) and symptomology (3.81) as moderately stressed, while on the subscale functionality he/she was assessed as well adapted to stress (4.20). An analysis of the percentage representation of stress categories (Table 2) showed that, according to total stress,

4.2% of the total sample belonged to the group of elevated stress, while on subscales the quality of life and symptomatology these values were significantly higher (11.6% and 14.7%, respectively), and on the subscale symptomatology, phenomenon of extremely stressed workers was also recorded (1.1%).

Analyzing variables that affect the occurrence of stress, it could be concluded that men on all three subscales, as a total stress rating, fell under the category of good adaptation, while women were in a group with moderate stress, excepting the subscale of functionality, where they also belonged to a group of moderate stress. Employees over 40 years of age achieved lower results on total stress and subscales compared to employees under 40 years of age. In accordance with this, the results obtained from the variable work experience showed that the group of workers over 25 years of age was the most at risk for stress, while the best adaptation had the group of employees with working experience ranging from 15 to 25 years. There were no significant differences in adaptation to stress among employees who had not children or had only one child in relation to employees with two or more children, except for the symptomatology subscale, according to which childless workers or those with one child were better adapted, although this difference was not statistically significant. Unmarried health care workers belonged to a well-adapted group, unlike their married colleagues who were under moderate stress, with the exception of the functionality subscale. Similarly, highly educated employees belonged to the group of those who were well-adapted to stress, as opposed to workers who had completed high school and belonged to the group with moderate stress. These differences were also noticeable in terms of the variable employment, which very similarly differentiated the sample to the subunits, as well as the variable education. With the exception of two respondents, all subjects with higher education were employed as doctors. Differences in stress levels among employees of different educational levels were even more pronounced when the sample was segmented according to the variable employment. According to the percentage distribution of stress categories (Table 2), there were differences in the adaptation to stress among physicians and nurses and technicians. Namely, it was noticeable that doctors in all subscales were better adapted to stress than other members of medical staff, and this figure was most noticeable when considering total stress – none doctors and 7.3% of the nurses and technicians belonged to the category of employees under increased stress. According to the department in which they work and the average daily number of patients, there was little difference among respondents in stress adaptation. The exception was the variable total stress, according to which employees who had up to 40 patients per day belonged to the group with good adaptation, while the employees who see more than that number of patients fell under the group of employees with moderate stress (3.97).

Although all the average values suggested moderate stress and good adaptation of medical staff, the number of minimal scores (Table 1) and the percentage representation

of stress level categories (Table 2) indicated that among employees there were those who belonged to the group of high and extreme stressed in the total sample as well as in subunits.

relation to the work experience, i.e. the length of health care service. There was are statistically significant difference (*p* < 0.05) between respondents with different marital status regarding to the quality of life, and between males and

Table 1
Descriptive statistical analysis and variance analysis of stress among community health centre workers – complete sample and subsamples

Parameters	Total stress						Life quality			Symptomatology			Functionality		
	n	min	max	M	SD	*p**	M	SD	*p**	M	SD	*p**	M	SD	*p**
All patients	95	2.70	4.96	3.97	0.56		3.92	0.64		3.81	0.82		4.20	0.50	
Gender															
m	10	3.43	4.93	4.28	0.62	0.07	4.20	0.79	0.15	4.28	0.85	0.05	4.38	0.50	0.24
f	85	2.70	4.96	3.94	0.54		3.88	0.62		3.75	0.81		4.18	0.51	
Age, (years)															
under 40	40	3.05	4.96	4.04	0.51	0.32	4.03	0.51	0.16	3.84	0.74	0.75	4.26	0.54	0.33
over 40	55	2.70	4.93	3.93	0.59		3.84	0.60		3.78	0.89		4.16	0.48	
Number of children															
1	49	2.70	4.93	3.99	0.56	0.81	3.93	0.66	0.90	3.85	0.81	0.59	4.19	0.47	0.84
> 1	46	2.86	4.96	3.96	0.57		3.91	0.63		3.76	0.84		4.21	0.55	
MS															
single	28	3.13	4.96	4.10	0.48	0.14	4.11	0.56	0.05	4.02	0.67	0.11	4.18	0.53	0.80
married	67	2.70	4.93	3.92	0.58		3.84	0.66		3.72	0.87		4.21	0.50	
Education															
secondary	53	2.70	4.93	3.81	0.54	0.00	3.72	0.58	0.00	3.58	0.78	0.00	4.13	0.52	0.14
college & faculty	42	3.34	4.96	4.18	0.52		4.17	0.72		4.09	0.88		4.29	0.49	
Position															
doctor	40	3.49	4.93	4.21	0.49	0.00	4.20	0.47	0.00	4.14	0.79	0.00	4.30	0.52	0.12
nurse	55	2.70	4.96	3.80	0.55		3.71	0.68		3.56	0.77		4.13	0.49	
LS (years)															
< 15	36	3.05	4.96	4.10	0.51		4.04	0.55		3.98	0.76		4.28	0.55	
15–25	29	3.13	4.93	4.16	0.50	0.00	4.03	0.61	0.03	4.09	0.67	0.00	4.37	0.43	0.00
> 25	30	2.70	4.90	3.64	0.53		3.66	0.72		3.32	0.83		3.95	0.43	
Unit of health care															
adults	54	3.05	4.90	3.99	0.54	0.72	3.90	0.58	0.81	3.86	0.78	0.45	4.21	0.52	0.83
children	41	2.70	4.96	3.95	0.59		3.93	0.72		3.73	0.88		4.19	0.49	
Number of patients /day															
< 40	46	2.70	4.96	4.01	0.59	0.53	3.94	0.68	0.78	3.90	0.88	0.31	4.20	0.53	0.99
> 40	49	2.86	4.90	3.94	0.53		3.90	0.61		3.72	0.76		4.20	0.49	

n – number of respondents; min – minimum; max – maximum; M – mean; SD – standard deviation; *One – way ANOVA; m – male; f – female; MS – maritial status; LS – length of service.

Table 2
Stress level categories among health care workers (in percentages)

Health care workers	Total stress				Life quality				Symptomatology				Functionality			
	WA	MS	IS	ES	WA	MS	IS	ES	WA	MS	IS	ES	WA	MS	IS	ES
All	53.7	42.1	4.2	0.0	57.9	30.5	11.6	0.0	44.2	40.0	14.7	1.1	70.5	28.4	1.1	0.0
Position																
doctor	70.0	30.0	0.0	0.0	75.0	22.5	2.5	0.0	65.0	27.5	2.5	0.0	77.5	22.5	0.0	0.0
nurse	41.8	50.9	7.3	0.0	45.5	36.4	18.2	0.0	29.1	49.1	20.0	1.8	65.5	32.7	1.8	0.0

WA – well-adjusted; MS – moderate stress; IS – increased stress; ES – extreme stress.

The results of the analysis of variance showed that there were statistically significant differences in total stress as well as in subclases the quality of life and symptomatology between health care workers with different education status and, accordingly, between doctors and nurses (*p* < 0.00). Similarly, there were statistically significant differences in total stress rate, as well as in subclasses the quality of life, symptomatology and functionality among respondents in

females regard in to subclass symptomatology. On the edge of statistical significance (*p* < 0.07), there was difference between male and female respondents regarding to variable total stress (Table 1).

In addition to the effects of individual workplace dimensions on stress variables, their interactions were also examined. In the case of total stress, a significant interaction was observed between the workplace and work experience [F

(2.72) = 3.22; $p < 0.046$]. The total stress of doctors and nurses varied in different ways from years of service (Figure 1). The interaction of these two factors could be explained to a large extent by their interaction with the quality of life [F (2.72) = 6.37; $p < 0.003$].
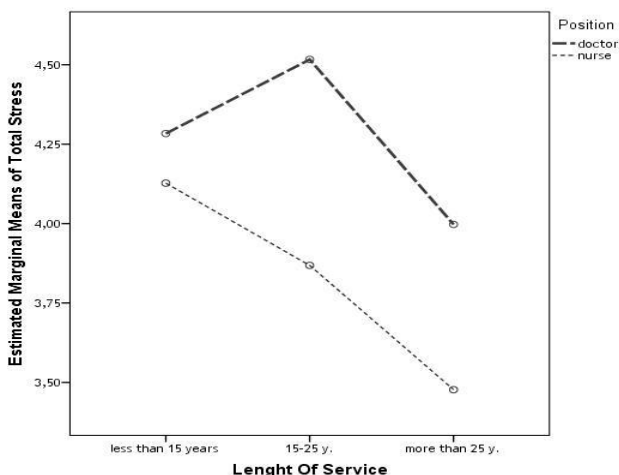

Fig. 1 – Differences in the average values of total stress among nurses and doctors by length of service.

Regarding the functionality, a significant interaction was observed between factors: work position (doctors vs. nurses) and workplace (adult health care department vs. children health care department) [F (1.72) = 10.60; $p < 0.002$], and the factor division and working time [F (2.72) = 3.36; $p < 0.040$]. The functionalities of doctors and nurses working in the adult health care department and the children health care department varied in different ways, while the functionality of employees in the adult health care department varied in different ways in relation to the years of service (Figure 2–4).
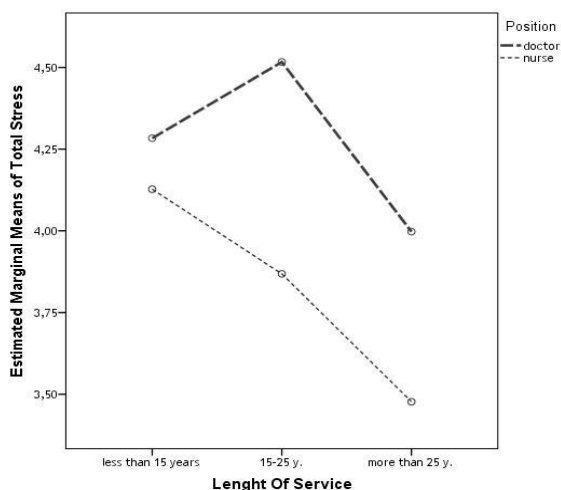
Fig.2 – Differences in the average values of the life quality of nurses and doctors by length of service.

In relation to the quality of life, a significant interaction of factors working hours and number of examinations was obtained [F (2.72) = 4.25; $p < .018$]. The quality of life

varied in different ways for employees who had up to 40 patients per day and those had over 40 patients per day compared to years of their service (Figure 5).
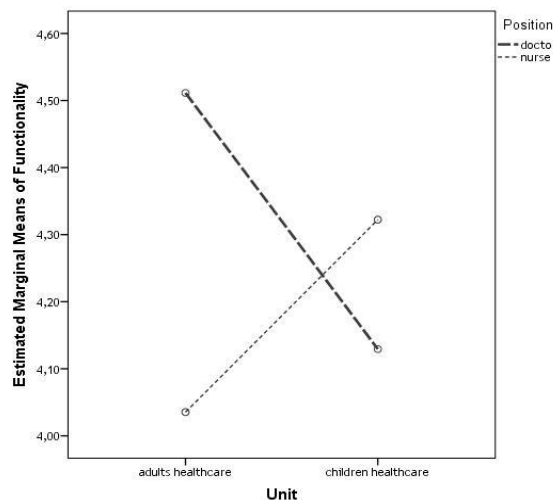

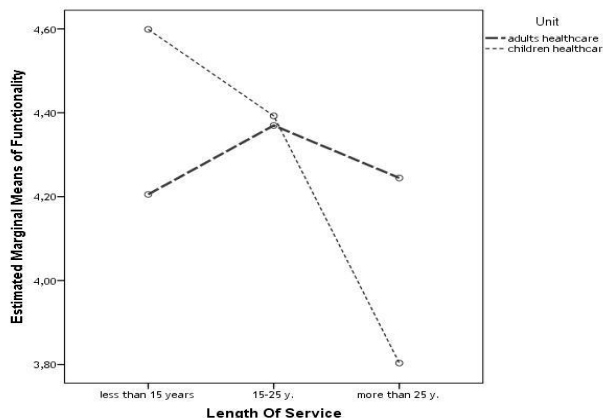**Fig. 3 – Differences in the average values of the functionality of nurses and doctors by units.**

Fig. 4 – Differences in the average values of functionality of health care workers working with children and adults by length of service.
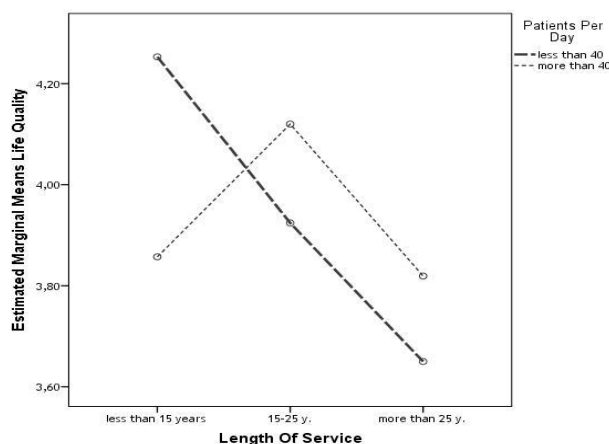

Fig. 5 – Differences in life quality average values of those who examine less than 40 patients per day and those examine more than 40 patients per day by length of service.

Discussion

The results of the survey showed that employees in the field of primary health care, though in the long term exposed to stress, were better adapted to it than could be expected given the specificity of their work, working conditions, insufficient number of employees, large volume of the work and material compensation. These facts are important because stress in the workplace can lead to a number of psychophysical problems in the workforce, a decline in work capacity, and concentration levels that can cause failures in work and fatal consequences. Although in a small percentage, the presence of extremely stressed workers is also cause for emergency intervention measures in order to prevent damage to their health, as well as consequences for users of health system services.

Most of the results obtained in our study, concerning stress levels and its relationship to personal characteristics and working conditions, are in line with theoretical frameworks and findings of previous empirical studies [23–28]. The greatest impact on stress adaptation is related to years of working hours and employment, or education. According to the results of the research, as the level of the respondents' education grows, their adaptation to stress also grows, so the best educated respondents are the best adapted. Since doctors are mainly amongst those in the highly educated group, while nurses and technicians have a middle degree of professional education, it is not surprising that by comparing these two groups, the results are almost identical as when respondents compare in relation to their education levels. Similarly, it can be noticed that when comparing the sample segments according to economic status – nurses and technicians have lower incomes, those with lower incomes are less adapted to stress. The discovery that nurses demonstrate more symptoms of burning out at work was earlier shown in other studies [23–26].

When looking at the interaction of the factors, the work experience and workplace, it can be seen that, unlike nurses and technicians whose adaptation to stress constantly decreased with length of service, in the case of doctors employed 15–25 years at the same workplace, adaptation to stress was better in relation to their colleagues with shorter and longer working time. This finding may be a supplement to the explanation of the above-mentioned findings of empirical studies [23–26]. Namely, it can be assumed that with the passing of time, doctors gain confidence in themselves and their skills, which makes them easier to deal with stress at the workplace, while the decline in adaptation after 25 years of service could be in part attributed to aging and consequently weakening of biological, emotional and mental capacities to combat stress, as well as the emergence of monotony in the workplace and the decline in skills and motivation for further training. Bearing in mind that there are no statistically significant differences between employees older than and under 40 years, it is more likely that this finding is not a consequence of aging or other reasons, but possible due to an insufficient sample size, and an especially insufficient number of young and extremely old respondents.

This finding must be taken with reserve, and may be the reason for more detailed future research.

Although there were no statistically significant differences between medical staff employed in adult and child health care departments, the interaction between the employment factor and the department speaks about the nature and organization of work as the primary cause of stress in primary health care. Nurses and technicians, when considering the overall pattern, are less adapted to stress than physicians when considering the sample from the adult health department. However, in the children health care department, medical nurses and technicians were slightly better adapted to stress than doctors This finding can be explained by the fact that medical work is more complex and responsible when dealing with children, while the pressure of patients on nurses and technicians as a result of greater fluctuation of patients is more pronounced in the adult healthcare department. It was demonstrated that the health care department for adults had a positive effect on work experience, so that those that the best adapted to stress were workers with 15–25 years of service. On the other hand, the length of service in the child healthcare department had a negative effect on adaptation to stress, and long-term employees in this department were a vulnerable group, which speaks in favor of the previous assumptions about the nature of work as the main source of stress in this study. These findings could be a complement to theoretical explanations of the relationship between workplace characteristics and stress [24, 27, 28], in which an emphasis is placed on interpersonal relationships and management attitude as the key characteristics of the workplace responsible for stress of employees.

It is somewhat surprising finding that, although there was a statistically significant link between daily number of examinations and the level of stress among employees, it had relatively small impact on stress. It is somewhat contrary to the findings of previous studies [24]. However, compared to some other countries where the number of daily examinations and interventions of medical staff does not exceed 10, the number of patients per day in this study ranged between 30–40 and over 40 indicating that the load was present to the extent that further increases in the number did not affect stress. Moreover, the interaction of factors, the work hours and the number of examinaions (Figure 5) shows that a large number of examinations mostly had a negative impact on adaptation to stress of employees who had a relatively short work experience (up to 15 years). Accordingly, doctors who had a large number of examinations and interventions per day were better adapted than those who were employed for more than 30 years, which indicates that with experience they gain skills and build a relationship that makes these doctors more demanding than others, and satisfaction at workplace represents a significant source of adaptation to stress. This finding is in accordance with the empirical findings that the assessment of one's own competence is cross-sectioned with high workload results in a burnout [24].

Previous research on this topic has demonstrated that women adapt less to stress at work [23, 26, 28], which can be attributed to the interdependence of psychological and biological specificity of the female sex, the use of varying coping strategies [28] or the inability to balance professional and family obligations. The results of this study argued in favor of the third assumption, but due to small number of males surveyed, they can only be taken as the starting point for future research. Although they are not unambiguous, the results presented also support the fact that in primary health care, the work organization is often more stressful than the nature of work, and that there are aspects of the work organization that the management of the institution could influence in order to reduce stress among employees, which is in line with the findings of previous studies [24, 26, 28].

The major limitations of this study are that all potential factors that could affect the occurrence of stress in the workplace have not been covered. During the research, it was noted that the inventory of independent and intervening variables was insufficient, and it should be expanded with indicators of both personal and material characteristics of the employees, as well as the social and material working conditions, which would require additional increases of the sample size. In order to better understand the state of stress of medical staff in primary health care, it is necessary to conduct similar research on a larger sample of examinees, and with an expanded inventory of independent and intervening variables.

Conclusion

It can be concluded that a certain number of employees in the field of primary health care have an increased level of stress, which is primarily related to the conditions and nature of the work, but also to personal and family characteristics. The results of this study show that university-educated men with 15 to 25 years of service are those best adapted to stress.

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