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Occupational Mental Stress Assessment of Elementary School Teachers and Firefighters – Rescuers

Abstract

The presented study aims to compare occupational stress of 50 teachers and 56 firefighters. Both these groups are laden with high exposure to work-related stress. For assessing the occupational load the Meister questionnaire was used. We found that teachers perceived their occupational stress worse than firefighters and reached the 2nd degree of load. They complained mostly about the factor of overload and factors of the stress reactions – fatigue, mental overload and unacceptability to perform pedagogical work in the same intensity for a long time. Firefighters achieved better results (1st degree of load), even better than the population norm. An explanation may be found in the fact that firefighters represent a selected population of emotionally, psychically and physically resistant individuals.

Keywords: *occupational mental stress, questionnaire inquiry, teachers, firefighters*

Introduction

During the recent decade the character of work has changed markedly. Heavy manual labor has been replaced by mental work, where workers are often exposed to chronic stress. By many authors the stress is considered as an excessive load that exceeds the adaptation abilities of the individual. Paulik (2008, 2010) defines the occupational load as a general term including situations that put certain working requirements on the individual. Dealing with those belongs to the function of professional adaptation. Work-related stress is then understood as a situation where

the relationship between work tasks and individual dispositions to their management is objectively inconsistent or perceived as contradictory.

The intensity of mental tension depends mostly on the type of personality of the exposed individual. The dominant components in the structure of personality are motivation, resistance to stress, ability to adapt, self-confidence, experience, level of professional preparedness, emotional stability, etc. In total, we may talk about subjective determinants (Kožená & Matoušek, 2001; Kebza & Šolcová, 2008).

The objective factors causing occupational load are determined by the character of work, type of the working means, procedures, and technologies and by an influence of the external factors of the working environment. Among the most frequent ones there belong working monotony, high responsibility and possibility of endangering one's own health or the health of other people, high time pressure, intensive social interaction, poor communication, small cohesiveness of the group, unclear competencies, night shifts, the necessity of mastering new technologies including the information ones, etc (Křivohlavý, 2001; Paulik 2010).

The presented study aims to compare the working psychological load in two selected professions that are characterized by a high level of exposure to work-related stress. Our attention was focused on primary school teachers and a group of firefighters-rescuers.

From the point of view of exposure to occupational mental stress, **the teaching profession** belongs to those of a very high risk. Authors interested in the analysis of the teacher's mental load describe the time pressure and high degree of neurotic disorders, including the loss of efficiency during the long-lasting professional activity (Židková & Martínková, 2003; Hodačová et al., 2007; Seibt et al., 2012). Paulík (1998) stated that teachers of all types of schools negatively assessed mainly the low social prestige of teachers, inadequate salary, insufficient equipment of schools and high administrative burden. Problems with pupils were mentioned as a less important factor. Paulik proved that teachers of various school levels evaluated the influence of various stressors on the final level of mental stress differently and also described differences in the evaluation of importance of individual stressors in men and women. Different moments in the perception of the measures of mental stress by men and women were also dealt with by Řehulka & Řehulková (1998), Kebza (2005) and Saforek & Pavlica (2008).

In terms of mental and physical demands, **the firefighter-rescuer profession** also has its own specifics that determine it as an activity highly demanding in both aspects. Here we can include a high degree of physical activity, intensive stress during rescue actions, working shifts, exposure to toxic materials, noise and high temperature (Šváb, 2006). Requirements on the personality of firefighters-rescuers

are defined by Regulation No 487/2004 of the Low Digest, describing personal capabilities for providing services in security corps. An active rescuer should show good personal prerequisites, such as a healthy level of self-confidence, an ability to work in a team with discipline and responsibility, and resistance to mental strain. A prerequisite for professional performance are repeated preventive follow-ups to check the psychological resistance as well as good general health.

Method

In the year 2011 at the Department of Hygiene and Preventive Medicine of Charles University Faculty of Medicine in Hradec Králové an anonymous questionnaire inquiry among 50 primary school teachers and 56 firefighters–rescuers was conducted. The general characteristic of the investigated set of respondents is shown in Table 1. This table shows that the average age of the teachers was rather higher than that of firefighters. As expected, in the group of firefighters there were more men than women, the majority of the teachers were women. The length

Table 1. General characteristics of both studied groups

	Teachers		Firefighters		p-value
Mean age	41.2 years		36.7 years		0.03
Duration of experience	15.3 years		14.8 years		p = 0.79
	n	%	n	%	p-value
Number and percentages of respondents	50	100	56	100.0	
Men	18	36.0	47	83.9	p <0.0001
Women	32	64.0	9	16.1	
Under 40 years	26	52.0	40	71.4	p = 0.04
Over or equal to 40 years	24	48.0	16	28.6	
High school education	0	0	42	75.0	
Lower university education	27	54.0	6	10.7	p <0.0001
Higher university education	23	46.0	8	14.3	
Marital status: married	30	60.0	29	51.8	
single	12	24.0	22	39.3	p=0.33
divorced	7	14.0	4	7.1	
mate	1	2.0	1	1.8	

of professional experience was comparable in both groups. All the teachers had a university education. In the group of firefighters 75% had a high school education; the others had a lower or higher university education.

The level of work psychological load was assessed with the use of Meister's questionnaire. The questionnaire has ten items, which are divided into three factors: I. Overload (time pressure, responsibility, conflictogenous work), II. Monotonous work (non-interesting, dull work with little impulses), and III. Non-specific stress response factor (too demanding, psychologically exhausting work, which cannot be performed for a long time with the same effectiveness). Statistical evaluation of the results starts with the calculation of the medians for each item found from the answers expressing the measure of agreement (5) or disagreement (1) on the 5-grade numerical scale. The bigger the value of the resulting median is, the more bothering the factor of overload, monotony or stress reaction is. For the possibility to compare our results with the norm, we present the median values given by Meister (Hladký & Matoušek, 1990; Žídková, 2002).

The final classification of mental stress was performed according to the standard method by Meister (accessible on <http://www.psvz.cz/zidkova/subdir/metody.htm>).

Statistical evaluation was performed using the program NCSS 2007. For comparison of quantitative data the Kruskal-Wallis analysis of variance with following multiple comparison tests (ANOVA) was applied. For assessing the qualitative data the χ^2 test of independence in contingency tables or Fisher's exact test was used.

Results

The results of occupational stress assessment in the group of firefighters-rescuers and teachers are presented in Tables 2 and 3. In the first column there are the total results for the whole set of probands, and then, separately, with regard of the age and gender of the respondents. In the last line we show the resulting degree of load. When comparing Tables 2 and 3 it is obvious that in all the items of Meister's questionnaire the firefighters obtained better results than the teachers and that these were even better than those given by the population norm or the critical values of median stated by Meister. Table 2 also shows that the male firefighters perceived occupational stress better than the female ones and that the younger members of the corps perceived individual items of the factor of overload and non-specific factor of stress reaction better than their older colleagues. The women and older respondents in the group of firefighters, however, complained about the time pressure and big responsibility, and their medians exceeded the level of the

Table 2. Results of occupational stress in firemen – rescuers. The levels of medians and critical value of median determined by Meister are presented

Factors and items	Whole set	Men	Women	Under 40 years	Over or equal to 40 years	Critical value
I. Overload						
Time pressure	3	3	4	3	4	3
Responsibility	2	2	4	2	4	3
Interpersonal conflicts	1	1	1	1	1	2.5
II. Monotony						
Dissatisfaction	1	1	1	1	1	2.5
Tedious work	1	1	1	1	1	2.5
Monotony	1	1	1	1	1	2.5
III. Nonspecific factor of stress reaction						
Nervousness	1	1	2	1	2	3
Exhaustion	1	1	2	1	2	3
Psychic fatigue	2	2	3	2	3	3
Decrease of long-term performance	2	2	2	1.5	2.5	2.5
Final level of load	1	1	1	1	1	

Table 3. Results of occupational stress in teachers. The levels of medians and critical value of median determined by Meister are presented

Factors and items	Whole set	Men	Women	Under 40 years	Over or equal to 40 years	Critical value
I. Overload						
Time pressure	4	3	4	4	3.5	3
Responsibility	3	3	3	3	3	3
Interpersonal conflicts	2	2	2	1	2	2.5
II. Monotony						
Dissatisfaction	2	3	2	2	2	2.5
Tedious work	2	2	1	2	1	2.5
Monotony	1	1	1	1	1	2.5
III. Nonspecific factor of stress reaction						
Nervousness	3	3	3	3	3	3
Exhaustion	2	2.5	2	2	2.5	3
Psychic fatigue	3	3.5	3	3	3	3
Decrease of long-term performance	4	3	4	3	4	2.5
Final level of load	2	2	2	1	2	

population norm. Both these subgroups showed also worse results when evaluating the factor of non-specific reaction (nervousness, exhaustion, fatigue), but these results did not reach the critical levels. Despite these intergroup differences, in the process of final **classification of the firefighters' psychic load** we proved that the firefighters reached **grade 1**; ie. Such a level of mental stress at which the health damage or affection of subjective state or effectiveness are not likely to appear. Level 1 of mental load was found in all the subgroups, ie. the men, women, young or older respondents.

Evaluation of mental stress in the teachers (Table 3) showed that the respondents from this group had obtained a bit worse results than the firefighters, but the critical value of median was exceeded only in the items of time pressure and decline of effectiveness in the long run. Both these items were negatively assessed mainly by the women and due to the higher number of them in the group of teachers it is possible that this fact explains the results of the whole set. The responsibility and conflicts at work were considered by the teachers (both men and women) to be worse than by the firefighters, but the results did not exceed the population norm. Also, the comparison of non-specific factor of stress by the representatives of both professional groups was worse in the teachers than in the firefighters, but the results were comparable with the population norm, and in the item of exhaustion it was even better. Only the item "decline of effectiveness in the long run" was considered by the teachers to be worse than by the rest of the population, regardless of age and gender. Nevertheless, the women and older teachers had higher values so they perceived the decline of effectiveness in the long run as worse than the men and younger individuals. An interesting finding was revealed in the male teachers in the items of exhaustion and fatigue. Similarly to the firefighters, no teacher considered their profession as tedious or monotonous, and thus showed better results than the general population. It should be pointed out that the male teachers felt less satisfied with their work than the female teachers. **Classification of psychological load in the teachers showed** that both men and women reached the **2nd grade of load**, which means the possibility of the subjective status or effectiveness is influenced. Grade 1 of load was found only in the teachers under the age of 40.

Possible statistical difference in evaluating the occupational mental stress in the teachers and firefighters is demonstrated in Table 4. It shows the percentage of particular answers of the respondents on all the 10 items of Meister's questionnaire. Answer NO means *I fully or rather disagree*, (assessment 1 or 2). Answer DON'T KNOW means *Sometimes yes, sometimes no* (assessment 3), and answer YES, means *I fully or rather agree*, (assessment 4 or 5). We were mainly interested in YES answers, by which the respondents expressed their belief that they were

Table 4. Comparison of firemen and teachers answers on particular items of Meister's questionnaire (results are presented in percentages; statistical analysis was done by χ^2 test in contingency tables)

Items:	Firemen			Teachers			p-value
	No	I do not know	Yes	No	I do not know	Yes	
Time pressure	30.4	41.1	28.5	14.0	32.0	54.0	0.013 (*)
Responsibility	53.6	23.2	23.2	30.0	38.0	32.0	0.144 (NS)
Interpersonal conflicts	92.9	7.1	0.0	66.0	28.0	6.0	0.0136 (*)
Dissatisfaction	85.7	7.1	7.2	64.0	30.0	6.0	0.003 (**)
Tedious work	94.6	5.4	0.0	76.0	18.0	6.0	0.008 (**)
Monotony	87.5	10.7	1.8	90.0	6.0	4.0	0.704 (NS)
Nervousness	80.4	12.5	7.1	40.0	48.0	12.0	< 0.001 (***)
Exhaustion	82.2	10.7	7.1	52.0	28.0	20.0	< 0.001 (***)
Psychic fatigue	64.3	25.0	10.7	30.0	38.0	32.0	< 0.001 (***)
Decrease of long-term performance	67.9	16.1	16.1	47.2	19.8	33.0	< 0.001 (***)

No = fully/rather disagree; I do not know = sometimes yes, sometimes no; Yes = fully/rather agree

increasingly exposed to particular sources of occupational mental stress. From Table 4 it is obvious that the employees of both professions complained about the work done under time pressure, though the teachers markedly more than the firefighters ($p=0.013$). The biggest differences were found in the answers on the non-specific stress factors items. In fact, our results showed that the teachers statistically more often complained about nervousness, exhaustion, and fatigue and considered it to be impossible to perform their profession in the long run in an unchanged intensity. On the contrary, the majority of the firefighters did not express these complains. The members of both groups did not consider their jobs to be monotonous; they considered them rather diverse than tedious (especially in the case of the firefighters), and their work satisfied them. Statistically more often this satisfaction may be found in the firefighters (85.7%), vs. the teachers (64%).

Discussion

The aim of this study was to compare the occupational mental stress of primary school teachers and firefighters-rescuers. The evaluation was performed by

a standard questionnaire method using the Meister questionnaire, which proved in the hygienic practice to be a suitable screening instrument for a quick assessment of the impact of work on the psychic response of workers in different professions. This questionnaire was also recommended as a supplementary instrument for categorization of jobs according to mental stress (Žídková 2002). Our results revealed that in spite of considering both professions as mentally demanding, the level of perceived mental stress was higher in the teachers than in the firefighters. Nevertheless, it is necessary to admit that the values of those usually did not exceed the population norm. It was exceeded only in the item of time pressure, namely in the female teachers, and in the loss of the long term efficiency, which was complained about mostly by the women and older individuals. An interesting finding was noticed: although the male teachers did not have a sense of overload, their profession brought them minor satisfaction than it did the women, which subsequently reflected in their feeling of exhaustion and fatigue. The explanation may be found in the study by Řehulka & Řehulková (2001). They discovered that female teachers saw a source of stress mainly in working with pupils and in the mastering of the atmosphere in the classroom, so it means in the educational activity. Male teachers, in contrast, were more stressed by the problems in the career advancement – small salary and impossibility of further growth, which contributed to the low prestige of the teaching profession. Thus, considering the question of career as the most important source of stress for men, as stated by Paulik (1998), this problem was perceived more intensively by men than by women. The question of prestige was also discussed by Paprštejnová (2011a). She proved that teachers were quite satisfied with their profession and attached a great value to the teaching profession. Nevertheless, most of them thought that the position of the teaching profession on the social ladder was very low and only a fifth of them were satisfied in this sphere.

The results of occupational mental stress assessment in the firefighters were quite different. In all the items they obtained better results than the teachers and their results were even better than the population norm, or the critical values of median set by Meister. The differences found may be explained, to a certain degree, by the selection of suitable individuals for the firefighter profession during the initial check-up and by following medical screening of health ability, including the mental one. From this point of view, firefighters represent a selected and regularly followed up population group, which only the psychically resistant individuals may join. This does not hold for the teaching profession. Another reason for the fact that the firefighters-rescuers perceived the occupational mental stress more easily is most probably bigger freedom in decision-making, thus, their work brought

them satisfaction and they considered it to be interesting and diverse. This fact, then, partially eliminates unfavourable effects of other factors.

While the psychological workload of the firefighters reached grade 1, the level of grade 2 was reached by the teachers. Anyhow, when compared with the data from the turn of the century, our results are more optimistic. Žaloudíková (2001) made a classification of occupational mental load of teachers and found this load being in the 3rd (highest) grade, where the health deterioration could not be excluded. In spite of the better findings of our study, we may conclude that our results are consistent with the published data of teachers' increased mental stress.

Due to a relatively small number of respondents, our study shows certain limits. The chosen method was also limited by the fact that only this single method was used for the occupational load assessment and the respondents' personality traits were not considered. The choice of the method was determined by our intention to use a method that is currently used in hygiene practice for the assessment of occupational psychological load in different professions from the collective risk point of view. Another limit of this study is represented by the impossibility to generalize its results on the whole teaching profession, as the extent of occupational mental stress in teachers of different school levels differs a lot. Elementary school teachers traditionally claim the maximum load (Papršteínová et al., 2011b, Žídková & Martínková, 2003). But even the elementary school teachers do not represent a homogenous group, as different perceptions of occupational stress may be presented by teachers of the 1st and 2nd grades. From this point of view our study is not differentiated.

The fact that within this study the respondents' personality traits were not investigated means a certain limitation. The reason for our choice of method was mentioned above. For further investigation it would be convenient to expand the battery of tests with methods established on the subjective perception of occupational load. As an example of methods focused on the personality diagnostics, the method based on a five-factor model of personality may serve (Paulik, 2010, Hřebíčková & Urbánek, 2006). In our country the standardized modification by Hřebíčková & Urbánek (2001) is available. Other method was used by Paulik (2008), who studied a possible influence of dispositional optimism, sense of coherence and hardiness on the relation of perception and assessment of occupational load.

Conclusion

Mental stress is an important factor affecting the sense of good health and satisfaction. Increased exposure to work stress may worsen both the physical and mental health of individuals, increase the number of days of sick leaves, and decrease productivity. The decisive role in the prevention of employees' disproportional workload is played by their employers. They should prevent the risk of increased exposure to work stress by searching for the sources of the load and their removal, permanent control and improvement of working conditions, and better work organization. In the case of the teaching profession, it is possible to go on with the implementation of psychosocial interventions, such as stress inoculation training, stress management training, social motivation training, co-worker support group formation, etc. The survey of most frequently used psychosocial programs is published in the paper by Czesław Czabala et al (2011). The individual psychological advisory has an irreplaceable role. It should be available even to candidates of teaching during all the years of studies. All this ought to be done with one goal – to raise healthy individuals, who will be able to take part in the education of future generations without detriment to their own health and that of our children.

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