

Comparison of Occupational Stress among Personnel of Firefighting and Emergency Medical Stations of Kermanshah (Iran) in 2013

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Abstract: Occupational stress is associated with several consequences including absence from work, job rotation, decreasing in performance and finally increasing of retirement and disability costs. The aim of present study was to determine the prevalence of occupational stress and compare it among personnel of firefighting and emergency medical station (EMS). Also, it has been assessed the relationship between stress and demographic-job characteristics. This descriptive-analytical study is conducted among firefighters (n=89) and EMS personnel (n=111) in 2013. Data was collected using Health and Safety Executive questionnaire to assess the occupational stress. Another questionnaire is used to obtain the demographic and job characterizes. Data was analyzed by descriptive and chi-square tests. The significance level was 0.05. Results showed that 98.9% of firefighters and 97.3% of EMS personnel exposed to low and average levels of stress, while no one was at severe level of stress. There were a significant correlation between occupational stress with age, work experience, marriage status, employment status and education among EMS personnel and also with exercise, hypertension and digestive disease among firefighters ($P < 0.05$). The severity of occupational stress among firefighters was significantly more than EMS personnel ($P < 0.05$). In Conclusion the EMS and firefighting personnel are exposed to high level of occupational stress, so both professions are classified as stressful jobs. The undesirable effects of stress can be reduced through stress management workshop, managerial support from each employee in order to be the better adaptation with stressors, encourage of persons to do regular exercise and having of good and friendly relationships in workplace.

Key words: Occupational Stress • Firefighting • Emergency Medical Stations (Ems)

INTRODUCTION

Stress has been identified as the 21st century disease that affecting human on different conditions [1]. Stress at work is a relatively a new phenomenon of modern life

styles. The nature of work is gone through drastic changes over the last few decades and it is still changing at rapid speed [2]. Human resources often account for a large part of an organization's cost structure in delivering its products and services and any substantial increase in

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these costs can adversely affect the ongoing viability and profitability of the organization [3]. For most people, workplace condition is one of the stressful situations which are called occupational stressors. Indeed, occupational stress refers to any events which can lead to a physical or mental damage and, in long term, it brings negative result on the performance of individual and organization [4]. The National Institute for Occupational Safety and Health (NIOSH) defined the occupational stress as “any harmful physical or mental response that occurring due to individual's incompatibility with his/her ability,” which might lead to aggressive behaviors, occupational injuries, physical diseases and even death [5].

International Labor Organization (ILO) has estimated that the cost imposed on countries due to occupational stress is about 1 to 3.5% of gross national product [6]. Institute of HSE estimated that between years 2007-2009 more than 13.5 million working days were lost due to stress-related absence and also organizations are charged with more four billion pounds a year due to occupational stress and its related damages [7].

Firefighting is a stressful and dangerous job and firefighters are always exposing to occupational stress and anxiety. Studies showed that, in most cases, illness and mortality of firemen, directly or indirectly, is related to stressful nature of their job, so that in term of occupational mortality, the United States ranked this job as the fifth stressful and dangerous job [8].

Stress is one of the most serious occupational hazards facing to the modern firefighting service. Because of stress can be adversely affected on wellbeing and mental health, job performance, decision making and family-social life [9]. Firefighters protect the general population against fire and other emergency events which exposes them at the risk of physical, chemical and biological risks [10]. The physiological, mental and behavioral consequences of occupational stress not only bring damages for individuals, but also impose heavy costs upon the organizations [11].

There is no doubt that EMS is one of the most stressful working environments where emergency personnel must perform the most proper treatment at the least possible time and also expose to a lot of risks through dealing with patients and their entourage [12]. The level of daily stress in emergency personnel is more than other common jobs [13]. The stressful situations are due to time restriction, critical situation of patients and expectations of their relatives, fear of incompetence in saving the life of dying patients and decision making in

emergency conditions. Emergency personnel faces a lot of tensions which is certainly impact on the quality of their work and it is clearly threatening the public health in every society [14].

Considering to existence of stress in both firefighting and emergency jobs; the aim of this study is to determine the prevalence of occupational stress and compare it among firefighting and EMS personnel at Kermanshah city (Iran) in 2013. Also the relationship between stress and demographic-job characteristics of personnel has been assessed.

MATERIALS AND METHODS

This is a cross-sectional and descriptive-analytical study. Statistical population involves all firefighting and medical emergency personnel in Kermanshah city. This study was performed on all of the personnel in seven firefighting stations (n=89) and fourteen emergency medical stations (EMS) (n=111). Data were collected using two questionnaires: the first questionnaire was included of demographic, job, individuals' habits and history of diseases of employees and the second questionnaire was Health & Safety Executive (HSE) questionnaire to assess the occupational stress.

First questionnaire: this questionnaire was included of; Age, Sex, Body mass index (BMI), Work experience, Marital status, Number of children, Education level, Employment status, Second job has or not, Working shift, Tea consumption, Smoking, Regular exercise, Hypertension and Digestive disease history.

Second questionnaire: the HSE questionnaire comprises 35 items to cover seven subscales of demand (8 questions), control (6 questions), managerial support (5 questions), peer support (4 questions), relationships (4 questions), role (5 questions) and change (3 questions).

Scores are given to the statements of each subscale: 5 = never, 4 = seldom, 3 = sometimes, 2 = often, 1 = always. But in demand subscale, scores are given in reverse order (never = 1, seldom = 2, sometimes = 3, often = 4, always = 5). Mean scores of phrases in each subscale represent the measured value in that subscale. Higher scores denote more health and safety relating to each dimension. The obtained scores are classified in the following order: high stress (score<1.5), average stress (1.5<score<2.5), low stress (2.5<score<3.5) and without stress (3.5=score). This questionnaire is designed in 1990 by Labour administration in the United Kingdom to identify the occupational stressors. As well as, the reliability and validity of HSE questionnaire is

Table 1: Distribution of demographic and job characteristics in EMS and firefighting personnel

Demographic and Job Variables	Classifications	Firefighting (n =89)		EMS (n =111)	
		frequency	percent	frequency	percent
Age (year)	< 40	9	10.1	102	91.9
	40-50	56	62.9	6	5.4
	≥ 50	24	27	3	2.7
Sex	Male	89	100	53	47.7
	Female	0	0	58	52.3
Marital Status	Single	1	1.1	49	44.1
	Married	88	98.9	62	55.9
Work experience (year)	< 5	0	0	54	48.6
	5-10	4	4.5	33	29.8
	11-15	5	5.6	14	12.6
	≥ 15	80	89.9	10	9
Education	Diploma	25	28.1	12	10.8
	Post diploma	34	38.2	9	8.1
	B.S	27	30.3	79	71.2
	M.S	3	3.4	11	9.9
Employment Status	Permanent	68	76.4	22	19.8
	Temporary	21	23.6	63	56.8
	Contractual	0	0	26	23.4
BMI(kg/m ²)	< 25	19	21.4	87	78.4
	25-30	56	62.9	22	19.8
	≥ 30	14	15.7	2	1.8
Number of Children	≤ 1	9	10.1	89	80.2
	2-3	58	65.2	17	15.3
	≥ 4	22	23.7	5	4.5

approved. This questionnaire validated in Iran by Marzabadi and Gholami and the Cronbach's alpha coefficient was reported 0.78 [7]. SPSS software (version 16) was used to perform the Descriptive and Chi-Square statistical tests for data analysis. The significance level was 0.05.

RESULTS

The mean and standard deviation of age in firefighters and emergency personnel were 46.51 ± 6.15 (range 33-60) and 29.95 ± 7.33 (range 19-61) years, respectively. Also, the mean and standard deviation of working experience were 20.96 ± 5.31 (range 6-35) and 6.66 ± 6.19 (range 1-30), respectively. Results of frequency and percent distribution of demographic and job characteristics for both groups are described in table 1. Also frequency and percent distribution of individuals' habits and history of personnel diseases are given in table 2. 12.6% of EMS personnel had second jobs while none of the firefighters had a second job. Working shift of EMS personnel had clockwise rotation shift and the rest (11.7%) were fixed in the morning shift. But, all of the firefighters were working based on clockwise rotation shift.

According to the findings, 97.3% of EMS and 98.9% of firefighting personnel were at low and average levels of stress but none of them were at high level of stress. Table 3 demonstrates relative frequency distribution and comparison of stress levels between EMS and firefighting personnel. Stress level in firefighters is significantly higher than EMS personnel ($P < 0.05$). Percentage distribution and comparison of stress levels between EMS and firefighting personnel shows in Table 3.

Chi-square test was performed to compare the occupational stress level of two occupations in various subscales. The results indicated that the firefighters were exposed to more stress than EMS personnel in subscales of demand, managerial support, peer support, role and changes, but the EMS personnel experience more stress than firefighters for the subscales of relationship ($P < 0.05$). It should be noted that control was the only subscale that hadn't significant difference between the two occupations.

There was no significant correlation between total stress and demographic-job characteristics as well as personal habits in both EMS and firefighting personnel.

Among EMS personnel, in more detailed, a significant correlation existed between demand subscale and tea consumption and smoking, control subscale and regular

Table 2: Distribution of individuals' habits and history of personnel diseases in EMS and firefighting personnel

Individual habits and history of diseases	Classifications	Firefighting (n =89)		EMS (n =111)	
		frequency	percent	frequency	percent
Tea consumption	No tea consumption	0	0	12	10.8
	Low (1-2 cups)	25	28.1	54	48.6
	Average (3-4 cups)	43	48.3	32	28.8
	High (≥ 4 cups)	21	23.6	13	11.7
Smoking	Yes	21	23.6	7	6.3
	No	68	76.4	104	93.7
Regular exercise	Yes	57	64	12	10.8
	No	32	36	99	89.2
Hypertension	Yes	10	11.2	7	6.3
	No	79	88.8	104	93.7
Digestive disease	Yes	14	15.7	41	36.9
	No	75	84.3	70	63.1

Table 3: Distribution and comparison of stress levels between EMS and firefighting personnel

Stress level	Firefighting (n = 89)	EMS (n = 111)	EMS vs. firefighting(P-value)
No stress	1.1%	2.7%	0.001
Low	48.3%	73%	
Average	50.6%	24.3%	
High	0%	0%	

exercise, managerial support subscale and hypertension, peer support subscale and age and employment status, relationship subscale and marital status, working experience, education level, employment status, working shift, hypertension and digestive diseases and also between change subscale and age and working experience ($P < 0.05$).

Among firefighting personnel, in more detailed, a significant correlations found between demand, peer support and change subscales and digestive diseases, managerial support subscale and regular exercise and also between role subscale and hypertension ($P < 0.05$).

DISCUSSION

Firefighting Personnel: This study indicated that stress distribution among firefighters was 98.9% which proves the presence of stressful situations in this profession like EMS. Lotfizadeh and *et al.* [5] found out that 53% of steel company workers had occupational stress. Torshizi and *et al.* [6] showed that 74.5% of Kavir Tire Factory Workers suffered from average and severe level of stress.

Among firefighting personnel, the significant correlations are detected between hypertension with role subscale, exercise with managerial support subscale and digestive diseases with demand, peer support and change subscales.

Firefighters with hypertension suffered from role based stress and also those who hadn't regularly exercise, suffered from stress due to lack of management's support. Stress in firefighters with digestive diseases raised from demand and change subscales, but it decreased by peer support. In addition to managerial and peer supports, having a healthy lifestyle such as exercise also decreased the adverse effects of stressors in workplace.

In this study there wasn't a significant correlation between stress with age, working experience and education. Also in lotfizadeh and *et al.* research, a significant correlation between stress with age [5].

Study on firefighters showed that the occupational stress had been decreased by increase of age and also persons who had the second job expressed more stress than other personnel. The occupational stress in firefighters was due to exposure to dangerous materials, harmful working conditions and awkward body positions during extinguish of fire [11].

EMS Personnel: As our findings confirmed, the prevalence of occupational stress among EMS personnel was 97.3%. That is, nearly all EMS personnel of hospitals are exposed to stress as an occupational risk factor. Sharifian and *et al.* [12] indicated that 54.9% of emergency nurses had exposure to average and high level of occupational stress. Aghilinejad *et al.* [15] showed that nurses working in emergency sections had experienced

more occupational stress than nurses of other sections. According to Elamo *et al.* [16] research on occupational stress of 1320 nurses in U.S, there is a high level of stress among personnel of this occupation. High rate of occupational stress prevalence in emergency units is due to dealing with patients in critical conditions, giving of emergency services at the least possible time and having of adequate accuracy for patient care and saving lives. It is necessary to say that, the patients relatives can be intensified the stressful condition by making of scream and impatience. Whereas, other care personnel are less involved in such stressful conditions and treat the patients with more comfort than EMS personnel.

Among EMS personnel, there were a significant correlation between age and working experience with change, relationship and peer support subscales. That is, with increasing of age and working experience, stress would decrease in change subscale which may be due to gradual increase of individual's experience and better adaptation with changes of work environment. On the other hand, they feel more stress when faced with lack of peer support and poor relationships.

Contract personnel in comparison with permanent personnel feel less stress in peer support and relationship subscales that probably is due to less committed to the organization.

Single peoples with high education had more stress. Because spite of having college degree and withstand to high stress in their job, do not received enough money to get married, so that it can be a source of stress for them.

Persons with rotating shift had more irregularity than persons without rotating shift in planning for spend more time with their family and to improve the social relationships, so that more stress could be imposed on them.

With regard to demand subscale, more stress was detected in smokers and tea drinkers. Perhaps, they were more inclined to smoking and tea consumption for better soothe and relief in stressful environment.

Individuals with regular exercise had more stress in control subscale. They may rely on exercise to strengthen your psychological characteristics and gain the properly ability to control the stressful situations.

Persons who had hypertension and digestive problems were exposed to more stress. It implies that good and friendly relationships and spirit of cooperation in workplace can indirectly improve the psychological dimension of health and as a result the physical dimension of health.

Comparison of Occupational Stress in Ems and Firefighting Personnel: According to the comparison made between EMS and firefighting personnel, stress level in these two groups was different. So that, a large percentage of EMS personnel (73%) had low level of occupational stress, while, in firefighters, almost the same percentage of personnel had either low (48.3%) or average (50.6%) levels of occupational stress. Although the prevalence of occupational stress were high in both professions, but the severity of stress in firefighters was more than EMS personnel.

CONCLUSION

Undoubtedly, EMS and firefighting personnel are more vulnerable than employees of other professions due to the nature of their job which is required to intervene in critical and predictable situations. As our findings, the EMS and firefighting personnel are exposed to high level of occupational stress, so both professions are classified as stressful jobs. Therefore, it is necessary to consider a proper plan for reduce the adverse impacts of available stressors in such workplaces. Otherwise, employees would gradually involve to burnout which indirectly imposes a lots of hidden costs to the organizations and society. The undesirable effects of stress can be reduced through stress management workshop, managerial support from each employee in order to be the better adaptation with stressors, encourage of persons to do regular exercise and having of good and friendly relationships in workplace. For further research, it is recommended to employ the other research techniques in addition to questionnaire, such as clinical interview to check the occupational stress and its related disorders.

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