

Role of demographic variables in investigating occupational stress of disaster and emergency medical management center 115

Javad Yoosefi Iebni

Tehran University of Medical Sciences

Jaffar Abbas

Shanghai Jiao Tong University

Parvin Abdi Gheshlaghi

Kermanshah University of Medical Sciences

Razie Toghroli

Hormozgan University of Medical Sciences

Vahid Hatami Garosi

Kermanshah University of Medical Sciences

Reza Pourmirza Kalhori

Kermanshah University of Medical Sciences

Mohammad Reza Salahshoor

Kermanshah University of Medical Sciences

Neda Kianipour

Kermanshah University of Medical Sciences

arash ziapour (✉ arashziapoor@gmail.com)

Kermanshah University of Medical Sciences <https://orcid.org/0000-0001-8687-7484>

Research article

Keywords: Occupational stress, Emergency medical, Emergency department, Demographic variables, Kermanshah, Iran

Posted Date: October 19th, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-32075/v3>

License:  This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

Background: The Emergency Medical Services (EMS) Center is a community-centric that coordinates with the entire health care system. Employees are the most crucial asset of this medical center. This present study investigates the role of demographic variables associated with 115 disasters and the occupational stress of emergency medical management center personnel in 2019.

Methods: This present descriptive study selected a statistical population based on 200 medical personnel associated with disaster and emergency medical management center 115 in Iran, according to inclusion chosen criteria. The review used a scale consisting of two parts, including demographic information and HSE standard questionnaire. The study selected respondents through Cochran's Sample Size Formula using stratified random sampling with a cross-sectional research design for data collection. The study has analyzed received data by using SPSS version 24 and performed the descriptive and inferential statistics (t-test and one-way ANOVA) at a significance level $p < 0.05$.

Results: The study results showed the mean score of total occupational stress 3.41 ± 0.26 . The results showed the highest (4.34 ± 0.35) and the lowest stress levels (2.72 ± 0.86) related to role dimensions. The study findings revealed a significant relationship between stress level and participants' age, marital status, educational level, type of base, workplace, and the number of work hours per month. There was no relationship between the type of employment and work experience with stress levels.

Conclusion: Emergency medical personnel experience a high level of occupational stress. Senior managers can use similar studies to implement measures to reduce the experience of employees' stress.

Background

Stress is an inevitable and essential part of life and follows a pervasive phenomenon, and it spreads widely throughout the life of employees. Occupational stress determines the condition of psychological stress associated with employees' work. It usually originates from pressures, which do not align with employees' skills, knowledge, or expectations. Job stress might increase when workloads are often excessive or too low. Workers often experience stress at the workplace, which keeps them motivated for their survival and growth. It affects employees regardless of their age, gender, race, economic status, or education level. Although it is a natural and necessary aspect of life, if the stress is severe, persistent, or repetitive, the individual maybe is unable to cope with it effectively. In the event where support resources are scarce, and casualties are increasingly more, stress refers to a negative phenomenon or catastrophe, which may cause physical and mental disorders [1]. Occupational stress has become a common and neglected issue in the workplace, creating negative consequences, and an overall high cost for organizations. As a result, the United Nations has called it a twentieth-century disease. In recent years, the World Health Organization (WHO) has declared it a widespread problem worldwide [2]. Numerous studies have shown the role of occupational stress in connection with disease symptoms, high labor displacement, and individuals' early retirement [3, 4]. The Health and Safety Executive has predicted over

13.5 million working days and more than £4 billion losses annually due to the damages from occupational stresses during 2007-2009 [5, 6].

In this regard, several organizations have implemented measures to protect the health and well-being of their employees. One of these organizations is the Disaster and Emergency Medical Management Center, which is responsible for providing clinical care to patients in a pre-hospital medical emergency and transferring to medical centers if necessary [7, 8]. Emergency Medical Services (EMS) staff are typically the first health professionals to participate in intensive care, providing care to injured and critically ill patients, suspended between life and death. As a result, these people often face specific conditions in which they experience professional stress [9, 10].

Health center is one of the main pillars of emergency health care units in all countries around the globe. According to the world's modern scientific standards, this system's most fundamental goal is to provide satisfactory services in the shortest possible time to the patients. [11]. Emergency medical services units differ from the other sections through a variety of ways, such as stressful environments, high pressure, the sensitivity of seconds, extraordinary stress on timely diagnosis, expectations and intimidation of near and dear ones, and the importance of protecting patients' lives [12]. Therefore, this is the highly stressed area of the medical services unit. The emergency medical services system is a part of a chain system responsible for patients' care from the severe critical time to their rehabilitation and discharge [13]. The personnel employed in this section are as the first individuals to respond to patients in emergency medical situations and the first sight of the critical moment [14]. This section provides the conditions in creating stress for the personnel employed in this sector due to time constraints in performing affairs, the critical status of the patient, expectations of companions, the openness of the environment, fear of inadequacy in rescuing a dying patient, decision-making power in urgent situations and factors related to workforce [15, 16].

The prolonged exposure of emergency medical personnel to unpredictable stress settings leads to some scholars to classify them as people at high risk of exposure to PTSD [17, 18]. Besides, if stress is not adequately addressed and properly managed in the right way, it can lead to many physical and psychological symptoms of EMS staff [19]. Some of such symptoms refer to anxiety[20, 21], depression [22], , sleep disorders, fatigue and unsafe behavior[23], gastrointestinal symptoms, backache [24], diminished occupational satisfaction [25], occupational burnout[26], emotional disturbance, and depersonalization[27, 28].

Increasing working hours causes an increase in conflict in occupational and family tasks, leading to occupational stress [29]. The rotating nature of work shifts of emergency medical technicians gives little opportunity to adapt to sleep patterns that can disrupt mental health [30]. Consequently, the effects of day and night shifts can be fatigue, sleep disorder, gastrointestinal disorders, and poor performance [31]. In domestic studies, Sharifi et al., in their research in Kerman, concluded that about half of emergency medical personnel experienced moderate occupational stress. There was a significant relationship between occupational stress with educational level and employment status, while age and marital status

didn't have any relationship with stress [32]. The results of Dadashzadeh et al. study in urban and road bases and pre-hospital emergency medical services in East Azarbaijan province showed that the most critical factor of stress load is occupational, environmental factors, and factors related to a patient. There was also a significant relationship between the amount of stress load with the number of missions, educational degree, and type of base and employment status [33]. Seyed Javadi et al., in a study conducted on employees in 115 provinces of Ardabil, stated a significant correlation between age and occupational stress. Still, there was no relationship between stress and marital status, educational level, type of workplace base, and working hours per week [34].

In foreign studies, the results of a study in the UK showed that emergency medical technicians had the highest rank in terms of physical stress, the second rank in terms of dissatisfaction, and the fourth rank in terms of mental health compared to the other 25 jobs [35]. The results of a study conducted in Turkey demonstrated that all the stressful and unfavorable conditions in the pre-hospital emergency medical services lead to the personnel's physical and psychological fatigue and eventually lead to burnout development [36]. Leszczynski et al. emphasized that physicians and nurses in the emergency medical services department suffered more burnout than emergency medical personnel did. They stated that emergency medical service personnel experienced the least amount of burnout compared to their colleagues [37]. Besides, the problems discussed above, emergency medical personnel employed by the Iranian Government's health-care system are involved in addressing other challenges, such as staff shortages, inadequate equipment, inadequate training of the necessary standards, interaction with people, skills training issues, anxiety and various forms of emotional distress [9, 38].

Despite all the studies conducted, reviewing different backgrounds indicates that no research was conducted in Kermanshah University of Medical Sciences to assess the occupational stress of the personnel employed in 115 of the Kermanshah provinces. Thus, keeping in view the stature of job, occupational stress is prominent in emergency medical workers, which is considered a key element in health systems. It provides the optimal provision of health care and clinical services for affected at a critical moment. This study focused on investigating the personnel's occupational stress status of the disaster and emergency medical management center 115, and the role of demographic variables play in 2019. This issue enables planning and comparison with other areas of the country while identifying specific cases supporting counseling and treatment.

Method

Study design

This cross-sectional descriptive study lasted from May to September 2019. This present descriptive study selected a statistical population based on 200 medical personnel associated with disaster and emergency medical management center 115 affiliated to Kermanshah University of Medical Sciences and designated sample size by using Cochran formula (95% confidence level and 5% error) in Iran, according to inclusion chosen criteria. The review used a scale consisting of two parts, including demographic

information and HSE standard questionnaire. The study selected respondents through Cochran's Sample Size Formula using stratified random sampling with a cross-sectional research design for data collection. In this study, the investigators recruited 85 urban base personnel and 115 personnel of emergency medical road bases of 115 in this statistical sample to draw the results. The study analyzed received data using SPSS version 24 and performed the descriptive and inferential statistics (t-test and one-way ANOVA) at a significance level $p < 0.05$. The study criteria consisted of the personnel list, individuals, and road, which specified the selection criteria.

The Research Ethics Committee of Kermanshah University of Medical Sciences approved this research project, and the authors obtained the informed consent form from all the participants of the study units. The authors asked respondents to fill the questionnaire forms at home to avoid the fatigue of the sample units of this present study. The participants needed 15-20 minutes to provide their feedback on the questionnaire and the authors collected the required data sets in nine weeks. The inclusion criteria required were as follows. (1.) Be employed in the pre-hospital emergency medical ambulance, as one of the technical categories rescuer, primary, middle and senior technician, and the authors did not include technicians employed in office and communication center. (2.) The technician's main job is to work in an ambulance 115 (not as overtime from other units and employment in low volume) (3.) having work experience of more than six months in an emergency medical services 115 with a diploma degree and above. The exclusion criteria removed those participants who did not show a willingness to participate in the survey or provided incomplete questionnaire forms. The authors explained that taking part in this research is optional, and all the received information would be strictly confidential. The researchers' team provided the self-reported questionnaires to eight faculty members of the school of nursing, psychology, emergency medicine, and six emergency medical personnel to determine the tool's face and content validity.

Tools

This present study incorporated a self-reported instrument to collect the desire data sets. The questionnaire had two-parts to record the selected respondents' feedback by using Cochran's Sample Size Formula. This study cross-sectional research design used stratified random sampling to collect the required data for further analysis. In the next phase, the authors analyzed data units by incorporating SPSS version-24 to perform the descriptive and inferential statistics (t-test and one-way ANOVA) at a significance level $p < 0.05$. The first part of the scale reported demographic variables, such as respondents' age, marital status, level and field of education, work experience, employment status, the workplace (urban, road, both), and categorized by hours of work per month. The second part described the standard occupational stress questionnaire related to the British Health and Safety Executive (HSE) [35]. This self-reported questionnaire contains 35-items with seven sub-scales of items. The demand covered questions related to workload, characteristics, and work environment with eight items (questions 3, 6, 9, 12, 16, 18, 20, and 22). The control specified to queries how it could assess that a person is on keeping a path of effectively doing his/her job with six items, including (questions 2, 10, 15, 19, 25, and 30). The support of authorities signifies the amount of support a person receives from their management and service

organization categorized with five items (questions 8, 23, 29, 33, and 35). The support of colleagues' measures the amount of support that a person receives from his/her colleagues. It was allocated with four items (questions 7, 24, 27, and 31). The relationship characterizes with an increase in practice and positive attributes to increase mass communication and reduce workplace conflict. It has a distribution of 4 items (questions 5, 14, 21, and 34), and the role attributes to the right understanding of personnel from their organization allocates five items (Questions 1, 4, 11, 13, and 17). Changes that address how to organize and change an organization's forces measure the outcome with three items (questions 26, 28, and 32). The questions of this questionnaire include a five-point Likert scale (never, rarely, sometimes, often, and always) that scores from 1 to 5, respectively. A high score from this questionnaire indicate less occupational stress [14]. The occupational stress questionnaire (HSE) was valid and reliable in a previous study conducted by Azad Marzabadi et al. The study showed a 78% reliability level based on Cronbach's alpha coefficient [39]. Its internal consistency was 89% based on Cronbach's alpha coefficient.

Data Analysis

In the next phase, this descriptive research study performed the analysis to draw the results. The study used descriptive analysis (frequency, percentage, mean and standard deviation) and inferential statistics (ANOVA and independent t-test) and SPSS statistical software version 24.0 by using a significance level set at $p < 0.05$.

Ethical approval

The authors obtained ethical approval from the Ethical Review Committee of Kermanshah University of Medical Sciences (KUMS). The research team explained the study's purpose to all participants and obtained the written informed consent from all participants. The authors assured all the respondents their anonymity and confidentiality.

Results

The results showed that the mean age of the participants was 30.14, with a standard deviation of 5.96 years. The study results showed the mean score of total occupational stress 3.41 ± 0.26 . The results showed the highest (4.34 ± 0.35) and the lowest stress levels (2.72 ± 0.86) related to role dimensions. The study findings revealed a significant relationship between stress level and participants' age, marital status, educational level, type of base, workplace, and the number of work hours per month. There was no relationship between the type of employment and work experience with stress levels. More than half of the participants (58%) were in the age range of 20-30 years. 57% of them were married, and the rest were single. Most individuals (80%) had an emergency medical degree. Nearly half of the individuals (47.5%) had less than five years of work experience, and 35.5% worked on the majority of the project. Concerning the type of base to the workplace, 42.5% of individuals were in the urban ground, and 57.5% in the road base. More than half of them (58%) worked between 200 and 250 hours per month (Table 1). The mean total score of occupational stress in single individuals (3.48 ± 0.29) was higher as compared to married individuals (3.35 ± 0.23). The independent t-test showed a significant difference ($P = 0.001$). The results of

this test showed that the mean total score of occupational stress in individuals employed in urban base (3.49 ± 0.24) was significantly higher than road base (3.34 ± 0.26) ($P=0.000$) (Table 1).

Table 1 Individual characteristics of study samples and Comparison of mean and standard deviation of occupational stress score according to demographic variables

Characteristics of research sample		N (%)	Mean \pm SD	P-Value
Married status	Single	86 (43%)	3.48 \pm 0.29	0.001 ^a
	Married	114 (57%)	3.35 \pm 0.23	
Age (year) 30.14 \pm 5.96	20-30	116 (58%)	3.47 \pm 0.29	0.000 ^b
	31-40	74 (37%)	3.34 \pm 0.18	
	41-50	10 (5%)	3.11 \pm 0.03	
Education level	Associate degree	(48.5%) 97	3.51 \pm 0.28	0.000 ^b
	Bachelor's degree	(49.5%) 99	3.30 \pm 0.20	
	Master's degree	(2%) 4	3.60 \pm 0.07	
Education degree	Emergency medical services	160 (80%)	3.37 \pm 0.26	0.000 ^b
	Nurse	18 (9%)	3.46 \pm 0.27	
	Anesthesia	10 (5%)	3.57 \pm 0.10	
	Practical nurse	12 (6%)	3.66 \pm 0.11	
Work experience	Less than 5 years	95 (47.5%)	3.44 \pm 0.32	0.092 ^b
	10-6	70 (35%)	3.36 \pm 0.20	
	20-11	27 (13.5%)	3.36 \pm 0.17	
	30-21	8 (4%)	3.55 \pm 0.04	
Type of employment	Formal	39 (19.5%)	3.44 \pm 0.26	0.241 ^b
	contractual	50 (25%)	3.39 \pm 0.17	
	Informal	40 (20%)	3.34 \pm 0.22	
	Plan	71 (35.5%)	3.43 \pm 0.33	
Base of workplace	Urban	85 (42.5%)	3.49 \pm 0.24	0.000 ^a
	Road	115 (57.5%)	3.34 \pm 0.26	
Work hour per month	<150	26 (13%)	3.60 \pm 0.07	0.000 ^b
	200-150	58 (29%)	3.25 \pm 0.23	
	250-200	116 (58%)	3.44 \pm 0.27	

SD= Standard deviation; a= Independent t-test; b= One-way ANOVA

The ANOVA test result showed that the total mean scores of occupational stress had decreased significantly with increasing age ($P=0.000$). ANOVA test showed a significant relationship between job stress with educational level and field of education ($P=0.000$), individuals with master's degrees had higher occupational stress score (3.60 ± 0.07), and individuals with an emergency medical degree had a lower score (3.37 ± 0.26) compared to other grades and fields. On the other hand, the results of this test showed that there is a significant relationship between occupational stress score and working hours per month ($P=0.000$); therefore, individuals with the lowest working hours (less than 150 hours per month) had higher occupational stress score (3.60 ± 0.23). However, there was no significant relationship between work experience ($P=0.092$) and type of employment ($P=0.241$) with occupational stress score (Table 1).

The mean and standard deviation of the total score of occupational stress was 3.41 ± 0.26 . The highest and the lowest level of occupational stress showed a relation to role dimensions (4.34 ± 0.35) and

changes (2.72 ± 0.86) (Table 2). The mean score of stress in terms of demand, control, and change showed a significant relationship with the type of base of the workplace ($P < 0.05$). Hence, the mean score in all these dimensions in urban bases employed was more than road bases (Table 3).

Table 2 Mean and standard deviation of occupational stress dimensions in the study population Variable

Statistical indicators		Mean-SD	Number (question)	Min.	Max.
Scale	Sub-scales				
Occupational stress	Demand	3.71±0.43	8	2.50	4.75
	Control	3.12±0.60	6	2	4.33
	Support of authorities	2.87±0.68	5	1.80	4.40
	Support of colleague	3.46±0.65	4	2	4.75
	Relation	3.61±0.69	4	2	5
	Role	4.34±0.35	5	3.80	5
	Changes	2.72±0.86	3	1.33	4.67
	Total occupational stress	0.26 ±3.41	35	2.77	3.86

Max=Maximum

Min=Minimum

Table 3. Relationship between occupational stress dimensions with work place of personnel of emergency medical center in Kermanshah Province

P-Value	Total individuals N=200	Road N=45	Urban N=100	Employees Occupational stress dimensions
0.018	3.71±0.43	3.65±0.45	0.40 ±3.80	Demand
0.000	3.012±0.60	2.95±0.59	3.35±0.52	Control
0.43	2.87±0.68	2.79±0.60	2.99±0.76	Support of authorities
0.123	3.46±0.65	3.40±0.78	3.53±0.40	Support of colleagues
0.366	3.61±0.69	3.65±0.66	3.56±0.72	Relation
0.847	4.34±0.35	4.35±0.39	4.34±0.29	Role
0.038	2.72±0.86	2.61±0.83	2.87±0.89	Changes
0.000	3.41±0.26	3.34±0.26	3.49±0.24	Total occupational stress

Discussion

The purpose of this study was to investigate the job stress levels of the personnel of the Accident and Emergency Management Center (Emergency Medical Services 115, EMS) and the role of demographic variables in 2019. The results showed that the highest and lowest job stress levels indicated an association with role and change dimensions, respectively. The role domain measures "people's right understanding of working in the organization." Therefore, in the present study, it seems that people had insufficient knowledge about their duties and responsibilities, goals, and views of the organization and their expectations in the workplace. On the other hand, the change domain is related to "how to organize and change the organization's forces." Therefore, in the present study, the officials acted strongly in this regard, and there is a good relationship between them and the staff regarding Intra organizational changes. In this regard, Hosseinzadeh et al. stated that the highest and lowest job stress levels in emergency medical personnel specified a link to the role and demand domains [40]. Sharifi et al. reported

that the demand dimension had the highest, and the role dimension had the lowest level of job stress among emergency medical personnel [32]. Mei Lu et al. showed that the subscale of problems related to time and workload based on the job stress questionnaire (which is in line with the HSE questionnaire's demand dimension) was one of the subscales with the highest score among emergency nurses [41]. However, Mahdizadeh et al. concluded that the workload issues do not cause much stress to EMS personnel [9]. With the past studies' evidence, findings concluded that the most substantial and weakest job stressors are very diverse and even contradictory. The characteristics and research environment of the study influence stressors. Officials should conduct similar fundamental studies to determine the root cause of stress and subsequently correct these factors in the workplace.

The results showed that younger people experienced more job stress. Similarly, Motie et al. reported that the stress levels decreased with technicians' age to about 40 to 45 years [15]. The level of job stress is normal to decrease with age and work experience; increasing age to a particular stage can play a protective role against stressors. d'Etorre et al. stated that respondents age had a significant relationship with the level of job stress in emergency nurses [42]. However, Seyyed Javadi et al. achieved contradictory results, so that the job stress in EMS personnel increases with age [34] and Bardhan et al. also considered age to be strongly associated with job stress levels, stating that age over 40 years is a higher risk factor for emergency nurses' stress. [43]. The researchers explained their findings by stating that as people get older, their ability to adapt and tolerate stressful work conditions decreases. It is usual for job stress to increase. This study aimed to observe an increase in stress levels among employees with more than 50 years of age in the present survey. According to the present study, unmarried workers had more job stress than married people. Similarly, Shareinia et al. stated that the stress levels were higher among single nurses [44].

However, a previous study of Seyyed Javadi et al. showed no relationship between EMS technicians' job stress and marital status [34]. Conversely, Mahboubi et al. reported that married EMS personnel had a higher level of job stress [45]. Recent study results indicated that there are more expectations from single people from the family and the workplace, increasing working hours and workload and thus increasing job stress. The educational level had a significant relationship with the level of job stress experienced by individuals. Only 2% of the participants were postgraduate students who participated more job stress than the lower grades, consistent with a study of Namdari et al. They stated that the intention to stay also decreases with increasing educational level [11].

Although increasing the educational level increases knowledge and skills, service delivery quality is expected to improve as people's expectations grow. They are often in more challenging situations and do more work that is specialized; these can increase job stress. Motie et al. concluded that technicians with a higher educational level of bachelor's degree had experienced more job stress than other people who has academic levels, such as associate degree and high school. However, there was no significant relationship between educational level and stressors. Their findings may be because people in stressful situations that require quick decision-making, regardless of their educational level, may not be able to function effectively and experience high stress [15]. Job stress had a significant relationship with

individuals' educational level because the EMS degrees workforce had less job stress than other fields of study (nursing, anesthesiology, and paramedic). Similarly, Namdari et al. described that there was a significant relationship between job stress and the field of study of EMS staff [11]. This study's findings showed that workers of the EMS graduates had undergone specialized academic training to provide pre-hospital services. Therefore, they experience less job stress than other disciplines who had typical training for hospital conditions. The results stipulate the need to employ more relevant people in EMS centers. It seems normal to choose people with a job-related degree to reduce workplace stress.

This study's findings showed that health workers in urban centers generally encountered higher job stress than road station staff. The results are consistent with the studies of Motie et al. [15] and Namdari et al. [11]. Seyyed Javadi et al. conducted a study and described no relationship between job stress level and station type [34]. Leszczyński et al. reported that the EMS employees experience varying degrees of occupational stress depending on the place of work because the technicians working in air EMS services had experienced less stress than other services (ground EMS services, emergency departments, etc.) [37]. Other medical groups revealed similar results. Yuwanich et al. conducted a study and described that the emergency nurses were more exposed to job stress than nurses in other departments because of the higher workload in the department [29]. In conclusion, the personnel in different places and departments experience different levels of job stress. Policymakers and senior managers should consider this issue.

The investigation revealed that the level of work-related stress in the three dimensions of demand, control, and change was significantly higher in urban station staff. Thus, results evidenced that the leading cause of more significant occupational stress is workload and pressure (demand dimension), lack of self-control (control dimension), and non-compliance with intra-organizational changes (change dimension) in the urban stations. As a result, officials can manage this issue by making the necessary changes in urban stations, such as reducing working hours, increasing the workforce per shift, etc. In this regard, Shareinia et al. showed a significant difference in workload subscale between emergency and non-emergency nurses (due to the high number of patients referred), which increased their job stress [44]. Sharifi et al. conducted a study and identified that the dimensions of change, role, peer support, and chairman support indicated a significant relation to the type of workplace station [32]. The results showed that although the mean total score of job stress was higher in people with less than five years of experience and 21 to 30 years of age (both sides of the spectrum). There was no significant relationship between work experience and job stress level. Motie et al. reached the same results. They stated that there is no relationship between work experience and job stress of EMS technicians, but the total score of stressors increases in the work experience of more than 20 years [15]. Yuwanich et al. stated that low experience and work experience are associated with the job stress of emergency nurses [29] and Bardhan et al. showed that less than ten years of work experience is a decisive risk factor for higher job stress in nurses, which are somewhat consistent with the present study [43]. On the other hand, d'Ettoire et al. considered work experience to be related entirely to emergency nurses' job stress [42].

Another study showed that job stress increases with increasing work experience of EMS personnel. The researchers found that prolonging work experience increases employees' overall attendance at work, and

they are more exposed to stressors [11]. In general, job stress is present throughout individuals' service life, but it increases among workers with less experience and the end stages of service. Although job security leads to reduced occupational stress, employees with a more permanent employment type (permanent and contractual) still experienced high job stress. However, the present study observed a significant relationship between work and the level of job stress. In this regard, some studies have shown that there is a notable relationship between employment status and job stress levels of EMS technicians and emergency nurses [11, 34].

The relationship between staff working hours and job stress was significant; unexpectedly, the results showed that people with the lowest working hours (less than 150 hours per month) experienced more job stress. Perhaps this finding can be justified because being away from work for a more extended time increases stress during attendance. However, there is no information about people with less working hours in this study to investigate the cause of more stress in them. Shareinia et al. showed that there is a slight positive relationship between overtime and job stress, that is, the more overtime, the more stress in emergency nurses [46]. Another study reported that working hours per week were not associated with job stress in EMS staff [43]. According to past studies, results evidenced that working hours are not the leading cause of job stress, and there are more factors, which are critical in this regard.

Conclusion

Emergency medical personnel are at risk of high occupational stress due to the nature of their job. Reducing the stress experienced by them in the workplace is critical and improves the quality of service provided to patients. Since the highest level of stress indicated a link to the role and demand, authorities should, in many ways, understand the correct people from the organization and reduce their workload. Based on the literature evidence on this research topic, the present study's findings provide essential information and contribute to the scientific literature. Senior managers need to pay special attention to this issue and use similar studies to develop strategies to reduce the stress of their employees, which would result in employees' better performance.

Abbreviations

OS: Occupational Stress;

EMS: Emergency Medical Services;

MC: Management Center;

RD: Role of Demographic

Declarations

Ethics approval and consent to participate

The study was approved by the Research Ethics Committee of Kermanshah University of Medical Sciences (Code: IR.KUMS.REC.1397.869). Written informed consent was obtained from group members. All the procedures performed in the study involving human participants were based on the ethical standards of the Institutional Research Committee and the Helsinki Declaration and its later amendments or comparable ethical standards.

Consent to publish

All participants consented verbally to publication of the interview data.

Availability of data and materials

The datasets using in the study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

Funding

This study did not receive any grant from funding agencies.

Authors' Contributions

All authors were responsible for study. JYL, RPK and AZ was responsible for the study Conceptualization and led the writing of the paper. PAG and VHG conducted the Literature review and assisted in writing the paper. AZ and JA conducted the Statistical analysis, assisted in interpreting the data and writing the paper. RT and JYL assisted with interpretation of the results and drafting programmatic Implications. MRS, NK and AZ was responsible for data collection and coordination of the Study. AZ co-led the conceptualization, supervised all aspects of writing the Paper, and provided extensive comments on the manuscript. All the authors have read and approved the final manuscript.

Acknowledgements

We are grateful to the Deputy for Research and Technology, Kermanshah University of Medical Sciences, for cooperating in this research. The authors would like to thank all the participants who patiently participated.

Author details

¹Health Education and Health Promotion, Health Institute, Kermanshah University of Medical Sciences, Kermanshah, Iran. ²Antai College of Economics and Management/School of Media and Communication, Shanghai Jiao Tong University, Shanghai, China. ³Health Institute, Kermanshah University of Medical Sciences, Kermanshah, Iran. ⁴Social Determinants in Health Promotion Research Center, Hormozgan

Health Institute, Hormozgan University of Medical Sciences, Bandar Abbas, Iran. ⁵ Department of Medical Emergencies, School of Paramedical Science, Kermanshah University of Medical Sciences, Kermanshah, Iran. ⁶Department of Anatomical Sciences, Medical School, Kermanshah University of Medical Sciences, Kermanshah, Iran. ⁷Students Research Committee, Kermanshah University of Medical Sciences, Kermanshah, Iran.

References

1. Torshizi L, Ahmadi F. Job stressors from clinical nurses perspective. *Iran J Nurs*. 2011;24(70):49-60.
2. Torshizi M, Saadatjoo S. Job stress in the staff of a tire factory. *J Birjand Univ Med Sci*. 2012;19(2):200-7.
3. Wang W, Kong AWM, Chair SY. Relationship between job stress level and coping strategies used by Hong Kong nurses working in an acute surgical unit. *Applied Nurs Res*. 2011;24(4):238-43.
4. Kerai SM, Khan UR, Islam M, Asad N, Razzak J, Pasha O. Post-traumatic stress disorder and its predictors in emergency medical service personnel: a cross-sectional study from Karachi, Pakistan. *BMC Emerg Med*. 2017;17(1):26-32.
5. Eltarhuni A. Job Stress Sources Among Doctors and Nurses Working in Emergency Departments in Public Hospitals. *J Nurs Health Sci*. 2016;5(6):84-8.
6. Garosi VH, Zarei MR, Farahan MA, Ziapour A, Haghani H. A study of nurses' performance relative to the risk factors for musculoskeletal disorders associated with patient mobility in the teaching hospitals across Kermanshah. *J Public Health*. 2020:1-6.
7. Abraham LJ, Thom O, Greenslade JH, Wallis M, Johnston AN, Carlström E, et al. Morale, stress and coping strategies of staff working in the emergency department: A comparison of two different-sized departments. *Emerg Med Australasia*. 2018;30(3):375-81.
8. Shirzad F, Hadi F, Mortazavi SS, Biglari M, Sari HN, Mohammadi Z, et al. First line in psychiatric emergency: pre-hospital emergency protocol for mental disorders in Iran. *BMC Emerg Med*. 2020;20(1):1-9.
9. Mahdizadeh M, Jaber AA, Bonabi TN. Massage Therapy in Management of Occupational Stress in Emergency Medical Services Staffs: a Randomized Controlled Trial. *Int J Therapeutic Mass* 2019;12(1):16-22.
10. Bishop-Williams KE, Berke O, Pearl DL, Kelton DF. A spatial analysis of heat stress related emergency room visits in rural Southern Ontario during heat waves. *BMC Emerg Med*. 2015;15(1):17-24.
11. Namdari M, Sharifi T, Tabatabaee SS. The effect of job stress on the quality of life of emergency personnel. *J Manag Med Inform School*. 2014;2(1):37-27.
12. Franklin A, Liu Y, Li Z, Nguyen V, Johnson TR, Robinson D, et al. Opportunistic decision making and complexity in emergency care. *J Biomed Inform*. 2011;44(3):469-76.
13. Ebrahimi H, Navidian A, Ameri M, Sadeghi M. Burnout, dimensions and its related factors in the operational staff of medicine emergency. *J Health Promot Manag*. 2014;3(3):16-26.

14. García-Izquierdo M, Ríos-Rísquez MI. The relationship between psychosocial job stress and burnout in emergency departments: An exploratory study. *Nurs Outlook*. 2012;60(5):322-9.
15. Motie Mr, Kalani M, Samadi A, Eshaghi H, Ghobadi P. Prevalence of job stressors in male pre-hospital emergency technicians. *J Fundamen Mental Health*. 2010;12(45):420-9.
16. Yoosefi Lebni J, Ebadi Azar F, Sharma M, Zangeneh A, Kianipour N, Azizi S, et al. Factors Affecting Occupational Hazards among Operating Room Personnel at Hospitals Affiliated in Western Iran: A Cross-Sectional Study. *J Public Health*. 2020:1-8.
17. Skogstad M, Skorstad M, Lie A, Conradi H, Heir T, Weisæth L. Work-related post-traumatic stress disorder. *Occup Med*. 2013;63(3):175-82.
18. Marzec ML, Scibelli A, Edington D. Impact of changes in medical condition burden index and stress on absenteeism among employees of a US utility company. *Int J Workplace Health Manag*. 2015;8(1):15-33.
19. Khamisa N, Oldenburg B, Peltzer K, Ilic D. Work related stress, burnout, job satisfaction and general health of nurses. *Int J Environ Res Public Health*. 2015;12(1):652-66.
20. Guthrie R, Ciccarelli M, Babic A. Work-related stress in Australia: The effects of legislative interventions and the cost of treatment. *Int J Law And Psychiatry*. 2010;33(2):101-15.
21. Back C, Tam H, Lee E, Haraldsson B. The effects of employer-provided massage therapy on job satisfaction, workplace stress, and pain and discomfort. *Holistic Nurs Pract*. 2009;23(1):19-31.
22. Kemper K, Bulla S, Krueger D, Ott MJ, McCool JA, Gardiner P. Nurses' experiences, expectations, and preferences for mind-body practices to reduce stress. *BMC Complement Alternat Med*. 2011;11(1):26-32.
23. Pirrallo RG, Loomis CC, Levine R, Woodson BT. The prevalence of sleep problems in emergency medical technicians. *Sleep Breath*. 2012;16(1):149-62.
24. Huerta-Franco M-R, Vargas-Luna M, Tienda P, Delgadillo-Holtfort I, Balleza-Ordaz M, Flores-Hernandez C. Effects of occupational stress on the gastrointestinal tract. *World J Gastrointest Pathophysiology*. 2013;4(4):108-18.
25. Rahimi A, Vazini H, Alhani F, Anoosheh M. Relationship between low back pain with quality of life, depression, anxiety and stress among emergency medical technicians. *Trauma Monthly*. 2015;20(2):e18686.
26. Tamers SL, Okechukwu C, Bohl AA, Guéguen A, Goldberg M, Zins M. The impact of stressful life events on excessive alcohol consumption in the French population: findings from the GAZEL cohort study. *Plos One*. 2014;9(1):e87653.
27. Essex B, Scott LB. Chronic stress and associated coping strategies among volunteer EMS personnel. *Prehosp Emerg Care*. 2008;12(1):69-75.
28. Gallagher S, McGilloway S. Experience of critical incident stress among ambulance service staff and relationship to psychological symptoms. *Int J Emerg Mental Health*. 2009;11(4):235-48.

29. Yuwanich N, Akhavan S, Nantsupawat W, Martin L. Experiences of occupational stress among emergency nurses at private hospitals in Bangkok, Thailand. *Open J Nurs.* 2017;7(6):657-70.
30. Patterson PD, Suffoletto BP, Kupas DF, Weaver MD, Hostler D. Sleep quality and fatigue among prehospital providers. *Prehosp Emerg Care.* 2010;14(2):187-93.
31. Berger AM, Hobbs BB. Impact of shift work on the health and safety of nurses and patients. *Clin J Oncology Nurs.* 2006;10(4):465-71.
32. Sharifi T, Namdari M, Hasheminejad N. The effect of job stress on the intention to stay as emergency personnel. *J Sabzevar Univ Med Sci.* 2016;23(1):133-42.
33. Dadashzadeh A, Rahmani A, Hasankhani H, Elmi S. Work Related Burden of Stress among Emergency Medical Service Personnel. *Iran J Emerg Med.* 2018;5:2.
34. Seyedjavadi M, Samadi N, Mohammadi R, Osmani A, Bakhtiari K, Seyedjavadi M. Assessment of Stress in Medical Emergency Staff in Ardabil Province. *Qom Univ Med Sci J.* 2014;7(6):41-5.
35. Executive HS. Tackling Stress: The Management Standard Approach. <http://www.hsegovuk/pubns/indg406pdf> (1 January 2011, date last accessed). 2011.
36. Deniz T, Saygun M, Eroğlu O, Ülger H, Azapoğlu B. Effect of exposure to violence on the development of burnout syndrome in ambulance staff. *Turkish J Med Sci.* 2016;46(2):296-302.
37. Leszczyński P, Panczyk M, Podgórski M, Owczarek K, Gałązkowski R, Mikos M, et al. Determinants of occupational burnout among employees of the Emergency Medical Services in Poland. *Ann Agricult Environ Med.* 2019;26(1):114-9.
38. Zangeneh A, Lebni JY, Azar FEF, Sharma M, Kianipour N, Azizi SA, et al. A study of the communication skills in health care and the role of demographic variables (a case study of the nurses at the Educational, Therapeutic and Research Center of Imam Reza Hospital, Kermanshah, Iran in 2018). *J Public Health.* 2019:1-7.
39. Azad ME, Gholami FM. Reliability and validity assessment for the HSE job stress questionnaire. *J Behav Sci.* 2011;4(4):291-97.
40. Hosseinzadeh M, Hosseinzadeh H, Razeghi N, Barzegar Z. The relationship between job satisfaction and job stress and its related factors among emergency medical services personnel of Mazandaran University of Medical Sciences in 2013. *J Neyshabur Univ Med Sci.* 2015;3(3):55-63.
41. Lu D-M, Sun N, Hong S, Fan Y-y, Kong F-y, Li Q-j. Occupational stress and coping strategies among emergency department nurses of China. *Arch Psychiatric Nurs.* 2015;29(4):208-12.
42. d'Ettorre G, Maselli C, Greco M, Pellicani V. Assessment and Management of Job Stress in Emergency Nurses: A Preliminary Study. *Int J Emerg.* 2015;18(4):1-3.
43. Bardhan R, Heaton K, Davis M, Chen P, Dickinson DA, Lungu CT. A cross sectional study evaluating psychosocial job stress and health risk in emergency department nurses. *Int J Environ Res Public Health.* 2019;16(18):3243.
44. Shareinia H, Khuniki F, Bloochi Beydokhti T, Eydi zeynabad A, Hosseini M. Comparison between job stress among emergency department nurses with nurses of other departments. *Q J Nurs Manag.*

2017;6(3,4):48-55.

45. Mahboubi M, Jalali A, Mohammadi M. Comparative assessment of relationship between sensation seeking with job stress in emergency medicine workers and non emergency medicine workers. *Hospital J.* 2013;12(3):132-8.
46. Shareinia H, Khuniki F, Bloochi Beydokhti T. Comparison between job stress among emergency department nurses with nurses of other departments. *Q J Nurs Manag.* 2018;6(3):48-56.