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Research Article

Knowledge levels of prehospital emergency health workers about occupational disease risk factors and influencing factors

Hastane öncesi acil sağlık çalışanlarının meslek hastalığı risk faktörleri ile ilgili bilgi düzeyleri ve etkileyen faktörler

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Abstract

Introduction: Today, occupational diseases are growing more and more significant. This study aims to determine pre-hospital health workers' degree of awareness regarding the risk factors they can run into related to occupational diseases and the factors that affect them.

Methods: This is a cross-sectional study. The study's sample population consists of 504 pre-hospital emergency medical services employees in Elazig province. The sample group has not been chosen, and the entire population is intended to be reached. The questionnaire consists of 25 questions. Face-to-face interviews using a questionnaire were conducted on a volunteer basis. The rate of participating in the survey was 84.6%. The collected data were entered into a statistical package program. For statistical analysis, Fisher's Exact and Chi-square tests were performed.

Results: The participants' average age was 30,61±9,83. Women comprised 59.6% of the workforce, 55.4% of those employed at district health facilities, and 40.9% were paramedics. 90,2% of the participants voluntarily choose the occupation. 93% of workers believed that musculoskeletal illnesses were a danger associated with their line of work. The risk of exposure to violence was the top "stress-generating issue" for 69.6% of workers.

Conclusion: The majority of respondents willingly chose the profession. Most frequently, ergonomic issues are considered to be risk factors for employment. Long night shift hours and a misfit night shift coworker are sources of high stress for doctors and emergency medical technicians (EMTs) respectively. It is suggested that health professionals receive more training on occupational diseases, that they become more sensitive to various biological and chemical risk factors, with the exception of common viruses like HBV transmission, and it is recommended to take further action against violence.

Keywords: Occupational diseases, health workers, risk factors, emergency medical services, ergonomics

Öz

Giriş: Meslek hastalıkları günümüzde giderek önemini arttırmaktadır. Bu çalışmanın amacı hastane öncesi sağlık hizmeti çalışanlarının, meslek hastalıkları ile ilgili karşılaşabilecekleri risk faktörlerine yönelik bilgi düzeylerini ve etkileyen faktörleri belirlemektir.

Yöntem: Bu araştırma kesitsel tipte bir çalışmadır. Çalışmanın evrenini Elazığ ili hastane öncesi acil sağlık hizmetlerinde çalışan 504 personel oluşturmuştur. Örneklem grubu seçilmemiş olup evrenin tamamına ulaşılması planlanmıştır. Anket 25 sorudan oluşmaktadır. Gönüllülük esasına dayalı olarak yüz yüze görüşme yöntemi ile anket uygulanmıştır. Anketlere katılım oranı %84,6 olarak gerçekleşmiştir. Elde edilen veriler istatistik paket programa kaydedilmiştir. İstatistiksel analiz için X^2 ve Fisher's Exact test kullanılmıştır.

Bulgular: Katılımcıların yaş ortalaması 30,61±9,83' idi. Çalışanların %59,6'sı kadın, %40,9'u paramedik ve %55,4'ü ilçe istasyonların da çalışmaktaydı. Mesleği isteyerek seçenlerin oranı %90,2'di. Çalışanların %93,0'ı mesleklerinin kas iskelet sistemi hastalıkları için risk oluşturduğunu düşünüyordu. Çalışanların %69,6'sı için şiddete maruz kalma riski stres oluşturan ana faktördü.

Sonuç: Katılımcıların çoğunluğu mesleği isteyerek seçmiştir. Mesleki risk faktörü olarak en sık ergonomik faktörler görülmektedir. Nöbet süresinin uzun olması doktorlar arasında, nöbet arkadaşının uyumsuz olmasını ise acil tıp teknisyenleri (ATT) arasında yüksek oranda stres kaynağıdır. Sağlık çalışanlarına yönelik meslek hastalıkları konusunda eğitimlerin sıklaştırılması, HBV bulaşı gibi sık bilinen enfeksiyonlar dışında diğer biyolojik risk faktörlerine ve kimyasal risk faktörlerine karşıda duyarlılığın arttırılması yanında şiddete karşı önlemlerin arttırılması önerilmektedir.

Anahtar kelimeler: Meslek hastalıkları, sağlık çalışanları, risk faktörleri, acil servis, ergonomi

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Introduction

Pre-hospital emergency care services are required to improve the chance of survival of the sick or injured person, stop any complications, and speed up healing [1]. Pre-hospital emergency health professionals exert a substantial amount of effort, which is intensified by emergency crisis settings. Especially in cases where quick intervention is required, they are more affected due to the fact that they provide the first aid [2].

The healthcare industry is listed as one of the riskiest economic sectors in both our national legislation and relevant literature. According to our country's legislation definition of "extremely dangerous jobs," the labor performed in healthcare enterprises falls into this category. So, the effects of occupational accidents and diseases that occur in healthcare facilities sometimes have more severe consequences than those that happen in other industries. Employees in the health care industry and ambulance services may be subjected to biological (sharp wounds, contact with blood and bodily fluids), chemical and drug exposure, as well as psychosocial (violence) elements that can result in occupational accidents and diseases [3]. The intense working tempo, long-term, uninterrupted work and work stress of healthcare professionals cause them to encounter much more occupational risks than those working in other business lines, and their health status to be adversely affected. In addition, in many research and scientific reports, it has been shown that with the increase in privatization in the health system, the current/possible dangers and risks, occupational diseases, work accidents, work-related health problems, disability and incapacity situations increase, new ones occur and diversity increases. Compared to other occupational categories, health workers are exposed to non-fatal occupational diseases at a rate of 34.7 per thousand, according to data from the US Department of Labor for 2018 [4]. The study's objective is to ascertain the extent to which pre-hospital emergency medical workers are aware of occupational disease risk factors that they may come across at work.

Methods

Study design and sample

This is a cross-sectional study. Personnel employed by Pre-Hospital Emergency Medical Services across the province were included in the study. Study's population consists of 504 personnel, including 121 ambulance drivers, 29 medical officers, 24 doctors, 175 paramedics, 145 ATTS, seven nurses, and three midwives. The sample group has not been selected, and it is planned to reach the entire population. 428participants (84.9%) were contacted for the study. Due to shifting employment and unwillingness to engage in the study, 76 persons could not be surveyed. After the appropriate literature review, the questionnaires were created and conducted face-to-face between the first of March and the fifteenth of April 2018. The questionnaire has 25 questions, 15 of them are about knowledge and habits, and ten are about sociodemographic information

Data collection

The sociodemographic and occupational diseases knowledge and attitude levels of the participants were questioned with a questionnaire prepared by scanning the literature data. The questionnaires were applied face-to-face between 01.03.2018 and 15.04.2018 after informing the participants on a voluntary basis. The questionnaire consisted of 25 questions (10 sociodemographic, 15 occupational diseases knowledge and attitude questions)

Research ethics committee approval

The study received ethical approval from Firat University's Non-Interventional Research Ethics Committee, with decision no. 18, dated 22.03.2018.

Statistical analysis

The study’s data were entered into the SPSS (SPSS Inc., Chicago, IL, USA) version 22 package program, which performed error checks, tables, and statistical analyses. The means are provided together with the standard deviations. For statistical analysis, Fisher's Exact and Pearson Chi-square tests were performed. $p<0.05$ was considered statistically significant.

Results

The study's participants were 59.6% (255) female, 65.4% (280) university graduates, 53.5% (229) married, and 57.2% (245) nonsmokers (Table 1). 40.9%(175) were paramedics, 27.6% (118) ATT, 23.1% (99) drivers, 4.7% (20) medical officers/nurses, and 55.4% (237) worked in district health facilities. The rate of those who chose their profession voluntarily was 90.2% (386). The rate of those who believed their occupation posed a risk for infectious diseases was 87.9% (376), 71.7% (307) for psychosocial problems, 93.0% (398) for the musculoskeletal system, and 57.7% for chemical injuries (247). **(Table 1)**

Table 1. Some socio-demographic characteristics of the participants.

	n	%
Gender		
Male	173	40.4
Female	255	59.6
Educational background		
Primary school graduate	6	1.4
Middle school graduate	17	4.0
High School graduate	125	29.2
University	280	65.4
Marital status		
Married	229	53.5
Single/Divorced/Widowed	199	46.5
Does he / she smoke?		
Yes	159	37.1
No	245	57.2
Quit smoking	24	5.6

Doctors were more likely to believe that their profession posed biological, psychosocial, and chemical risks (p=0.003). EMT's were more likely to believe it was a risk for low back pain (Table 2).

Table 2. Participants' opinions on occupational disease risk factors.

	Yes		No		
	n	%	n	%	X2/p
Distribution of those who believe it poses a risk for infectious diseases.					
Doctor	16	100.0	0	0.0	X2=16.804 p=0.003
Paramedics	160	91.4	115	8.6	
EMT	105	89.0	113	11.0	
Nurse	19	95.0	11	5.0	
Driver	76	76.8	223	23.2	
Distribution of those who believe it poses a risk for psychosocial diseases.					
Doctor	14	87.5	2	12.5	X2=4.728 p=0.318
Paramedics	124	70.9	51	29.1	
EMT	89	75.4	29	24.6	
Nurse	15	75.0	5	25.0	
Driver	65	65.7	34	34.3	
Distribution of those who believe it poses a risk for back and low back pain diseases.					
Doctor	15	93.8	1	6.2	*X2=2.461 p=0.658
Paramedics	161	92.0	14	8.0	
EMT	113	95.8	5	4.2	
Nurse	19	95.0	1	5.0	
Driver	90	90.9	9	9.1	
Distribution of those who believe it poses a risk for Chemical exposure diseases.					
Doctor	10	62.5	5	37.5	X2=8.319 p=0.079
Paramedics	106	60.6	69	39.4	
EMT	69	58.5	49	41.5	
Nurse	6	30.0	14	70.0	
Driver	51	51.5	48	48.5	

For statistical analysis, a Chi-square test was performed. * Fisher's Exact test was performed. EMT: Emergency medical technician

The percentage of those who responded, "suggestion and patience" to the open-ended question "What do you do to cope with stress?" was 20.5%. Examining the participants' replies to the knowledge questions revealed a 54.2% of right answers to the question about the proper stretcher lifting technique. (232). The rate of correct answers to the question about physical and occupational diseases was 88,6% (379). The rate of correct answers to the question about "the method of cleaning blood-contaminated instruments" was 26,4% (113). When responding to the question "What vaccines do you require in your profession?" the proportion of people who thought the HBV vaccine should be given was 97.1%. With 29.9% (124), the proportion of those who believe chicken pox shots should be given was the lowest (Table 3).

Table 3. The distribution of participants who correctly answered some knowledge questions.

Occupational disease knowledge	n	%
About the stretcher lifting technique	232	54.2
About physical and occupational diseases	379	88.6
Hand injury with an infected needle-stick	325	75.9
What to do after the contact of mucosal membranes with body fluids	269	62.9
Regarding the blood-borne transmission of HBV	270	63.1
Regarding the technique for disinfecting blood-contaminated objects	113	26.4
Vaccinations required for work-related purposes		
HAV	251	60.5
HBV	403	97.1
Influenza	153	36.9
MMR	158	38.2
DBT	152	36.6
Chickenpox	124	29.9
Meningococcus	134	32.3
Being aware of the occupational health and safety law	231	55.8

HAV: hepatitis a virus; HBV: hepatitis B virus; MMR: measles-mumps-rubella; DBT: diphtheria-pertussis-tetanus

When the correct responses given to the questions by profession were examined, it was noted that while doctors provided more accurate responses to the query on the cleaning of ambulance equipment, paramedics provided more accurate responses to the query regarding what to do in the event of mucous membrane contact with infectious materials (Table 4).

Table 4. The distribution of participants who respond accurately to knowledge questions by profession.

	Correct answer		Wrong answer		
	n	%	n	%	X2/p values
The knowledge question about the technique of stretcher lifting					
Dr.	7	43.8	9	56.3	
Paramedics	99	56.6	76	43.4	X^2=5.537
EMT	59	50.0	59	50.0	p=0.237
Nurse	15	75.0	5	25.0	
Driver	52	52.5	47	47.5	
What to do in the event of getting a needle-stick?					
Dr.	11	68.8	5	31.3	
Paramedics	144	82.3	31	17.7	X^2=6,646
EMT	85	72.0	33	28.0	p=0.156
Nurse	14	70.0	6	30.0	
Driver	71	71.7	28	28.3	
What to do after the contact of mucosal membranes with infected materials?					
Dr.	6	37.5	10	62.5	
Paramedics	130	74.3	45	25.7	X^2=19.807
EMT	70	59.3	48	40.7	p=0.001
Nurse	8	40.0	12	60.0	
Driver	59	59.6	40	40.4	
Knowledge question about the mode of transmission of HBV					
Dr.	12	75.0	4	25.0	
Paramedics	147	84.0	28	16.0	X^2=5.688
EMT	92	78.0	26	22.0	p=0.224
Nurse	17	85.0	3	15.0	
Driver	72	72.7	27	27.3	
Knowledge question about disinfecting the equipment.					
Dr.	7	43.8	9	56.3	
Paramedics	38	22.5	131	77.5	X^2=15.520
EMT	44	38.3	71	61.7	p=0.004
Nurse	7	36.8	12	63.2	
Driver	17	18.5	75	81.5	

For statistical analysis, CHI-SQUARE TEST was performed. Dr: doctor; EMT: Emergency medical technician

The percentage of those who consider the risk of exposure to violence as a source of stress was 69.6% (n=289), the percentage of those who consider the misfit night shift coworker was 67.2% (n=279), and the percentage of those who consider the long night shift hours was 28.6% (n=119), the percentage of those who consider the possibility of encountering a fatal case was 28.3% (n=117), the percentage of those who consider the fear of late intervention was 46.0% (n=191). Long night shift hours and a misfit night shift coworker are sources of stress for doctors 66.7% (n=10) and emergency medical technicians (EMT) 82.5% (n=94), respectively. The risk of being exposed to violence is the same for all occupational groups and occurs with a similar frequency (Table 5).

Table 5. Distribution of situations that may cause stress according to professional groups.

	Yes		No		
	n	%	n	%	X2/p
Long night shift hours					
Dr.	10	66.7	5	33.3	
Paramedics	40	23.3	132	76.7	X^2=17.667
EMT	41	36.0	73	64.0	p=0.001
Nurse	6	31.6	13	68.4	
Driver	22	22.9	74	71.1	
Misfit night shift coworker					
Dr.	9	60.0	6	40.0	
Paramedics	110	64.3	61	35.7	X^2=18.061
EMT	94	82.5	20	17.5	p=0.013
Nurse	11	57.9	8	42.1	
Driver	55	57.3	41	42.7	
Risk of exposure to violence					
Dr.	14	93.3	1	6.7	
Paramedics	123	71.9	48	28.1	X^2=6.741
EMT	79	69.3	35	30.7	p=0.150
Nurse	13	68.4	6	31.6	
Driver	60	62.5	36	37.5	

For statistical analysis, Chi-Square Test was performed. Dr:doctor; EMT: Emergency medical technician

Discussion

The current study showed that 87.9% of participants believe that their profession increases the danger of contracting infectious diseases. According to all doctors and 76.8% of drivers, pre-hospital health services are at risk for contagious infections. The percentage of workers believed they were at risk for infectious diseases varied significantly. According to a study by Tokuç et al., the possibility of infection transfer from patients is the circumstance that bothers ambulance staff members the most [5]. Health professionals' risks of HBV, HCV, HIV, and tuberculosis infections are exceptionally high [6]. Currently, there is no question about the use of vaccines against the hepatitis C and HIV viruses, as well as other diseases that can be treated with prophylaxis by vaccination to stop the virus from spreading. In addition to specific infections and conventional preventative measures, it is crucial to perform post-injury tests and report the results for follow-up, prevention, and treatment throughout the pieces of training.

Although there was no significant difference compared to the other groups, physicians (87.5%) were more likely than the other groups to believe that providing pre-hospital care increased the chance of developing psychosocial disorders. When discussing the workplace's health and safety aspects, chemical and physical variables were frequently mentioned; however, today, psychosocial factors are also considered. More than in the past, today's evolving workplace conditions have made psychosocial issues a concern [6]. According to the literature, 25.0 and 71.2% of employees report feeling stressed out due to their work [5, 7].

Musculoskeletal disorders are regarded by 93% of participants as the most prevalent occupational risk factor. Although there was no significant difference in comparison to the other groups, EMTs were more likely than the other groups to believe that working in pre-hospital care units poses a high risk for back and low back pain diseases. Health professionals are more likely to complain of back and low back pain. This is caused by the failure to implement waist-protecting precautions when performing routine tasks [6].

Chemical exposure was the most negligible frequent occupational risk factor among the participant. Although there was no significant difference in comparison to the other groups, physicians were more likely than the other groups to believe that chemical exposure poses high is considered a high occupational risk factor. The usage of chemicals is less common in the field of health compared to the other fields. Nevertheless, workers in the health industry can exhibit toxic consequences [6].

The percentage of participants who responded with the hepatitis B vaccine (HBV) when asked, "For your occupation, which vaccine should you get?" was 60.5%, and the percentage of those who responded with the hepatitis A vaccine (HAV vaccine) was 97.1%. The rates for other infectious diseases were under 50%. In a different study, 79.5% of healthcare professionals were found to have received the hepatitis B vaccine [8]. Hepatitis B, Influenza, MMR (measles, mumps, rubella vaccination), varicella, Tdap (tetanus, diphtheria, pertussis), and meningococcal vaccines are advised for health care workers under certain circumstances by the CDC (Centers for Disease Control and Prevention) [9]. There is an apparent sensitivity to HBV infection among the individuals. The infectious disease most usually caused by workplace exposure is hepatitis B. Healthcare workers are more likely to be hepatitis B antibody-positive than the general public [6]. Pre-hospital healthcare professionals are required to intervene on patients quickly in a confined area. Healthcare workers are consequently more vulnerable to diseases. Having the employer administer the immunizations rather than leaving them up to the employee could be a preventative measure against communicable diseases.

There is no significant difference between the groups when the responses to the question "what to do in the event of the needle-stick on hand" are compared. The frequency of needle-stick injuries on hand varies from 13.8% to 79.1%, according to the research [5, 10]. For health workers, needle-stick injuries account for 40% of hepatitis B and C infections and 44% of HIV infections. Additionally, 20% of SARS patients in 2013 — one of the acute diseases — were made up of medical personnel [5]. More than 500 000 needle-stick injuries occur annually in the United States, suggesting that health care workers are frequently exposed to different biological risk factors [6]. According to a study conducted by Sencan et al., 58% of workers with injuries like needle sticks have been injured in the same way several times a year [11]. Moving ambulances also increase the risk of injuries like needlesticks [10]. To reduce the hazards through occupational trainings may be helpful in circumstances like needle-stick injuries.

Although there was no significant difference between the groups in terms of the rate of providing correct answers to the question “What to do during the contact of mucous membranes with infective material?”, it was higher in paramedics with 74.3%. According to a study, 30.9% of pre-hospital emergency medical care workers had blood or mucous in their eyes while performing their job [10].
According to our study, less than 50% of respondents correctly answered the question about sanitizing the instruments and equipment in the ambulance. The Ministry of Health provides guidelines on how to clean the Emergency Medical Station ambulance and any equipment used in it following a case, as well as what cleaning supplies and disinfectants to use [12]. 51% of healthcare professionals suffer hand abrasions, according to a study conducted by Sencan et al. The same study indicated that 72.7% of emergency healthcare professionals were exposed to blood and infectious material [11]. The Occupational Health and Safety Law was known to 55.8% of the participants. According to 59.7% of participants in the study conducted by Çelikkalp et al., occupational health and safety apply to all employees [5]. There is no doubt about the lack of education in this area. In our study, the proportion of participants who felt the long night shift hours were a source of stress was much higher in the group of doctors than in the other employees. In a study conducted by Okutan and Tengilimoglu, it was found that long night shift hours are a moderately important source of stress [13].

The percentage of those who considered the misfit night shift coworker was 67.2% (279); this rate was highest (82,5%) for EMTs when the subgroups were evaluated. In a study by Önder et al., 21.2% of the participants reported that they had psychological issues as a result of their interactions with their colleagues [7]. Among the problems that stressed out the participants, the risk of being exposed to violence was at the forefront. Although there was no statistically significant difference between the groups, EMT's see the risk of being exposed to violence as the highest cause of stress. In the study conducted by Gülen et al., the rate of verbal violence of employees by people was 94.9%, the rate of physical violence by relatives of patients was 39.8%, and the rate of violence by relatives of patients was 18.4% [10]. Compared to other professional groupings, healthcare personnel experience violence 16 times more frequently [14]. Both employee discontent and organizational structure are

significantly impacted by workplace violence and the fear of violence. Violence in healthcare facilities is a long-standing psychosocial issue. Although violence was first disregarded, it has become more significant due to works on workplace safety and other developments [15, 16].

Limitations

The study is limited by the fact that it was only carried out in one location.

Conclusion

The majority of respondents willingly chose the profession. Most frequently, ergonomic issues are considered to be risk factors for employment. The risk of exposure to violence and the misfit night shift coworker are other risk factors. Employees deal with stress by using inculcation and patience strategies. The HBV vaccine is the one that is recommended the most frequently among the necessary vaccinations. Long night shift hours and a misfit night shift coworker are sources of high stress for doctors and emergency medical technicians (EMT), respectively.

Conflict of Interest: The authors have not disclosed conflicts of interest.

Author Contributions		Author Initials
SCD	Study Conception and Design	FK, AFO, RG, MK
AD	Acquisition of Data	FK, AFO, RG
AID	Analysis and Interpretation of Data	FK, AFO, MK
DM	Drafting of Manuscript	FK, AFO, MK
CR	Critical Revision	FK, AFO, RG

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References

1. Aslan S, Guzel S. Pre-hospital emergency health services in Turkey. J Soc Humanities Sci Res 2018;5(31):4995-2. http://dx.doi.org/10.26450/jshsr.856
2. Yildirim SA, Gerdan S. Occupational risks of pre-hospital emergency medicine workers in the context of occupational health and safety. Pre-Hospital J 2017;2(1):37-50. Available at: https://dergipark.org.tr/en/pub/hod/issue/58618/797514 (Access Date: July 26, 2022)
3. Bulut A. [Determination of OHS Risks and OHS Guideline for 112 Emergency Ambulances] (in Turkish). Ministry of the Labour and Social Security, Directorate General of Occupational Health and Safety. Ankara; 2016. Available at: http://nek.istanbul.edu.tr:4444/ekos/TEZ/57103.pdf (Access Date: July 26, 2022)
4. US Bureau of labor statistics (2018). Survey of occupational injuries & illnesses charts package. Available at: https://www.bls.gov/iif/soii-charts-2018.pdf/ (Access Date: May 20, 2020)
5. Celikkalp U, Saracoglu G, Tokuc B. Increase of knowledge level of nursing students about occupational health and safety. Namik Kemal Med J 2017;5(1):36–43. https://doi.org/10.19127/mbsjohs.625203
6. Bilir N. Occupational Health and Safety. 1st Edi. Ankara: Gunes Tip Kitabevleri; 2014.
7. Onder OR, Agirlas I, Yasar GY, Aksoy A. [evaluation of physicians and nurses working in Ankara Numune Education and Research Hospital in terms of work accidents and occupational diseases] (In Turkish). Ankara J Health Serv 2011;10(1): 31-44. Available at: https://dergipark.org.tr/tr/pub/ashd/issue/40350/482204 (Access Date: July 26, 2022)
8. Altiok M, Kuyurtar F, Karacoglu S, Ersoz G, Erdogan S. [Healthcare workers experiences with sharps and needlestick injuries and precautions they took when injuring] (In Turkish). Maltepe Univ Nurse Sci Art J 2009;2(2):70-9. Available at: https://www.researchgate.net/profile/Erdogan_Semra/publication/239601046_Saglik_Calisanlarinin_Delici_Kesici_Aletlerle_Yaralanma_Deneyimleri_ve_Yaralanmaya_Yonelik_Alinan_Onlemler/links/54d90bb10cf24647581d5493.pdf (Access Date: July 26, 2022)
9. CDC. Recommended vaccines for healthcare workers. Available at: https://www.cdc.gov/vaccines/adults/rec-vac/hcw.html/ (Access Date: July 26, 2022)
10. Gulen B, Serinken M, Hatipoglu C, Ozasir D, Sonmez E, Kaya G, et al. Work-related injuries sustained by emergency medical technicians and paramedics in Turkey. Turk J Trauma Emergency Surg 2016;22(2):145-9. https://doi.org/10.5505/tjtes.2015.94224
11. Sencan I, Sahin I, Yildirim M, Yesildal N. Unrecognized abrasions and occupational exposures to blood-borne pathogens among health care workers in Turkey. Occup Med 2004;54(3):202-6. doi.org/10.1093/occmed/kqh048
12. Ambulance and medical equipment cleaning and disinfection instruction (in Turkish). The Ministry of Health-Turkey. Available at: https://acilafet.saglik.gov.tr/Eklenti/2610/0/ambulanstakibi-malzeme-temizlik-dezenfeksiyonupdf.pdf (Access Date: July 26, 2022)
13. Okutan M, Tengilimoglu D. [Stress in the work environment and methods of coping with stress: a case study] (in Turkish). J Ankara Haci Bayram Veli Univ Fac Econ Admin Sci 2002;(4)3:15-42. Available at: https://dergipark.org.tr/tr/pub/gaziuiibfd/issue/28347/301329 (Access Date: July 29, 2022)
14. Guidelines for preventing workplace violence for healthcare and social service workers. Available at: https://www.osha.gov/sites/default/files/publications/osha3148.pdf. (Access Date: May 17, 2020)
15. Turan P, Turan M, Tacgin E. [Work accidents of healthcare professionals: violence] (in Turkish). Turk J Occup Health Saf 2017;16:60-61. Available at: http://ttb.org.tr/msg/images/files/dergi/60-61/60-61.pdf (Access Date: July 28, 2022)
16. Akgun, S. [Work accidents in health sector] (in Turkish). Health Care Acad J 2015;2(2):67-5. Available at: https://dergipark.org.tr/en/pub/sagakaderg/issue/46750/586379 (Access Date: July 28, 2022)