Original Article

Occupational Health Problems of Nurses Working at Emergency Departments

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Abstract

Background: Emergency departments, where individuals under extreme stress are served and frequent deaths, life threatening accidents, and critical cases are observed, are evaluated as settings with high occupational stress.
Aim: This study was conducted to determine common occupational health problems of nurses working at emergency departments in Gaziantep/Turkey.
Method: This was a descriptive cross-sectional study. The sample of the study consisted of 111 nurses who were voluntary to participate in the study. The data of this study were collected through face-to-face interview technique by using personal information and questionnaire form that was prepared by the researchers upon the literature review.
Results: The nurses stated that they were most commonly stuck by a needle (83.8%) and noise (54.1%); whereas, they stated that the most common psychological factor faced by them was verbal abuse by patients and/or patient relatives (81.1%), the most common chemical factor faced by them was being subjected to disinfectants (64.0%), and the most common biological factor faced by them was being subjected to viral infections (48.6%). More than half of the nurses (64.9%) had complaints of waist and back aches. It was determined that the nurses who were working at emergency departments for 1-3 years experienced more problems of discal hernia in a statistically significant manner (50.0%) ($p<0.05$).
Conclusions: It was determined that nurses working at emergency department faced with occupational factors and risks during work and experienced many health problems related to these factors and risks.

Key Words: Occupational health problems, emergency department, nurse, occupational factors, environment

Introduction

Working life provides a certain role, status, and economic power to individuals within the society. However, working life not only brings advantages but also causes both physiologically and psychologically occupational problems (Healy & Tyrrell, 2011). Employed people experience various physiological, physical, and psychological health problems due to the tasks they have to keep on repeating (Buker, Aslan, Altug & Cavlak, 2006).

Possibility of healthcare personnel to encounter occupational risks varies according to their profession, job, and the department they work at

(Mollaoglu, Fertelli & Tuncay, 2011). Nursing is accepted as a stressful profession with work overload due to several negative factors (overwork, overtime and long working hours, role conflict and ambiguity, problems with shift work etc.) arising from work circumstances in Turkey (Kebapci & Akyolcu, 2011). Nurses, as one of the professional service groups, tend to be exposed to extreme workloads (Liu, Pan, Chen & Lin, 2010). Since nurses spend more time in direct contact with the patients and they are responsible for care of the patients, they are more likely to encounter health risks compared to other health personnel (Moustaka & Constantinidis, 2010; Aras & Uskun, 2015). Nurses may also have numerous health problems resulting from work environment and conditions such as work overload, long working hours, overtime, violence in the work place, microorganisms, ionised radiation, being exposed to medications and anaesthetics, and penetrating stab wounds (Khamisa, Oldenburg, Peltzer & Ilic, 2015; Terry, Le, Nguyen & Hoang, 2015; Tan, Polat & Sahin, 2012; Ugurlu, Yilmaz & Karacak, 2010).

Emergency departments, where individuals under intense stress are served and frequent deaths, life threatening accidents, and critical cases are observed, are evaluated as settings with high occupational stress (Healy & Tyrrell, 2011; Stathopoulou, Karanikola, Panagiotopoulou & Papathanassoglou, 2011). Hence, emergency department staff encounter the highest stress among all health professionals (Potter, 2006). Therefore, especially emergency department nurses have more problems due to several reasons such as busy schedule, giving care for many patients simultaneously, unexpected sudden deaths, giving care for an seriously or deadly ill person within limited time and intensity, and noisier and crowded work environment of emergency department (Annagur, 2010; Robinson, Jagim & Ray, 2004). These occupational health problems include ones such as stab wounds, musculoskeletal system problems related to transfer of patient and positioning patient in the bed or being exposed to violence by patients and their relatives (Castro, Cabrera, Gee, Fujishiro & Tagalog, 2009; Sorour & El-Maksoud, 2012). All these problems cause to decrease productivity by affecting the service quality of nurses and lead to affect quality of life negatively (Stathopoulou et al., 2011). Thus, it is important to evaluate emergency department nurses' health problems resulting from their work environment and working conditions.

Previous studies focused mostly on stress and exposure to violence of emergency department nurses (Liu et al., 2010; Talas, Kocaoz & Akguc, 2011). In addition, there have been a limited number of studies examining the occupational health problems of nurses (Healy & Tyrrell, 2011; Sorour & El-Maksoud, 2012). On the other hand, in Turkey, the number of studies examining occupational health problems of nurses is very limited (Curcani & Tan 2009; Kesgin & Kublay, 2011). Furthermore, there is no study that examines common occupational health problems of emergency department nurses who work in a much more crowded and intense environment in Turkey. Hence, the aim of this study was to determine common occupational health problems of the nurses working at emergency departments in Gaziantep (a metropolitan city of Turkey).

Materials and Methods

Design and Sample

This descriptive cross-sectional study was planned to determine common and occupational health problems of nurses working at emergency departments of all hospitals in Gaziantep in Turkey. The sample of the study consisted of 111 nurses who were working at emergency departments and were voluntary to participate in the study during January-June 2013. The population of the study consisted of 177 nurses working at emergency departments of four public hospitals, one university hospital and seven private hospitals located in Gaziantep/Turkey. The sample constituted 62.7% of the population.

Instruments

The data of this study were collected using the questionnaire prepared by the researchers upon the literature review (Talas et al., 2011; Healy & Tyrrell, 2011; Sorour & El-Maksoud, 2012). The questionnaire consisted of two parts. The first part of this form had a total of 9 items including socio-demographic characteristics such as age, marital status, educational background, and working hours of nurses, as well as mean number of patients they provided care in a day. The second part included 15 questions which assessed occupational factors (physical, psychological, chemical, and biological) nurses encounter during care practices, health problems

experienced depending on these occupational factors and job and harmful or harmless habits (consuming excessive amounts of tea, coffee and alcohol, habit of excessive smoking etc.) they acquire due to these health problems. The questions were not likert-type questions. Therefore, cronbach alpha was not stated. One of the questions asked in this section was as follows: "What are chemical factors we encounter during care practices?" (İt is possible to mark more than one options) 1) Disinfectants, 2) Antiseptics, 3) Chemotherapeutic agents, 4) Anaesthetic substances, 5) Other, 6) I did not encounter any factor. Other questions were asked in a similar manner.

Validity and reliability study of the questionnaire was not performed. However, before the questionnaire began, questions which were asked to 10 nurses and were not understood were corrected and expert opinions were taken while preparing the questionnaire. The questionnaire was administered by using the face-to-face interview method after the nurses were briefly informed about the study and the questionnaire and their consents were obtained. It took approximately 8-10 minutes to complete the questionnaire.

Ethical Considerations

This study was approved by the institutional review board. The purpose and procedures of the study were explained to the director for approval at each hospital. All participants were informed that they were free to not participate and withdraw from the study at any time without prejudice. It was also explained that information would be collected anonymously and data would be presented as mean values rather than individual values. The participants were informed about the purposes and procedures of the study and then allowed to decide upon participation. Informed consent was obtained from all of those who agreed to participate.

Data Analyses

In order to evaluate the data, statistical analyses were carried out by using the Statistical Program for Social Sciences (SPSS) version 15.0 for Windows (SPSS Inc., Chicago, IL, USA). Numbers, Percentage, and Chi-square analysis were used to analyse the data. The results were considered to be significant when p value was less than 0.05.

Results

The mean age of the nurses, who participated in the study, was 28.15±6.06 years and 36.9% were in the age group of 18-25 years; all participants were female, 53.2% were married, 43.2% were graduates of medical vocational high schools, and 51.4% were working for 1-5 years. 68.5% of the nurses were working at emergency department for 1-3 years, 46.8% were working in shifts and 76.9% of the nurses who were working in shifts had 3 shifts per week and 42.3% stated that they provided care to 100 patients or less per day (Table 1).

Table 2 shows the occupational factors of the nurses while carrying out patient care practices. The nurses stated that the most common physical factor encountered by them was noise (54.1%); whereas, they stated that the most common psychological factors encountered by them was verbal abuse by patients and/or their relatives (81.1%), the most common chemical factor encountered by them was being subjected to disinfectants (64.0%) and the most common biological factor encountered by them was being subjected to viral infections (48.6%). When health problems experienced by the nurses during patient care practices due to occupational factors were examined, the most common problems encountered by them due to physical factors were varicosis at the rate of 45.9% and migraine at the rate of 36.9% and the most common problems encountered by them due to biological factors was stuck by a needle at the rate of 83.8%. The nurses stated that the most common problems encountered by them due to psychological factors were stress and anxiety, sleeplessness, motivation disorder (76.6%, 45.9%, 44.1%, respectively); the most common problems encountered by them due to chemical factors were allergies at the rate of 39.6% and eczema at the rate of 25.2%. More than half of the nurses (64.9%) had complaints of waist and back aches in the other health problems (Table 3).It was determined that 34.2% of the nurses gained habits of consuming excessive amounts of tea and coffee, 22.5% gained the habit of excessive smoking, 15.3% had to use drugs continuously due to treatment, and 3.6% gained the habit of consuming excessive amounts of alcohol.

Table 1. Socio-demographic characteristics

	(n)	(%)
Marital status		
Married	59	53.2
Single	52	46.8
Age Groups (years)		
18-25	41	36.9
26-30	35	31.5
31 and above	35	31.5
Graduated from		
Vocational school of health	48	43.2
Associate degree	20	18.0
Bachelor's degree	37	33.3
Master's degree	6	5.4
Working shifts		
Only morning shifts (8a.m.-4p.m.)	23	20.7
Sometimes morning and sometimes night shifts (8a.m.-8p.m. or 8p.m.-8a.m.)	36	32.4
Always evening or night shifts (4p.m.-8a.m.)	52	46.8
Shift frequency (n=52)		
2 shifts per week	9	17.3
3 shifts per week	40	76.9
4 shifts per week	3	5.8
Duration of work		
1 to 5 years	57	51.4
6 to 10 years	34	30.6
11 years and longer	20	18.0
Time in ED*		
1 to 3 years	76	68.5
4 to 6 years	24	21.6
7 years and longer	11	9.9
Number of patients cared per day in ED		
100 patients and under	47	42.3
101-500 patients	39	35.1
501 patients and above	25	22.5

*ED=Emergency department

Table 2. Occupational factors that nurses face during patient care applications

	(n)	(%)
Physical factors		
Noise	60	54.1
Extreme cold	20	18.0
Extreme hot	9	8.1
N/A	11	9.9
Biological factors		
Viral infections	54	48.6
Fungus infections	20	18.0
Vector contact	7	6.3
N/A	48	43.2
Psychological factors		
Violence of patient and/or patient relatives (verbal violence)	90	81.1
Conflict with other health professionals	37	33.3
Colleague conflict/colleague violence	26	23.4
Conflict with management	31	27.9
Chemical factors		
Disinfectants	71	64.0
Antiseptics	53	47.7
Chemotherapeutic agents	8	7.2
Anesthetic substances	8	7.2
N/A	34	30.6

*Nurses reported more than one answer

Table 3. Health problems that nurses face due to occupational factors

	(n)	(%)
Health problems due to physical factors		
Varicosis	51	45.9
Hemorrhoid	16	14.4
Migraine/head ache	41	36.9
N/A	17	15.3
Health problems due to biological factors		
Stuck by a needle	93	83.8
Health problems due to psychological factors		
Stress and anxiety	85	76.6
Sleeplessness	51	45.9
Malnutrition	17	15.3
Less concentration	24	21.6
Less motivation	49	44.1
N/A	12	10.8
Health problems due to chemical factors		
Eczema	28	25.2
Chronic dermatitis	22	19.8
Allergies	44	39.6
N/A	51	45.9
Other health problems		
Cuts and injuries (hand, finger etc.)	44	39.6
Jamming and crushes	22	19.8
Waist and back ache	72	64.9
Joint ache	50	45.0
Weariness	71	64.0
Discal hernia	22	19.8
Burns	5	4.5
Soft tissue trauma	13	11.7
N/A	18	16.2

*Nurses reported more than one answer

Table 4. Comparison of the socio-demographic and work properties of nurses with occupational health problems

	Waist and back ache		Discal hernia		Stuck by a needle		Allergies		Sleeplessness	
	n (%)	p	n (%)	p	n (%)	p	n (%)	p	n (%)	p
Age Groups (years)										
18-25	23 (31.9)		3 (13.6)		35 (37.6)		12 (27.3)		23 (45.1)	
26-30	24 (33.3)	0.324	4 (18.2)	0.001	32 (34.4)	0.142	11 (25.0)	0.012	19 (37.3)	0.015
31 and above	25 (34.7)		15 (68.2)		26 (28.0)		21 (47.7)		9 (17.6)	
Marital status										
Married	43 (59.7)		17 (77.3)		49 (52.7)		29 (65.9)		26 (51.0)	
Single	29 (40.3)	0.059	5 (22.7)	0.013	44 (47.3)	0.823	15 (34.1)	0.029	25 (49.0)	0.672
Work duration										
1 to 5 years	34 (47.2)		4 (18.2)		52 (55.9)		17 (38.6)		33 (64.7)	
6 to 10 years	23 (31.9)		8 (36.4)		27 (29.0)		17 (38.6)		15 (29.4)	
11 years and longer	15 (20.8)	0.428	10 (45.5)	0.001	14 (15.1)	0.061	10 (22.7)	0.095	3 (5.9)	0.004
Time in ED*										
1 to 3 years	46 (63.9)		11 (50.0)		64 (68.8)		25 (56.8)		39 (76.5)	
4 to 6 years	17 (23.6)		4 (18.2)		20 (21.5)		14 (31.8)		10 (19.6)	
7 years and longer	9 (12.5)	0.303	7 (31.8)	0.001	9 (9.7)	0.978	5 (11.4)	0.078	2 (3.9)	0.107
Working shifts										
Morning shifts	20 (27.8)		12 (54.5)		18 (19.4)		14 (31.8)		7 (13.7)	
Morning and night shifts	16 (22.2)		3 (13.6)		30 (32.2)		11 (25.0)		15 (29.4)	
Evening or night shifts	36 (50.0)	0.003	7 (31.8)	0.001	45 (48.4)	0.666	19 (43.2)	0.055	29 (56.9)	0.105

*ED=Emergency department

Discussion

Many studies have determined that healthcare personnel have physical (waist, extremity, and back aches, noise, etc.), chemical (disinfectants, antiseptics, etc.), biological (viruses, fungi, etc.), and psychological (stress etc.) injuries or undergo occupational accidents (Clarke et al., 2007; Terry et al., 2015).

The studies have stated that injuries and diseases are important problems among nurses (Tabak, Shiaabana & Shasha, 2006; Clarke, Schubert & Korner, 2007). It was determined in this study that the most common problems experienced by nurses among physical factors was being subjected to noise. One of recommendations regarding hospital areas is that the noise level should not exceed 55 dB. Levels above this value are considered uncomfortable and can cause extra-auditory effects in the body in general (Filus, de Lacerda & Albizu, 2015). Studies being conducted in the United States and measuring noise levels in ED have demonstrated average noise levels between 50 and 60 dB, and 60-65 dB, with individual peaks of 94-117 dB occurring every minute (Short, Short, Holdgate, Ahern & Morris, 2011). Noise in ED may be perceived to be high by both patients and nurses (Graneto & Damm, 2013). Similar studies have also revealed that nurses are mostly exposed to noise in the work environment among physical factors. While Incesesli (2005) determined that nurses were mostly exposed to noise at work environment at the rate of 52.5%, Curcani & Tan (2009) stated that nurses were exposed to noise at the rate of 36.2%.

It was determined in this study that among biological factors, the nurses were exposed to viral infections at most. In the study of Incesesli (2005), it was found that nurses were mostly exposed to bacteria (73.8%), virus (67.3%), and fungi (55.5%) in work environment and those encountering these three agents at most were staff working at emergency unit. In their study, Curcani & Tan (2009) determined that infection risk was the highest (97.9%) among biological risk factors caused by work environment while nurses were implementing their profession. Again in the same study, it was stated that 76.6% of the nurses were exposed to penetrating stab wounds (Curcani & Tan, 2009). Kilic et al. (2008) stated that nurses were exposed to penetrating stab wounds at the highest rate in work environment. It was stated that the occupational blood exposure rate was very high in nurses and 4.27 times more compared to doctors and this was most commonly seen as being stuck by a needle during injection practice (Ramsay, Denny, Szirotnyak, Thomas, Corneliuson & Paxton 2006). Previous studies revealed that injuries due to being stuck by contaminated needles were most frequently seen among nurses and most of these accidents were preventable (Leight et al. 2007). It was found in another study that the frequency of being stuck by a needle was the highest in the dialysis unit, intensive care unit, and emergency department (50.0%, 45.0%, and 38.3% respectively) (Bilski, 2005). In the study of Inceseli (2005), it was revealed that wounds induced by lancet, scissors, and glass were experienced at emergency department at the rate of 100.0%. Even though the results were statistically insignificant, it was determined in this study that the nurses in the younger age groups who had an experience of a few years and were working at night shifts were subjected to being stuck by a needle more compared to the others. This result made us think that in addition to carelessness caused by sleeplessness associated with lack of occupational experience, the burn-out leads to the problem of being stuck by a needle more compared to others. In a study, it was estimated that the risk of needle stick and sharps injuries (NSIs) among nurses younger than the average (27 years) was 3.1 to 4.5 times higher than for nurses who were older than average (Smith, Choe, Jeong, Jeon, Chae & An, 2006). It was found in another study that more than 80% of NSIs occurred among nurses aged 25 years or younger (Zhang, Gu, Cui, Stallones & Xiang, 2015).

In this study, the nurses were determined to face verbal violence by the patients and/or their relatives at the most among the psychological factors. In a study, it was stated that 60.3% of the nurses were exposed to violence many times and mostly exposed to arguments as verbal violence (Demir, 2014). Yilmaz et al. (2006) specified that 46.6% of the nurses were exposed to verbal violence, 1.2% were exposed to physical violence and 40% of this violence were committed by patient relatives. It was found in a study conducted in Turkey that 88.6% of the emergency department staff were subjected to verbal violence; whereas, 49.4% were exposed to

physical violence (Boz et al., 2006). Emergency departments are settings where violence incidents occur at the highest (James, Madeley & Dove, 2006; Talas, Kocaoz & Akguc, 2011) and nursing staff are primary targets of violence at the ED (Ramsay et al. 2006). While Incesesli (2005) stated that those exposed to traumas induced by patients and their relatives at most were emergency department staff with the rate of 46.2%, Demir (2014) stated that emergency departments were the second setting, where violence was exposed at most, with rate of 67.7% after haemodialysis and outpatient clinics (86.2%). It is also emphasised that excessive crowds at emergency departments are a factor that limits the timely intervention of healthcare professionals to critically ill patients (Hwang & Chang, 2010). It is stated that the main reason for violence at the workplace is colleagues (including doctors and other nurses) (Castro et al., 2009); relatives of patients commit violence on healthcare professionals as much as patients (Ayranci, Yenilmez, Balci & Kaptanoglu, 2006); and verbal violence is more frequent and dangerous than physical violence (Chappell & Martino, 2006). The fact that those working at emergency department were generally persons who were in the first years of the occupation and had less experience was revealed to increase the risk of being exposed to violence (Lau, Magarey & McCutcheon, 2004).

Various chemical risks such as hazardous medicines used during patient care and treatment, latex, several detergents used for sterilisation and disinfection, formaldehyde, glutaraldehyde, and ethylene oxide used in gas sterilisation are encountered (Ramsay et al., 2006; Meydanlioglu, 2013). In the study of Incesesli (2005), it was stated that those working at emergency department used antiseptic substances at the rate of 46.2% and disinfectant substances at the rate of 53.8%. Again in the same study, it was found that nurses experienced dermatitis at the rate of 9.1% and allergy problem at the rate of 1.9% depending on chemical substances (Incesesli, 2005). In this study, the nurses stated that among chemical factors, they were most commonly subjected to disinfectants and faced allergy problems due to chemical factors. Curcani & Tan (2009) stated that 63.8% of nurses were exposed to allergic substance. The effects of chemical factors are dependent on the intensity of the substance, duration of exposure, type of exposure, and the properties of the chemical (Parlar, 2008). Indeed, the fact that the high rate of allergy problems in nurses having an experience of 31 years and above supports this information. In addition, this situation can be explained by the high amount of chemical exposure due to high patient circulation and more frequent treatment practices at emergency department.

In this study, it was determined that nurses experienced work-related stress and anxiety at the most among the occupational health problems. Emergency departments are particularly stressful work environments, and emergency department staff must cope with acute or chronic stressors, often on a daily basis (Healy & Tyrrell, 2011). It is stated that nurses experience more stress (Moustaka & Constantinidis, 2010) and emergency departments cause more stress and tension due to the high work load, care given to severe and deadly ill patients, obligation to make fast decisions and move rapidly, violence, and crowds (Kebapci & Akyolcu, 2011).

It was determined in this study that the other health problems mostly experienced by the nurses among the occupational health problems were waist/back ache. In several studies, the most common physical problem is the backache among health professionals (Curcani & Tan, 2009; Bos, Krol, Star & Groothoff, 2007). According to the study including all health personnel in Germany, it was stated that musculoskeletal diseases (52.0%) were among the most common problems due to the work risks (Hasselhorn & Lagerstrom, 1999). In numerous studies examining occupational health problems of the nurses, it was reported that musculoskeletal system problems were seen commonly (Sorour & El-Maksoud, 2012). Musculoskeletal problems were reported to be caused by reasons such as intensive and heavy physical working, staying up for a long time, inadequate resting intervals, carrying, pulling and pushing occupational devices during work, lifting weight, and frequently bending forward (Kesgin & Kublay, 2011; Buker et al., 2006). Castro et al. (2009) stated that 78.2% of nurses experienced backache and 53% continued working despite the pain. Hooper et al. (2010) determined in their studies that 86% of emergency department nurses in particular suffer from mild or high tiredness. In the study of

Incesesli (2005), it was found that nurses having complaint of waist ache were observed in the operating room at most with rate of 100.0% and at emergency unit with rate of 92.3%; whereas, nurses having complaint of backache were mostly observed at emergency unit with 84.6%.

In a study conducted by doctors; age, ergonomics, and level of psychological stress were found to be the most effective factors in the development of musculoskeletal system problems. When comparing physicians with musculoskeletal system problems and without musculoskeletal system problems; mean of age and working year were determined to be significantly in physicians with musculoskeletal problems (Dilek et al., 2016). It was found in this study that nurses who were 31 years old and over, and working for 11 years and longer had waist/back ache and discal hernia problems at higher rates. It is not surprising that working for a long time in nursing which is an intensive and tiring profession, and maintaining this profession at emergency service with heavy workload cause musculoskeletal problems. Besides, the fact that most of the nurses at this age group were married and there are home and family-related responsibilities brought by the marriage indicated discal hernia and waist/back ache were experienced at higher rate.

It was determined in this study that the nurses consumed excessive amounts of tea and coffee and smoke cigarettes due to occupational health problems. Similarly, Burke determined in a study that malnutrition and increased consumption of cigarettes and alcohol were more common especially in nurses who experienced occupational stress (Burke, 2006).

Limitations of the study

This study has various limitations. The first limitation was that this study was conducted only on nurses working at emergency departments of all hospitals located in one city of Turkey and the differences between the hospitals were not examined. This limits the ability to generalise these results to nurses in Turkey. The second limitation was that only occupational health problems mentioned by nurses themselves were evaluated. In addition, health problems caused by factors not associated with the work environment have not been questioned by thinking that they might be related to the past of the individuals and individual factors may create a conflicting effect.

Conclusion

It was determined in this study that occupational factors emergency department nurses faced in their working lives were; noise, verbal violence by patients and/or their relatives, exposure to disinfectants, and needle stick. Nurses stated that health problems they experienced at the most depending on occupational factors and job were waist and back ache, stress, and sleeplessness.

In line with these results, it can be suggested to determine the factors associated with the working environment of emergency department nurses and correct the working conditions that might have negative effects and increase security measures against the infliction of violence. In addition, in-service training programs should be carried out to protect the nurses from these risks and consultancy service organizations should be arranged against violence. It is thought that such practices will increase health and well-being of nurses, thereby contributing to the increase of patient care quality. We hope that the results of this study would raise awareness especially in the nurse management at emergency departments of hospitals to enhance the working conditions and take the necessary precautions. To this end, it can be suggested to conduct future studies that evaluate potential attempts to enhance the health conditions of nurses and encourage qualified patient care.

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