Annals of Clinical and Analytical Medicine

Prevalence and Risk Factors of Occupational Injuries among Emergency Health Service Providers

Suliman Mohammed Zayed Al Balhareth (1) *, Hadi Ali Bin Hadi Almansour (1), Ali Mohammed Faris Al monajam (1), Rakan Hamad Bin Rakan Alsharif (1), Mohammed Faris Abdullah Almansour (1), Saeed Hamad Saleh Al Yami (1), Shaeel Mahdi Fares Al Yami (1), Mohammed Hussain Saleh Al Yami (1), Mesfer Ali Mesfer Al Hutaylah (2), Fahad Hamad Hussain Al Zubayd (3)

(1) Emergency Medical Services, Aba Al-saud Health Center, Najran.
(2) Nursing, Aba Al-saud Health Center, Najran.
(3) Emergency Medical Services, Dhadha Health Center, Najran.

Received 17/10/2022; Revised 15/11/2022; Accepted 18/12/2022

****Corresponding author***

Abstract

Introduction: There are limited number of studies focused on the occupational health of Emergency medical health services providers in Saudi Arabia. Moreover, studied conducted in Saudi Arabia focused on either subgroup of health workers such as nurses or assessed certain type of occupational injuries. Thus, we aim to assess comprehensively the prevalence and determinants of work-related injuries among all health workers.

Methods: This is a cross-sectional study aimed to assess the prevalence and determinants of work-related injuries among health workers in governmental hospitals in Najran. Emergency medical health services providers who work in governmental hospitals located in Najran. The number of participants required to estimate the prevalence of occupational injuries is calculated to be 282 health service providers. A structured online questionnaire was sent to emergency staff in order to collect data about study variables. The validated version of a questionnaire was obtained with Cronbach's alpha >0.80 for occupational hazards assessment.

Results: The total number of recruited Emergency medical health services providers in this study was 282, all the respondents were males. A half of all Emergency medical health services providers were distributed equally on medical and surgical wards as their current working department. About 98% of the Emergency medical health services providers reported the availability of protocol and safety guidelines for reporting the work injuries in their hospital. About 93% of the Emergency medical health services providers know about the work safe devices and 88% always use work safe devices. This study reported a lifetime occurrence of occupational injuries among Emergency medical health services providers to be 37.6%. The most common reason of this delay in reporting the injury was that works had not been yet used in a patient, followed by patients had no infectious disease of the concern and being busy at that time in 15% and 11.7%, respectively.

Conclusions: The occurrence of occupational injuries could not be predicted by Emergency medical health services providers' characteristics such as years of experience, educational level, hours of working and number of patients in the duty. Further qualitative researches are recommended to explore the attitudes and opinions of Emergency medical health services providers regarding the prevention of work injuries injury.

Keywords: Work, Injuries, Emergency, Safety, Saudi

Introduction

Provision of safety work climate and safety practices played an important role in reduction of work-related injuries [1-2]. The most important occupational hazards in the hospitals are mainly related to biological infections with blood-borne or body fluid pathogens. COVID-19 and influenza have been a major occupational hazards of health workers [3,4]. Emergency medical health services providers are known as those who provide care for critically ill people either directly as or indirectly as administrative or general service providers. Many health hazards present in the work environment of health workers including biological, chemical, physical, musculoskeletal, work-place violence and psychological hazards. Hence, work environment of health workers should follow strict safety policies, procedures and practices [5].

Physical hazards are quite common in the hospital environment, as a considerable proportion of work injuries are due to falls, electrical shocks, imaging radiation, heat or fire, noise, poor lightening, and inadequate ventilation. Moreover, laser radiation was responsible for eye lesions among 73% of health workers who deal with laser-induced procedures [8]. Several chemical hazards are present in the hospital including anti-microbial agents, anti-septic products, formaldehyde, detergents and solvents. Recently, more attention has been given to the psychological hazards such as burnout, stress, anxiety, and depression. About 59% of the health workers who had burnout were diagnosed to be anxious and about 58% of them were considered to have an affective disorders such as depression [9].There are limited number of studies focused on the occupational health of Emergency medical health services providers in Saudi Arabia. Moreover, studied conducted in Saudi Arabia focused on either subgroup of health workers such as nurses or assessed certain type of occupational injuries [5-7]. Thus, we aim to assess comprehensively the prevalence and determinants of work-related injuries among all health workers.

Methods

This is a cross-sectional study aimed to assess the prevalence and determinants of work-related injuries among health workers in governmental hospitals in Najran. Emergency medical health services providers who work in governmental hospitals located in Najran, during the proposed study period were our target population, from which the sample were selected. There is no study estimated the overall prevalence of occupational injuries among health workers in Saudi Arabia, however, prevalence for certain injuries was reported. About 35% of health workers were exposed to work-stick injury in Northern region [14]. The pooled prevalence of low back pain was 40.8% among health workers in Saudi Arabia [6]. Due to inclusion of many types of occupational injuries in our study, we chose to use 50% proportion as an expected prevalence of occupational injury. Because when we use 50% expected proportion in the equation, it yields the largest sample size. The number of participants required to estimate the prevalence of occupational injuries is calculated to be 282 health service providers. A structured online questionnaire was sent to emergency staff in order to collect data about study variables. The validated version of a questionnaire was obtained with Cronbach's alpha >0.80 for occupational hazards assessment [11].

The questionnaire is self-administered and consists of three sections, section A contains questions about sociodemographic and workplace-related factors of the healthcare workers. Section B contains question about prevalence and frequency of work injuries. Section C contains questions related to different types of occupational hazards. Data were entered and analyzed by Statistical Package of Social Science SPSS, version 26. The descriptive statistics such as frequencies, percentages were calculated to summarize nominal and ordinal data, while mean, median and standard deviation or the range to describe numerical variables. Chi-squared test was applied to evaluate the association between the determinants and the outcome variables, while the means of work injury.

Occupational hazards scores were compared using T-test among subgroups. Regression analysis was performed to identify significant predictors of occupational hazards. Any P-value < 0.05 was considered as an indication for a statistically significant association or difference.

Results

The total number of recruited Emergency medical health services providers in this study was 282, , all the respondents were males. A half of all Emergency medical health services providers were distributed equally on medical and surgical wards as their current working department. The majority of the Emergency medical health services providers were married (62.8%) and 61.3% of them have bachelor degree in nursing (table 1). About 91% of the Emergency medical health services providers work in shifts of 8-9 hours per day, while only 3.2% work for 12 hours. When Emergency medical health services providers asked How many patients do you care for during duty time? 79.8% of them take care of 10 patients or less per duty time, while only 14.5% said they take care of more than 10 patients.

Regarding the safety standards available at work place, the Emergency medical health services providers' responses confirmed the high availability of safety measures in their work places. About 98% of the Emergency medical health services providers reported the availability of protocol and safety guidelines for reporting the work injuries in their hospital. Additionally, approximately 93% reported the presence of safety guidelines and work safe devices in their workplaces (table 2). The personal safety precautions were highly followed by the Emergency medical health services providers, since almost all Emergency medical health services providers except 6 of them said they you regularly use personal protective equipment. Regarding safety training they received, about 93% and 89% of them reported they have received training on work injuries safety and prevention and on work safe devices, respectively. About 93% of the Emergency medical health services providers know about the work safe devices and 88% always use work safe devices. This study reported a lifetime occurrence of occupational injuries among Emergency medical health services providers to be 37.6% (CI = 31.9% to 43.3%) with 1.8% have been previously to exposed to occupational injuries more than two times. The syringe work was the most common items caused the recent NSIs among the affected Emergency medical health services providers (78.3%) followed by intravenous catheter and tapping work with prevalence of 11.3 and 7.5%, respectively. The majority of Emergency medical health services providers (56.6%) reported the injury to the department of infection control and 85% of them reported that immediately after the injury, while 3.3% reported the in the following days after the injury. The most common reason of this delay in reporting the injury was that works had not been yet used in a patient, followed by patients had no infectious disease of the concern and being busy at that time in 15% and 11.7%, respectively. About 36% of the injuries occurred in the morning shift and similar percentage occur in the evening shift. Approximately, 46.2% of the injured Emergency medical health services providers did not receive medical care after injury. Figure 2 demonstrates what type of item caused recent occupational injuries among Emergency medical health services providers, while results show reasons for the recent work injuries injury. Only number of working hours per day was significantly associated with occurrence of injuries. Emergency medical health

Table (1): Background characteristics of the Emergency medical health services providers

Characteristics	**Frequency**	**Percent (%)**
Gender		
Female	0	0.0
Male	259	91.8
Marital status		
Married	177	62.8
Single	102	36.2
Widowed	2	.7
Separated	1	.4
Educational level		
Diploma	90	31.9
Graduate (Bachelor)	173	61.3
Others	19	6.7

services providers who works in shifts of 8-9 hours were significantly more injured than those work in shifts of 12 or other hours (p= 0.019). Gender, level of education and working department were not significantly associated with occurrence of work injuries injury.

Discussion

Health workers have an occupational hazard of acquiring blood-transmitted infections, particularly Emergency medical health services providers who are routinely deal with injections, venipunctures and intravenous fluid administration in hospitals, nurseries and sometimes during home care [1]. Among 20 infections transmitted by blood, infections such as HIV or hepatitis B and hepatitis C viruses are the main infections of concern. In 2002, the WHO reported that 2 million health care workers experienced percutaneous exposure for communicable diseases [2]. In the United States, about 600,000 to 800,000 work injuries reported annually and 100,000 in UK [3]. in Germany it was estimated that 500,000 occupational injuries occur every year among health workers [3]. Additionally, contaminated works become a biological hazard for public in many developing countries since no proper disposal is implemented by health authorities [4]. The majority of health workers who subjected to work injuries are Emergency medical health services providers. A study found 65% of work injuries occurred in Emergency medical health services providers [5].

In Malaysia, the highest occurrence of occupational injuries was among Emergency medical health services providers in comparison to other health workers [6]. Abu-Gad and Al-Turki conducted study in Eastern province of Saudi Arabia and found 67.4% of the injured healthcare workers were nurse [7]. The proportion of injured Emergency medical health services providers among all healthcare workers was 45.1% in a surveillance data collected from King Khalid University Hospital, Riyadh, Saudi Arabia [8]. In our study about 98% of the Emergency medical health services providers reported the availability of protocol and safety guidelines for reporting the work injuries in their hospital. Similarly Rampel et al. found

Table (4): Factors related to personal safety precautions

Characteristics	Frequency	Percent
Do you regularly apply standard precautions?		
yes	280	99.3
no	2	.7
Do you regularly use personal protective equipment?		
yes	276	97.9
no	6	2.1
If you use personal protective equipment, how often do you use?		
always	252	89.4
sometimes	29	10.3
occasionally	1	.4
Have you received any form of training on work safety?		
yes	261	92.6
no	21	7.4
Have you ever vaccinated against hepatitis b virus?		
yes	267	94.7
no	15	5.3
Have you exposed to work injuries?		
yes	262	92.9
no	20	7.1
Have you ever exposed to work hazards?		
yes	252	89.4
no	30	10.6
How often do you use exposed to work injury?		
always	249	88.3
sometimes	19	6.7
occasionally	14	5.0

96.5% of Malaysian health workers aware about presence of universal precaution guidelines [6]. Abozead et al. found 62% of Jordanian Emergency medical health services providers aware about universal precaution guidelines [9-11]. In the present study approximately 93% reported the presence of safety guidelines and work safety devices in their workplaces. Rampel et al. reported that only 52.5% of health workers aware about work safe devices [6]. Abozead et al. found 64% of Jordanian Emergency medical health services providers aware about work safety devices [12-14]. The personal safety

precautions were highly followed by the Emergency medical health services providers, since almost all Emergency medical health services providers except 6 of them said they you regularly use personal protective equipment. Rampal et al. found that compliance with personal safety precautions among health workers were ranged from 66.1% in item "Should works be recapped/bent after use? "to 98.3% in item of "Do you use gloves during phlebotomy?" [15].

The present study reported a lifetime occurrence of occupational injuries among Emergency medical health services providers to be 37.6% (CI = 31.9% to 43.3%) with 1.8% have been previously exposed to occupational injuries more than two times. In contrast, a study among Egyptian Emergency medical health services providers reported 72.9% prevalence of occupational injuries in Zagazig university hospitals. This can be attributed to the educational nature of Zagazig university hospital where usually training of students and general practitioners are practiced [10]. furthermore, a study conducted in Jordon found 75.5% prevalence of occupational injuries among Emergency medical health services providers in both public and private hospitals [9]. A high prevalence of 74% reported by Alam among health workers in Armed Force Hospital, Saudi Arabia [16]. The low prevalence reported in our study can be attributed to the high training among Emergency medical health services providers, since 93% and 89% of them received training on work injuries safety and prevention and on work safe devices. Abozead et al. found only 57% of Emergency medical health services providers attended a training program about infection control, which reflected the reported high prevalence of occupational injuries where 75.5% have experienced the injury [9]. Differently, low prevalence of occupational injuries (29%) was reported among Australian Emergency medical health services providers [17].

Conclusions

The occurrence of occupational injuries could not be predicted by Emergency medical health services providers' characteristics such as years of experience, educational level, hours of working and number of patients in the duty. Training on NSIs prevention and availability of safety guidelines in their work place were the major determinants of the work injuries. Infection control programs should focus in quality of training and provision of works safety guidelines. Further qualitative researches are recommended to explore the attitudes and opinions of Emergency medical health services providers regarding the prevention of work injuries.

Conflict of interests

The authors declared no conflict of interests.

References

1. Gerberding, J.L., Incidence and prevalence of human immunodeficiency virus, hepatitis B virus, hepatitis C virus, and cytomegalovirus among health care personnel at risk for blood exposure: final report from a longitudinal study. Journal of infectious diseases, 1994. 170(6): p. 1410-1417.
2. Prüss-Üstün, A., E. Rapiti, and Y. Hutin, Estimation of the global burden of disease attributable to contaminated sharps injuries among health-care workers. American journal of industrial medicine, 2005. 48(6): p. 482-490.
3. Hofmann, F., N. Kralj, and M. Beie, Work injuries injuries in health care-frequency, causes und preventive strategies. Gesundheitswesen (Bundesverband der Arzte des Offentlichen Gesundheitsdienstes (Germany)), 2002. 64(5): p. 259-266.
4. Patwary, M.A., W.T. O'Hare, and M.H. Sarker, Assessment of occupational and environmental safety associated with medical waste disposal in developing countries: a qualitative approach. Safety science, 2011. 49(8-9): p. 1200-1207.
5. Shah, S.F., et al., The epidemiology of work injuries injuries among health care workers in a newly developed country. Safety science, 2006. 44(5): p. 387-394.
6. Rampal, L., et al., Work injuries and sharps injuries and factors associated among health care workers in a Malaysian hospital. Eur J Soc Sci, 2010. 13(3): p. 354-62.

7. Abu-Gad, H.A. and K.A. Al-Turki, Some epidemiological aspects of work injuries among the hospital health care workers: Eastern Province, Saudi Arabia. European journal of epidemiology, 2001. 17(5): p. 401-407.

8. El-Hazmi, M.M. and F.M. Al-Majid, Work injuries and sharps injuries among health care workers: A 5-year surveillance in a teaching center in Saudi Arabia. 2008.

9. Abozead, S.E.-S., et al., Knowledge and practices of Jordanian nurses on work injuries: An evaluative study. Infectious Diseases in Clinical Practice, 2015. 23(1): p. 21-25.

10. Ahmed, A.S., Work injuries and Sharp Injuries among Nurses at Zagazig University Hospitals, Sharkia Governorate, Egypt.

11. Alam, M., Knowledge, attitude and practices among health care workers on work-stick injuries. Ann Saudi Med, 2002. 22(5-6): p. 396-9.

12. Knight, V.M. and N.J. Bodsworth, Perceptions and practice of universal blood and body fluid precautions by registered nurses at a major Sydney teaching hospital. Journal of Advanced Nursing, 1998. 27(4): p. 746-751.

13. Hashmi, A., S. Al Reesh, and L. Indah, Prevalence of work-stick and sharps injuries among healthcare workers, Najran, Saudi Arabia. Epidemiol, 2012. 2(117): p. 2161-1165.

14. Bekele, T., et al., Factors associated with occupational work injuries and sharps injuries among hospital healthcare workers in Bale Zone, Southeast Ethiopia. PLoS One, 2015. 10(10): p. e0140382.

15. Lee, L.K. and I.N. Hassim, Implication of the prevalence of needle injuries in a general hospital in Malaysia and its risk in clinical practice. Environmental health and preventive medicine, 2005. 10(1): p. 33-41.

16. Gurubacharya, D., K. Mathura, and D. Karki, Knowledge, attitude and practices among health care workers on work-stick injuries. Kathmandu Univ Med J (KUMJ), 2003. 1(2): p. 91-4.

17. Rai, S.K., et al., The health system in Nepal—an introduction. Environmental health and preventive medicine, 2001. 6(1): p. 1-8.


Emerging Sources Citation Index (ESCI)
Clarivate
Analytics
WEB OF SCIENCE
THOMSON
REUTERS