Journal of Community Medicine & Health Care

Open Access

Austin Publishing Group

Research Article

Occupational Hazards among Health Workers in Hospitals of Mukalla City, Yemen

Bin-Ghouth AS[1], Al-Ammary SS[1], Alsheikh GYM[2]*, Alhaddadi AAS[3], Al-broad MSA[3], Alswail AMA[3], Bokura FAAS[3], Al-Hussaini EAS[3], Alriwi SKS[3], Alnagashi MAM[3], Alaodi RAS[3], Maghram BHR[3], Alsharabi OA[3], Basabaa SOM[3], Al-Jarou AJ[3], Bahah HDO[3], Quhaif OKM[3], Humran SKSH[3], Algazi MSA[3], Bin-Merdhah MAB[3], Al-Ammari SAA[3] and Bin-Dohman FMA[3]

[1]Department of Community Medicine, Hadhramout University College of Medicine, Yemen

[2]WHO Collaborating Centre for Public Health Education and Training, Hadhramout University College of Medicine, Yemen

[3]Hadhramout University College of Medicine, Yemen

***Corresponding author:** Alsheikh GYM, WHO Collaborating Centre for Public Health Education and Training, Imperial College London, UK. Former Dean, Hadhramout University College of Medicine, Mukalla, Yemen

Received: December 26, 2020; **Accepted:** January 19, 2021; **Published:** January 26, 2021

Abstract

Background: Occupational health is a neglected public health issue among healthcare workers in developing countries like Yemen and they may expose them to various forms of hazards, which have had negative consequences on their wellbeing and performance at work.

Objective: The study aims at exploring the forms of occupational health hazards prevalence and methods to mitigate these hazards among Health Care Workers (HCW) in governmental hospitals in Mukalla city.

Methods: It is a cross-sectional study conducted among health workers in the main hospitals in Mukalla city in Hadhramout province in eastern Yemen. The sample size is calculated statistically as 366 workers from different categories including doctors, nurses and lab technicians. A sample of 391 workers were selected randomly who were distributed to be representative and proportional to the size of each professional category.

Results: The prevalence of biological hazards among the healthcare workers accounted for 298 (76%) whereas the non-biological hazards accounted for 306 (78%). The most prevalent biological hazards are needle prick injury (80%) followed by exposure to contact with contaminated material (75%), while the most frequent non-biological hazards are back pain (79%) followed by extra-time work (72%). In logistic regression age, gender and duration of work and professional category have significant association with exposure of health workers to biological hazards while only gender is the only variable associated with non-biological hazards.

Conclusion: There is a high prevalence of occupational hazards (biological and non-biological) among health workers in hospitals of Mukalla city. A prevention and infection control and patient safety programs are highly recommended in Mukalla hospitals to save health workers and patients.

Keywords: Occupational hazards; Health workers; Hospital; Mukalla; Yemen

Abbreviations

HCW: Health Care Workers; HBV: Hepatitis B Virus; HCV: Hepatitis C Virus; HIV: Human Immunodeficiency Virus; HAI: Healthcare Associated Infection; ISTH: Ibn-Sina Teaching Hospital; MMCH: Mukalla Maternal and Childhood Hospital; SPSS: Statistical Package for Social Science; ECHUCOM: Ethical Committee in Hadhramout University College of Medicine; PPE: Personal Protective Equipment

Introduction

Worldwide, the healthcare workforce represents 12% of the working population [1]. Health Care Workers (HCW) operate in an environment that is considered to be one of the most hazardous occupational settings [2]. In addition to the usual workplace related exposures, healthcare workers encounter diverse hazards due to their work-related activities [3,4]. In spite of this knowledge, the healthcare work environment continues to be neglected by governments and organizations [5]. Hospitals and medical clinics are favorable settings for the transmission of infectious diseases because infected and susceptible persons are brought into close proximity. HCW are at particular risk because their work demands close contact with patients who may be harboring pathogenic microorganisms [6]. Health workers in areas such as operating, delivery and emergency rooms and laboratories have an enhanced risk of exposure. Cleaners, waste collectors and others whose duties involve handling blood-contaminated items are also at risk [7]. Among the 35 million health workers worldwide, about 3 million receive percutaneous exposures to blood-borne pathogens each year; two million of those to HBV, 0.9 million to HCV and 170 000 to HIV. These injuries may result in 15000 HCV, 70 000 HBV and 500 HIV infections. More than 90% of these infections occur in developing countries [7]. Occupational health is a neglected public health issue among healthcare workers in developing countries. This has exposed healthcare workers in developing countries to various forms of hazards, which have had negative consequences on their wellbeing and performance at work. Evidence from sub-Saharan Africa indicates that healthcare workers are frequently exposed to chemical, biological, physical and psychosocial occupational hazards [4,8]. For instance, one Ethiopian study showed a high level of exposure to blood and body fluids among

Citation: Bin-Ghouth AS, Al-Ammary SS, Alsheikh GYM, Alhaddadi AAS, Al-broad MSA, Alswail AMA, et al. Occupational Hazards among Health Workers in Hospitals of Mukalla City, Yemen. J Community Med Health Care. 2021; 6(1): 1045.

healthcare workers, which put them at significant risk of Healthcare Associated Infections (HAIs) [9]. Another Ethiopian study also revealed that significant numbers of health-care workers (66%) were exposed to blood and body fluids, of which 29% were caused by needle-stick injury [10]. In Yemen, the studies about occupational exposure of health workers to hazards are scarce; a Yemeni study showed that most health workers, including doctors, have poor compliance with hand washing practice (90%) and unsatisfying infection control practice (78%) [11]. In Mukalla city in Hadhramout, there is no study addressing occupational hazards among health care workers. Therefore, the aim of this study is to explore the forms of occupational health hazards prevalent and methods to mitigate these hazards among Health Care Workers (HCW) in governmental hospitals in Mukalla city.

Methods

The study is a cross-sectional survey among health workers in the main hospitals in Mukalla city in Hadhramout at eastern Yemen. The two main referral general hospitals in Mukalla city, namely: Ibn-Sina Teaching Hospital (ISTH) that provides medical and surgical care with 418 professionals; (doctors, nurses and lab technicians) and Mukalla Maternal and Childhood Hospital (MMCH) with 411 health workers. The study population was all doctors, nurses and lab technicians working in the above-mentioned two hospitals in Mukalla with a total of 829 workers. The sample size is calculated statistically as 366 workers from different categories (doctors, nurses and lab technicians). However, a sample of 391 workers were randomly selected to proportionally represent the size of each professional category. The study tool for data collection was self-administered questionnaire. The questionnaire is consisted of closed questions, which were categorized into three sections to achieve the study objectives. Section one of the questionnaire-covered collection of data on the socio-demographic characteristics of the respondents, which included age, sex, profession, field of health service work and duration in service. Section two of the questionnaire covered collection of data on the occupational health hazards facing the healthcare workers, the hazards that they experienced in their work place and exposure to one or both hazards. The first hazard type included biological hazards (needle stick injury, exposure to contaminated blood and body fluids, cuts, wounds and infectious disease). The second covered non-biological hazards and included back pain, working over-time, working in multiple facilities, pressure from job and physical injuries. Section three of the questionnaire covered collection of data on bio-safety measures applied to minimize those hazards like safety education, training on how to use the machinery and equipment, provision of special and sufficient containers for disposal of medical wastes and on taking vaccinations. The data were entered and analyzed by using Statistical Package for Social Science 25 (SPSS version 25) software. Frequency tables pie and bar graphs are used for establishing the data. Chi-square test was used to test association and p-value where the value of <0.05 was considered as significant association. An ethical approval was obtained from the Ethical Committee in Hadhramout University College of Medicine (ECHUCOM) and a permission letter was obtained from the managers of the Mukalla Governmental Hospitals to facilitate our work and data collection. Authors provided enough information about our research, its objectives and procedures for the participants. Then agreement of participants was obtained, with their right to proceed or withdraw, with insuring that the information be only used in the research and keeping the privacy of their information.

Results

Socio-demographic characteristics

The study population comprised a range of healthcare workers working in selected governmental health facilities. These included doctors (39%), nurses (49%), and laboratory technicians (12%). Of the 391 participants, the females were (51%) and the males were (49%) they could be nearly equal. In term of age, the participants' age ranged from 20-70 years with a mean of (32.44±8.94) year. About 57% of participants are at age equal or less than 30 years while 43% are at age more than 30 years. In term of duration of work, it ranges from 1-45 years with mean of (7.39±8.39). Majority 78% of them work for 10 years or less and 22% for more than 10 years (Table 1).

Occupational hazards

The prevalence of biological hazards among the healthcare workers was 298 (76%) whereas the non-biological hazards was 306 (78%) indicating that the majority of respondents was exposed to both biological and non-biological hazards with slight difference in magnitude and as shown in (Table 2). Among 298 respondents who were exposed to biological hazards, the results indicate that the majority of them were exposed to needle prick injury (80%) followed by exposure to contact with contaminated material (75%), getting wound during work (60%) and those who were exposed to biological hazard through acquiring infectious disease during work counted for 19% as shown in (Figure 1). Among the 306 respondents who indicated their exposure to non-biological hazards, the results

Table 1: Socio-demographic characteristics of health workers in governmental hospitals in Mukalla.

Socio-demographic characteristics		Number of health workers	%
Age group	≤30 years	224	57%
	>30 years	167	43%
	Total	391	100
Gender	Male	192	49%
	Female	199	51%
	Total	391	100.00%
Duration of work	10	305	78%
	>10	86	22%
	Total	391	100.00%
Specialization	Doctor	150	39%
	Nurse	193	49%
	Laboratory technician	48	12%
	Total	391	100.00%

Table 2: Prevalence of occupational hazards among health workers in hospitals of Mukalla city.

Types of occupational exposure	Number of health workers (N-391)	Prevalence of occupational exposure %
Exposure to biological hazards	298	76%
Exposure to non-biological hazards	306	78%

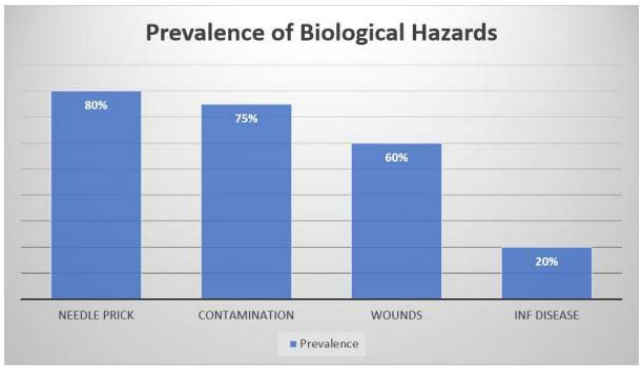

Figure 1: Prevalence of Biological Hazards among Health workers of hospitals in Mukalla.

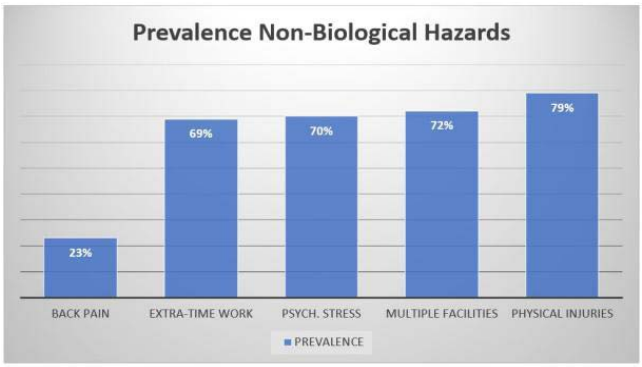

Figure 2: Prevalence of non-biological hazards among health workers in hospitals in Mukalla.

indicate that the majority of them were exposed to back pain (79%) followed by extra-time work (72%), psychological stress (70%), work in more than one health facility (68%) and exposure to physical injuries (23%). See (Figure 2).

Biological occupational hazards

Females are significantly exposed to biological hazards in higher rate than males (82%) whose rate is (70%) with a p-value =0.003. Nurses had significantly exposure to biological hazards (85%) in comparison to laboratory technicians (77%) and doctors (65%) with a p-value =0.000. Also, those of experience who worked for 10 years or less, are at a higher risk to biological exposure (79%) than those who have worked for more than 10 years of experience (67%) with a p-value = 0.024 while there is no significant difference in regard to age group with a p-value =0.550 (Table 3). In logistic regression; all the socio-demographic and professional variables are of significant association with the exposure to the biological occupational hazards (Table 4).

Figure 3: Safety practice and preventive measures among health workers in hospitals in Mukalla.

Non-biological occupational hazards

There are significant variations regarding non-biological exposure were observed in females (85.43%) more than males (70.83%) (P-value =0.000). While no significant variations exist due to exposure to non-biological hazard between the age groups ((P-value =1), duration of work (P-value =0.202) or professional categories (p-value =0.112) (Table 5). In logistic regression only the gender has significant association with the exposure to non-biological hazard (P-value =0.001) (Table 6).

Table 4: Logistic regression of the association between the socio-demographic variables with the biological hazards.

Socio-demographic characteristics	OR	CI 95%	*p-value*
Age group	2.438	1.248-4.762	.009*
Gender	2.151	1.305-3.545	.003*
Duration of work	0.349	0.168-0.727	.005*
Professional category	1.899	1.293-2.788	.001*

*Significant

Table 3: Prevalence of biological occupational hazards.

Socio-demographic characteristics		Exposure to biological hazards		X^2	*P-value*
		No exposed	Prevalence e%		
Age group	≤30 years (n=224)	168	75%	0.427	0.55
	>30 years (n=167)	133	71%		
Gender	Male (n-192)	134	70%	8.58	0.003*
	Female (n=199	164	82%		
Duration of work	≤10 years (n=305)	240	79%	4.68	0.024
	>10 years (n=86)	58	67%		
Professional category	Doctor (n=150)	98	65%	17.04	0.000*
	Nurse (n=193)	163	85%		
	Laboratory technician (n=48)	37	77%		

*Significant

Table 5: The prevalence of Non-biological occupational hazards.

Socio-demographic characteristics		Exposure to non-biological hazards		X^2	*P-value*
		No exposed	Prevalence e%		
Age group	≤30 years (n=224)	175	78.10%	0.006	1
	>30 years (n=167)	131	78.40%		
Gender	Male (n-192)	136	70.80%	12.23	0.000*
	Female (n=199	170	85.43%		
Duration of work	10 years (n=305)	242	79.30%	0.957	0.202
	>10 years (n=86)	64	74.40%		
Professional category	Doctor (n=150)	119	79.33%	4.37	0.112
	Nurse (n=193)	155	80.31%		
	Laboratory technician (n=48)	32	66.67%		

*Significant

Table 6: Logistic regression of the association between socio-demographic and professional variables with the non-biological hazards.

Socio-demographic characteristics	OR	CI 95%	*P-value*
Age group	1.333	0.716-2.482	0.364
Gender	2.362	1.416-3.938	0.001*
Duration of work	0.714	0.351-1.453	0.353
Professional category	0.827	0.576-1.187	0.303

*Significant

Safety practices and preventive measures: There is a marked lack of training of the health workers on using medical devices, data indicated that (71%) of healthcare workers have not been trained i.e. only (29%) of them had sufficient training on how to use their medical devises. However, results show that 61% of respondents indicated that their hospitals do provide suitable container to dispose medical wastes. Less than half of the healthcare workers in the surveyed governmental hospitals reported that they have sufficient safety tools (46%) and only (27%) of them have received HBV vaccine (Figure 3).

Discussion

This study reveals that there are of a high prevalence of exposure of health workers in hospitals in Mukalla city to both biological and non-biological occupational hazards (76% and 78% respectively). It was more than what was reported in the study conducted in Kampala (Uganda) which concluded that prevalence of the biological health hazards among health workers was 39.5% and that the prevalence of none-biological hazards was 31.5% [12]. These differences indicated that the prevention and infection control and patient safety practices are poorly operated in Mukalla hospitals. However, the high prevalence of biological hazards was also reported in a study in south India where most healthcare workers were exposed to biological hazards (81.5%) [13]. Injury by contaminated sharp instruments and needles constitutes a major occupational hazard for healthcare workers [14]. The most biological hazards in this study is the needle prick injury (80%). Such needle prick injuries is prevalent in developed countries e.g. in a study in German University hospital, it was found that about 31.4% (n=226) of participant HCWs had sustained at least one needle stick injury in the last 12 months before the study [15]. The present study reveals that the largest proportion of respondents who were exposed to biological hazards are nurses. These results are in agreement with the study done in southern India [13]. Nurses are at high risk to occupational hazards and injuries in the course of their day-to-day activities in the health care environment [16]. By considering the nature of the nurse's working environment, responsibilities and duties, it is clear that nurses are at high risk of numerous occupational hazards such as infectious disease, chemical risks, environmental risks, and psychosocial risks [17,18]. In this study; back pain is found to be the common non-biological hazards especially in females. In logistic regression, only the gender has a significant association with the exposure to non-biological hazard. Multivariate regression analysis revealed that female gender, health care personnel other than doctors, working overtime, dissatisfaction with workplace atmosphere and not using the necessary Personal Protective Equipment (PPE) were independent predictors for experiencing a biological hazard [19]. Similarly, female gender, presence of family conflict, and not using the required PPE were found to be independent predictors for experiencing non-biological hazards in India [19]. Triolo in 1980 reported in a survey that nurses lost 750,000 working days a year as a result of back pain which was twice the national average [20]. Uses of precautionary measures by health workers in Mukalla hospitals are inadequate. This is an important concern in developed and developing countries alike. The awareness of and compliance with standard precautions vary among HCWs and have been found to be inadequate [21-23]. Many exposures can be prevented by careful adherence to existing infection control precautions, immunization against hepatitis B and provision of personal protective equipment during the management of emergencies [24-26]. In a study in India, the existence of inadequate needle safety precautions was found along with low compliance to standard guidelines, and improper disposal of sharps among the health care workforce in a trauma care setting. This was found to co-exist in the presence of an active infection control committee and the presence of posters stressing the need to comply with standard precautions [27].

Conclusion

There is a high prevalence of occupational hazards, both biological and non-biological, among health workers in hospitals of Mukalla city. A prevention and infection control alongside patient safety programs are highly recommended in Mukalla hospitals to save health workers and patients. Likewise, continuous training of health workers in Mukalla hospitals on infection prevention and patient safety should be taken seriously and raise the concerns among health decision makers in this part of Yemen to prevent occupational

hazards and protect health workers and patients.

References

1. Goniewicz M, Wloszczak-Szubzda A, Niemcewicz M, Witt M, Marciniak-Niemcewicz A, Jarosz MJ. Injuries caused by sharp instruments among healthcare workers-international and Polish perspectives. Annals of Agricultural and Environmental Medicine. 2012; 19: 523-527.
2. Ndejjo R, Musinguzi G, Yu X, Buregyeya E, Musoke D, Wang J-S, et al. Occupational health hazards among healthcare workers in Kampala, Uganda. J Environ Public Health. 2015; 2015: 913741.
3. Manyele S, Ngonyani H, Eliakimus E. The status of occupational safety among health service providers in hospitals in Tanzania. Tanzania Journal of Health Research. 2008; 10: 159-165.
4. Nsubuga F, Jaakkola M. Needle stick injures among nurses in sub-Saharan Africa. Tropical Medicine and International Health. 2005; 10: 773-781.
5. Lipscomb J, Rosenstock L. Healthcare workers: Protecting those who protect our health. Infection Control and Hospital Epidemiology.1997; 18: 397-399.
6. Chong CY, Goldmann DA, Huskins WC. Prevention of occupationally acquired infections among health care workers. Pediatr Rev. 1998; 19: 219-231.
7. World health Organization. AIDE-MEMOIRE: For a strategy to protect health workers from infection with blood borne viruses. 2003.
8. Tinuba B, Mbada C, Oyeyemi A, Fabunmi A. Work-related musculoskeletal disorders among nurses in Ibadan, South-West Nigeria: A cross-sectional survey. BMC Musculoskeletal Disorders. 2010; 11: 12.
9. Reda A, Fisseha s, Mengistie B, Vandeweerd J-M, Standard Precautions: Occupational Exposure and Behavior of Health Care Workers in Ethiopia," PLOS ONE. 2010.
10. Yenesew MA, Fekadu GA. Occupational exposure to blood and body fluids among health care professionals in bahir dar town, northwest Ethiopia. Safety Health Work. 2014; 5: 17-22.
11. El-Hebsh HS, Fahmy HD, Sharkawi SA, Alhanshi A. Nurses' knowledge and practice about infection control in outpatient clinics of governmental hospitals at Al-Mukalla city-Yemen, Assiut Scientific Nursing Journal. 2018; 6: 63-71.
12. Ndejjo R, Musinguzi G, Yu X, Buregyeya E, Musoke D, Wang J, et al. Occupational health hazards among health care workers in Kampala, Uganda. Journal of Environmental and Public Health. 2015.
13. Senthil A, Anandh B, Jayachandran P, Thangavel G, Josephin D, Yamini R, et al. Perception and prevalence of work-related health hazards among health care workers in public health facilities in Southern India. International Journal of occupational and Environmental health. 2015; 21: 74-81.
14. Elmiyeh B, Whitaker IS, James MJ, Chahal CA, Galea A, Alshafi K. Needle-stick injuries in the National Health Service: a culture of silence. J R Soc Med. 2004; 97: 326-327.
15. Wicker S, Jung J, Allwinn R, Gottschalk R, Rabenau HF. Prevalence and prevention of needle stick injuries among health care workers in a German university hospital. Int Arch Occup Environ Health. 2008; 81: 347-54.
16. Issara AR, Ofili AN. Prevalence of occupational accidents/Injuries among health care workers in a federal medical center in southern Nigeria. West Afr J Med. 2012; 31: 47-51.
17. Senthil A, Anandh B, Jayachandran P, et al. Perception and prevalence of work-related health hazards among health care workers in public health facilities in southern India. Int J Occup Med Environ Health. 2015; 21: 74-81.
18. Carayon P, Gurses AP. Nursing workload and patient safety-A human factors engineering perspective. An evidence-based handbook for nurses. Agency Healthcare Res Qual. 2005; 21: 284-301.
19. Kumar A, Panigrahi A. Occupational health hazards among health care personnel working in public health facilities in Bhubaneswar, India. J Public Health (Berl.). 2019.
20. Triolo PK. Occupational health hazards of hospital staff nurses. Part II: Physical, chemical, and biological stressors. AAOHNJ. 1989; 37: 274-279.
21. Marcus R. The CDC cooperative needle sticks surveillance group. Surveillance of health care workers exposed to blood from patients infected with the human immunodeficiency virus. The New England Journal of Medicine. 1988; 319: 1118-1123.
22. Wong ES, Stotka JL, Chinchilli VM, Williams DS, Stuart CG, Markowitz SM. Are universal precautions effective in reducing the number of occupational exposures among health care workers? A prospective study of physicians on a medical service. Journal of the American Medical Association. 1991; 265: 1123-1128.
23. World Health Organization. Health care worker safety. 2014.
24. Roberts C. Universal precautions: improving the knowledge of trained nurses. British Journal of Nursing. 2000; 9: 43-47.
25. Kermode M, Jolley D, Langkham B, Thomas MS, Holmes W, Gifford SM. Compliance with Universal/Standard Precautions among health care workers in rural north India. The American Journal of Infection Control. 2005; 33: 27-33.
26. Wu S, Li L, Wu Z, Gao H, Lin C, Yan Z, et al. Universal precautions in the era of HIV/AIDS: perception of health service providers in Yunnan, China. AIDS and Behavior. 2008; 12: 806-814.
27. Punia S, Nair S, Shetty RS. Health Care Workers and Standard Precautions: Perceptions and Determinants of Compliance in the Emergency and Trauma Triage of a Tertiary Care Hospital in South India. Int Sch Res Notices. 2014; 2014: 685072.