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Title: Prevalence and factors associated with occupational health hazards among health care providers at King Faisal Hospital.

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Abstract

Population's wellbeing and development would be better depending on working. Unfortunately, there are specific form of risks to the health and safety of individual related to the working environment. Rwanda as a country with quick social economic development has created all necessary to stop occupational health hazards within its public and the private health places. The aim of this study was to determine the prevalence and factors associated with occupational health hazards among healthcare workers at King Faisal Hospital and a cross-sectional study design was used. Simple random sampling technique was applied to select 269 people as sample size from the target population who was healthcare providers at King Faisal Hospital. To analyze data of this study SPSS V.21 was used and enable to calculate measures of central tendency. The study findings showed that the majority of participants 43.9% aged between 41years and 55 years and 43.1% were male while 56.9% of them were female. The study revealed that that 56.9% participants had hazard and 43.1% participants didn't have hazard. The respondents aged 56 years and above were less like to meet hazard [AOR=0.325; 95% CI=0.167-2.11; P=0.03] compared to respondents aged 25-40 years. Health provider with master's degree and above were less likely to meet hazards [AOR=0.241; 95% CI=0.075-0.776; P=0.09]

compared to health provider with Bachelor's degree. To address this, the researcher has provided some recommendations to Ministry of health and RBC to reduce frequency and severity of occupational accidents in different industries.

Keywords: King Faisal Hospital, Occupational health hazards

Introduction

Population's wellbeing and development would be depending on working. Unfortunately, there are specific form of risks to the health and safety of individual related to the working environment. Employees' health can be potentially affected by unique hazards found within the hospitals. Healthcare working place is considered as a safe and healthy environment to work in. Worldwide, common occupational health hazards encountered are biological, chemical, and physical hazards [1]. (Sub Hani, 2010).

Henrietta et al (2016),[2] found out that the main physical hazards met are heat, electrical current, noise and vibration, physical agents or other radiation forms radiation. Antiseptics, disinfectants and other chemicals mostly used in laboratories are belong in chemical hazardous. Healthcare workers may be exposed to a large number of biological hazards including; bacteria, hepatitis B and other biological hazards without knowing what they are exposed to. Patients and clients develop aggression behavior depending on the bad situation they are facing and this may lead to physical hazard to the handling staffs because of physical, emotional and/or mental abuse [2]. (Henrietta et al 2016).

According to Goldstein, occupational illnesses are associated with health hazards. in Africa where mechanization of work is developing, health and lives of people are more exposed by being treated as tools for production [3].

Rwanda as a country with quick social economic development has created all necessary to stop occupational health hazards within its public and the private health places. It is a field of occupational hazard prevention based on the social prevention such as the creation of the Rwanda Biomedical Centre (RBC), which initiated to completely remove duplication of work, delivery service improvement and increased output; establishment of organ of appropriate use of standards in charge (RSB*)* and reinforcement of RNMU (Rwanda Nurses and Midwives Union). The health hazards prevention is also between the high medical specialists who have chosen to work generally with the form of legal protection, to the specific interests of its members

Instead of its effort, data on occupational hazards among healthcare workers remain scarce in Rwanda. Reason for which, in this study we will evaluate the level of occupation health hazards prevention in King Faisal as big medical center in for findings generalization to the remains

healthcare countrywide. Thus the study will assess the occupational health hazards faced by healthcare workers at King Faisal hospital and its influencing factors.

The complexness of working environment within the hospital can lead to significant risks to staff health. The poor occupational safety has an impact but the stuffs could also be affected by the patients they while treating them. Occupational health and safety (OHS) covers staff safety, welfare and health in the working place. Major hazards exist in public hospitals such as chemical agents, materials, manual handling of patients, trips, falls, exposure to infectious and occupational violence could make OHS a particular important. Acute traumatic injury, musculoskeletal injuries and infections such as hepatitis and potentially even death, are all associated to occupational hazards [4] (Victoria 2013).

As King Faisal is the principal hospital in Rwanda, it is a big and immense medical center with 827 workers. This institution has established the strategies for employees' protection from specific hazards and risks associated with their occupations, such as contagious diseases and patients' protection from risks associated with unhealthy employees and it has established a workplace health and safety committee. It created a safe environment in which employees working within risk free condition. Despite these developments, some hazards are still emerging and little is known about its prevalence and factors associated with different hazards appear at King Faisal Hospital.

Study design

This study used cross-sectional study design which is suitable for prevalence studies. This study design helped researcher to collect quantitative data to enable answer on the total number of healthcare workers faced occupational health hazards and helped researcher to determine the types of hazards occur at King Faisal Hospital. Cross sectional study also enabled to study relativity between exposure and outcome and then, it was also helped researcher to examined the factors influencing the health hazards in King Faisal.

Target Population and Sample size

According to Orkney P, targeted population means a set of people with elements that possess the common characteristics in which the researcher extracts the sample to interrogate or to observe. The target population of this study will be a total of 827 healthcare providers who worked at King Faisal Hospital from 2017 to 2021 and among them 397 have diploma or

bachelor's degree in health while 88 have PHDs and 100 are supporting staff and during this research, a total of 269 health providers were recruited in this study [5]. (Orkney P, 2016),.

Sampling procedure

Structured questionnaires were printed and distributed to the participants at the workplace and give them time to complete the questionnaire by answering closed questions after getting their signed consent and the answered questionnaire were returned on the same day. To avoid the misunderstanding of questionnaire which can alter the research process and lead to false data and conclusion, the researcher was designed it in such away it will be understandable and very easy in answering.

Reliability and validity of questionnaire

To ensure the reliability, a pilot study was prepared and pre-tested by selecting 15 healthcare workers from same hospital in order to make necessary changes where needed. To check whether the asked questions were consistent in such way they create a good reliability between dependent and independents variables or whether they were understood in the same way. To ensure the validity**,** questions were formulated to mean the same as to obtain reliable answer and cooperation between respondents and the questionnaire was assessed by other experienced researchers.

Data analysis and ethical consideration

Data were analyzed by using SPSS V.21 and enabled to calculate measures of central tendency. All data from different components of the questionnaire were entered to an SPSS computer program by researcher and further cleaned.

Descriptive statistics, mainly frequency, mean and percentage was applied to demographic, socio-economic, demographic profiles of participants and other variables of contributing factors related to occupational hazards that the healthcare workers faced and therefore, quantitative data was presented using tables, charts and graphs.

Regression analysis (logistic regression and multivariate analysis): to explore factors that may have significant influence on occupational health hazards among healthcare workers at King Faisal Hospital. Confidence interval of 95% and P-value of less than 5% was considered as level of statistical significance for influencing factors of occupational health hazards among healthcare workers at King Faisal Hospital.

The study was implemented in accordance with the research protocol approved by both the MKUR research ethical committee, King Faisal Hospital and Ministry of Health and ethical

Permissions from them was also obtained. Consent form was signed by respondents to willingly participate in the study and this study kept the privacy and the confidentiality of the respondents. This carried out ethically by considering self-determination where respondents' right to self-determination was assured by explaining the purpose and significance of the study. The researcher utilized the data for academic purpose only.

Results

Demographic characteristics of respondents

The participants of this study were 269 health providers working at King Faisal hospital. A cluster sampling technique was used to select 269 health care providers from 7 departments which was considered as clusters. The table below presents the socio-demographic characteristics of health providers working at King Faisal hospital.

Table 1 Socio-demographic characteristics

Variables	Frequency	Percentage
Age group		
25-40 Years	105	39
41-55 Years	118	43.9
56 and above	46	17.1
Sex		
Male	116	43.1
Female	153	56.9
Marital status		
Married	211	78.4
Single	9	3.3
Divorced	16	5.9
Widowed	33	12.3
Educational level		
Diploma	4	1.5
Bachelor's degree	209	77.7
Masters and above	56	20.8
Experience years in group		
>5 Years	55	20.4
6-15 Years	90	33.5
16 and above	124	46.1
Profession		
Nurse	69	25.7
Physiotherapy	31	11.5
Medical Doctor	29	10.8
Other Departments	140	52

Training on safety and health in workplace		
Yes	263	97.8
No	6	2.2
Training on fire outbreak		
Yes	171	63.6
No	98	36.4
Do you think you are exposed to the risk		
Yes	216	80.3
No	53	19.7
Absence of extinguishers		
Yes	18	6.7
No	251	93.3
Fire prevention and detection		
Yes	10	3.7
No	259	96.3

Source: Primary data

The table above presents the socio-demographic characteristics of respondents. It shows that the majority of participants 118(43.9%) aged between 41years and 55 years and 116(43.1%) were male while 153(56.9%) of them were female. A significant number 211(78.4%) health providers working at King Faisal hospital were married, the level of education of 209(77.7%) of them was Bachelor's degree and 55(20.4%) of respondents have less than 5 years of experience. 69(25.7%) participants were nurses and 140(52%) were working in other departments (rehabilitation services, critical department, healthcare assistant, housekeeping services, health worker, business manager, …). Almost all respondents 263(97.8%) said that they had training on safety and health in workplace and specifically 171(63.6%) respondents had training on fire outbreak.

Presentation of findings

The findings of this study are presented according to three research objectives. The first objective was to identify the types of health hazards faced by the health providers, the second objective was to determine the prevalence of occupational health hazards and the third objective was to examine the factors influencing the health hazards at King Faisal hospital.

The types of health hazards faced by the health workers at King Faisal hospital

The first objective was to identify the types of health hazards faced by the health providers at King Faisal hospital. Different questions were asked to identify the type of hazards that may be faced by health workers.

Table 2 The types of health hazards faced by the health workers at King Faisal hospital

Variables	Frequency	Percentage
Burn hazards		
Yes	38	14.1
No	231	85.9
Chemicals reaction		
Yes	18	6.7
No	251	93.3
Implosion		
Yes	20	7.4
No	249	92.6
Asphyxiate/Suffocation		
Yes	37	13.8
No	232	86.2
Toxic, harm or irritant		
Yes	40	14.9
No	229	85.1
Corrosion		
Yes	26	9.7
No	243	90.3
Exposure to Micro-organisms		

Yes	74	27.5
No	195	72.5
Exposed to human blood or body fluids		
Yes	106	39.4
No	163	60.6
Exposed to radiation of X-rays		
Yes	15	5.6
No	254	94.4
Exposed to radiation of Ultra-violent		
Yes	14	5.2
No	255	94.8
Exposed to radiation of Lasers		
Yes	11	4.1
No	258	95.9
Hazards from sharp edges		
Yes	94	34.9
No	175	65.1
Hazards of inadequate light		
Yes	18	6.7
No	250	92.9
Hazards of inadequate ventilation		
Yes	16	5.9
No	253	94.1
Hazards of inadequate space		
Yes	29	10.8
No	240	89.2

Hazards of unavailable washrooms		
Yes	4	1.5
No	265	98.5

Source: Primary data

The results of this study in above table revealed that human blood or body fluid and sharp edges were the most hazards that health workers are exposed to, where 106(39.4%) respondents said that they are exposed to human blood or body fluid and 94(34.9%) respondents were exposed to sharp edges. 38(14.1%) respondents met burn hazards, 18(6.7%) respondents especially those who dealing with laboratory services met chemical reaction hazards, 74(27.5%) respondents were exposes to micro-organisms and 15(5.6%) respondents who were working in radiography were exposed to radiation of X-rays. 16(5.9%) respondents said that the room space where they use to work from is too small that was the reason to be exposed to hazards of inadequate ventilation.

The prevalence of occupational health hazards King Faisal hospital

The second objective was to determine the prevalence of occupational health hazards at King Faisal hospital. To estimate the prevalence of occupational hazards, the score assessment for all questions related to hazards faced by health care workers presented in table 2 have been used, given score 1 to yes and 0 to No responses and the mean score was 16.02. The number respondents with above mean score estimated as prevalence of occupational hazards.

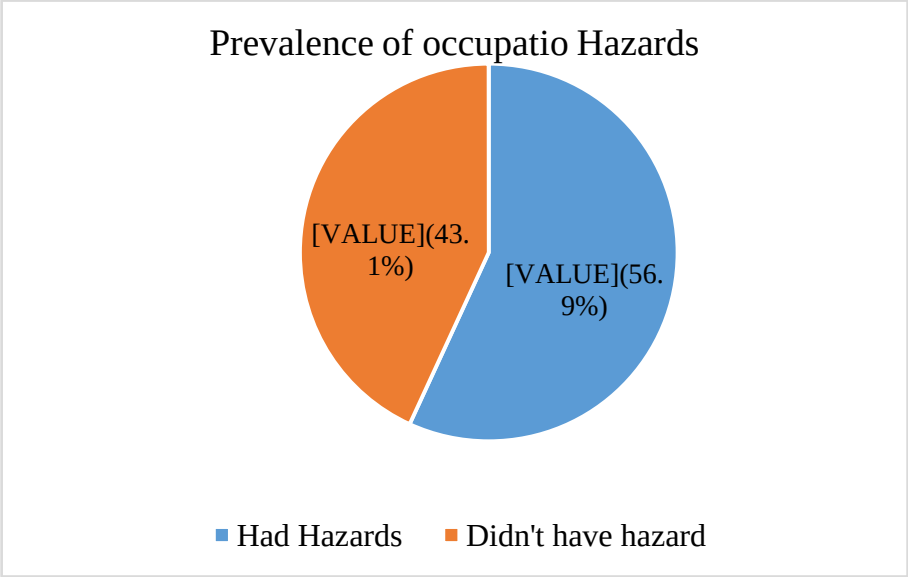

Figure 1: The prevalence of occupational health hazards

The study results presented in figure above shows that 153(56.9%) participants had hazard and 116(43.1%) participants didn't have hazard.

Factors influencing the health hazards in King Faisal hospital.

The third objective was to examine the factors influencing the health hazards at King Faisal hospital. Eleven variables including socio-demographic characteristics were used to assess the factors influencing the health hazards.

Table 4 Factors influencing the health hazards in King Faisal hospital(Bivariate)

Variables	Health hazards		P-Value	Chi-square
	Had hazard n(%)	Didn't have hazard (n%)		
Age group			**0.03**	4.722
25-40 Years	53(45.70)	52(34.00)		
41-55 Years	44(39.90)	74(48.40)		
56 and above	19(16.40)	27(17.60)		
Sex			**0.01**	7.632
Male	55(47.40)	61(39.90)		
Female	61(52.60)	92(60.10)		
Marital status			1.711	0.899

Married	90(77.60)	121(79.10)		
Single	26(22.40)	32(20.90)		
Educational Level 2			**0.01**	5.775
Bachelor's degree	97(81.30)	116(75.80)		
Masters and above	19(18.3)	37(24.20)		
Experience years in group			1.344	0.25
>5 Years	27(23.30)	28(18.30)		
6-15 Years	36(31.00)	54(35.30)		
16 and above	53(45.70)	71(46.40)		
Professional			**0.02**	6.821
Nurse	22(19.00)	47(30.70)		
Medical Doctor	15(12.90)	16(10.50)		
Other Department	79(68.10)	90(58.80)		
Had training			**<0.01**	9.144
Yes	114(98.30	149(97.40)		
No	2(1.70)	4(2.60)		
Training on fire outbreak			0.091	0.277
Yes	67(57.80)	104(68.00)		
No	49(42.20)	49(32.00)		
Working hours per day			**0.01**	8.602
Less than 8 Hours	1(0.90)	4(2.60)		
8 Hours	58(50.00)	67(43.80)		
8-10 Hours	40(34.50)	49(32.00)		
More than 10 Hours	17(14.70)	33(21.60)		
Fixed breaks during working hours			**0.03**	4.452
Yes	19(16.40)	27(17.60)		
No	97(83.60)	12682.40)		
Availability of materials of facultative			0.05	1.306
Yes	105(90.50)	132(86.30)		
No	11(9.50)	21(13.70)		

Source: Primary data

As indicated in the Table above, there was statistically significant association between age, sex, educational Level, professional, to have training on safety, working, hours per day and fixed breaks during working hours and health hazards with <0.005 P-value calculated to 95% CI.

Table 5 Factors influencing the health hazards in King Faisal hospital(Multivariate)

Variables	**AOR**	**95%CI**	**P-Value**

			Lower	Upper	
Age group					
25-40 Years	Ref				
41-55 Years		1.509	0.477	8.30	0.542
56 and above		0.325	0.167	2.311	**0.03**
Sex					
Male	Ref				
Female		1.476	0.944	5.615	0.081
Educational Level 2					
Bachelor's degree		Ref			
Masters and above		0.241	0.075	0.776	**0.019**
Professional					
Nurse		13.488	2.034	89.455	**0.004**
Medical Doctor		Ref			
Other Department		2.643	0.593	11.779	0.481
Had training on safety					
Yes	Ref				
No		5.288	1.013	81.873	**0.006**
Working hours per day					
<8 Hours		0.891	0.067	2.560	**0.005**
8-10 Hours		1.499	0.385	5.842	0.559
More than 10 Hours	Ref				
Availability of materials of facultative					
Yes		0.367	0.104	1.292	0.119
No	Ref				

Source: Primary data

The respondents aged 56 years and above were less like to meet hazard [AOR=0.325; 95% CI=0.167-2.11; P=0.03] compared to respondents aged 25-40 years. Health provider with master's degree and above were less likely to meet hazards [AOR=0.241; 95% CI=0.075-0.776; P=0.09] compared to health provider with Bachelor's degree, Nurses were more likely to meet hazards [AOR=13.488; 95% CI=2.034-89.455; P=0.004] compared to Medical Doctors. Health provider who did not have training on safety were more likely to meet hazards [AOR=5.288; 95% CI=1.013-81.873; P=0.006] compared to those who had training on safety and health workers with few working hours(<8hours) were less likely to meet hazards [AOR=0.891; 95% CI=0.067-2.560; P=0.005] compared to those who use to work more than ten hours.

Discussion

The poor occupational safety has an impact but the stuffs could also be affected by the patients they while treating them. Occupational health and safety (OHS) covers staff safety, welfare and health in the working place. Major hazards exist in public hospitals such as chemical agents, materials, manual handling of patients, trips, falls, exposure to infectious and occupational violence could make OHS a particular important.

This study was conducted to assess the occupational health hazards faced by healthcare providers at King Faisal hospital and its influencing factors. The first objective was to identify the types of health hazards faced by the health providers at King Faisal hospital. Different questions were asked to identify the type of hazards that may be faced by health workers.

The results of this study revealed that respondents are exposed to different hazards including human blood or body fluid, sharp edges, burn hazards, chemical reaction hazards, micro-organisms, radiation of X-rays and hazards of inadequate ventilation.

The study conducted by the researcher called Muchiri assessed the types of hazards within health workplace was almost in same line with the present study, where it has found out that healthcare workers are also exposed to blood-borne infections in many countries and the infections such as; hepatitis B and hepatitis C, TB and HIV and this leads to loss of skilled health professionals both in low and middle income countries [6]. (Muchiri, 2018)

The study conducted by Hanrietta was in some line with the present study where it revealed that employees' health can be potentially affected by unique hazards found within the hospitals and some of them are; physical patients handling, infectious diseases exposure, sharp materials and blood born pathogen exposure like HIV and Hepatitis B. Psychological impact could be brought by abuse and violence that healthcare workers face within working place. The hazards can be categorized as ergonomic, chemical, biological, physical and psychological hazards [2]. (Henrietta et al 2016).

The second objective was to determine the prevalence of occupational health hazards at King Faisal hospital. The prevalence has been determined referring to the number of health workers who met health hazard around the workplace. The study results show that 240(89.2%) participants had hazard and 29(10.8%) participants didn't have hazard.

The study conducted in Rwanda by Edward which was assessing the prevalence of occupational health related risks and use of safety measures it has revealed that 86.4% (190/220) of the respondents reported having suffered from work hazards and the work related injuries faced by the brewery employees were a result of physical, ergonomic and psychosocial hazards[7]. This prevalence was in some range with present study.

The third objective was to examine the factors influencing the health hazards at King Faisal hospital. Eleven variables including socio-demographic characteristics were used to assess the factors influencing the health hazards. The present study revealed that there was statistically

significant association between age, sex, educational level 2, professional, to have training on safety, training on fire outbreak, working, hours per day, fixed breaks during working hours and availability of materials of facultative and health hazards.

The present study revealed that health workers who had training on fire outbreak were more likely to meet hazards compared to workers who did not have training on fire outbreaks. This can be linked with the assessment on occupational safety and health training done in Columbia, where it found out that knowledge or skills acquired in training may not always result in improved performance in actual work situations. This may indicate lack of suitable motivation, training content does not fit job demands and dissimilarity or conflicts between the instruction/practice in training conditions when compared to actual job conditions [8] (Newman, 2016).

The present study revealed that health workers with few working hours(8hours) were less likely to meet hazards compared to those who use to work more than ten hours.

The study conducted by Rosen was in some line with present study. It revealed that health workers are always get stressed in dealing with health and lives of people which may damage their mental and physical health (Rosen & stock 2006).

According to Sadler the nature of job is a leading cause of any specific hazard within an organization. Hence the attitude of a given organization's workers may contribute to the accidents happening, for example; refusal to carry out an extra safety procedures and refusal to wear protective clothing [9]. (Sadler, 2019).

According to Khari potential workplace hazards elimination, material control, good installations, equipment and tools arrangement as well as regular maintenance and information awareness are all prevention measures. Needle stick, handling sharp and bloody tools causes injuries frequently to the 62% of paramedical and medical staff. Risks should be minimized to both caregivers and

patients and they should have the access of sufficient information on hazards and risk factors [10]. (Khari et al 2017).

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