

Original Research Article

Occupational health and safety hazards faced by health care professionals in Kathmandu based hospital: a cross-sectional analytical study

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ABSTRACT

Background: Occupational health and safety is a broad discipline that covers several specialized fields, including physical, psychological, chemical, biological, and mechanical/electrical, and assesses the health and safety of employees in a broader context. Healthcare workers including physicians and nurses get regularly exposed to occupational hazards. The objective of the study was to analyse the occupational health and safety hazards faced by healthcare professionals in Kathmandu.

Methods: A quantitative cross-sectional analytical study was conducted in the hospitals of the Kathmandu district. Ethical approval was taken from National Academy for Medical Sciences and hospitals. Purposive sampling was used to select the hospitals and convenience sampling was used to collect the data from respondents using semi-structured questionnaires. The total sample size was 247. Data collected from respondents were entered into EpiData and were analysed and expressed using SPSS version 25.

Results: Back pain (64.8%) and needle injury (59.5%) were the most perceived injury that might occur in hospitals along with hepatitis B (35.2%) and covid (23.9%) as infections. The majority (88.7%) of health workers used PPE while working and biological hazards (88.3%) were the most suffered hazards followed by chemical hazards (87%). The age group of 50-60 years, higher secondary level graduates, government health workers, doctors, and nurses were statistically significant with safety practices whereas Buddhist, married participants, governmental health workers, nurses, and radiologists were associated with hazards.

Conclusions: The development and updates of existing policy on OHS and training/workshop, exposure to information, and awareness are necessary for improving occupational health and safety of health care workers in Kathmandu valley.

Keywords: Hazards, Kathmandu, Knowledge, Nepal, Occupational health, Safety

INTRODUCTION

According to the World Health Organization (WHO), "Occupational Health and Safety (OHS) addresses all aspects of workplace health and safety and has a strong focus on primary prevention of hazards". OHS is a multidisciplinary field of healthcare concerned with empowering an individual to carry out their job in a way that causes reduces harm to their health. A report published on GitHub mentioned that OHS is consistent

with the advancement of workplace health and safety, which is focused on avoiding harm from occupational hazards.¹

According to the WHO, an estimated 59 million people work in healthcare facilities globally, accounting for roughly 12% of the working population considered to be one of the most hazardous occupational settings.² The WHO also reports that all healthcare workers, including healthcare professionals, are exposed to occupational

hazards. The ILO (International labor Organization) that millions of healthcare workers suffer from work-related diseases and accidents, and many succumb to occupational hazards.³ Scholars and practitioners in the field of healthcare and OHS are striving to raise awareness of the risk factors and importance of workplace health and safety among this population.⁴ With the exception of a few enactments under the Labour Act of 1992, OSH (occupational safety and hazards) concerns continue to lack legal support. Unfortunately, the MoHP (Ministry of Health and Population) is ignorant about workplace health concerns. In Nepal, no health programs address the prevention and control of occupational diseases and conditions.¹

The objective of the study was to analyse the occupational health and safety hazards faced by health care professionals in Kathmandu.

METHODS

Hospital based quantitative cross sectional analytical study design was adopted to study the occupational health and safety hazards faced by healthcare professionals in Kathmandu, District from December 2021 to June 2022. Ethical Approval letter was taken from National Academy for Medical Sciences (NAMS) and the hospitals (National Trauma Center and All Nepal hospital Pvt. Ltd) before preceding the data collection process. Informed consent was taken from the respondents by ensuring privacy and confidentiality. Rights of the respondents were respected and participants were not forced to participate in the study purpose.

Inclusion and exclusion criteria

Health care professionals from hospitals who were on duty were included in the study whilst staffs and health care professionals who are not available during the data collection were excluded.

Sampling technique

Purposive sampling was used to select the hospitals and convenience sampling was used to collect the data from respondents. The total sample size was 247.

Semi-structured questionnaire was used as the tool in this study. The questionnaire was developed by reviewing different article. The questionnaire included different sections i.e. socio-demographic status of participants, knowledge, attitude and perceptions about occupational health and hazards safety practices and use of PPE (personal protection equipment) and about hazards i.e. chemical, biological, mechanical, physical and psychological hazards. The necessary data information was collected by self-administered. Confidentiality was maintained throughout the study.

The collected data were input into Epidata version 3.1 and processed, modified, and verified. Errors for inconsistency or incompleteness of responses connected to questionnaire questions was verified and corrected before labeling and analysing the data. The entered data were exported to the Statistical Package for Social Science (SPSS) for further processing and analysis. Crude odd ratio and adjusted odd ratio was used to show association between variables. P value less than 0.05 was considered as statistically significant throughout the analysis in this study.

RESULTS

Socio-demographic characteristics of respondents

The age groups of respondents were classified into five different age groups. More than half (54.3%) of the respondents were from the age group 21-30 years followed by the 31-40 years age group (28.3%). Females were slightly more in number compared to male participants, at 51.8% and 48.2% respectively. Nearly, three fourth (72.9%) of the participants were Hindu while others were Christian, Muslim, and Buddhist accounting for less than 14 percent. More than one quarter (37.2%) of participants were Brahmin 51.4% were married. More than half (57.5%) of the participants had an educational status of bachelor and above/ medical students.

Nearly two-thirds of respondents (59.5%) were governmental health workers. Most of the participants (43.7%) had income between NPR (Nepalese Rupees) 21,000-40,000 whilst only 5.3% had the highest earning which was between NPR 81,000-1,00,000. More the one quarter (34.4%) were nurses followed by 19% doctors with other health professions not exceeding 15 percent. More than two-thirds (76.9%) had working experience between one to five years whereas 6.5% had of 10-15 years (Table 1).

Knowledge, attitude and perceptions about occupational health and hazards

The majority (96.4%) of the respondents had known about occupational health and safety before. The hospital was the main source for getting information on OHS accounting for 74.5% followed by 66% of friends. The majority of participants had knowledge of what occupation hazards and occupational safety were, at 86.6% and 89.5% respectively. Nearly half (42.1%) had acquired infections from the facility before whereas the majority (96.4%) were injured at the facility before. Less than half (45.7%) of the total participants had attended training/workshops on OHS. About half of the participants (46.2%) had rated their current knowledge of OHS as good while 6.5% had rated it as bad. More than one quarter (35.2%) had told that hepatitis could occur due to the hazards in hospitals followed by 25.1% with HIV.

Table 1: Sociodemographic characteristics of respondents.

Characteristics	Frequency	Percentage
Age group (years)		
21-30	134	54.3
31-40	70	28.3
41-50	26	10.5
51-60	17	6.9
Sex		
Male	119	48.2
Female	128	51.8
Religion		
Hindu	180	72.9
Buddhist	34	13.8
Muslim	15	6.1
Christian	18	7.3
Ethnicity		
Brahmin	92	37.2
Chhetri	58	23.5
Janajati	58	23.5
Dalit	16	6.5
Others	23	9.3
Marital status		
Married	127	51.4
Unmarried	120	48.6
Educational status		
Higher secondary level/ diploma level	31	12.6
Bachelor level	59	23.9
Bachelor level and above/medical student	142	57.5
Bachelor and above/non-medical student	15	6.1
Main occupation		
Government healthcare worker	147	59.5
Private healthcare worker	100	40.5
Income (NPR)		
5,000-20,000	40	16.2
21,000-40,000	108	43.7
41,000-60,000	64	25.9
61,000-80,000	22	8.9
81,000-1,00,000	13	5.3
Categories		
Doctor	46	19.0
Nurse	85	34.4
Pharmacist	26	10.5
Lab technician	28	10.9
Radiologist/Radiographer	25	10.1
Others	37	15.0
Working years		
1-5 years	190	76.9
5-10 years	41	16.6
10-15 years	16	6.5

Nearly two-thirds (64.8%) had told that back pain is the most injury that could occur in the hospital followed by 59.5% needle prick injury. The majority (88.3%) of the participants had perceived that OHS matters to them as a

health worker whereas 71.3% believed that the hospital environment poses danger to them while 90.3% viewed that they always need to protect themselves at hospitals (Table 2).

Table 2: Knowledge, attitude and perceptions about occupational health and hazards.

Characteristics	N	%
Known about OHS before?	Yes	238
	No	9
From what source?*	Radio	69
	Television	95
	Hospital	184
	Friends	163
	Posters	26
	Banners	20
	Newspapers	68
	Magazines	54
Occupational hazards refer to all potential cause/ increase the risk of injury/ill health.	True	214
	False	33
Occupational safety is the control of hazards in the health facility to reduce risk.	True	221
	False	26
Have you acquired any infection from the facility before?	Yes	104
	No	143
Have you injured at the facility before?	Yes	238
	No	9
Have you attended any workshops/ training on OHS?	Yes	113
	No	134
Rating of knowledge on OHS	Excellent	66
	Good	114
	Fair	51
	Poor	16
What types of infections acquired due to hazards in hospital?	TB	39
	HIV	62
	Hepatitis	87
	COVID-19	59
What types of injury can occur in hospital?*	Needle prick	147
	Back pain	160
	Leg injury	71
	Others	7
OHS matters should concern me as a health care worker?	Yes	218
	No	29
The hospital environment poses danger to me as a worker?	Yes	176
	No	71
I need to always protect myself while at the hospital	Yes	223
	No	24

Note*-multiple response

Safety practices, use of personal protective equipment and hazards

The majority (88.7%) of participants use PPE (personal protective equipment) when working all the time. 89.5% told that mask is the available PPE for use while boots were the least used, at 12.1%. The same PPE was observed in the case of PPE used at work for most used and least used accounting for 91.1% and 6.9% respectively. More than two third of participants said that PPE is always available for use and easily accessible totaling up to 77.7% and 72.9% respectively.

The majority (80.6%) of participants viewed hazards as a situation within the workplace that has the potential to

cause injury or adverse health effects for people. More than half (57.9%) believed that biological hazards are faced mostly by health workers. The majority (87%) had suffered from chemical hazards and more than half (53.8%) had suffered from allergies. Furthermore, 88.3% had suffered from biological hazards and two-thirds (66.4%) of them had been victims of viral hazards. Almost half (46.6%) of respondents were always exposed to radiation. Moreover, nearly half (46.6%) said that the hospital used safety measures like walls to reduce the effects of radiation. The majority (85.8%) of the respondents had sleep disturbances whilst more than one quarter (32%) had personality disorders (Table 3).

Table 3: Safety practices, use of personal protective equipment and hazard.

Characteristics		Frequency	Percent
Do you use PPE when working all the time?	Yes	219	88.7
	No	28	11.3
Types of PPE available for use*	Head covers	106	42.9
	Hand gloves	168	68.0
	Mask	221	89.5
	Apron	176	71.3
	Boots	30	12.1
	Protective goggles	35	14.2
	Protective gown	43	17.4
Types of PPE used at work*	Head covers	95	38.5
	Hand gloves	165	66.8
	Mask	225	91.1
	Apron	180	72.9
	Boots	17	6.9
	Protective goggles	19	7.7
	Protective gown	51	20.6
Is there PPE always available for use?	Yes	192	77.7
	No	55	22.3
Is the PPE easily accessible for use?	Yes	180	72.9
	No	67	27.1
Hazard refers to a situation having potential to cause injury or adverse health effects	Yes	199	80.6
	No	48	19.4
In your view, which hazards are faced mostly by health workers?*	Mechanical	124	50.2
	Chemical	128	51.8
	Biological	143	57.9
	Physical	97	39.3
	Psychological	86	34.8
Suffered from chemical hazards?	Yes	215	87.0
	No	32	13.0
Types of chemical hazards you were victim of?*	Allergies	133	53.8
	Rashes	97	39.3
	Vomiting	58	23.5
	Skin disease	54	21.9
	Cancer	2	0.8
	Reproductive disorders	1	0.4
	Others	6	2.4
Have you suffered from biological hazards?	Yes	218	88.3
	No	29	11.7
Types of biological hazards faced?*	Viral	164	66.4
	Fungal	74	30.0
	Bacterial	93	38.1
	Parasites	23	37.7
	Organic dust	50	20.6
How much are you exposed to radiation?	Always	115	46.6
	Never	132	53.4
Safety measures used by hospital to protect/lessen the effects of radiation	Use of PPE	42	17.0
	Use of walls	115	46.6
	Greater distance	90	36.4
Are you suffering from sleep disturbances?	Yes	212	85.8
	No	35	14.2
Mental disorders	Anxiety disorders, panic disorder	59	23.9
	Depression, and other disorders	27	10.9
	Eating disorders	48	19.4
	Personality disorder	79	32.0
	Skipped	34	13.8

Factors associated with safety practices

Age group 51-60 years had 3.285 significantly higher safety practice compared to its counterparts. (95% CI=1.143-9.439, $p=0.027$). Sex of the respondents was not statistically significant with safety practices. Participants who were from Brahmin ethnicity had 2.045 times (95% CI=0.791-5.292) and Dalit had 3.125 times (95% CI=0.829-11.779) good safety practice compared to others. Participants who were Muslim had 2.006 times (95% CI=0.685-5.875) and Christian had 1.338 times (95% CI=0.507-3.529) good safety practice compared to Hindu whereas Buddhist had poor safety practice by 52% than Hindu. Married participants were 1.144 times (95% CI=0.870-2.404) likely to follow good safety practice than unmarried. Respondents whose educational status was higher secondary level were statistically significant with safety practices (COR=4.762, 95% CI=1.234-18.371, $p=0.023$). Governmental health workers were statistically significant with safety practices. (COR=3.217, 95% CI=1.853-5.58, $p<0.001$). In addition,

doctors (COR=4.840, 95% CI=1.860-12.593, $p=0.001$) and nurses (COR=3.039, 95% CI=1.282-7.203, $p=0.012$) were statistically significant with safety practices whilst income and working years of participant were not statistically significant with safety practices.

At multivariate analysis, the independent predictors for experiencing safety practice were age groups 51-60 years (AOR=4.184, 95% CI=1.015-17.254, $p=0.048$), respondents belonging to Brahmin ethnicity (AOR=8.669 95% CI=1.623-46.300, $p=0.012$) and having an educational status of bachelor level and above/medical (AOR=0.156, 95% CI=0.29-0.850, $p=0.032$). Similarly, the odds of good safety practice of governmental health worker were 7.23 times (95% CI=2.806-18.595, $p<0.001$) compared to private health workers. The participants who were doctors (AOR=5.869, 95% CI=1.705-20.194, $p=0.005$) and those respondents who have an income of NPR 21,000-40,000 (AOR=0.151, 95% CI=0.044-0.519, $p=0.003$) were statistically significant with safety practice (Table 4).

Table 4: Factors associated with safety practice.

Variables	Safety practices		COR (95% CI)	P value	AOR (95% CI)	P value
	Poor (%)	Good (%)				
Age group (years)						
21-30	86 (64.2)	48 (35.8)	Ref		Ref	
31-40	39 (55.7)	31 (44.3)	1.424 (0.790-2.567)	0.240	0.860 (0.339-2.183)	0.752
41-50	12 (46.2)	14 (53.8)	2.090 (0.895-4.881)	0.088	0.716 (0.713-2.956)	0.644
51-60	6 (35.3)	11 (64.7)	3.285 (1.143-9.439)	0.027*	4.184 (1.015-17.254)	0.048*
Sex						
Male	74 (62.2)	45 (37.8)	Ref		Ref	
Female	69 (53.9)	59 (46.1)	1.406 (0.846-2.337)	0.189	1.458 (0.486-4.375)	0.502
Ethnicity						
Brahmin	44 (47.8)	48 (52.2)	2.045 (0.791-5.292)	0.140	8.669 (1.623-46.300)	0.012*
Chhetri	33 (56.9)	25 (43.1)	1.420 (0.521-3.873)	0.493	5.027 (0.869-29.096)	0.071
Janajati	45 (77.6)	13 (22.4)	0.542 (0.188-1.559)	0.256	1.265 (0.237-6.747)	0.784
Dalit	6 (37.5)	10 (62.5)	3.125 (0.829-11.779)	0.092	6.023 (0.995-36.445)	0.051
Others	15 (65.2)	8 (34.8)	Ref		Ref	
Religion						
Hindu	103 (57.2)	77 (42.8)	Ref		Ref	
Buddhist	25 (73.5)	9 (26.5)	0.482 (0.213-1.090)	0.080	0.328 (0.90-1.202)	0.092
Muslim	6 (40.0)	9 (60.0)	2.006 (0.685-5.875)	0.204	5.716 (0.953-34.286)	0.056
Christian	9 (50.0)	9 (50.0)	1.338 (0.507-3.529)	0.557	1.253 (0.194-8.109)	0.813
Marital status						
Married	68 (53.5)	59 (46.5)	1.144 (0.870-2.404)	0.155	1.304 (0.579-2.938)	0.522
Unmarried	75 (62.5)	45 (37.5)	Ref		Ref	
Educational status						
Higher secondary level	6 (19.4)	25 (80.6)	4.762 (1.234-18.371)	0.023*	1.846 (0.274-12.423)	0.529
Bachelor level	37 (62.7)	22 (37.3)	0.680 (0.217-2.132)	0.508	0.411 (0.75-2.257)	0.306
Bachelor level and above/ medical	92 (64.8)	50 (35.2)	0.621 (0.213-1.813)	0.384	0.156 (0.29-0.850)	0.032*
Bachelor level and above/non- medical	8 (53.3)	7 (46.7)	Ref		Ref	
Main occupation						
Governmental health worker	69 (46.9)	78 (53.1)	3.217 (1.853-5.587)	<0.001*	7.223 (2.806-18.595)	<0.001*
Private health worker	74 (74.0)	26 (26)	Ref		Ref	

Continued.

Variables	Safety practices		COR (95% CI)	P value	AOR (95% CI)	P value
	Poor (%)	Good (%)				
Categories of job						
Doctor	18 (39.1)	28 (60.9)	4.840 (1.860-12.593)	0.001*	5.869 (1.705-20.194)	0.005*
Nurse	43 (50.6)	42 (49.4)	3.039 (1.282-7.203)	0.012*	2.160 (0.539-8.648)	0.277
Pharmacist	20 (76.9)	6 (23.1)	0.933 (0.286-3.042)	0.909	0.730 (0.161-3.318)	0.684
Lab technician	17 (60.7)	11 (39.3)	2.013 (0.692-5.853)	0.199	1.396 (0.328-5.950)	0.652
Radiologist	17 (68.0)	8 (32.0)	1.464 (0.474-4.519)	0.507	1.564 (0.357-6.853)	0.553
Dentist	28 (75.7)	9 (24.3)	Ref		Ref	
Income (Nrs)						
5,000-20,000	25 (62.5)	15 (37.5)	Ref		Ref	
21,000-40,000	70 (64.8)	38 (35.2)	0.905 (0.426-1.919)	0.794	0.151 (0.044-0.519)	0.003*
41,000-60,000	35 (54.7)	29 (45.3)	1.381 (0.616-3.096)	0.433	0.433 (0.188-1.591)	0.207
61,000-80,000	8 (36.4)	14 (63.6)	2.917 (0.991-8.580)	0.052	0.974 (0.179-5.307)	0.976
81,000-1,00,000	5 (38.5)	8 (61.5)	2.667 (0.736-9.665)	0.135	0.951 (0.152-5.942)	0.957
Working year						
1-5 years	115 (60.5)	75 (39.5)	Ref			
5-10 years	19 (46.3)	22 (53.7)	1.775 (0.900-3.502)	0.098	1.630 (0.580-4.581)	0.354
10-15 years	9 (56.3)	7 (43.8)	1.193 (0.426-3.339)	0.737	2.068 (0.425-10.060)	0.368

Note: COR=crude odd ratio, AOR= adjusted odd ratio, *Statistically significant at p value<0.05.

Table 5: Factors associated with hazards.

Variables	Hazards		COR (95% CI)	P value	AOR (95% CI)	P value
	Risk (%)	Safe (%)				
Age group (years)						
21-30	94 (70.1)	40 (29.9)	Ref		Ref	
31-40	44 (62.9)	26 (37.1)	1.389 (0.755-2.555)	0.291	1.902 (0.742-4.877)	0.181
41-50	17 (65.4)	9 (34.6)	1.244 (0.512-3.026)	0.630	2.914 (0.736-11.544)	0.128
51-60	11 (64.7)	6 (35.3)	1.282 (0.444-3.705)	0.647	2.085 (0.509-8.545)	0.307
Sex						
Male	83 (69.7)	36 (30.3)	Ref		Ref	
Female	83 (64.8)	45 (35.2)	1.250 (0.733-2.131)	0.412	0.539 (0.172-1.687)	0.288
Ethnicity						
Brahmin	65 (70.7)	27 (29.3)	1.177 (0.419-3.307)	0.757	2.463 (0.421-14.411)	0.317
Chhetri	39 (67.2)	19 (32.8)	1.380 (0.46-4.066)	0.559	2.230 (0.360-13.799)	0.388
Janajati	34 (58.6)	24 (41.4)	2.000 (0.688-5.815)	0.203	1.741 (0.297-10.205)	0.539
Dalit	11 (68.8)	5 (31.3)	1.288 (0.315-5.267)	0.725	0.932 (1.36-6.398)	0.943
Others	17 (73.9)	6 (26.1)	Ref		Ref	
Religion						
Hindu	129 (71.7)	51 (28.3)	Ref		Ref	
Buddhist	17 (50.0)	17 (50.0)	2.529 (1.199-5.335)	0.015*	2.031 (0.678-6.088)	0.206
Muslim	8 (53.3)	7 (46.7)	2.217 (0.763-6.420)	0.144	4.311 (0.774-24.002)	0.095
Christian	12 (66.7)	6 (33.3)	1.265 (0.451-3.550)	0.656	2.877 (0.609-13.595)	0.182
Marital status						
Married	68 (53.5)	59 (46.5)	3.865 (2.166-6.897)	<0.001*	4.028 (1.787-9.080)	0.001*
Unmarried	98 (81.7)	22 (18.3)	Ref		Ref	
Educational status						
Higher secondary level	19 (61.3)	12 (38.7)	1.263 (0.346-4.608)	0.723	0.573 (0.094-3.489)	0.546
Bachelor level	34 (57.6)	25 (42.4)	1.471 (0.447-4.840)	0.526	0.958 (0.172-5.327)	0.961
Bachelor level and above/medical	103 (72.5)	39 (27.5)	0.757 (0.243-2.356)	0.631	0.334 (0.063-1.768)	0.197
Bachelor level and above/ non-medical	10 (66.7)	5 (33.3)	Ref		Ref	
Main occupation						
Governmental health worker	90 (61.2)	57 (38.8)	2.006 (1.138-3.533)	0.016*	2.490 (1.016-6.103)	0.046*
Private health worker	76 (76.0)	24 (24.0)	Ref		Ref	
Categories of job						
Doctor	33 (71.7)	13 (28.3)	2.035 (0.688-6.020)	0.199	1.542 (0.417-5.695)	0.516
Nurse	48 (56.5)	37 (43.5)	3.983 (1.504-10.545)	0.005*	3.621 (0.811-16.160)	0.092

Continued.

Variables	Hazards		COR (95% CI)	P value	AOR (95% CI)	P value
	Risk (%)	Safe (%)				
Pharmacist	21 (80.8)	5 (19.2)	1.230 (0.332-4.558)	0.757	0.918 (0.201-4.185)	0.912
Lab technician	20 (71.4)	8 (28.6)	2.067 (0.623-6.851)	0.235	2.194 (0.526-9.156)	0.281
Radiologist	13 (52.0)	12 (48.0)	4.769 (1.473-15.438)	0.009*	6.406 (1.500-27.354)	0.012*
Dentist	31 (83.8)	6 (16.2)	Ref		Ref	
Income (NPR)						
5,000-20,000	22 (55.0)	18 (45.0)	Ref		Ref	
21,000-40,000	69 (63.9)	39 (36.1)	0.691 (0.331-1.443)	0.325	0.247 (0.079-0.775)	0.017*
41,000-60,000	53 (82.8)	11 (17.2)	0.254 (0.103-0.624)	0.003*	0.094 (0.023-0.379)	0.001
61,000-80,000	15 (68.2)	7 (31.8)	0.570 (0.191-1.700)	0.314	0.096 (0.017-0.540)	0.008*
81,000-1,00,000	7 (53.8)	6 (46.2)	1.048 (0.298-3.678)	0.942	0.713 (0.104-4.875)	0.730
Working year						
1-5 years	125 (65.8)	65 (34.2)	Ref		Ref	
5-10 years	31 (75.6)	10 (24.4)	0.620 (0.286-1.344)	0.226	0.368 (0.126-1.076)	0.068
10-15 years	10 (62.5)	6 (37.5)	1.154 (0.402-3.316)	0.790	1.014 (0.222-4.642)	0.986

Note: COR= crude odd ratio, AOR= adjusted odd ratio, *Statistically significant at p value <0.05.

Factors associated with hazards

Respondents between ages 31-40 years 1.389 times (95% CI=0.755-2.555), age 41-50 years 1.244 (95% CI=0.512-3.026), and age 51-60 years 1.282 times (95% CI=0.444-3.705) were safe from hazards compared to age group 21-30 years. There was no significant association between hazards and the sex of respondents. Participants belonging to Janajati ethnicity were 2 times (95% CI=0.688-5.815) safe from hazards compared to others followed by Chettri 1.380 times (95% CI=0.46-4.066). Respondents from the Buddhist religion were statistically significant with hazards (COR=2.529, 95% CI=1.199-5.335, $p=0.015$) and also there was a significant association between married participants and hazards (COR=3.865, 95% CI=2.166-6.897, $p<0.001$) however there was no any significant association between the educational status of participants and hazards.

The participants who were governmental health workers (COR=2.006, 95% CI=1.138-3.533, $p=0.016$), nurses (COR=3.983, 95% CI=1.504-10.545, $p=0.005$), radiologists (COR=4.769, 95% CI=1.473-15.438, $p=0.009$) and those who earn between NPR 41,000-60,000 (COR=0.254, 95% CI=0.103-0.624, $p=0.003$) were statistically significant with hazards. Respondents who had working experience for 10-15 years were 1.154 times (95% CI=0.402-3.316) safe from hazards and 32% more at risk from hazards compared to the working experience of 1-5 years. At multivariate analysis, the odds of hazards were significant with married participants (AOR=4.028, 95% CI=1.787-9.080, $p=0.001$) and governmental health workers (AOR=2.490, 95% CI=1.016-6.103, $p=0.046$). The independent predictors experiencing hazards were radiologists (AOR=6.406, 95% CI=1.500-27.354, $p=0.012$) and participants whose income varies from NPR 21,000 to 80,000 (AOR=0.247, 95% CI=0.079-0.775, $p=0.017$), (AOR=0.094, 95% CI=0.023-0.379, $p=0.001$), (AOR=0.096, 95% CI=0.017-0.540, $p=0.008$) respectively (Table 5).

DISCUSSION

There was a total of 247 participants and more than half of the respondents belonged to the 21-30 age group (54.3%) and female participants (51.8%) were slightly more compared to male participants (48.2%). These findings were consistent with the studies conducted in Greater Accra Regional Hospital of Ghana and Abeokuta, Nigeria.^{5,6}

According to this study, more than one-quarter of respondents were nurse 34.41% which was consistent with other similar study done in Greater Accra Regional Hospital, Ghana (72%), and case study of Nigeria (40.7%) which mean that nurses comprise the major manpower in hospitals.^{5,7}

96.4% of healthcare workers had known about occupational hazards and safety and the hospital was the main source for getting information about occupational hazards and safety. These findings were consistent with the studies done in Greater Accra Regional Hospital of Ghana (93%).⁵ However, similar studies found that the respondents knew about OHS from seminars/Workshops i.e., 30% and 33% conducted in two psychiatric hospitals in Ghana and Tanzania.^{8,9}

According to this study, the types of infection that can be acquired from the facility as per respondents were hepatitis i.e., 35.2% followed by 25.1% HIV. 23.9% was COVID and the least infection that could occur was TB 15.8%. It was also found that back pain was the major injury that can occur in the facility i.e., at 64.8% followed by needle prick at 59.5%, leg injury at 28.7%, and 2.8% others. A study done in Tanzania showed similar higher needle prick injury i.e., 52.9% whereas a study was done in Abeokuta, Nigeria showed 48.6% and Greater Accra Regional Hospital of Ghana showed 16.7% needle injury which was less compared to back pain and neck pain which was greater in number i.e. 84.8% and 27.6%

respectively.^{5,6,9} Similarly, a study done in Saudi Arabia showed the prevalence of back pain at 71.5% and 65% after a 6-month follow up which was reduced due to good knowledge of preventing back pain among respondents.¹⁰

About half of the respondents, 45.7% had attended workshops/training on occupational health. (88.7%) respondents knew that OHS matters should concern them as health care workers and 90.7% of respondents thought they need to protect themselves at a hospital which was consistent with the study done in Greater Accra Regional Hospital of Ghana.⁵

Mask and apron were mostly available PPE for use in the facility i.e., 89.5% and 71.3% respectively whereas boots were least available for use i.e., 12.1%. In the same way, the most preferred or mostly used PPE at work were mask 91.1% and apron 73.3% and least preferred PPE was boots 6.9%. However, a similar study showed that most available and used PPE were hand gloves (93.1%, 91.9%) followed by face mask (87.8%, 86.6%) whereas least available and least used PPE was goggles (40.2%, 29.7%).⁵

From the study, it was found that the majority (87.0%) of respondents were victims of chemical hazards; allergies were mostly faced by 53.8% followed by rashes 39.3% and vomiting 23.5%. Likewise, it was seen that out of 88.3% biological hazards, viral hazards were mostly faced by respondents i.e., 66.4% followed by bacterial hazards i.e., 38.1%, and the least was organic dust 20.6%. A similar study found that health workers had suffered from physical health hazards (53%) followed by biological (20%) and psychosocial (17%) health hazards.⁸

Our study showed that 46.6% of respondents had been exposed to radiation. A similar study also revealed that 67.6% were exposed to radiation.⁶ Our study also revealed that 85.8% of respondents had suffered from sleep disturbances due to workplace while 32% of respondents had suffered from personality disorders followed by 23.9% anxiety disorders, and panic disorders while depression and other disorders were the least i.e., 10.9% and 13.8% respondents had not answered or skipped.

The limitation of this study was that the information was collected mainly through a self-administered questionnaire. Since it was self-administered, a common threat to the validity was desirability and recall bias. In addition, no interventional activities were conducted during the study duration.

CONCLUSION

The study reveals that 88.7% of respondents used PPE while working all the time working and the mostly used PPE at work were masks 91.1% and apron 72.9% and the least preferred PPE was boots 6.9%. Many respondents had knowledge about occupational health and hazards and

the hospital was the main source of obtaining information on OHS. In a question about rating current knowledge of occupational hazards in the facility, nearly half (46.2%) of respondents rated themselves as good. Likewise, 80.6% of respondents answered correctly about the definition of the hazard.

Most of the participants were aware of OHS and had positive attitudes and perceptions of it to protect themselves from OHS all the time while working. Out of the total respondents, 45.7% had attended workshops/training on occupational health and safety. It was found that more than one quarter (35.2%) believed that hepatitis was the main infection that can be acquired from the facility. Moreover, back pain is the major injury that can occur in the facility i.e., 64.8% followed by needle prick at 59.5%. The majority of respondents had faced chemical and biological hazards accounting for 87% and 88.3% respectively.

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