




The Prevalence of Occupational Accidents and the Associated Factors Among Janitorial Staff at a University Teaching Hospital in South Ethiopia

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Background: The healthcare industry is widely regarded as a high-risk environment for workers' occupational health and safety. As a result, healthcare workers are constantly exposed to a wide range of hazards, including biological, chemical, physical, ergonomic, and psychosocial hazards. Consequently, janitorial staff are the most vulnerable section of the healthcare workforce to occupational injuries when compared to others due to the nature of their work. Therefore, this study aims at assessing the magnitude of occupational accidents and associated factors among Janitorial staff at Dilla University Teaching Hospital.

Methods: This cross-sectional institutional-based study was conducted from August to September 2022 at a University Teaching Hospital in South Ethiopia. A total of 105 janitorial staff were included in the study with a response rate of 93.8%. The data were collected using a structured interviewer-administered questionnaire. Data were entered using Epi Info version 7.2.5 and exported to IBM SPSS statistics 22 for further cleaning and analysis. The binary logistic regression model was used to identify predictors of occupational accidents and variables with a *p*-value of <0.05 during the multivariable analysis were considered statistically significant.

Results: The prevalence of occupational accidents is 61% (95% CI: 51.4, 70.5). Of the total study participants, 52 (45.5%) and 33 (31.4%) of the participants had reported that they have experienced chemical splash and needle stick injury, respectively. The age of participants was one of the factors for occupational accidents. The participants who did not receive training were 3 times [AOR=2.9, 95% CI (1.04, 8.02)] more likely exposed. Having good practice was protective against occupational injuries.

Conclusion: The study highlights the high prevalence of occupational accidents, particularly chemical splashes, and needle stick injuries, among janitors in the study settings. The study emphasizes the importance of age, training, awareness, and adherence to infection prevention and control strategies as factors influencing the likelihood of experiencing occupational injuries.

Keywords: occupational accident, occupational injury, chemical splash, needle stick injury, sharp injury

Background

Occupational accidents refer to sudden unexpected events that occur in the workplace, resulting in a range of non-fatal occupational and fatal occupational injuries. These accidents can range from minor incidents such as cuts and bruises to major life-threatening situations, and they can result in human suffering, loss of productivity, and significant financial losses. According to the International Labour Organization (ILO), there are approximately 2.78 million occupational fatalities and 374 million non-fatal work-related injuries and illnesses worldwide each year.^{1,2}

The healthcare industry, which includes huge hospitals to small clinics that provide important medical services to the public, is widely regarded as a difficult and high-risk environment for workers' occupational health and safety. As a result, healthcare workers (HCWs) are constantly exposed to a wide range of hazards, including biological, chemical, physical, ergonomic, and psychosocial hazards.³ Specially, the health workforce in the lower and middle-income nations are highly vulnerable to occupational hazards, owing to limited resources.⁴

The healthcare sector in Africa has several occupational safety and health (OSH) concerns, resulting in accidents that have serious consequences for the well-being and performance of healthcare employees. Scarcity of resources,

overcrowding, lack of well-equipped facilities, personnel shortages, lack of training, and inadequate execution of safety regulations are the key factors ascribed to the increased risk of occupational accidents.^{5,6} The majority of the healthcare providers in Africa are exposed to blood and body fluids via needle stick and sharp injuries and splash of blood and body fluids to mucous membranes with a lifetime and annual prevalence of 65.7% and 48%, respectively.⁷

In Ethiopia, the first proclamation No. 58/1945, which established occupational health and safety in the country, was issued in the 1940s. Since then, several policies, regulations, and proclamations have been put into effect in the nation, emphasizing the safety of workers.⁸ Despite the availability of these numerous declarations and regulations, occupational accidents and injuries are very common in the manufacturing, agriculture, and service delivery sectors.^{9,10}

One of the most dangerous workplaces in the country is the healthcare setting, where the employees are at risk due to the presence of a variety of hazards, including biological, chemical, physical, ergonomic, and psychosocial hazards.^{11,12} The prevalence of occupational exposure to blood and body fluids among healthcare workers attributed to needle stick injuries, sharp injuries, and splash injuries is 54.95% and 44.24% for lifetime and twelve months, respectively.¹³

Studies suggested that janitorial/cleaning staff are the most vulnerable section of the healthcare workforce to occupational injuries when compared to others due to the nature of their work, which includes exposure to physical, chemical, ergonomic, and biological hazards.^{14,15} Despite this fact, most studies conducted to assess occupational injuries among healthcare workers focused on other groups of the health workforce and little is known about the prevalence of occupational accidents among janitorial staff.

In the current study setting, the generation rate of hazardous waste including sharp, biological, and chemical wastes is higher compared to the WHO standard. In addition, the overall healthcare waste management practice within the hospital was poor making the janitorial staff involved in waste handling vulnerable to injuries and accidents.¹⁶ Therefore this study aimed to assess the prevalence of occupational accidents among janitorial staff at a University Teaching Hospital in South Ethiopia. In this study, an occupational accident was defined as the self-reported lifetime exposure to one or a combination of occupational injuries. These injuries included needle stick injuries, sharp injuries, blood and body fluid splashes, and chemical splashes that occurred within the participants' current work profession.

Methods and Materials

Study Area and Design

This institutional-based cross-sectional study was carried out from August to September 2022 at a University College of Medicine and Health Sciences & Teaching Hospital. The hospital is located in Southern Nations and Nationalities Regional State of Ethiopia. The hospital provides inpatient and outpatient services in different specialties including Internal medicine, Gynaecology and obstetrics, Radiology, Surgery, Orthopaedics, Maternal and child health, Paediatrics, Psychiatry, Dentistry, Ophthalmology, and so on. The hospital also serves as a teaching hospital for the practical attachment of more than eight department students.

Participants

The source population for this study were all housekeeping/cleaning staff working at the University Teaching Hospital. The study population was all housekeeping staff who had served six months in the hospital.

Inclusion Criteria

All janitorial/cleaning staff who have worked for six months within the hospital before the data collection period and were willing to participate in the study were included.

Exclusion Criteria

Janitorial/cleaning staff who were on maternal and sick leave during the data collection period were excluded from the study.

Sample Size and Sampling

The number of janitorial staff within the hospital was 124 during the data collection time. The number of the janitorial staff was manageable and in order to increase the study's precision or accuracy, all 124 workers were included and 112 fulfilled the inclusion criteria.

Data Collection Method and Tool

The data were collected using a structured interviewer-administered questionnaire. The instrument used was prepared reviewing different literatures. The tool is organized in three sections consisting of items/questions capturing socio-demographic and work-related characteristics of the participants, behavioural characteristics and magnitude of occupational injuries. The study team consisted of one MPH environmental health supervisor and three BSC environmental health professional data collectors.

Data Management and Analysis

Using a data entry template, the collected data were coded and entered into Epi Info version 7.2.5. The data were cleaned before being sent to IBM SPSS Statistics 22 for further cleaning and analysis. Tables, frequencies, percentages, and graphs were used to illustrate descriptive statistics. Knowledge on IPC was measured by 10 knowledge-related questions and the right answer was given a value of 1 and for those incorrect answers a value of 0 was given. Then, the total score was computed by summing up all the items together and the respondent's score was categorized into three as poor ($\leq 50\%$), fair (51–75%) or good knowledge ($>75\%$). Participants' attitude on IPC was measured by 10 attitude-related questions on a five-point Likert scale. Then, the respondent score was computed by summing up all the items together and the respondent's score was dichotomized as favourable attitude ($>$ mean) or unfavourable attitude ($<$ mean). Practice on IPC was measured asking 10 practice-related questions on a five-point Likert scale. Then, the respondent score was computed by summing up all the items together and the respondent's score was categorized into three as poor ($\leq 50\%$), fair (51–75%), or good knowledge ($>75\%$).

The binary logistic regression model was used to identify predictors of occupational accidents and variables with a p -value of <0.2 in bivariate analysis were entered into multivariable analysis to predict the strength of association, and variables with a p -value of <0.05 was considered statistically significant.

Ethical Consideration

The study complies with the Declaration of Helsinki Ethical Principles for Medical Research involving human subjects. The study was conducted after obtaining ethical approval and clearance from the Institutional Review Board (IRB) of Dilla University College of Medicine and Health Science with approval number DU/IRB/0082/22/A1. Participants were provided with a written informed consent form that outlines the purpose of the research, what is expected of them as participants, any potential risks or benefits of participating, and how their data will be handled anonymously for presentation and publication purpose. Written informed consent was obtained from each study participant before data collection. The data collected from the participants were kept with the research team securely and no other person had access to the data.

Result

Demographic and Work-Related Characteristics of Respondents

Out of the 112 participants included in the study, 105 were willing to participate in the study; hence the response rate of the study was 93.8%. From the study participants almost three-quarters were female (Table 1).

Behavioural-Related Characteristics

From the participants 62 (59%) had taken training on infection prevention and control. On the other hand, only 22.9% had received at least one dose of HBV vaccination. Almost two-thirds of the participants had good knowledge (64.8%) and positive attitude (63.9%) on IPC measures. Fifty-nine (56.2%) of the study participants adhere to IPC protocols and procedures during their work (Table 2).

Table 1 Demographic and Work-Related Characteristics of Janitorial Staff at a University Teaching Hospital, Southern Ethiopia, 2022

Variables	Frequency	Percentage
Sex		
Male	29	27.6
Female	76	72.4
Age (in years)		
≤25	44	41.9
26–35	45	42.9
≥36	16	15.2
Educational status		
Elementary (1–8)	26	24.8
Secondary (9–12)	45	42.9
College and above	34	32.4
Marital status		
Married	76	72.4
Single	19	18.1
Divorced/widowed	10	9.5
Experience in current profession (in years)		
≤5	41	39
6–10	49	46.7
≥11	15	14.3
Current working unit		
Medical & general ICU	28	23.8
Pediatrics & neonatal ICU	8	7.6
Surgical ward and OR	16	15.2
Gynecology and obstetrics	16	15.2
Emergency	17	16.2
Others*	23	21.9

Note: *Other; OPD, Psychiatry, MCH.

Prevalence of Occupational Accident

From the total participants included in the study 61% (64) had faced at least one occupational injury during their entire career. Out of this, 52 (45.5%) and 33 (31.4%) of the participants had reported that they have experienced chemical splash and needle stick injury, respectively (Figure 1).

Out of the total 61 participants who had experienced occupational accidents, 26 (40.7%) of them had faced only one type of injury and 15 (23.4%) of them had experienced four types of injuries including needle stick injury, sharp injury, blood and body fluid splash, and chemical splash in the current work profession (Figure 2).

Table 2 Behavioural-Related Characteristics of Janitorial Staff at a University Teaching Hospital, Southern Ethiopia, 2022

Variables	Frequency	Percentage
Training on IPC		
Yes	62	59
No	43	41
Vaccination against HBV		
Yes	24	22.9
No	81	77.1
Knowledge on IPC		
Poor	18	17.1
Fair	19	18.1
Good	68	64.8
Attitude toward IPC		
Negative	38	36.1
Positive	67	63.9
Practice on IPC		
Poor	28	26.7
Fair	18	17.1
Good	59	56.2

Factors Associated with Occupational Accidents

Among the socio-demographic and work-related and behavioural-related variables included in the study, 5 had shown significant association with occupational accidents during the bivariate analysis with p -value ≤ 0.2 . These variables were entered to multivariate analysis to test the association by independently controlling for other potential confounders (Table 3).

The age of participants showed significant association with occupational incident; respondents aged between 26 and 35 years were 67% less likely exposed to occupational accidents than respondents 25 years old and less [AOR=0.33, 95%

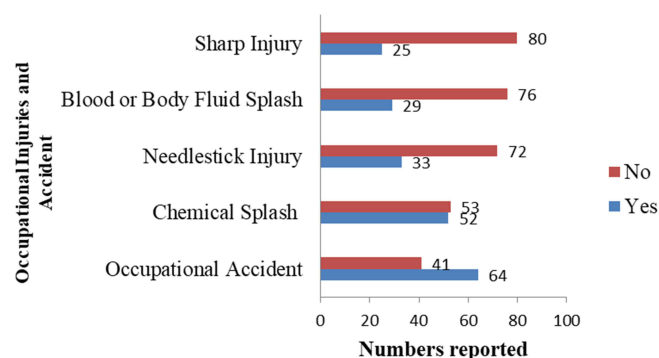


Figure 1 Number of occupational injuries and accidents faced by type among janitorial staff at a University Teaching Hospital, southern Ethiopia, 2022.

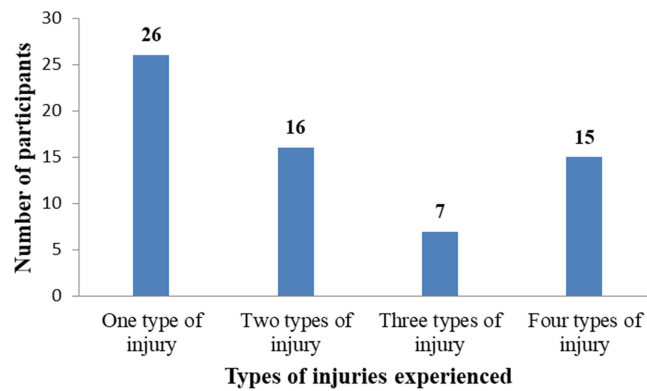


Figure 2 The number by types of injuries experienced among janitorial staff at a University Teaching Hospital, southern Ethiopia, 2022.

CI (0.12, 0.93)]. Housekeeping staff who do not take training on IPC were 2.9 times more likely to report occupational incidents as compared to those who took training [AOR=2.9, 95% CI (1.04, 8.02)].

The results revealed that participants who had fair and good knowledge on IPC were more likely exposed to occupational accident as compared to those who had poor knowledge [AOR=8.26, 95% CI (1.55, 43.93)] and [AOR=4.22, 95% CI (1.1, 16.15)], respectively.

Table 3 Bivariate and Multivariate Regression of Factors Associated with Occupational Accidents Among Housekeeping Staff at a University Teaching Hospital, Southern Ethiopia, 2022

Variables	Occupational Injury		COR (95% CI)	AOR (95% CI)
	Yes	No		
Sex				
Male	14 (48.3)	15 (51.7)	1	1
Female	50 (65.8)	26 (34.2)	2.06 (0.86, 4.91)	2.5 (0.89, 7.02)
Age (in years)				
≤25	33 (75)	11 (25)	1	1
26–35	23 (51.1)	22 (48.9)	0.34 (0.14, 0.82)	0.33 (0.12, 0.93)*
≥36	8 (50)	8 (50)	0.33 (0.07, 1.56)	0.55 (0.13, 2.23)
Training on IPC				
Yes	34 (54.8)	28 (55.2)	1	1
No	30 (69.8)	13 (30.2)	1.9 (0.83, 4.31)	2.9 (1.04, 8.02)*
Knowledge on IPC				
Poor	6 (33.3)	12 (66.7)	1	1
Fair	14 (73.7)	5 (26.3)	5.6 (1.36, 23.05)	8.26 (1.55, 43.93)**
Good	44 (64.7)	24 (35.3)	3.66 (1.22, 11)	4.22 (1.1, 16.15)*
Practice on IPC				
Poor	20 (71.4)	8 (28.6)	2.25 (0.85, 5.93)	4.82 (1.41, 16.45)**
Fair	13 (72.2)	5 (27.8)	2.34 (0.74, 7.42)	4.23 (1.06, 16.75)*
Good	31 (52.2)	28 (47.8)	1	1

Notes: **AOR of p-value significant at <0.01; *AOR of p-value significant at <0.05.

Participants who practice infection prevention and control measures fairly and poorly were 4.23 [AOR=4.23, 95% CI (1.06, 16.75)] and 4.82 [AOR=4.82, 95% CI (1.41, 16.45)] times more likely to experience occupational accidents as compared to those who have good practice, respectively (Table 3).

Discussion

According to the study's findings, a considerable number of the participants had suffered at least one occupational injury during their lifetime careers, and the prevalence of occupational accidents was 61% (95% CI: 51.4, 70.5). The study finding is slightly higher compared to a study conducted in southwest Nigeria, which examined the prevalence of occupational hazards among hospital cleaners and reported that half of the participants were exposed to either physical, chemical, mechanical, or biological hazards.¹⁷ The reason for the slight difference in results might be due to factors such as the number of participants in each study, the length of time over which exposure was assessed, and the safety culture and infrastructure of the hospitals involved.

Chemical splash was the most commonly reported occupational hazard in the current investigation, with 52 (49.5%) study participants reporting exposure. The study's findings are significant high when compared to a study conducted in Gambella, Ethiopia, which found that 20% of study participants were exposed to chemical risks in their professions.¹² The possible explanation for this might be that the current study's participants are janitors, whereas the previous study only included health professionals; thus, cleaners are the most responsible healthcare workforce for handling cleaning and disinfectant chemicals because of their job nature, and they are most likely to be exposed to chemicals.^{17–19}

The second most frequently reported occupational injury was needle stick injury, 33 (31.4%). The finding is lower than a study conducted in India,²⁰ which found a 51.4% prevalence of needle stick injury for three months among hospital sanitarians/cleaners. Also, the current finding is better as compared to studies that reported the lifetime prevalence of NSI as 46%, 63.6%, 64%, and 76% in Nigeria,²¹ Ethiopia,²² Pakistan,²³ and Iran,²⁴ respectively.

The prevalence of occupational accidents was strongly correlated with participant age in the current study, with the middle age group janitors (26–35 years old) being more likely to be exposed as compared to the younger age group workers. Similarly, studies found that the older age groups of healthcare workers were more likely to be exposed to injuries compared to the younger age workers.^{6,25} This could be because workers burn out and lose physical and cognitive abilities as they age, making it difficult for them to act correctly at work and putting them vulnerable to injuries.

Occupational accident reduction programs that include occupational health and safety training interventions are successful in lowering the prevalence of workplace occupational injuries among frontline workers.²⁶ The findings of the current study revealed that taking IPC training was protective against being exposed to occupational accidents. Similarly different studies had shown that HCWs who did not take infection prevention training were more likely exposed to injuries.^{27–29}

Participants with poor awareness of infection prevention and control strategies, on the other hand, were less likely to experience occupational injuries than those with good or fair knowledge. Similarly, a meta-analysis conducted in Africa found that a lack of information about needle stick injury prevention methods was associated with a decreased likelihood of occupational needle stick injuries.³⁰ Workers with good knowledge of safety measures are overconfident, which may lead them to underestimate potential hazards and disregard safety protocols in the belief that they can handle any arising issues. They also tend to rationalize the associated risks as part of their job, which makes them more vulnerable to occupational accidents.

Healthcare providers who did not adhere to infection prevention guidelines were more likely to experience occupational injuries as compared to those who adhere.^{31,32} The current study also pointed that those who adhere fairly and poorly to IPC precaution were more prone to occupational injuries. This was inconsistent with previous studies that reported injuries were significantly associated with IPC malpractices like recapping of needles and improper use of PPE.^{33–35}

Strength and Limitation

The study tried to understand an unexplored area and had tried to investigate a range of occupational hazard exposures. However, the study did not determine changes in magnitude over time. The study did not investigate ergonomic and psychosocial hazards due to a variety of reasons.

Conclusion

The study highlights the high prevalence of occupational accidents, particularly chemical splashes, and needle stick injuries, among janitors in the study settings. The study emphasizes the importance of age, IPC training, awareness, and adherence to infection prevention and control strategies as factors influencing the likelihood of experiencing occupational injuries. It is also crucial for healthcare organizations to prioritize the safety and well-being of their frontline workers, including janitors, by providing continuous occupational health and safety training, promoting awareness of potential hazards, and emphasizing the importance of adhering to infection prevention protocols. Furthermore, the culture of safety within healthcare facilities should be strengthened and regularly evaluated to ensure all staff members are protected from avoidable occupational accidents. Ultimately, fostering a safe working environment not only benefits the well-being of the staff but also contributes to better patient care and overall healthcare service delivery.

Abbreviations

AOR, Adjusted Odds Ratio; COR, Crude Odds Ratio; HBV, Hepatitis B Virus; IP, Infection Prevention; IPC, Infection Prevention and Control; NSI, Needle Stick Injury; PPE, Personal Protective Equipment; WHO, World Health Organization.

Data Sharing Statement

All the relevant data for the quantitative study are included in this paper. The qualitative datasets are not publicly accessible and cannot be shared because of participant confidentiality. However, both the qualitative and quantitative datasets may be available on reasonable request from the corresponding author (agziabel@gmail.com).

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Disclosure

The authors declare no conflicts of interest in this work.

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