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# Prevalence of Occupational Injury and Knowledge of Post-Exposure Prophylaxis Accessibility among Healthcare Workers in Mogadishu, Somalia

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## Abstract

**Introduction:** Healthcare workers in Mogadishu, Somalia face significant occupational injury risks, particularly needle stick injuries, with 61.1% reporting incidents. This poses a serious threat to their health, leading to infections such as hepatitis B, hepatitis C, and HIV. Despite the high prevalence of injuries, awareness of Post-Exposure Prophylaxis (PEP) accessibility is relatively high, with 84.0% of respondents aware of it. However, there are gaps in knowledge and implementation, as evidenced by variations in availability of PEP. Improving workplace safety measures, providing comprehensive training on injury prevention and PEP protocols, and ensuring consistent availability of PEP in healthcare facilities are crucial steps to safeguard the well-being of healthcare workers in Mogadishu, Somalia. **Methods:** A cross-sectional study was conducted among hospital workers in Mogadishu, Somalia, focusing on professionals from various healthcare facilities. The study targeted nurses, doctors, laboratory personnel, and pharmacists. Purposive sampling was employed, resulting in a sample size of 383 calculated using Fisher's sample size formula. Data were collected using coded questionnaires entered into Microsoft Excel 2019 and analyzed with SPSS software to generate frequencies and

proportions, presented through frequency tables and pie figures. **Results:** The study in Mogadishu, Somalia, examined the prevalence of occupational injuries and knowledge of Post-Exposure Prophylaxis (PEP) accessibility among healthcare workers. Findings indicate a high prevalence of injuries, with 61.1% reporting incidents, predominantly needle stick injuries (60.6%). Despite the majority seeking prompt medical attention (72.0%), work-related illnesses affected 53.2% of respondents, notably work-related stress (59.5%). While most received training on injury and illness prevention (68.9%), gaps exist in PEP awareness, with 16.0% unaware of it. Nonetheless, 84.0% were aware, predominantly through health facilities (52.0%). Availability of PEP was reported by 71.3% in healthcare facilities, with variations in shift availability. The majority reported guidelines for PEP use (55.7%). Efforts are needed to bolster PEP awareness and ensure consistent availability in healthcare facilities to safeguard worker health. **Conclusion:** High prevalence of occupational injuries among healthcare workers, with needle stick injuries being the most common (60.6%). Despite this, 84.0% of respondents were aware of Post-Exposure Prophylaxis (PEP), primarily learning about it from health facilities (52.0%). While 71.3% reported the availability of PEP in their facility, 28.7% noted its unavailability. These results emphasize the need for improved education and accessibility of PEP to mitigate occupational injury risks.

## Keywords

Prevalence of Occupational Injury, Post-Exposure Prophylaxis (PEP), Accessibility, Healthcare Workers, Needle Stick Injuries, Infections (Hepatitis B, Hepatitis C, HIV), Awareness, Knowledge, Workplace Safety, PEP Availability, Blood-Borne Diseases, Personal Protective Equipment (PPE), HIV PEP (Post-Exposure Prophylaxis)

## 1. Introduction

An occupational injury is any physical harm brought on by an outside source when a person is performing tasks connected to their job, such as falls and needle stick injuries (NSI), among other things. [1] Healthcare professionals work in some of the riskiest work environments, where they must offer patient care. [2] It is estimated by the World Health Organisation (WHO) that 3 million HWs have percutaneous exposures annually, leading to 200 - 5000 HIV infections; over 90% of these infections occur in low-resource countries (Varghese, Abraham & Mathai 2003), where HWs sustain two-four needlestick injuries annually. [3] Health workers make up approximately 12% of the working population worldwide, and the majority of them face a variety of occupational dangers. One serious risk to health workers' safety at work is blood-borne pathogen infection via needle sticks and sharp objects that expose them to blood and other bodily fluids. [4]

It is estimated that 1 in 10 healthcare workers worldwide sustain a sharp in-

jury each year.

Healthcare workers' sharps injuries in 2000 led to 16,000 cases of hepatitis C virus (HCV), 66,000 cases of hepatitis B virus (HBV), and 1000 cases of HIV. These illnesses have a big effect. According to estimates, these infections will result in 145 premature deaths from HCV, 261 premature deaths from HBV, and 736 early deaths from HIV between 2000 and 2030. [2]

Health professionals' productivity and well-being are being impacted by the morbidity and mortality linked to occupational risks, which can lead to expensive medical bills, negative health outcomes, psychological anguish, and missed workdays. [5]

The economic cost of inadequate workplace safety and health standards is estimated to be 3.94% of the worldwide Gross Domestic Product (GDP) annually. This underscores the high expense of occupational illnesses and accidents. According to ILO estimates from 2014, occupational sickness and accidents cost the world's economy approximately 4% of its yearly GDP. Additionally, these diseases and injuries have significant noneconomic effects on quality of life. For instance, they may impair one's ability to function both physically and psychologically in day-to-day activities, lower one's sense of self-worth and confidence, strain family ties, and negatively impact labour relations at work (Boden, Biddle *et al.* 2001). [1]

Sharps and needle injuries (NSSI) are serious workplace risks that are frequently linked to the practice standards of healthcare workers (HCWs). As a result of NSSIs, more than 20 distinct kinds of bloodborne infections can spread. The risk of catching the hepatitis B, hepatitis C, and HIV viruses can lead to psychological distress, including anxiety, depression, and post-traumatic stress disorder, as well as a decline in quality of life for healthcare workers (HCWs), even in the presence of effective therapies. Following transcutaneous damage, the estimated rates of HIV, HCV, and HBV transmission are 0.2%, 1.8%, and 30%, respectively; only HBV infection is vaccine-preventable. [6]

By 2020, governments have to switch to using safety injection devices exclusively, per a directive from the World Health Organization (WHO). Most sub-Saharan African nations have not passed laws protecting healthcare workers, despite the fact that affluent nations have followed this advice. In addition to provider behaviors that raise the risk of occupational hazards, impediments at the system level raise the risk of hazards in the healthcare context. Bloodborne pathogen exposure and avoidable infections are made more likely by unsafe working conditions in healthcare facilities, a dearth of personal protective equipment (PPE), and a high provider-to-patient ratio. [2]

The prevalence of NSSIs among HCWs has been shown to be high and varies greatly throughout nations in Africa, and sub-Saharan Africa in particular (Amira *et al.*, 2014). However, there is considerable variation in this frequency. In sub-Saharan Africa, more than 50% of healthcare workers are exposed to non-serious sexual infections (NSSIs) that carry the potential to spread blood-borne viruses. Some nations have a 31% exposure rate, while others have a 75% expo-

sure rate medical treatment. [7] According to the World Health Organisation (2007), PEP has been used in Europe since 2000 for healthcare professionals who have been exposed to HIV at work. PEP is to be initiated as soon as possible after exposure, ideally within two to three hours. Any triple combination of antiretroviral medications that have been approved for the treatment of HIV patients should be used regularly to start it.

To prevent personnel, patients, and visitors from coming into contact with blood-borne diseases, the safe handling and disposal of needles and other sharp objects is a crucial component of a comprehensive clinical waste disposal plan. [8]

HIV PEP is an emergency medical intervention that is provided as soon as possible following suspected exposure to lower the risk of HIV infection. [9] The significance of PEP giving a person's immune system an opportunity to defend against the virus and stop HIV from taking hold in the body is the goal of HIV PEP (USAID 2013). The following series of activities is observed in experimental models of HIV infection: Local HIV replication takes place in tissue macrophages or dendritic cells following percutaneous or mucosal contact; host cytotoxic T cells will eradicate productively infected target cells. If infection cannot be controlled at this point, HIV will replicate in local lymph nodes within two to three days, and viremia will occur three to five days after viral injection (HIV Clinical Resource 2014). [3]

This study aims to assess the prevalence of occupational injuries and the level of knowledge regarding Post-Exposure Prophylaxis (PEP) accessibility among healthcare workers in Mogadishu, Somalia are reported in developing countries, including Somalia. The situation facing healthcare professionals in Somalia is typified by a lack of information on all fronts, erroneous and partial information about the workers, and a lack of credible or up-to-date statistics. There is a dearth of trustworthy safety and protection for healthcare professionals in Somalia, and there are more issues with the workplace in the field. Some healthcare facilities may not have any policies in place regarding occupational health and safety (WHO, 2015). [10]

## 2. Problem Statement

The World Health Organization (WHO) estimates that more than 1.4 million individuals worldwide have infections acquired in healthcare facilities at any one moment. Several infectious illnesses, including the human immunodeficiency virus (HIV), tuberculosis (TB), hepatitis B, and influenza, posed a risk to hospital staff. (Lavoie and colleagues, 2010) Healthcare workers who are exposed to blood in the job as a result of an accident are more prone to infections and other illnesses. [1] This study investigates prevalence of occupational injury and healthcare workers' knowledge and awareness of post-prophylaxis options.

When healthcare professionals become ill or injured, they become less productive. This not only has a negative impact on the worker's family's financial stability, but it also leads to a drop in the health workforce.

The study looked into the incidence of accidents and adherence to post-exposure

prophylaxis among healthcare workers, as well as the prevalence of occupational injuries and accidents. Health workers in developing countries are at serious risk of infection from blood-borne pathogens such as hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV) due to the high prevalence of such pathogens in many poorer parts of the world, particularly in Sub-Saharan Africa (HIV). Based on the findings of the research, preventive strategies are implemented. Because the majority of medical sharp injury cases are not recorded in underdeveloped countries like Somalia, the purpose of this research is to gather information on medical sharp injuries among health professionals in hospitals and health centers.

## 3. Methodology

### 3.1. Study Design

A cross-sectional design was used for this study conducted among Hospital Workers at the Benadir Region Hospitals in Mogadishu Somalia.

### 3.2. Target Population

The research targeted healthcare professionals employed across various healthcare facilities in Mogadishu, Somalia, encompassing both public and private sectors. The sampled hospitals included Banadir Hospital, SOS Hospital, and Shafi Hospital. Within these institutions, the study focused on a range of healthcare roles, including nurses (comprising nurses, midwives, and healthcare assistants), doctors (encompassing doctors and physician assistants), laboratory personnel (comprising biomedical scientists and laboratory technicians), and pharmacists (including pharmacists and dispensary technicians) stationed at health center hospitals.

### 3.3. Study Area

Mogadishu (2˚20'0"N, 45˚20'0"E) is the capital of the Federal Republic of Somalia and is located on the Indian Ocean. It is the country's most important administrative, political, cultural, healthcare, and educational hub, with about 3 million people living in seventeen districts.

### 3.4. Sampling Methods & Sample Size

The sampling methodology adopted involved selective or purposive sampling within the healthcare sector. The target population comprised healthcare workers, selected through a non-probability convenience sampling approach.

Specifically, hospitals in Mogadishu, including both private (Shaafi Hospital) and public hospitals (Banadir University and SOS), were selectively chosen for inclusion in the study. Participants were then selected through non-probability convenience sampling, whereby individuals who were readily available and willing to participate were included in the study.

Calculation of the sample size using Fisher's sample size formula is shown be-

low:

$$n = Z^2 P(1-P)/(d)^2$$

where,

$n$ = sample size required.

$Z$ = confidence level (95% level of confidence 1.96).

$P$ = Estimated prevalence of Occupational Hazards occurrence at similar research at Bosaso (39%). [4]

$d$ = Margin of error (5% = 0.05).

$n = Z^2 P(1-P)/(d)^2$ , *substituting*, $n = (1.96)^2 (0.39)(1-0.39)/(0.05)^2$ = 365.566.

We have added 5% of non-respondents to the sample size and the total of the sampling of this research will be 383. (5% of non-respondents) (Sample size required.) = (0.05) (365) = 383.

### 3.5. Data Collection Period and Analysis

This study utilized guided questionnaires to gather quantitative data from healthcare personnel. The questionnaire included variables designed to measure the prevalence of occupational injuries and the awareness of the availability of post-exposure prophylaxis. Each item on the questionnaire was read and explained to individual respondents who met the inclusion criteria.

The data collection period spanned three months, from May to July 2023. The administered questionnaires were coded and entered Microsoft Excel 2013. The data will be analyzed using SPSS software to obtain frequencies and proportions. The results will be presented in the form of frequency tables and pie figures.

### 3.6. Variables

**Dependent variables**

- Prevalence of occupational injury among healthcare workers.

**The independent variables included**

- Knowledge of Post-Exposure Prophylaxis (PEP) Accessibility.
- Demographic characteristics.

### 3.7. Ethical Clearance

The research conducted at Abrar University College of Medicine and Health Science has obtained ethical approval, ensuring adherence to rigorous ethical standards. This approval underscores the institution's commitment to upholding ethical guidelines in all research endeavors, safeguarding the welfare of participants, and upholding the integrity of scientific inquiry.

## 4. Result

### 4.1. Demography Factors

Age: The distribution of respondents across different age groups provides valuable

**Table 1.** Demography factors.

| Variables | | Frequency | Percentage % |
|---|---|---|---|
| Age of the respondent | 18 - 25 years | 153 | 42.9 |
| | 26 - 35 years | 161 | 45.1 |
| | 36 - 44 years | 29 | 8.1 |
| | 45 years and above | 14 | 3.9 |
| | Total | 357 | 100.0 |
| Education level | Certificate level | 16 | 4.5 |
| | Diploma level | 24 | 6.7 |
| | Bachelor level | 269 | 75.4 |
| | Postgraduate ate level | 48 | 13.4 |
| | Total | 357 | 100.0 |
| sex | Male | 117 | 32.8 |
| | Female | 240 | 67.2 |
| | Total | 357 | 100.0 |
| Marital status | Single | 156 | 43.7 |
| | Married | 137 | 38.4 |
| | Divorced/separated | 62 | 17.4 |
| | Widowed | 2 | 0.6 |
| | Total | 357 | 100.0 |
| Health facility | Clinical center | 23 | 6.4 |
| | General hospital | 189 | 52.9 |
| | Specialist hospital | 97 | 27.2 |
| | Pharmacy | 35 | 9.8 |
| | Others specify | 13 | 3.6 |
| | Total | 357 | 100.0 |
| Cadre of health worker | Doctors | 119 | 33.3 |
| | Nurse | 95 | 26.6 |
| | Midwife | 63 | 17.6 |
| | Laboratory technician | 53 | 14.8 |
| | Clinical officer | 27 | 7.6 |
| | Total | 357 | 100.0 |
| Duration in service experience | Less 1 years | 101 | 28.3 |
| | 1 - 5 years | 170 | 47.6 |
| | More than 5 years | 86 | 24.1 |
| | Total | 357 | 100.0 |

**Continued**

| | | | |
|---|---|---|---|
| Department Unit you are working in currently | Medical ward | 49 | 13.7 |
| | OPD | 33 | 9.2 |
| | Surgical ward | 44 | 12.3 |
| | Gyn & Obst | 123 | 34.5 |
| | Pediatric ward | 60 | 16.8 |
| | Laboratory | 8 | 2.2 |
| | Pharmacy | 21 | 5.9 |
| | Other | 19 | 5.3 |
| | Total | 357 | 100.0 |
| Working overtime | YES | 214 | 59.9 |
| | NO | 143 | 40.1 |
| | Total | 357 | 100.0 |
| Hours of sleep | Less 8 hours | 209 | 58.5 |
| | More 8 hours | 148 | 41.5 |
| | Total | 357 | 100.0 |

insights into the demographic composition of the study sample. With 357 total respondents, it's evident that the largest portion falls within the 26 - 35 age range, comprising 161 individuals, or 45.1% of the total sample. This suggests that individuals in this age bracket are more likely to participate in the study or are more accessible for data collection.

Following closely behind is the 18 - 25 age group, with 153 respondents, constituting 42.9% of the sample. This indicates a significant representation of young adults, possibly reflecting their engagement or interest in the subject matter under study. Conversely, there is a notable decline in participation among older age groups. The 36 - 44 age group comprises only 29 respondents, or 8.1% of the sample, while those aged 45 and above make up the smallest segment, with just 14 respondents, accounting for 3.9% of the total.

Education Level: Among the education levels, the highest frequency and percentage are observed in the "Bachelor level" category, with 269 individuals, accounting for 75.4% of the total. On the other hand, the lowest frequency and percentage are found in the "Certificate level" category, with only 16 individuals, making up 4.5% of the total. The frequencies and percentages for the other education levels are as follows: "Diploma level" with 24 individuals (6.7%) and "Postgraduate level" with 48 individuals (13.4%). Gender distribution, the highest frequency and percentage are attributed to the "Female" category, with 240 individuals, representing 67.2% of the total. Conversely, the "Male" category has the lowest frequency and percentage, with 117 individuals, accounting for 32.8% of the total.

When considering marital status, the highest frequency and percentage are

observed in the "Single" category, with 156 individuals, accounting for 43.7% of the total. On the other hand, the "Widowed" category has the lowest frequency and percentage, with only 2 individuals, making up 0.6% of the total. The frequencies and percentages for the other categories are as follows: "Married" with 137 individuals (38.4%) and "Divorced/Separated" with 62 individuals (17.4%).

Health Facility: the highest frequency and percentage are found in the "General Hospital" category, with 189 individuals, representing 52.9% of the total. Conversely, the "Others Specify" category has the lowest frequency and percentage, with only 13 individuals, accounting for 3.6% of the total. The frequencies and percentages for the other categories are as follows: "Clinical Center" with 23 individuals (6.4%), "Specialist Hospital" with 97 individuals (27.2%), and "Pharmacy" with 35 individuals (9.8%).

Cadre of Health Worker: the highest frequency and percentage are attributed to the "Doctors" category, with 119 individuals, representing 33.3% of the total. On the other hand, the "Clinical Officer" category has the lowest frequency and percentage, with only 27 individuals, making up 7.6% of the total. The frequencies and percentages for the other categories are as follows: "Nurse" with 95 individuals (26.6%), "Midwife" with 63 individuals (17.6%), and "Laboratory Technician" with 53 individuals (14.8%).

When comes to the duration of service/experience, the highest frequency and percentage are observed in the "1 - 5 years" category, with 170 individuals, accounting for 47.6% of the total. Conversely, the "More than 5 years" category has the lowest frequency and percentage, with only 86 individuals, making up 24.1% of the total. The frequencies and percentages for the other categories are as follows: "Less than 1 year" with 101 individuals (28.3%).

Among the department units where individuals are currently working, the highest frequency and percentage are found in the "Gyn & Obst" category, with 123 individuals, representing 34.5% of the total. Conversely, the "Laboratory" category has the lowest frequency and percentage, with only 8 individuals, accounting for 2.2% of the total. The frequencies and percentages for the other categories are as follows: "Medical Ward" with 49 individuals (13.7%), "OPD" with 33 individuals (9.2%), "Surgical Ward" with 44 individuals (12.3%), "Pediatric Ward" with 60 individuals (16.8%), "Pharmacy" with 21 individuals (5.9%), and "Other" with 19 individuals (5.3%).

In terms of working overtime, the highest frequency and percentage are attributed to the "YES" category, with 214 individuals, representing 59.9% of the total. On the other hand, the "NO" category has the lowest frequency and percentage, with only 143 individuals, making up 40.1% of the total. When considering the hours of sleep, the highest frequency and percentage are observed in the "Less than 8 hours" category, with 209 individuals, accounting for 58.5% of the total. Conversely, the "More than 8 hours" category has the lowest frequency and percentage, with only 148 individuals, representing 41.5%. (**Table 1**)

## 4.2. Prevalence of Occupational Injuries and Illnesses among Health Care Workers

### 4.2.1. Prevalence and Type of Occupational Injuries

This table provides information on the prevalence and types of occupational injuries among healthcare workers. The majority of respondents (61.1%) reported having suffered an injury at work, while 38.9% reported no injuries. (Figure 1)

Among those who experienced injuries, the most common type reported was needle stick injuries (60.6%), followed by lacerations/cuts (19.7%) and pricks (10.6%). Fractures, musculoskeletal injuries, slips/trips or falls, poisoning, and other types of injuries were less common. (Table 2)

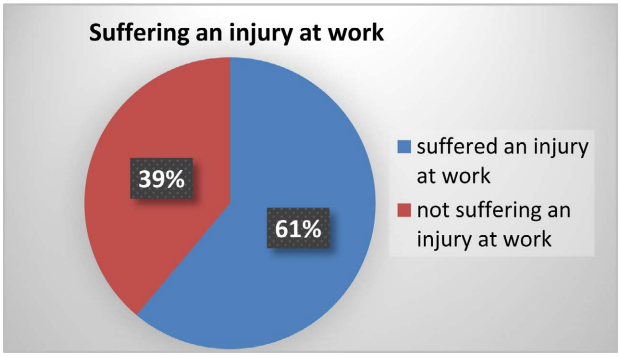


Figure 1. Prevalence occupational injuries.

Table 2. Type of occupational injuries.

| Variables | | Frequency | Percentage % |
|---|---|---|---|
| Which of the following injuries did you encounter? | Needle stick injury | 132 | 60.6 |
| | Fracture | 1 | .5 |
| | Prick | 23 | 10.6 |
| | Laceration/cuts | 43 | 19.7 |
| | Musculoskeletal injury | 4 | 1.8 |
| | Slips Trips or Falls | 6 | 2.8 |
| | Poisoning | 2 | .9 |
| | Others | 7 | 3.2 |
| | Total | 218 | 100.0 |

### 4.2.2. Prompt Medical Attention for Work-Related Injury or Illness Resulting in Time off Duty

This table presents data on seeking prompt medical attention for work-related injuries or illnesses among healthcare workers. The majority of respondents (72.0%) reported seeking medical attention promptly, while 28.0% did not. Among those who sought medical attention, the most common types of medical attention sought were tetanus shots (30.6%), disinfecting (18.5%), and plastering/dressing (21.0%). Post-exposure prophylaxis (PEP), resuscitation, and pain reliever medicine were also sought, but less frequently. (Table 3)

**Table 3.** Prompt medical attention for work-related ınjury or ıllness resulting in time off duty.

| Variables | | Frequency | Percentage % |
|---|---|---|---|
| Seek medical attention promptly | YES | 157 | 72.0 |
| | NO | 61 | 28.0 |
| | Total | 218 | 100.0 |
| The type of medical attention you seek when you suffer the injury | Post Exposure Prophylaxis ( PEP) | 8 | 5.1 |
| | Tetanus shot | 48 | 30.6 |
| | Disinfecting | 29 | 18.5 |
| | Plastering/dressing | 33 | 21.0 |
| | Resuscitation | 13 | 8.3 |
| | Pain Reliever Medicine | 26 | 16.6 |
| | Total | 157 | 100.0 |
| The injury or disease cost you some days off duty | YES | 98 | 45.0 |
| | NO | 120 | 55.0 |
| | Total | 218 | 100.0 |

**Table 4.** Work-related ıllness.

| Variables | | Frequency | Percentage % |
|---|---|---|---|
| Any illness resulting from your exposure at work | YES | 116 | 53.2 |
| | NO | 102 | 46.8 |
| | Total | 218 | 100.0 |
| Which of the following illnesses did you suffer from? | Tuberculosis | 3 | 2.6 |
| | HIV | 1 | .9 |
| | Hepatitis B | 8 | 6.9 |
| | Hepatitis C | 9 | 7.8 |
| | Work-related stress | 69 | 59.5 |
| | Other | 26 | 22.4 |
| | Total | 116 | 100.0 |

This Table provides information on work-related illnesses among healthcare workers. About 53.2% of respondents reported experiencing illnesses resulting from their exposure at work, while 46.8% did not. The most commonly reported illnesses were work-related stress (59.5%), followed by hepatitis B (6.9%), hepatitis C (7.8%), and other illnesses (22.4%). Tuberculosis and HIV were reported by a small percentage of respondents. (Table 4)

This table presents data on workplace training regarding the prevention of injuries and occupational illnesses among healthcare workers. The majority of

respondents (68.9%) reported receiving training on injury and illness prevention, while 31.1% did not receive any training. Among those who received training, it was provided by different sources. Management provided training to 32.9% of respondents, NGOs provided training to 64.6%, and district officials provided training to 2.4%. (Table 5)

Table 5. Workplace training on ınjury and ıllness prevention.

| Variables | | Frequency | Percentage % |
|---|---|---|---|
| Any training regarding the prevention of injuries and occupational illnesses | YES | 246 | 68.9 |
| | NO | 111 | 31.1 |
| | Total | 357 | 100.0 |
| If yes, who provided the training | Management | 81 | 32.9 |
| | NGO | 159 | 64.6 |
| | District officials | 6 | 2.4 |
| | Total | 246 | 100.0 |

## 4.3. Knowledge of Post-Exposure Prophylaxis Accessibility

### 4.3.1. Understanding Post-Exposure Prophylaxis: Learning Sources, Drug Count, Initiation Window, Duration, and Facility Protocols.

Among the respondents, 84.0% (300 individuals) reported being aware of Post-Exposure Prophylaxis, while 16.0% (57 individuals) were not aware of it. (Figure 2) The highest frequency and percentage of respondents who learned about Post-Exposure Prophylaxis from a particular source was through health facilities, with 52.0% (156 individuals) reporting this source. The lowest frequency and percentage were for the "Radio" source, with only 1.0% (3 individuals) reporting it. The highest frequency and percentage of respondents reported using a single PEP drug, with 43.0% (129 individuals) falling into this category. The lowest frequency and percentage were for the "Three" PEP drugs category, with 22.7% (68 individuals) falling into this category.

The majority of respondents, 66.3% (199 individuals), reported an initiation window of less than 72 hours for Post-Exposure Prophylaxis. The lowest frequency

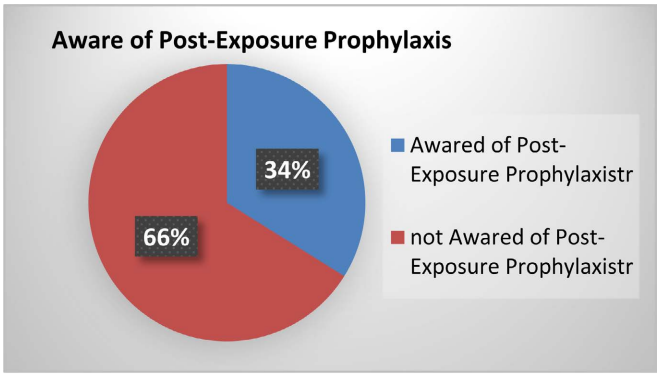


Figure 2. Aware of post-exposure prophylaxis.

Table 6. Learning sources, drug count, initiation window, duration, and facility protocols.

| Variables | | Frequency | Percentage % |
|---|---|---|---|
| Where did you learn about Post-Exposure Prophylaxis from? | Friend/Relative | 5 | 1.7 |
| | Health facility | 156 | 52.0 |
| | Radio | 3 | 1.0 |
| | Television | 4 | 1.3 |
| | Internet | 52 | 17.3 |
| | Training | 64 | 21.3 |
| | Written source | 9 | 3.0 |
| | Other | 7 | 2.3 |
| | Total | 300 | 100.0 |
| How many PEP drugs are used during Post-Exposure Prophylaxis? | One | 129 | 43.0 |
| | Two | 103 | 34.3 |
| | Three | 68 | 22.7 |
| | Total | 300 | 100.0 |
| What is the maximum time limit to initiate PEP? | <72 hours | 199 | 66.3 |
| | >72 hours | 101 | 33.7 |
| | Total | 300 | 100.0 |
| How long should a HW take PEP? | Less than 4 weeks | 175 | 58.3 |
| | More than 4 weeks | 125 | 41.7 |
| | Total | 300 | 100.0 |
| Do you have any guidelines and protocols on how to use PEP after exposure in this health facility? | YES | 167 | 55.7 |
| | NO | 133 | 44.3 |
| | Total | 300 | 100.0 |

and percentage were for the initiation window of over 72 hours, with 33.7% (101 individuals) falling into this category. The highest frequency and percentage of respondents reported a duration of less than 4 weeks for Post-Exposure Prophylaxis, with 58.3% (175 individuals) falling into this category. The lowest frequency and percentage were for the duration of more than 4 weeks, with 41.7% (125 individuals) falling into this category.

The majority of respondents, 55.7% (167 individuals), reported having guidelines and protocols on how to use PEP after exposure in their health facility. The lowest frequency and percentage were for the category of not having guidelines and protocols, with 44.3% (133 individuals) falling into this category. (Table 6)

The availability of Post-Exposure Prophylaxis in the health facility was assessed. Among the respondents, 71.3% (214 individuals) reported that PEP is readily available in their health facility, while 28.7% (86 individuals) reported that it is not readily available. For those respondents who reported that PEP is

readily available, the duration of availability was further investigated. Among them, 44.3% (133 individuals) reported that PEP is available only during the day, whereas 16.0% (48 individuals) reported that it is available only during the evening shift. Additionally, 39.7% (119 individuals) stated that PEP is available during all the above-mentioned shifts. (Table 7)

Table 7. Analysis of availability of post-exposure prophylaxis (PEP) in health facility and duration of availability.

| Variables | | Frequency | Percentage % |
|---|---|---|---|
| Is Post-Exposure Prophylaxis readily available in this health facility? | YES | 214 | 71.3 |
| | NO | 86 | 28.7 |
| | Total | 300 | 100.0 |
| During which of the following shifts is Post-Exposure Prophylaxis (PEP) readily available? | Only day | 133 | 44.3 |
| | Only evening | 48 | 16.0 |
| | All the above | 119 | 39.7 |
| | Total | 300 | 100.0 |

#### 4.3.2. Associations between Demographical Factors and Occupational Injury and Knowledge of PEP Accessibility

Variables with p-values less than the conventional significance level (usually 0.05) can be considered statistically significant, indicating a potential association between the demographic factor and the occurrence of injuries. On the other hand, variables with p-values greater than 0.05 are not considered statistically significant, suggesting that there may not be a significant relationship between the demographic factor and the occurrence of injuries.

Our analysis revealed significant associations between several demographic and occupational factors and the occurrence of workplace injuries among health workers. Specifically, education level ($p = 0.014$), marital status ($p < 0.001$), level of health facility ($p < 0.001$), cadre of health worker ($p < 0.001$), duration in service ($p < 0.001$), and department of current employment ($p < 0.001$) were all found to be statistically significant predictors of injuries. These findings suggest that individuals with certain demographic characteristics or occupational roles may be more susceptible to workplace injuries within the healthcare environment. (Table 8)

The analysis reveals several terms of the level of health facility, there is a significant association between working in a clinical center and knowledge of PEP accessibility (p-value = 0.019). when considering the duration of service, respondents with less than 1 year of service showed a significant association with knowledge of PEP accessibility (p-value = 0.031). The department of work also exhibited associations with knowledge of PEP accessibility. Notably, medical ward and gynecology/obstetrics department showed significant associations (p-values = 0.038). Lastly, working overtime also displayed a significant association with knowledge of PEP accessibility (p-value = 0.048). While socio-demographic factors

**Table 8.** Associations between demographical factors and suffered an injury at work:

| Variable | | Have you suffered an injury at work? | | P value |
|---|---|---|---|---|
| | | YES | NO | |
| Education level of the respondents | Certificate level | 2.8% | 7.2% | 0.014 |
| | Diploma level | 7.8% | 5.0% | |
| | Bachelor level | 79.4% | 69.1% | |
| | Postgraduate ate level | 10.1% | 18.7% | |
| Marital status | Single | 39.0% | 51.1% | 0.001 |
| | Married | 36.7% | 41.0% | |
| | Divorced/separated | 23.4% | 7.9% | |
| | Widowed | 0.9% | 0.0% | |
| Level of health facility | Clinical center | 6.4% | 6.5% | <0.001 |
| | General hospital | 45.0% | 65.5% | |
| | Specialist hospital | 30.7% | 21.6% | |
| | Pharmacy | 14.7% | 2.2% | |
| | Others specify | 3.2% | 4.3% | |
| Cadre of health worker | Doctors | 23.4% | 48.9% | <0.001 |
| | Nurse | 32.1% | 18.0% | |
| | Midwife | 17.0% | 18.7% | |
| | Laboratory technician | 18.3% | 9.4% | |
| | Clinical officer | 9.2% | 5.0% | |
| Duration in service | less 1 years | 23.9% | 35.3% | <0.001 |
| | 1 – 5 years | 55.5% | 35.3% | |
| | More than 5 years | 20.6% | 29.5% | |
| Department are you working in currently | Medical ward | 12.4% | 15.8% | <0.001 |
| | OPD | 6.9% | 12.9% | |
| | Surgical ward | 17.9% | 3.6% | |
| | Gyn & Obst | 33.0% | 36.7% | |
| | Pediatric ward | 11.0% | 25.9% | |
| | Laboratory | 2.8% | 1.4% | |
| | Pharmacy | 8.3% | 2.2% | |
| | Other | 7.8% | 1.4% | |

(age, sex, education and work experience) were not significantly associated with occurrence of NSSIs ($p > 0.05$). [7] While another side factors (length of working hours ($p = 0.021 < 0.05$) and health awareness of NSSIs ($p = 0.000 < 0.05$) were

significantly associated with occurrence of NSSIs among the health workers. [7] (Table 9)

Table 9. Associations between demographical factors and knowledge of PEP accessibility.

| Variables | | Are you aware of Post-Exposure Prophylaxis? | | p-value |
|---|---|---|---|---|
| | | YES | NO | |
| Level of health facility | Clinical center | 6.3% | 7.0% | 0.019 |
| | General hospital | 53.7% | 49.1% | |
| | Specialist hospital | 29.0% | 17.5% | |
| | Pharmacy | 7.7% | 21.1% | |
| | Others | 3.3% | 5.3% | |
| Duration in service | Less 1 years | 25.7% | 42.1% | 0.031 |
| | 1 - 5 years | 48.7% | 42.1% | |
| | More than 5 years | 25.7% | 15.8% | |
| Which department are you working in currently? | Medical ward | 14.3% | 10.5% | 0.038 |
| | OPD | 9.3% | 8.8% | |
| | Surgical ward | 14.0% | 3.5% | |
| | Gyn & Obst | 34.0% | 36.8% | |
| | Pediatric ward | 16.0% | 21.1% | |
| | Laboratory | 2.7% | 0.0% | |
| | Pharmacy | 4.3% | 14.0% | |
| | Other | 5.3% | 5.3% | |
| Working overtime | YES | 62.0% | 49.1% | 0.048 |
| | NO | 38.0% | 50.9% | |

## 5. Discussion

### 5.1. Demographic Factors

The distribution of participants among various age brackets yields significant insights into the demographic makeup of our study sample. It's apparent that the highest proportion falls within the 26 - 35 age range, constituting 161 individuals, which accounts for 45.1% of the total sample. In Saudi Arabia specifically, 44.7% of respondents fall within the 30- to 39-year age range. [11]

Regarding education levels, the data indicates that the highest frequency and proportion are found among individuals at the "Bachelor level," comprising 269 respondents, which accounts for 75.4% of the total sample. Conversely, the "Certificate level" category exhibits the lowest frequency and percentage, with only 16 individuals, representing 4.5% of the total. Additional education levels show the following frequencies and percentages: "Diploma level" with 24 indi-

viduals (6.7%) and "Postgraduate level" with 48 individuals (13.4%).

In the context of Bosaso, findings show that 51.9% of respondents have attained a diploma as their highest level of education, amounting to 108 individuals. Additionally, 23.6% possess a Bachelor's Degree, comprising 49 individuals, while 5.3% hold a Master's degree, totaling 11 individuals. Furthermore, 19.2% of respondents, totaling 40 individuals, have education levels categorized as primary and below, all of whom work as cleaners. [4] In Tanzania, the majority of respondents, constituting 62.3%, possess education levels classified as certificate level, amounting to 149 individuals. [9]

Regarding gender distribution, the data reveals that the highest frequency and proportion are attributed to the "Female" category, with 240 individuals, constituting 67.2% of the total sample. Conversely, the "Male" category exhibits the lowest frequency and percentage, with 117 individuals, accounting for 32.8% of the total.

In Tanzania, more than half of the participants, specifically 148 individuals, or 61.9%, were females. [9] Similarly, in the West Indies, 65% of the respondents were females. In Bosaso, a majority of health workers, totaling 117 individuals or 56.0%, were female, while 91 individuals, accounting for 43.5%, were male. [4] Additionally, in Alebtong District, located in the Northern Region of Uganda, the majority of respondents, comprising 52 individuals or 61.2%, were female. [3] In Saudi Arabia, 71% of respondents were females. [11]

Marital status, the data indicates that the highest frequency and proportion are found in the "Single" category, comprising 156 individuals, which accounts for 43.7% of the total sample. Conversely, the "Widowed" category exhibits the lowest frequency and percentage, with only 2 individuals, representing 0.6% of the total. Additional categories display the following frequencies and percentages: "Married" with 137 individuals (38.4%) and "Divorced/Separated" with 62 individuals (17.4%). While in Tanzania, more than half of the study participants, specifically 143 individuals or 59.8%, were married. [9] Conversely, in the West Indies, 32% of participants were married. [8] In Alebtong District, located in the Northern Region of Uganda, 58 individuals or 68.2% were certificate holders. [3]

In terms of health facility types, the data reveals that the highest frequency and proportion are observed in the "General Hospital" category, with 189 individuals, constituting 52.9% of the total sample. Conversely, the "Others Specify" category exhibits the lowest frequency and percentage, with only 13 individuals, making up 3.6% of the total. Additional categories display the following frequencies and percentages: "Clinical Center" with 23 individuals (6.4%), "Specialist Hospital" with 97 individuals (27.2%), and "Pharmacy" with 35 individuals (9.8%).

The cadre of health workers, the data indicates that the highest frequency and proportion are attributed to the "Doctors" category, with 119 individuals, representing 33.3% of the total sample. Conversely, the "Clinical Officer" category exhibits the lowest frequency and percentage, with only 27 individuals, making up 7.6% of the total. Additional categories display the following fre-

quencies and percentages: "Nurse" with 95 individuals (26.6%), "Midwife" with 63 individuals (17.6%), and "Laboratory Technician" with 53 individuals (14.8%).

In Alebtong District, located in the Northern Region of Uganda, the majority of respondents, comprising 44 individuals or 58.8%, were enrolled nurses. [3] Similarly, in Tanzania, nurses constituted the majority, with 120 individuals or 50.2%. (50.2%) [9]

In Saudi Arabia, approximately 81.3% of respondents held positions as residents or general practitioners. Additionally, 70.6% of respondents in Saudi Arabia were nurses. [11] And in Bosaso, among the respondents, 16.8% were Pharmacists, 7.2% were Laboratory technicians, 51.4% were Nurses, 4.3% were Medical doctors, and 1% were Public Health officers. The remaining 19.2% comprised hospital and health center cleaners. [4]

When considering the duration of service or experience, the data shows that the highest frequency and proportion are observed in the "1 - 5 years" category, with 170 individuals, accounting for 47.6% of the total sample. Conversely, the "More than 5 years" category exhibits the lowest frequency and percentage, with only 86 individuals, making up 24.1% of the total. Additional categories display the following frequencies and percentages: "Less than 1 year" with 101 individuals (28.3%). In Alebtong District, located in the Northern Region of Uganda, the majority of respondents, comprising 72 individuals or 84.7%, had experience of less than five years. [3] Also in Ghana, the distribution of work experiences was as follows: less than a year (34.2%), 1 - 5 years (40.2%), 6 - 10 years (14.5%), and more than 10 years (11.1%). [12] In the West Indies, one-fifth of the respondents spent between 6 to 10 years in their current occupation, 59.5% had less than 6 years of experience, and 11% had 20 years or more of experience. [8]

In Saudi Arabia, 31.8% of respondents had between six to 10 years of experience, while 19.3% had less than two years of experience. [11] Additionally, in Bosaso, 12% of health workers had been working for less than 1 year in Bosaso health centers and hospitals. Furthermore, 96 individuals (46.2%) had been working for 1 - 5 years, 41 individuals (19.7%) for 5 - 10 years, 24 individuals (11.5%) for 10 - 15 years, and the remaining 22 individuals (10.5%) had been working as health workers for 15 - 30 years. [4]

In terms of department units where individuals are currently employed, the data reveals that the highest frequency and proportion are found in the "Gyn & Obst" category, with 123 individuals, representing 34.5% of the total sample. Conversely, the "Laboratory" category exhibits the lowest frequency and percentage, with only 8 individuals, accounting for 2.2% of the total. Additional categories display the following frequencies and percentages: "Medical Ward" with 49 individuals (13.7%), "OPD" with 33 individuals (9.2%), "Surgical Ward" with 44 individuals (12.3%), "Pediatric Ward" with 60 individuals (16.8%), "Pharmacy" with 21 individuals (5.9%), and "Other" with 19 individuals (5.3%). In Alebtong District, located in the Northern Region of Uganda, 37.6% of the respondents worked in OPD. [3] Additionally, in Kochi, India, Needlestick Injuries (NSIs) were reported most frequently in the patient room/ward (32.5%),

followed by the dental clinic (18.1%) and ICU (18%). [13] Regarding working overtime, the data indicates that the highest frequency and proportion are attributed to the "YES" category, with 214 individuals, representing 59.9% of the total sample. Conversely, the "NO" category exhibits the lowest frequency and percentage, with only 143 individuals, making up 40.1% of the total. In Bosaso, the majority of health workers, comprising 112 individuals or 53.8%, reported working more than 8 hours daily. Additionally, up to 68 respondents or 32.5% worked for 5 - 8 hours daily. [4]

## 5.2. Prevalence of Occupational Injuries and Illnesses among Health Care Workers

### 5.2.1. Prevalence and Type of Occupational Injuries

The findings indicate that the majority of respondents, constituting 61.1%, reported experiencing an injury at their workplace, while 38.9% reported no injuries. In Tanzania, more than half of the participants, specifically 121 individuals or 50.6%, reported having experienced occupational exposures. [9] Among those who reported experiencing injuries, needle stick injuries (60.6%) emerged as the most common type, followed by lacerations/cuts (19.7%) and pricks (10.6%). In Hargeisa, Somalia, a prevalence of 73.7% was observed for Needle Stick and Sharp Injuries (NSSIs) among workers attending Edna Adan Maternity Hospital. [7] In Bosaso, 82 health workers (39.4%) reported being involved in medical sharp injuries during their work, while the majority were not. [4] In Saudi Arabia, the incidence of Needle Stick Injuries (NSIs) among Healthcare Workers (HCWs) in Abha city was 11.57%. [11] In Tanzania, 57 individuals (47.1%) reported exposure to blood splash and 45 (37.2%) had needle stick injuries. Among 121 respondents, 61 (50.4%) reported exposure occurring in the past year. [9] In Ghana the most common injuries were needle sticks (27.4% of 318 injuries) and other sharp injuries (26.7%). Additionally, injuries from blunt objects (19.5%), workplace violence (18.9%), and falls (7.5%) were also reported. [12]

### 5.2.2. Prompt Medical Attention for Work-Related Injury or Illness Resulting in Time off Duty

The majority of respondents, accounting for 72.0%, reported promptly seeking medical attention following their injuries, while 28.0% did not. Among those who sought medical attention, the most common types of care sought included tetanus shots (30.6%), disinfection (18.5%), and plastering/dressing (21.0%). Post-exposure prophylaxis (PEP), resuscitation, and pain reliever medications were also sought, albeit less frequently. In Ghana, a significant proportion (20.8%) reported encountering difficulties in seeking care, citing factors such as the absence of post-exposure medication. [12] In Alebtong District, 33.3% of respondents visited Healthcare Centers (HCT), 27.8% applied pressure to encourage bleeding, 16.7% reported to their supervisor, while 11.1% washed with alcohol and another 11.1% washed with soap and water. [3]

#### 5.2.3. Workplace Training on Injury and Illness Prevention

In terms of workplace training regarding the prevention of injuries and occupational illnesses among healthcare workers, the majority of respondents (68.9%) reported receiving such training, while 31.1% did not receive any training.

In Bosaso, the majority of health workers, comprising 149 individuals or 71.6%, received infection control and prevention training. Conversely, 59 individuals or 28.4% did not receive this training. [4] Among respondents who received training, it was facilitated by various sources. Management provided training to 32.9% of respondents, NGOs delivered training to 64.6%, and district officials were responsible for training 2.4% of the respondents.

### 5.3. Knowledge of Post-Exposure Prophylaxis Accessibility

#### 5.3.1. Understanding Post-Exposure Prophylaxis: Learning Sources, Drug Count, Initiation Window, Duration, and Facility Protocols

Among the respondents, a significant majority of 84.0% (300 individuals) reported being aware of Post-Exposure Prophylaxis (PEP), while 16.0% (57 individuals) were not aware of it. In Tanzania, slightly more than half of Healthcare Workers (HCWs), comprising 124 individuals or 51.9%, had inadequate overall knowledge of HIV PEP. [9] In Alebtong District, located in the Northern Region of Uganda, the majority of respondents, specifically 79 individuals or 92.9%, were aware of PEP, while 53 individuals or 62.4% possessed knowledge about it. [3]

The primary source from which respondents learned about Post-Exposure Prophylaxis (PEP) was health facilities, with 52.0% (156 individuals) reporting this as their source. Conversely, the lowest frequency and percentage were attributed to the "Radio" source, with only 1.0% (3 individuals) reporting it. In Alebtong District, located in the Northern Region of Uganda, the majority of respondents acquired information about PEP from health facilities. [3]

The majority of respondents, comprising 43.0% (129 individuals), reported using a single PEP drug, while the lowest frequency and percentage were for the "Three" PEP drugs category, with 22.7% (68 individuals) falling into this category. In Alebtong District, located in the Northern Region of Uganda, the majority of respondents, specifically 40 individuals or 47.1%, indicated the use of three PEP drugs during PEP. [3]

In the research findings, it was revealed that a majority of participants, constituting 66.3% (199 individuals), advocated for initiating Post-Exposure Prophylaxis (PEP) within a timeframe of less than 72 hours. Conversely, a smaller subset, comprising 33.7% (101 individuals), favored initiation beyond the 72-hour mark. Notably, within Alebtong District, situated in the Northern Region of Uganda, 69 respondents, representing 81.2% of the sample, emphasized the critical importance of commencing PEP within the initial 72-hour window. [3]

In our study, the majority of respondents, accounting for 58.3% (175 individuals), favored a Post-Exposure Prophylaxis (PEP) duration of less than 4 weeks. Conversely, a smaller portion, comprising 41.7% (125 individuals), opted for a

duration exceeding 4 weeks. Notably, within Alebtong District, located in the Northern Region of Uganda, half of the respondents, specifically 43 individuals, constituting 50.6% of the sample, asserted that PEP typically spans a duration of less than 4 weeks. [3]

It was found that a majority of respondents, comprising 55.7% (167 individuals), indicated the presence of guidelines and protocols for Post-Exposure Prophylaxis (PEP) utilization in their respective health facilities. Conversely, a smaller proportion, accounting for 44.3% (133 individuals), reported the absence of such guidelines and protocols. Specifically, within Alebtong District, situated in the Northern Region of Uganda, six out of every ten respondents, totaling 51 individuals or 60% of the sample, stated the lack of guidelines and protocols for PEP utilization in their health facility. [3]

#### 5.3.2. Availability of Post-Exposure Prophylaxis (PEP) in Health Facility

In our assessment of the availability of Post-Exposure Prophylaxis (PEP) within health facilities, it was observed that the majority of respondents, constituting 71.3% (214 individuals), affirmed the ready availability of PEP in their respective health facilities. Conversely, a smaller portion, comprising 28.7% (86 individuals), indicated that PEP is not readily available in their health facility. Furthermore, in Tanzania, a significant proportion of respondents, specifically 74.9%, reported the availability of HIV PEP at their workplace. [9]

Upon further investigation into the duration of availability of PEP (Post-Exposure Prophylaxis), it was found that in Alebtong District, located in the Northern Region of Uganda, 47 out of 85 respondents, constituting 55.3%, affirmed the ready availability of PEP in the health facility. [3] Among the respondents who indicated the ready availability of PEP, the breakdown of availability during different shifts was examined. Of these respondents, 44.3% (133 individuals) reported that PEP is accessible solely during daytime hours, while 16.0% (48 individuals) mentioned availability exclusively during the evening shift. Furthermore, 39.7% (119 individuals) stated that PEP is accessible across all shifts mentioned. Additionally, 40 respondents, constituting 47.1%, specified that PEP was readily available solely during the day shift. [3]

The Ministry of Labour and Social Affairs' Department of Occupational Safety and Health was founded in 2020 in reaction to the COVID-19 pandemic, which highlighted the vital role that this department plays. The department was established and has been operating for four years, with its headquarters located in Mogadishu. [14]

Despite thorough searches, no direct policy specifically related to the safety of healthcare workers was found. However, various policies indirectly touch upon aspects of healthcare worker safety, such as occupational health and safety regulations, infection control guidelines, and workplace safety protocols. While a specific policy addressing the safety concerns of healthcare workers may not exist, these related policies provide a framework for ensuring a safe working environment and protecting the well-being of healthcare professionals.

## 6. Conclusion and Recommendation

### 6.1. Conclusion

In conclusion, our study in Mogadishu, Somalia, revealed a concerning prevalence of occupational injuries among healthcare workers, with 61% reporting such incidents. Needle stick injuries were the most commonly reported type, comprising 60.6% of all injuries. On the topic of Post-Exposure Prophylaxis (PEP), 84.0% of respondents demonstrated awareness of its existence, while 16.0% were not informed about it. Health facilities emerged as the primary source of knowledge about PEP, cited by 52.0% of respondents. Regarding accessibility, 71.3% of participants affirmed the ready availability of PEP in their health facility, while 28.7% reported its unavailability. These findings underscore the importance of ensuring adequate education and access to PEP among healthcare workers to mitigate the risks associated with occupational injuries.

### 6.2. Recommendation

**1) Enhance Workplace Safety Measures:** Given the high prevalence of occupational injuries, particularly needle stick injuries, healthcare facilities should prioritize implementing comprehensive safety measures. This includes providing appropriate protective gear, implementing safe handling procedures for sharp objects, and ensuring a clean and safe working environment.

**2) Education and Training Programs**: Increase the frequency and depth of education and training programs on injury and illness prevention. These programs should cover topics such as proper handling of medical equipment, infection control measures, and stress management techniques to mitigate work-related stress.

**3) Timely Medical Attention**: Encourage healthcare workers to seek prompt medical attention in the event of work-related injuries or illnesses. Facilities should ensure that medical resources, including tetanus shots and PEP, are readily available and easily accessible to employees.

**4) PEP Awareness Campaigns:** Despite the majority of respondents being aware of PEP, there is still a significant portion who lack awareness. Launch targeted awareness campaigns to educate healthcare workers about the importance of PEP, its initiation window, duration, and facility protocols.

**5) Availability of PEP:** Ensure consistent availability of PEP in healthcare facilities. Address the reported discrepancies in availability during different shifts to ensure that PEP is accessible to all healthcare workers regardless of the time of day.

**6) Strengthen Guidelines and Protocols:** Healthcare facilities should establish clear guidelines and protocols on the use of PEP after exposure. This includes standardizing procedures for PEP administration, follow-up care, and monitoring to ensure adherence to best practices.

**7) Regular Review and Monitoring**: Regularly review and monitor the implementation of safety measures, training programs, and availability of PEP.

This will help identify areas for improvement and ensure continuous enhancement of occupational health and safety standards.

## 7. Limitation of Study

The study on occupational injury prevalence and post-exposure prophylaxis knowledge among healthcare workers in Mogadishu faces several limitations. Firstly, there's a risk of sampling bias as specific healthcare facilities was chosen, potentially skewing results. Secondly, relying on self-reported data introduces the possibility of recall and social desirability biases. Challenges in achieving a high response rate could lead to non-response bias. Additionally, transportation issues and the use of outdated methods like paper-based surveys may affect data accuracy. Hospital administrations' refusal to participate further complicates data collection. These limitations highlight the need for cautious interpretation and improvements in future research efforts.

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## Author Contributions

As researchers, all of the authors of this document have made substantial contributions to the study. They have been involved in various aspects, including the conception and design of the study, data acquisition and analysis, interpretation of the findings, and drafting and revising the article. They have collectively reviewed and given final approval for the version to be published. Furthermore, they have reached an agreement on the journal to which the article has been submitted. As responsible researchers, they are willing to take accountability for all aspects of the work, ensuring its integrity and accuracy.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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## Abbreviation

PEP—Post-Exposure Prophylaxis
NSI—Needle Stick Injuries
HWs—Healthcare Workers
HBV—Hepatitis B Virus
HCV—Hepatitis C Virus
HIV—Human Immunodeficiency Virus
GDP—Gross Domestic Product
NSSIs—Needle and Sharp Object Injuries
HCWs—Healthcare Workers
PPE—Personal Protective Equipment
WHO—World Health Organization:
SPSS—Statistical Package for the Social Sciences:
AIDS—acquired immunodeficiency syndrome
ILO—International Labour Organization.

## Appendix

**Questionnaire**

### Section A. Demography factors

1. Age of the respondent ( ) A. 18 - 25 B. 26 - 35 C. 36 - 44 D. Above 45
2. Gander of respondents ( ) A. Male B. Female
3. Education level of the respondents ( ) A. Certificate B. Diploma C. bachelor's degree D. postgraduate
4. Marital status ( ) A. Single B. Married C. Separate D. widow
5. Level of health facility ( ) A. Clinical center B. General hospital C. Specialized hospital D. Pharmacy E. Others
6. Cadre of health worker ( ) A. Doctors B. Nurse C. Midwife D. Laboratory technician E. Clinical officer
7. Duration in service ( ) A. Less 1 year B. 1 - 5 years C. Above 5 years
8. Which department are you working in currently ( )
   A. Medical wards B. OPD C. Surgical wards D. GYN & OBS
   E. Pediatric ward F. Laboratory G. Pharmacy H. Others
9. Working overtime ( ) A. Yes B. No
10. Hours of sleep ( ) A. Less 8 hours B. More than 8 hours

### Section B. Prevalence of Occupational Injury

1. Have u suffered an injury at work ( ) A. Yes B. No
2. Which of the following injuries did you encounter ( )
   A. Needle stick B. Fracture C. Laceration D. Muscle skeletal injury E. Work related violence
   F. Slips trips or fall G. Burn H. Poisoning I. Others
3. Seek medical attention promptly ( ) A. Yes B. No
4. Which type of medical attention you seek when you suffered the injury ( )
   A. PEP B. Tetanus C. Disinfection D. Plastering/dressing E. Resuscitation F. Pain reliever
5. Did the injury or disease cost you some days off duty ( ) A. Yes B. No
6. Have you suffered from any illness resulting from your exposure at work ( ) A. Yes B. No
7. Which of the following illnesses did you suffer from ( )
   A. TB B. HIV C. HBV D. HCV E. Work related stress.
8. Have you got any training/CME regarding the prevention of injuries and occupational illnesses ( )
   A. Yes B. No
9. If yes, who provided the training ( ) A. management B. NGO C. District office

### Section C. knowledge of Post-Exposure Prophylaxis Accessibility

1. Are you aware of Post-Exposure Prophylaxis? ( ) A. Yes B. No
2. Where did you learn about Post-Exposure Prophylaxis from? ( )
   A. Friends relatives B. Health facility C. Radio D. TV
   E. Internet F. Training G. Written source H. Others
3. How many PEP drugs are used during Post-Exposure Prophylaxis ( )
   A. One B. Two C. Three
4. What is the maximum time limit to initiate PEP ( ) A. Less 72 hr B. More 72 hr
5. How long should a HW take PEP ( ) A. Less than 4 weeks B. More than 4 weeks
6. Do you have any guidelines and protocols on how to use PEP after exposure in this health facility ( )
   A. Yes B. No

7. Is Post-Exposure Prophylaxis readily available in this health facility ( ) A. Yes B. No
8. During which of the following shift is Post-Exposure Prophylaxis (PEP) readily available? ( )
A. Only Day B. Only evening C. Only night D. All above