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Prevalence and determinants of medical sharp injuries among health care workers at Entebbe Regional Referral Hospital, Wakiso District. A cross-sectional Study.

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Abstract.

Background:

Globally, sharps injuries continue to affect healthcare workers despite improvements in infection prevention practices. Studies report varying prevalence rates, influenced by individual behaviors, training levels, and hospital safety systems. This study was to assess the prevalence and determinants of medical sharps injury among the health workers at Entebbe Regional Referral Hospital.

Methodology:

A descriptive cross-sectional study was conducted among 140 healthcare workers at Entebbe RR hospital using a structured questionnaire and a convenience sampling method.

Results:

The study revealed that 63% of respondents had ever had a medical sharps injury. In the past 12 months, 74.3% of those injured had sustained at least one injury, with needle stick injuries being most common (55.7%), and 81.8% reported their most recent injury. 54.3% believed sharps injuries are preventable, 63.6% regularly used PPE, and 80% had received training in injection safety or infection prevention. Also, 70.7% reported adequate PPE availability, 97.1% had sharps containers at workstations, 54.3% indicated containers were sometimes emptied on time, 95% reported accessible safety guidelines, and 77% had attended in-service training.

Conclusion:

Despite the availability of PPE, sharps containers, and infection prevention guidelines, sharps injuries remain common among healthcare workers. Individual behaviors such as inconsistent PPE use, occasional recapping, and underestimation of risk, combined with occasional delays in emptying sharps containers, continue to contribute to injuries.

Recommendations:

The Ministry of Health should strengthen national surveillance and increase access to safety-engineered devices. Also, Entebbe Regional Referral Hospital should ensure timely emptying of sharps containers, reinforce no-recapping policies, and intensify in-service training.

Keywords: *Medical sharp injuries, Health care workers, Entebbe Regional Referral Hospital, Wakiso District, Uganda.*
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Background.

According to the Occupational Safety and Health Administration, 5.6 million workers are at risk for developing disease through sharp injuries (Mohamed, 2020). Worldwide, an estimated 2 to 3 million healthcare workers sustain sharps injuries each year (Yun et al., 2023). A meta-analysis covering 87 studies across 31 countries found a prevalence of 44.5% for experiencing at least one medical sharp injury in 12 months (Auta et al., 2018). In low- and middle-income settings, especially in sub-Saharan Africa and parts of Asia, face the highest prevalence and lowest health safety infrastructure, with underreporting being a common concern (Yadav et al., 2021). The annual prevalence of medical sharps injury (MSI) ranges from 27% to 57%, depending on the setting and group. Many health

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workers have reported experiencing multiple injuries per year (Kiconco et al., 2019).

There is a 6-30% chance that a person exposed to an injury from a sharp object contaminated with Hepatitis B virus will be infected, while that of HIV is 0.3% globally (Alfulayw et al., 2021). Healthcare workers at Entebbe Hospital operate in a resource-limited, high-demand environment like other public health facilities in Uganda (Mawanga, 2020). This puts them at an elevated risk of sharps injuries due to unknown determinants**.** According to the hospital Performance report (2024), there is a worrying increase in the number of health workers, including clinical students, reporting sharp injuries at Entebbe Regional Referral Hospital. The number of reported incidents increased from 58 cases in 2023 to 82 cases in 2024, a rise of approximately 41%, which highlights an urgent concern over routine safety, training adequacy, and supervision. Safeguarding staff health and ensuring safe clinical practices is therefore essential. Hence, there is an urgent need to investigate the prevalence and determinants of medical sharp injuries and develop modified interventions to create awareness and reduce the burden.

Methodology

Study Design.

A quantitative descriptive cross-sectional study design was used to assess the prevalence and determinants of medical sharp injuries among health care workers at Entebbe regional referral hospital. This design was selected because it enables the researcher to have detailed information about the study in the shortest time possible from the respondents at one point in time.

Study Setting.

The study was conducted at Entebbe Regional Referral Hospital, formerly referred to as Grade B hospital, which is a public hospital. The hospital has a bed capacity of 250 and provides services like inpatient and outpatient services to both urban and semi-urban populations. The hospital has 220 staff, and it was selected due to the increasing number of medical sharp injuries at the facility.

Study Population.

The study population was composed of all the health workers at Entebbe RR Hospital who had consented to participate in the study.

Sample Size Determination.

The study employed 140 health workers to provide better information about the study. According to Yamane (Survey Sampling, 1967), statistical formulae for surveys:

n = N / (1 + Ne2)

n = sample size

No, the representative sample for proportions

N= population size

Ne2 = (**No/N)**

No, the representative sample for proportions, therefore, the representative sample is calculated as below:

N0 = (z2pq)/d2

z = standard normal deviation (1.96) at 95% confidence interval

p = proportion of the target population 50 % (0.5)

q= 1-p

d = degree of occurrence desired (0.05)

Therefore No = (1.962*0.5*0.5)/0.052 = 384

Hence, the study sample size is;

n=384/ (1+384/220). = 140.

Sampling Procedure.

A convenience sampling method was used with the goal of identifying the participants' information desired for this study. This was done by employing all eligible participants who were available at any time of the day and at their convenience. On each visit, the researcher sampled 20 respondents for 7 days to reach a sample size of 140 to participate in the study.

Inclusion Criteria.

All the health workers at Entebbe Hospital aged 18years to 45, both males and females, and Ugandans who were present and consented to participate in the study were enrolled.

Exclusion criteria.

All the health workers who withdrew from the study or were off duty, and all the health workers who were not available at the time of sampling.

Study Variables.

Dependent Variable.

Medical sharps injury among health workers at ERRH.

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Independent Variables.

Prevalence of medical sharps injury among health workers at ERRH

Individual determinants of medical sharps injury among health workers at ERRH

Hospital-related determinants of medical sharps injury among health workers at ERRH.

Research Instrument.

The study employed a semi-structured, researcher-administered questionnaire with closed-ended questions. The questionnaire contained 4 sections: section A, which consisted of the demographic data of the respondents, section B, which consisted of the prevalence of MSI, section C, which consisted of the individual determinants of medical sharps injuries, and section D, which consisted of the hospital-related determinants of MSI.

Data Collection Procedure.

An introductory letter from the school was issued, and an introduction was made to the ERRH health workers. The purpose of the study was thoroughly explained to the health workers, consent was then sought from the respondents, and a questionnaire was issued to the participants. The time to answer the questionnaire was 15-20 minutes to avoid losing the respondents' concentration. Filled questionnaires were checked and edited before being considered for final use.

Data Management.

Data from the study was first thoroughly checked and validated for completeness and then stored in a database established using Microsoft Excel. A password was used to prevent unauthorized access to the database. The data will also be backed up on a flash and a hard disk before and after analysis. Data on the questionnaire was kept under lock and key, while electronically stored data was password-protected.

Data Analysis.

The data was first cleaned, organized, and checked for any gaps, after which it was changed into codes and later transferred to Microsoft Excel 2021 for presentation of tables and figures.

Data Quality.

The questionnaire was first pre-tested on 14 health workers at Naguru hospital to check the strength of the questionnaire. This was because of the fact that Naguru and Entebbe are both referral hospitals serving almost a similar population that includes the high, middle, and low classes.

Ethical Considerations.

After the approval of the proposal by the school research committee, an introductory letter was given to the researcher, allowing him to carry out the study. An introductory letter was taken to the Hospital director, ERRH, to seek permission. The researcher then introduced himself to the respondents, explaining the purpose of the study as well as the objectives. The consent was obtained from the respondents; however, their contact identity was kept anonymous throughout the study, and the researcher used codes to identify the respondents but not their names. Furthermore, no one else except the researcher had access to the completed research instruments for confidentiality.

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Results.

Socio-Demographic Data of the Respondents.

Table 1: Shows demographic characteristics of the respondents, n=140

VARIABLES	RESPONSE	FREQUENCY (f)	PERCENTAGE (%)
Age group	26-35 years	62	44.3
	18-25 Years	48	34.3
	36-45 years	30	21.4
Sex	Female	81	57.9
	Male	59	42.1
Profession Category	Nurse	66	47.1
	Midwife	39	27.9
	Doctor	19	13.6
	Clinical Officer	09	6.4
	Laboratory	07	5
Level of experience	6-10 years	73	52.1
	1-5 years	31	22.1
	Above 10 years	26	18.6
Total		**140**	**100%**

Table 1 shows that 62(44.3%) of the respondents were aged 26-35 years, while the least were 30(21.4%) aged 36-45 years. Most 81(57.9%) were females while the rest 59(42.1%) were males. Most 66(47.1%) were Nurses while the least 7(5%) were laboratory staff. Regarding experience, most 73(52.1%) had 6-10 years working experience, while the least 26(18.6%) had experience above 10 years.

Prevalence of Medical Sharps Injuries among health workers at ERRH.

Figure 1: Shows whether ever sustained a medical sharp injury in career n=140.

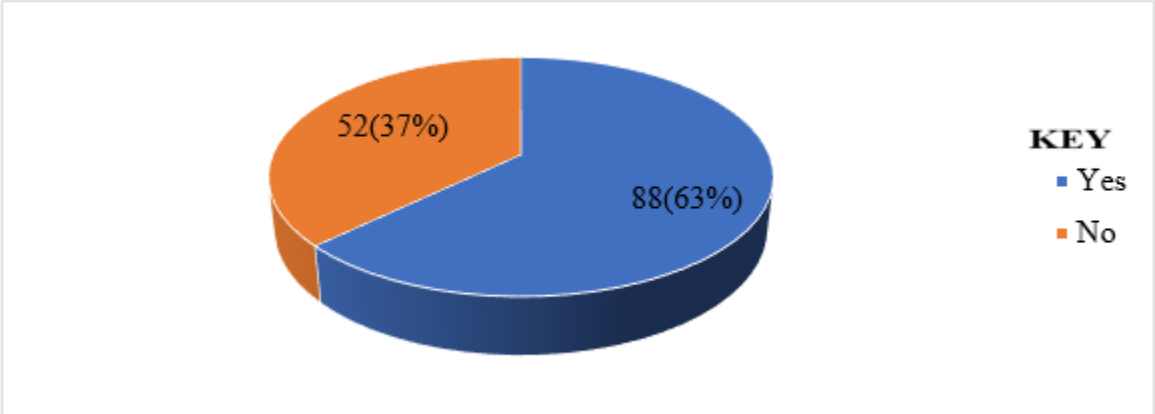

Figure 1 indicates that 88(63%) of the participants had ever sustained a medical sharp injury in their career, while the remaining 52(37%) had never.

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Table 2: Shows the Prevalence of Medical Sharps Injuries among health workers at ERRH, n=88

VARIABLES	RESPONSE	FREQUENCY (f)	PERCENTAGE (%)
How many times have you sustained a sharps injury in the past 12 months	Once	67	74.3
	2-3 times	11	25.7
What type of sharp object caused your most recent injury	Needle stick	49	55.7
	Iv Cannula	21	23.9
	Surgical blade	18	20.4
Was the sharp contaminated	No	51	58
	Yes	27	30.7
	Don't Know	10	11.3
Did you report your last sharps injury	Yes	72	81.8
	No	16	18.2
Total		**88**	**100%**

Table 2 indicates that the majority, 67/88(74.3%) of the participants had sustained a sharps injury once in the past 12 months,
while the remaining 11/88(25.7%) had sustained 2-3 times in the past 12 months. Most 49/88(55.7%) had been injured by a needle stick, while the least 18/88(20.4%) was by a surgical blade. Most 51/88(58%) said the sample was not contaminated, while the least 10/88(11.3%) did not know whether it was contaminated. Regarding reporting, the majority, 72(81.8%), reported the last sharp injury, while the remaining 16(18.2%) did not report.

Individual Determinants of Medical Sharps Injury among Health Workers at ERRH

Table 3: Shows the Individual Determinants of MSI among health workers at ERRH, n=140

VARIABLES	RESPONSE	FREQUENCY (f)	PERCENTAGE (%)
Do you believe most sharp injuries are preventable	Yes	76	54.3
	No	64	45.7
Do you regularly use personal protective equipment while handling sharps	Some times	89	63.6
	Always	51	36.4
Do you recap needles after use	Never	76	54.3
	Some times	40	28.6
	Rarely	24	17.1
Total		**140**	**100%**

Table 3 shows that 76(54.3%) of the participants believed that most sharps injuries are preventable, while the remaining 64(45.7%) do not believe so. Most 89(63.6%) sometimes regularly use personal protective equipment while handling sharps, while the remaining 51(36.4%) always do so. Most 76(54.3%) said they never recap needles, while the least. 24(17.1%) rarely do.

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Figure 2: Shows whether ever received training in injection safety or infection prevention, n=140.

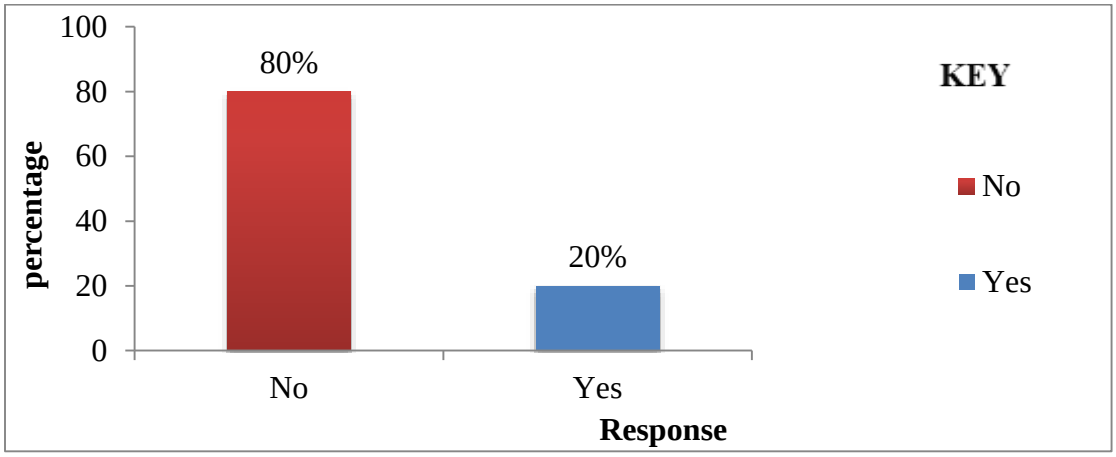

Figure 2 indicates that the majority, 112(80%) of the respondents had received training in injection safety or infection prevention, while the remaining 28(20%) had never received such training.

Figure 3: Shows whether respondents know the correct department or procedure for reporting a sharps injury, n=140.

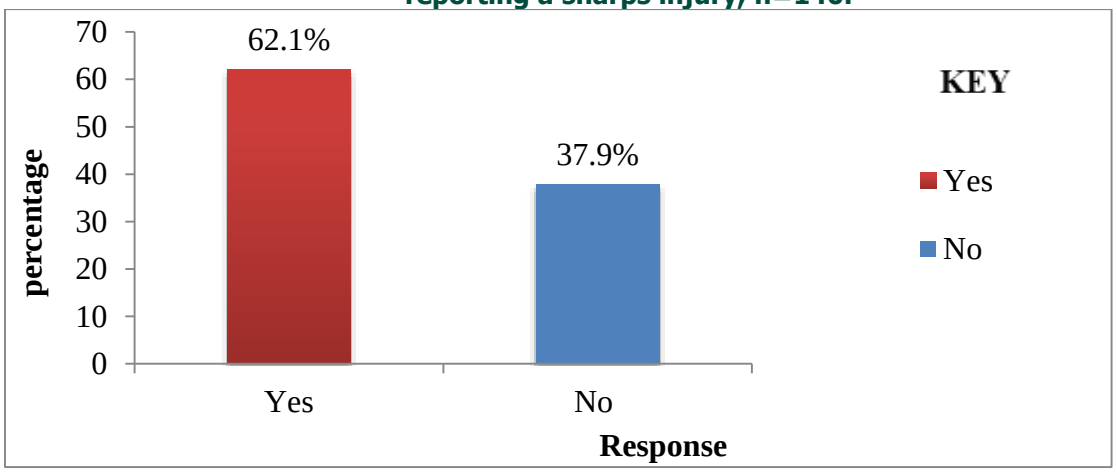

Figure 3 shows that 87(62.1%) of the participants reported knowing the correct department or procedure for reporting a sharps injury, while the remaining 53(37.9%) said they do not know.

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Table 4: Shows the hospital-related determinants of sharps injury, n=140

VARIABLES	RESPONSE	FREQUENCY (f)	PERCENTAGE (%)
Does your workplace provide adequate PPE	Always	99	70.7
	Some times	41	29.3
Are sharps disposal containers available at your workstation	Always	136	97.1
	Some times	04	2.9
How often are sharps containers emptied before they become full/overflowing	Sometimes	76	54.3
	Always	56	40
	Rarely	08	5.7
Are infection prevention and safety guidelines displayed or accessible in your facility	Yes	133	95
	No	07	5
Total		**140**	**100%**

Table 4 shows that the majority, 99(70.7%) of the respondents said the workplace provides adequate PPE, while the remaining 41(29.3%) said they provide some times. An overwhelming number, 136(97.1%), said that sharps disposal containers are always available at the workstation, while the rest. Said they are sometimes available. In regards to emptying sharps containers, most 76(54.3%) of the participants said that sometimes sharps containers are emptied before they become full/overflowing, while the least said rarely is it done. The majority, 133(95%), reported that infection prevention and safety guidelines are displayed or accessible in the facility, while the remaining 7(5%) said they are not.

Figure 4: Shows whether ever attended in-service training or refresher courses on safe sharps handling, n=140.

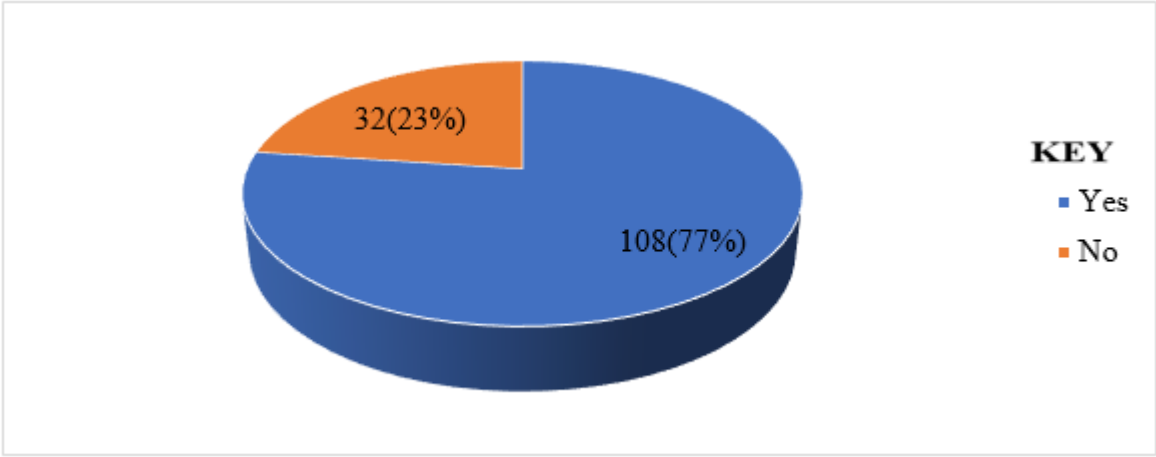

Figure 4 indicates that the majority, 108(77%) of the participants had ever attended in-service training or refresher courses on safe sharps handling, while the remaining 32(23%) had never attended.

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Discussion.

Demographic Data of the Respondents.

Findings of this study showed that most (44.3%) of the respondents were aged 26–35 years, indicating a relatively young health work force at Entebbe hospital. Females formed the majority (57.9%), which could be because most of the hospital population is female. Most participants were nurses (47.1%), which is consistent with studies by Abouseif et al. (2019) and Alshammari (2022), which revealed that nurses experience the highest exposure to sharps injuries, which could be due to frequent patient contact and procedural tasks. Over half of the respondents (52.1%) had 6-10 years of experience, which indicates that they were sufficiently exposed to clinical procedures that increase sharps injury risks.

Prevalence of Medical Sharps Injuries among health workers at ERRH.

The purpose of the study was to assess the prevalence and determinants of medical sharps injury among the health workers at ERRH, and results revealed a high prevalence of sharps injuries, with 63% of participants having ever sustained a sharps injury. This indicates that the burden is big and equally comparable to the global challenge, and the high prevalence indicates that interventions are not just needed, but urgent and broadly relevant. These findings align with studies from the USA (Yun et al., 2023) reporting 58.8%, and Egypt reporting 35-68% (Abouseif et al., 2019), although lower than the 95.4% reported in a Nigerian study among emergency nurses (Abass et al., 2020). In the past 12 months, 74.3% of the injured respondents had sustained the injury once, which is in line with a study by Mekonnen et al. (2018), who found that annual exposures remain high due to frequent clinical procedures. In addition, needlesticks were the most common injury (55.7%), consistent with global literature by Sharew et al. (2017); Mohamud et al. (2023), where hypodermic needles remained the leading cause. More than half (58%) reported that the sharp causing injury was not contaminated. Notably, 81.8% of respondents reported their last injury to the responsible people, which contrasts with studies by Yun et al. (2023) and Sun et al. (2021) that found underreporting due to fear, workload, and misconceptions about reporting. This highlights a stronger safety culture and relatively good reporting structures at ERRH. However, the good reporting is only valuable if it really translates into prevention and system changes.

Individual Determinants of Medical Sharps Injury among Health Workers at ERRH.

The purpose of the study was to assess the prevalence and determinants of medical sharps injury among the health workers at ERRH, and results showed that most respondents (54.3%) believed sharps injuries are preventable. This aligns with findings by Yun et al. (2023), where residents perceived 87% of sharps injuries as preventable through improved safety practices and training. The majority (63.6%) reported regular use of PPE, which is contrary to a study by Mohamud et al. (2023), where only 62.7% regularly wore gloves, and some reported using no PPE. Similarly, Mekonnen et al. (2018) reported inconsistent PPE use, with 7.8% never using PPE.

This study indicated that 54.3% of the respondents never recap needles. This aligns with global recommendations discouraging recapping to prevent injuries (Foda et al., 2018). However, recapping remains common in other settings; for example, Mekonnen et al. (2018) found 39.7% of health workers recapped needles always or sometimes. In addition, training levels were high, with 80% having received training in injection safety or infection prevention. This far exceeds findings from Yekatit Hospital, where only 23% of providers were trained (Beyene et al., 2023), which indicated a stronger training system at ERRH. Knowledge of injury reporting procedures was reported by 62.1%, similar to the 69.7% in Ethiopia (Sharew et al., 2017), which showed that awareness of reporting systems is generally improving. The findings indicate that some recommended practices are being followed; further work is needed, especially to eliminate all recapping that is still done, ensure full reporting, and translate reporting into prevention and follow-up.

Hospital-Related Determinants of Sharps Injury among Health Workers at ERRH

The purpose of the study was to assess the prevalence and determinants of medical sharps injury among the health workers at ERRH, and results showed that the majority (70.7%) acknowledged adequate PPE supply. This contradicts Mekonnen et al. (2018), who found 62% reported inadequate PPE, and Mohamud et al. (2023), where unavailability of PPE posed a major risk, yet adequate PPE provision is a known protective factor (Hewitt & Southard, 2023). Almost all respondents (97.1%) reported availability of sharps disposal containers at workstations better than findings by Kakodkar et al. (2025), which showed inadequate placement of containers contributed to injuries. These findings suggest improved infrastructure and

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adherence to point-of-use disposal guidelines. These findings support the need for continuous reinforcement of safe practices through training, audits, and policy enforcement to ensure that available resources translate into reduced injuries.

More than half (54.3%) of the participants in this study said containers are sometimes emptied before becoming full, yet overflowing containers are a known risk factor identified in multiple studies (Syed, 2023; Kakodkar et al., 2025). Therefore. The "sometimes" response indicates moderate compliance, but areas for improvement. Most respondents (95%) reported availability of infection prevention guidelines, which is consistent with Sharew et al. (2017), who noted that the absence of guidelines increases risk. Also, 77% of the participants had attended an in-service training compared to only 31% in some Ethiopian settings (Mekonnen et al., 2018). Regular training is strongly associated with reduced injury risks (Mohamed, 2020).

Conclusion

The study demonstrated that medical sharps injuries remain a significant occupational health concern, with a high prevalence. Needlestick injuries were the most common type. Individual factors such as consistent PPE use, avoidance of needle recapping, and training in infection prevention significantly influence injury risk. Hospital-related determinants, including adequate PPE supply, accessible sharps containers, and availability of safety guidelines, were largely satisfactory in this study.

Recommendations.

MoH should strengthen national enforcement of injection safety guidelines and PPE supply chain management. Also, increase funding for continuous professional development on infection prevention and control.

The hospital should ensure timely emptying and monitoring of sharps containers to avoid overflow, strengthen internal reporting systems and reduce barriers to incident reporting, maintain a consistent supply of PPE and safety boxes at point-of-use, and also conduct regular in-service training and practical drills in injection safety.

Nurses should promote strict adherence to universal precautions at all times, integrate sharps safety education into routine clinical meetings and mentorship programs, and also ensure proper demonstration and supervision during procedures performed by junior staff or students.

Acknowledgement

I extend my deepest gratitude to my supervisor, Ms. Nansereko Hasifa, for her un tireless guidance, support, and encouragement throughout this research journey. Her expertise and insightful feedback have been instrumental in shaping this study.

List of Acronyms.

ERRH:	Entebbe Regional Referral Hospital
HIV:	Human Immune Deficiency Virus
MSI:	Medical Sharps Injuries

Source of funding

The study was not funded.

Conflict of interest.

There is no conflict of interest.

Availability of data.

Data used in this study are available upon request from the corresponding author.

Authors contribution.

SN designed the study, conducted data collection, cleaned and analyzed data, drafted the manuscript, and HN supervised all stages of the study from conceptualization of the topic to manuscript writing and submission.

Author's biography.

Simon Nabuyaka Wabomba is a student at Mildmay Uganda School of Nursing and Midwifery.

Hasifa Nansereko is a research supervisor at Mildmay Uganda School of Nursing and Midwifery.

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