



NEEDLES STICK AND SHARPS INJURIES AND ITS ASSOCIATED FACTORS AMONG HEALTH CARE WORKERS AT SOS HOSPITAL IN HELIWA DISTRICT, MOGADISHU SOMALIA

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ABSTRACT

Background: Out of 35.7 million healthcare workers, about 3 million experience percutaneous exposure to infectious diseases each year. 37.6% of hepatitis B, 39% of hepatitis C and 4.4% of HIV/AIDS in healthcare workers around the world were due to needle stick injuries.

Objective: This study aimed to determine the occurrence of needle sticks and sharps injuries and their associated factors among healthcare workers at SOS hospital.

Methodology: This institution-based quantitative cross-sectional study was conducted from January to March 2022 amongst healthcare workers at SOS hospital, Mogadishu- Somalia. The study recruited two hundred and ten hospital staff at SOS hospital who are exposed to needle stick injuries, excluding the administrative; therefore, our sample size was those two hundred and ten hospital staff at SOS hospital. Data have been collected using purposive sampling with a structured and pre-tested questionnaire.

Analytical methods used: The data were analyzed using SPSS. Association was determined using logistic regression. The level of significance was set at $P < 0.05$. Associations were examined using multivariate logistic regression.

Results: This study reveals an occurrence of needle stick/sharp injury of 25.7% at the SOS Hospital, Mogadishu.

Even though the male participants, 116(55.8%), were slightly higher than female participants 94(44.8%). Males were almost 0.16 times more likely to be exposed to needle sticks and sharp injuries than females. (OR 0.16, 95% CI 0.76-0.365). (P-value 0.001).

Conclusion: NSIs are a potentially serious threat to healthcare workers exposing them to the risk of acquiring blood-borne pathogens through sharps or instruments. This study reveals occurrence was 25.7% among healthcare workers in SOS hospital. The factors influencing needle stick and sharps injuries were found to be the worker's gender, categories of work or occupation, marital status, and protective equipment. However, the gender of the healthcare workers during the study was found to be associated with the prevalence of needle sticks and sharp injuries. Male was almost one time more likely to be exposed to needle stick and sharp injuries compared to Female. It is recommended that SOS hospital management and other hospitals provide protective equipment and safe medical devices to minimize needle stick and sharps injuries. In addition to adequate training of HCWs regarding the safe use and disposal of needles, post-exposure prophylaxis and vaccination will reduce NSI.

Keywords: Occurrence of needle stick, health workers, needle stick injury, Somalia

Background

Healthcare providers are at greater risk of occupational exposure to sharps, and needle stick injuries (1). Healthcare workers are more likely to contract blood-borne diseases such as the human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus when exposed to blood and bodily fluids through NSIs (2). According to the World Health Organization, approximately 4 needle stick injuries per worker occur annually in African, Mediterranean, and Asian populations, 3 million healthcare workers are annually exposed to infectious diseases through percutaneous means, and 35.7 million healthcare workers are at risk of needle stick injuries (3). The World Health Organization estimates that NSIs account for 40% of hepatitis B and C and 2.5% of HIV globally (4). More than 90% of these infections happen in healthcare facilities in developing countries where adherence to standard safety measures is poor (5). The factors associated with needle sticks and sharp injuries were socio-demo-graphic factors (work experience, educational status, qualification, monthly income, job category), environmental factors (training on infection prevention, long working hours), and other behavioral factors including recapping needles, Use of personal protective equipment's (PPE), not abide by the standard operating procedures(6). According to a study, healthcare workers had the highest occurrence of needle sticks and sharp injuries, and age, education level, the number of shifts worked each month, and previous experience in the field were all risk factors. Preparation of the instruments, injection, and recapping of used needles resulted in the highest risk of needle sticks and sharp injuries. (7). Studies indicated that the incidence of wounds to healthcare workers caused by sharp objects ranges from 1.4 to 9.5 per 100 healthcare workers per year, resulting in 0.42 HBV infections per 100 sharp-object injuries per year(8). A study conducted at the Germany university Germapital showed that 31.4% of health care workers sustained at least one needle stick injury in one year, while in Greek the overall injury rate of health care was 2.4% per year out of the total full-time employees engaged in patient-related activities(9). Studies on healthcare workers in Iran, Malaysia, and Saudi Arabia showed a prevalence rate of 24.9, 74, and 39.4% respectively(9). Similar studies in Nigeria, Uganda, and Kenya showed a one-year prevalence of needle stick/ sharps object injuries were 18.5, 32.4 and 20.2%, respectively. A study in Bahir Dar, Amhara, Ethiopia, showed that 65.9% of healthcare providers were exposed to blood and body fluids in the past year, of which 29.0% were needle stick injuries(7). Additionally, doctors are far less likely than other healthcare professionals to disclose a needle stick injury, and African healthcare workers experience two to four needle sticks annually on average. (10). Hepatitis B is the most prevalent and dangerous blood-borne infection in the world, increasing occupational dangers for nurses, healthcare workers, and the general public's health. (11). In Somalia, few studies were conducted regarding needle sticks and sharp injuries among healthcare workers. This study aimed to

determine the occurrence of needle sticks and sharps injuries and their associated factors among healthcare workers at SOS hospital, Mogadishu- Somalia.

Methodology

This institution-based quantitative cross-sectional study was conducted from January to March 2022 amongst healthcare workers at SOS hospital, Mogadishu- Somalia. SOS Hospital is a referral hospital that locates in Heliwa District, Mogadishu- Somalia, which provides care for mother and children through its various support structures, so this hospital was purposefully sampled as the study site. The study recruited two hundred and ten hospital staff at SOS hospital who are exposed to needle stick injuries, excluding the administrative; therefore, our sample size was those two hundred and ten hospital staff at SOS hospital. The study comprised hospital staff members who perform duties involving the use of needles and sharp objects. The study focused on healthcare workers who might be exposed or contacted if they come into contact with medical sharps. Data have been collected using purposive sampling with a structured and pre-tested questionnaire. Three data collectors held bachelor degrees in nursing and medicines who speak both English and Somali (local) languages were selected as research assistants and then given two-days training about the study objectives, data collection tools, ethical issues, responsibilities of data collectors and quality control. The questionnaire used in this study was addressed socio-demographic characteristics of respondents, Environmental factors and Management/organizational factors. The researchers checked the returned and finished tools to make sure they were finished. By redistributing the questionnaire among the responders, missing data from the original form were filled in. The study was performed after receiving an ethical clearance from the department of the Master of Public health program at Benadir University, as well as the Somali ministry of health. A letter of allowance was obtained from the Study area, (SOS hospital). Through the research assistants, the participants were asked to engage in the study by responding to the questionnaire. All information provided to interviewers was kept confidential, and records were safely stored. All of the data that interviewees gave was handled with confidentiality and security. Participants' names, identities, and anonymity were kept a secret. The study only included their comments and findings.

Data analysis

Before entering the data for analysis, the researchers checked it for its completeness and consistency. Running frequencies and standard scores were used to clean the data for missing values and extreme values. For analysis, cleaned data were exported from Excel to the Statistical Package for Social Sciences (SPSS) version 20.0. Descriptive statistics were calculated and presented as texts and tables.

A binary outcome variable indicating “have you ever experienced needle stick or sharps injury in the course of your work?” The answer was coded as “Yes” or “No” and it was used as the dependent variable. Bi-variate analysis was employed to determine the association between predictor and response variables. Multivariable logistic regression model was adapted to identify the relationship of each predictor to the dependent variable by controlling for the confounding variables. Those variables with P-values less than 0.3 that were identified as potential independent predictors in bivariate analysis were moved into multivariable logistic regression analysis. An odds ratio (OR) with a 95% confidence interval was used to determine the relationship between dependent and independent variables (CI). The significance level was set at (0.05).

Results

Sociodemographic respondents

A total of 210 health care workers at SOS hospital participated in the study giving a response rate of 100%. This study revealed an occurrence of needle stick/sharp injury of 25.7% at the SOS Hospital, Mogadishu. Out of 210 respondents

for age distribution 198(94.2%) of the respondents were between 15-35, while 12(5.8%) were 36 and above. According to gender distribution, 116 (55.2%) were males and 94 (44.8%) were females.

The majority of the respondents participated in this study 107 (51%) were married, 76 (36.2%) were single in their marital status, while 27(12.8%) were divorced.

Of the 210 health care workers selected for the study, 71 (33.8%) participated were bachelor degrees, while the least 37(17.6%) fell of secondary. According to the respondents' Job category included 88 (41.9%) nurses, 18 (8.6%) midwives, 22 (10.4%) laboratory technicians, 45(21.4) were medical doctors (general practitioners), 19 (8.6%) cleaners, 7(3.3%) laundry workers and 11 (15.3%) other healthcare professionals.

Management/organizational factors

Majority of respondents 125 (59.5%) reported that they have been trained in infection prevention control during their professional training, while few numbers of participants 85 (40.5%) reported that they have not been trained in infection prevention control during their professional training. Based on the procedures/guidelines most of the respondents 139 (66.2%) reported that they had given clear work procedures/guidelines in their job, while 71 (33.8%) reported that they had not been given. 53 (25.2%) of the respondents used syringes with auto-retractable needles, while 157 (74.8%) reported that they didn't use syringes with auto-retractable needles. most of respondents 156 (74.3%) reported that they had not experienced needle stick or other healthcare sharps injury in the course of their work, while 54 (25.7%) reported that they experienced. Majority of respondents 163 (77.6%) reported that they were penetrated mildly, while 40 (19.0%) moderately, 7 (3.3%) were severely. During the course of penetrating, most of the respondents participated this study mentioned that there were busy in injecting the patients during the contact of needle injuries. Furthermore, the contributing factors of needles and sharp injuries included, because mostly 114 (54.2%) encountered fatigue during their course of work. Despite the findings revealed the majority of the healthcare workers participated the study were vaccinated Hepatitis B.

Table 1: Management and organizational factors

Management/organizational factors	Variable	Frequency	Percentage
Were you trained in infection prevention control during your professional training?	Yes	125	59.5%
	No	85	40.5%
Are you professionally trained in the type of work that you perform in your ward/unit/department?	Yes	139	66.2%
	No	71	33.8%
Are you given clear work procedures/guidelines in your job?	Yes	139	66.2%
	No	71	33.8%
Do you use syringes with auto-retractable needles?	Yes	53	25.2%
	No	157	74.8%
Have you ever experienced needle stick or other healthcare sharps injury in the course of your work?	Yes	156	25.7%
	No	54	74.3%
The needle penetrated you was it clean or contaminated?	Yes	156	74.3%
	No	54	25.7%

How it was penetrated you?	Mild	163	77.6%
	Moderate	40	19.0%
	Severe	7	3.3%
What were you doing when stick penetrated you?	Suturing	52	24.8%
	Injecting	136	64.8%
	Cannel	9	4.3%
	Other (specify).....	13	6.2%
Do your departments have any needle stick policy?	Yes	164	78.1%
	No	35	16.7%
	Don't know	11	5.2%
Did you seek for Post exposure prophylaxis?	Yes	139	66.2%
	No	71	33.8%
Did you report the injury that occurred to anybody?	Yes	139	66.2%
	No	71	33.8%
Are there standard guidelines for handling used disposable healthcare sharps in your ward/dept?	Yes	164	78.1%
	No	35	16.7%
	Don't know	11	5.2%
What personal protective equipment/ material does the hospital provide for your use?	Masks	118	56.2%
	Gloves	78	37.1%
	Other (specify).....	14	6.7%
Is the personal protective equipment provided adequate for use all the time?	Yes	150	71.5%
	No	60	28.5%
How often do you use the personal protective equipment?	Always	111	52.9%
	Occasionally	69	32.9%
	Rarely	30	14.3%
What would you consider as the contributing factor(s) to needle stick and other sharps injuries?	Fatigue	114	54.3%
	Pressure	85	40.5%
	Any other(specify)	11	5.2%
Have you been vaccinated against Hepatitis B?	Yes	156	74.3%
	No	54	25.7%

Table 1. Multivariate binary logistic regression analysis. Factors associated with needle stick and sharps injuries

This study reveals an occurrence of needle stick/sharp injury of 25.7% at the SOS Hospital, Mogadishu. Even though the male participants, 116(55.8%), were slightly higher than the female 94(44.8%). Males were almost two times more likely to be exposed to needle sticks and sharp injuries than females. (OR 2.447, 95% CI 1.291-4.616). (P-value 0.04).

Variables	Categories	Frequency (%)	AOR	95% CI	p-value
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Gender	Male	116(55.2)	0.167	0.76- 0.365	0.001
	Female	94(44.8)	1		
Marital status	Married	107(51)	2.053	0.862- 4.893	.104
	Single	76 (36)	4.267	1.605-11.345	0.004
	Divorced	27 (13)	1		
Is the personal protective equipment provided adequate for use all the time?	No	107 (51)	0.021	0.0154-0.451	0.002
	Yes	103 (49)	1		
Job categories of the health workers	Doctors	45(21.4)	9.964	1.900-52.149	0.007
	Nurse	88(41.9)	16.342	3.253-82.095	0.001
	Laboratory Techn	22(10.4)	10.500	1.360-81.053	0.013
	Laundry	12(5.7)	11.345	1.970-4.765	0.375
	Midwives	18(8.6)	13.543	1.880-3.765	0.056
	Clearers	19(9.0)	7.7114	1.284-46.364	0.039
	Others	11(5.2%)	1		
Have you been vaccinated against Hepatitis B?	Yes	156(74.2)	0.304	0.109- 0.847	0.321
	No	54(25.8)	1	0.273-0.887	
What personal protective equipment/material does the hospital provide for your use?	Masks	118(56)	1.230	0.209- 0.747	0.90
	Gloves	78(37)	0.890	0.159- 0.747	
	Other	14(7)	1		

Discussion

This section outlines the entire findings of study conducted at SOS Hospital between the periods from January to March 2022. It also reviewed factors that contribute to the occurrence of the needle stick and sharps injuries and the measures the hospital management has put in place to control and manage these sharps injuries. Below is the outline of various findings and discussions made. This study revealed occurrence of 25.7% among health care workers in SOS hospital, which is lower than a study conducted in eastern Ethiopia 55.1% (343) of health care workers were injured by needle sticks in the past one year, which is higher than our findings findings(12). Our finding is very close to a prevalence of NSSIs among healthcare workers in the last 12 months was 124(28.3%), which is relatively similar to studies conducted in Awassa and Bahir Dar(9). Most of the respondents 88 (41.9%) nurses, 45(21.4%) medical doctors 18 (8.6%) midwives. This study is different with a study conducted in Indonesian tertiary teaching hospital were most NSSIs were experienced by nurses (42.7%), but the highest incidence was among midwives (18.9/1000- PY), followed by nurses, medical students and medical doctors (15.2/1000- PY, 12.6/1000- PY and 11.8/1000- PY, respectively)(13).

The descriptive statistics revealed that 116 (55.2%) of the respondents were males with approximately 94 (44.8%) being females. Hence, it could be inferred that the number of males in SOS Hospital seems to be greater than females on the average. The current study is consistent with a study conducted in Ondo State, Nigeria (70.2%) of male and (53.0%) female respondents sustained NSIs(14). Also this study was inconsistent a study conducted in Jeddah, Saudi Arabia. It was revealed that 86.1% of the sample studies were females(15).

Conclusion and recommendation

NSIs are a potentially serious threat to healthcare workers exposing them to the risk of acquiring blood-borne pathogens through sharps or instruments. This study reveals occurrence was 25.7% among healthcare workers in SOS hospital. The factors influencing needle stick and sharps injuries were found to be the worker's gender, categories of work or occupation, marital status, and protective equipment. However, the gender of the healthcare workers during the study was found to be associated with the prevalence of needle sticks and sharp injuries. Male was almost one time more likely to be exposed to needle stick and sharp injuries compared to Female. It is recommended that SOS hospital management and other hospitals provide protective equipment and safe medical devices to minimize needle stick and sharps injuries. In addition to adequate training of HCWs regarding the safe use and disposal of needles, post-exposure prophylaxis and vaccination will reduce NSI..

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The author's contribution

Nor Haji conducted the analysis of the data and prepared the manuscript. Dr. Ali Hassan performed all the required supervision and gave consultations on data collection, and designed the data collection sheets. Finally, the final version of the manuscript has been read and approved by all author

Disclosure statement

No conflict of interest.

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