

MAGNITUDE AND ASSOCIATED FACTORS OF NEEDLE STICK INJURY AMONG HEALTH CARE PROFESSIONALS IN ST PAUL'S HOSPITAL MILLENNIUM MEDICAL COLLEGE



**A RESEARCH SUBMITTED TO THE DEPARTMENT OF PUBLIC HEALTH,
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OF MEDICINE**

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Abbreviations and Acronyms	
AA	Addis Ababa
AIDS	Acquired Immunodeficiency Syndrome
BBF	Blood and Body Fluids
CDC	Center for Disease Control and prevention
CI	Confidence Interval
HBV	Hepatitis B Virus
HCP	Health Care Professional
HCV	Hepatitis C Virus
HCW	Health Care Workers
HIV	Human Immunovirus
IP	Infection Prevention
MOH	Ministry Of Health
NSI	Needle Stick Injury
OR	Operation Room
PEP	Post Exposure Prophylaxis
SD	Standard Deviation

Abstract

Back ground

Needle Stick Injuries results from accidental piercing of the skin and or mucocutaneous membranes of health profession. It can be caused from suturing needles and other sharps used during clinical care. It is an occupational hazard in health care sector. Needle stick injuries expose health care workers to blood and body fluids which may be infected and can be transmitted to them. Adequate knowledge and adherence to safety practices could prevent the occurrence of NSI and related consequences.

Objective

To assess the prevalence and determinants of needle stick injuries among health professionals in SPHMMC.

Method

A cross-sectional survey was used. The actual sample size for the study was determined using the formula for single population proportion making the sample size 280. P value of less than 0.05 was taken as significant. A Self-administered questioner was distributed among health care workers in SPHMMC.

Result

A total of 280 health care workers were participated in the study with a response rate of 100%. The prevalence of needle stick injury in our study was 108(38.6). Most of the professionals who sustained needle stick injury are nurses which were 53(40.8%). Among those who sustained needle stick injury 54(49.1%) were in the age group between 18-24 years. Males accounted for 58 (39.5%) while Females accounted for 50(37.9%) of needle stick injury cases. Among those who sustain needle stick injury majority worked at Maternity/Delivery 38(59.4%). Among people who sustained needle stick injury 39(36.1%) of them claim excess client as the contributing factor for needle stick injury. The study has identified that, Age, work area, service years, excess client, shortage of sharp box, shortage of gloves, removing of used needles, emergency situations and recapping of needles has association with sustaining needle stick injury.

Conclusion and recommendation

The study has shown that the prevalence of NSI in the hospital is high at 38.6%. The study identified that Age, work area and experience, excess client, shortage of sharp box, shortage of gloves, removing of used needles, emergency situations and recapping of needles have significant statistical association with sustaining needle stick injury. Therefore, there is need to organize Formal training and continuous monitoring of the work place safety and other measures that can be taken to mitigate the problem by SPHMMC and the MOH

1. Introduction

1.1 Background of the study

Needle stick injury can be defined as a penetrating stab wound from a needle, scalpel or other sharp objects that may expose to blood or other body fluids (1). The risk associated with unsafe injection can result in needle stick injury (NSI) which exposes to blood and body fluids. Occupational exposure to blood and body fluids is a serious concern for health care workers, and causes a major risk for the transmission of infections such as Human Immunodeficiency Virus (HIV), hepatitis viruses and other viral diseases. The exposures are caused by a percutaneous injury, contact of mucus membrane or skin with blood and other body fluids to which universal precaution apply. The major documented determinants factors are giving injection, suturing, recapping needles, bend, cut, or break needles, removing needles from syringes after injection, disposing sharps in poor puncture resistant sharp container, work load and unsustainable supply of protective materials (1).

The World Health Organization (WHO) estimates that about 3 million HCWs face occupational exposure to blood borne viruses each year (2 million to HBV, 900,000 to HCV, and 300,000 to HIV), 90% of the infections that result from these exposures are in low income countries. This accounted 2.5% of HIV, 40% HBV, & HCV and 5% of bacterial infections worldwide and for 28 million preventable disability adjusted life years" due to unsafe injection practices. Developing countries, especially those in sub-Saharan Africa, that account for the highest prevalence of HIV-infected patients in the world also report the highest incidences of occupational exposures (2).

In Ethiopia, there are only a few studies that describe occupational exposures and compliance to Safe Practices among HCWs. In 2006, the Ethiopian Public Health Association identified standard precautions as an area of research gap and public health importance in the country citing lack of investigations in this area. Since then, the governmental and non-governmental organizations (NGOs) have given attention to standard precautions by initiating post-exposure prophylaxis (PEP) and increased supply of materials such as safety boxes. However, the evidence base surrounding Safe Practices in this resource poor setting remains limited (1).

1.2 Statements of the problem

Infectious diseases are constantly in transition. The spread of blood borne viral diseases through sexual and vertical means is decreasing, while their transmission by needle stick injuries are assumed to be increasing (3). There are day to day medical hazards in health institution among physicians, nurses, mid wives, medical students, laboratory technicians, cleaners and the community (4). The burden of the problem is not only on individual health but also human resources, economic and social destruction (5-8). Blood borne pathogens are generally considered endemic in sub-Saharan Africa (2). Despite the burden of potential exposures, in Ethiopia, there are only few researches that have been conducted; as a result, there is clearly paucity of information on this regard. A small-scale survey conducted in 2007 by Ethiopian nurse association in Bahir Dar health centers showed that the prevalence of injuries from needles and other sharp medical devices is 35%. In SPHMMC there has not been any information available on the magnitude and factors which contribute for needle stick injuries among health care professionals. Therefore, the aim of this study is to assess the extent of injury by sharps including needle and those potential risk factors.

1.3. Significance of the study

The persistence of preventable, life threatening occupational hazard particularly needle stick injury at work place is a problem that should be given due attention. This research is intended to generate base line information on the possible determinants of needle stick injuries and its prevalence. Understanding the magnitude and associated factors of needle stick injuries could help to decrease the extent of the problem by improving safe practices in our hospital and could also be used as an input for the country level effort.

2. Literature Review

2.1.1 Characteristics of needle stick injury

Among occupational injuries needle stick injuries are the largest problem in health care setting; Exposure to NSI which have contact with Blood and Body Fluids (BBFs) during health care procedures introduce them to various blood-borne diseases which, in turn, will have an impact on their health, their families and the delivery of health care services in many countries, particularly in developing countries with limited resources (9). In developing countries, the use of injections for management of serious and even minor medical problem is common and often unnecessary and they are used unsafely. Studies have shown that the degree of unsafe use of injections was highest (75%) in the South East Asia Region including Nepal (10). A study done by World Health Organization reviewed annual number of injection per person and its proportion with needle stick injury, ranged from 1.7% to 11.3%. Of these, the proportion of administered with unsafe injection equipment's are from 1.2% to 75%. In other study done revealed that, transitional and developing countries where unnecessary injection is common, the average number of health care injection per person is averagely estimated to be 3.7/year. This includes all health care injection, includes those given to diabetic patients for administering insulin. Many injections as well as being unnecessary are also in effective or inappropriate and unsafe. Generally, in developing countries exposure and health impact of NSI are rarely monitored and poorly managed. In one study done (64.52%) of NSI were attributed by needle, followed by surgical blade 69 (16.43%). Injection and suturing contribute to the sharp injuries in 40% of the situation (11).

2.1.2: Magnitude of Needle sticks injuries

Globally, two million health care workers suffer from accidental needle stick injury each year (12). In UK, a study showed that 37% of health care professionals reported needle stick injuries at some stage during their career. Where as in the united stated 384,325 HCW sustained injury by sharps including needle stick injury in four years duration (7). In Nepal a survey reported that needle stick injury among Health Care Workers was 46.9% and among them 44.7% had sustained more than one episode (13). Needle Stick Injury and occupational exposure to BBFs among HCPs in high in-come countries has been well documented, which is essential for designing a range of preventive interventions. However, exposure in low income countries is less well documented. (14). on average, healthcare workers (HCWs) in Africa suffer two to four needle stick injuries per year (15).

2.2: Factors Associated with Needle Stick Injuries.

2.2.1. Socio demographic Factors

The socio-demographic characteristics include factors like age, sex, duration of service year or experience. A study done in South Africa reported that those less than 23 years of age are more likely to be injured than higher age, and more female than male are also associated with higher risk of needle stick injuries. The lower the service year (less than 5Yrs), the higher the risk to be injured (64%) by NSI(5). In other study in Pakistan reported that those health professionals less than five years are more likely to be injured than those experienced health care workers. Professionally, more nurses are likely to be injured than others health professions. (2), in one study done in Addis Ababa hospitals 98(38.6%) of the participants were in the age group 20-29 years. With regard to gender distribution, 1:1 ratio was recorded. Amongst health professionals, greater than 50 % of them were nurses, Physicians 25.6, Midwifery's 10.2, Laboratory Technician 13.8. Duration of Service (in years) less than 10 years 65%, 11-20 16.9% and more than >20 18.19 % (16).

2.2.2. Work environment related factors

Medical workers directly involved in treating patients face a great risk of needle stick injury which consequently results in acquiring blood born infections from the work place. One study witnessed that the risk activity in work places are 56% recapping, 35.5% transfusion and 74.8% of inadequate waste disposal are directly related to needle stick injury. Health care workers in Hospitals with the most favorable working environment were one third less likely to be injured than those in the opposite situation (17). In other study related to work environment factors reasoned that injections and sample taking were the most common causes of needle stick injury (42%), followed by two handed recapping used after injection. (2). In Ethiopia a national survey done in 2000 documented that only 48% of them had at least one steam sterilizer, 38% of Health Facilities sharps were disposed in an open ground or other unprotected field. Majority of health facilities had open waste basket for sharp disposal that were overflowing. 21% of the facilities dump sharps in unsupervised area. In 72% of the health facilities, collection of sharps was with either open, non-leak or puncture proof containers. In 14 (35%) of the health facilities, dirty syringes and needles were observed disposed in a way that exposed the health workers and the community for injury or other conditions (18).

2.2.3. Behavioral factors

Extended hours of working were associated with the increasing the chance of getting NSI; only 23% of health providers and 4.2% of the waste handlers are trained in injection safety practices and infection prevention. In Middle East 15 to 19%, in West Africa 15% and in Sub-Saharan Africa more than 50% of injections were given without any formal training (18). The sudden movement of a patient during blood sampling or during intramuscular or venous injection of drugs (34.4%); during suturing of episiotomy or obstetrics and gynecology procedures (26.2%); during the handling of specimens (21.5%); during recapping of samples (13.6%); during the handling and collection of waste (10.1%); (19).

3. OBJECTIVE OF THE STUDY

3.1 General objective

To assess the magnitude and associated factors of needle stick injuries among healthcare professionals in SPHMMC in 2017.

3.2 Specific objectives

To assess the prevalence of needle, stick injury in SPHMMC

To determine factors associated with needle stick injuries in SPHMMC

4. Methods and Materials

4.1 Study area

The study was conducted in SPHMMC which is located in northern part of Addis Ababa the capital city of Ethiopia. The Hospital was built by Emperor Haileselassie I in 1969 G.C as a source of medical care for underserved populations. It was named St Paul General specialized Hospital till 2008 and a medical college was formed in 2007. The college has undergraduate programs in medicine, emergency nursing & ICU care and OR nursing.

The postgraduate programs were launched in 2012 with departments of Obstetrics and Gynecology and IESO (Integrated Emergency Surgery and Obstetrics). The college has already started the postgraduate program in departments of internal medicine, pediatrics and surgery.

4.2 Study period

The data was collected from January 6 to May 20 2017

4.3 Study design

Facility based descriptive cross sectional study was conducted to assess the magnitude and associated factors of needle stick injuries among healthcare professionals in SPHMMC.

4.4 Source population

All Healthcare professional working in SPHMMC having contact with injection services while giving care to their patients or clients.

4.5 Study population

The Study population are Healthcare professional working in SPHMMC at the time of data collection.

4.6 Inclusion and Exclusion criteria

Inclusion criteria

Health care professionals who were willing and present at the time of data collection who sustained NSI within the past 12 month.

Exclusion criteria

Those healthcare professionals who sustained NSI before then past 12 month.

4.7 Sample size and sampling procedure

4.7.1 Sample size determination

The sample is determined using a single population proportion formula by using prevalence (P) of 35% from a pilot study done by Ethiopian nurses association in Bahir Dar health centers and assuming 95% confidence level and 5% degree of precision. A study population of 1149. Then the sample size was calculated as:

$$n = \frac{Z_{\alpha/2}^2 p(1-p)}{d^2}$$

$$n=349$$

Where n=minimal sample size, d= margin of error, P=prevalence, α =degree of accuracy

Population correction formula was used due to the fact that the total population size of the study area is less than 10,000

$$n_f = \frac{n_o}{1 + \frac{n_o}{N}}$$

where n_o = minimal sample size

nf=final sample size

N= study population

nf= considering 5% non-response rate which is 13 giving total of 280

4.7.2 Sampling procedure

A convenient sampling technique was used to select the participants of the study. Samples from each profession was selected based on their proportion. From the data we got from human resource the number of nurses were 533(, 46.4%) for whom we gave 130 samples, the number physicians were 491(42.8%) for whom we gave 120 samples the number of midwife's and anesthetists were 58(4.6%) each for whom we gave 13 samples each and the number of laboratory technicians were 16(1.4%) for whom we gave 4 samples.

4.8 Study variables

Dependent variable

Needle stick injury

Independent variables

Unsafe injections (recapping, bending needle, reusing syringes and etc.) and unsafe clinical practices (inconsistence use of protective materials, not using the right equipment's, not using the right sharp disposals), and background variables (profession, age, sex, years of service etc.)

4.9 Data collection

A Self-administered standard questionnaires was used For the purpose of data collection. The questionnaires was developed in English. The principal investigators and the students of SPHMMC collected the data.

4.10 Operational Definition of Variables

Healthcare Professionals: - the term health professional (HP) refers to all staffs of medical persons working in Hospitals setting who potentially have exposure to clinical care with medical sharp equipment's including needles.

Needle Stick Injury: - is a percutaneous piercing wound typically set by a needle point, but possibly also by other sharp instrument or objects.

Safe injection: -an injection that does not harm the recipient, does not expose the health care worker to any avoidable risk and does not result in waste that is dangerous for the community.

Unsafe practice: -an injection that expose health care worker at risk of HBV, HCV, and HIV infection through percutaneous injury or contact of mucus membrane or non-intact skin with blood, tissue, or other body fluids that are potential infectious.

Safe: - Clean and no potential contamination of any sharps, syringe and needle with blood or other body fluids.

Risky: - Dirty and potential contamination of any sharps, syringe and needle with blood or other body fluids.

4.11 Data analysis, processing and interpretation

The analysis was completely done on the basis of data collected directly from the participants. Statistical analysis techniques will be applied to compute percentages and other quantitative data using SPSS 20 software.

4.12 Data quality assurance

To ascertain the quality of the data pilot test was undertaken on 5% of the sample. The principal investigator supervised the data collection process. The data was checked for any missing, inappropriate or anomalous values before analysis.

5 Ethical Consideration

Ethical clearance to carry out the research was obtained from the SPHMMC. An informed verbal consent was obtained from participants who were given the questionnaires. Healthcare professionals who refused to participate in the survey were not forced to participate in the study. Privacy and confidentiality of information was kept by avoiding names in the questionnaires. Each study subject was informed about the objective of the study.

6 Dissemination of result

The finding of this study will be disseminated to Saint Paul's hospital Public Health department, Federal Ministry of Health, Addis Ababa City Administration Health Bureau. The results of the research will finally be presented to the medical college community and other scientific conferences. Further effort will be undertaken to publish the finding of the present study.

7. Result

7.1. Socio demographic Characteristics

The total sample of the study was 280 with a response rate of 100%. The majority of respondents were between the age group of 18-24 years which account for 110 (39.3%). About 147 (52.5%) respondent are male while female account for 133 (47.5%). Majority of the professionals in the study were nurses which account 130 (46.4%); followed by physician 120 (42.8%). About 157(56.1) of respondent had less than 5 years of clinical experiences, The highest numbers of participants were from under five pediatrics' ward 93 (33.2%).

Table 5.1 Socio demographic Characteristics of respondent

Characteristics	number	percent
Age		
18-24	110	39.3
25-30	108	38.6
31-35	36	12.8
36-40-	19	6.8
41and above	7	2.5
Subtotal	280	100%
Professional		
physician	120	42.8
midwife	13	4.6
nurse	130	46.4
laboratory technician	4	1.4
anaesthetist	13	4.6
Subtotal	280	100%
Gender		
male	147	52.5
female	133	47.5
Subtotal	280	100%

Working place		
emergency	64	22.9
opd	50	17.8
U5/paediatrics	93	33.2
adult in patient	43	15.4
Maternity/ Delivery	13	4.6
other	17	6.1
Subtotal	280	100%
Service year		
<3	157	56.1
4-10	99	35.4
11-15	18	6.4
>15	6	2.1
Subtotal	280	100%

7.12 Relationship between the occurrence of NSI and Socio demographic Characteristics

Most of the professionals who sustained NSI are nurses which were 53(40.8%). Among those who sustained NSI 54(49.1%) were in the age group between 18-24 years. Males accounted for 58 (39.5%) while Females accounted for 50(37.9%) of NSI cases. Among those who sustained NSI majority worked at Maternity/Delivery 38(59.4%). 81(51.6%) of respondent who sustained NSI had less than 3 years of Work experience. Among people who sustained NSI only 9(25.7%) of them knew that there was an infection prevention committee.

Table 5.12 Relationship between the occurrence of NSI and Socio demographic Characteristics

variables		Have needle stick injury			p-value
			yes	no	
Profession	physician	Count	45	75	.070
		% within profession	37.5%	62.5%	
	midwife	Count	8	5	
		% within profession	61.5%	38.5%	
	nurse	Count	53	77	
		% within profession	40.8%	59.2%	
	laboratory technician	Count	0	4	
		% within profession	0.0%	100.0%	
	anaesthetist	Count	2	11	
		% within profession	15.4%	84.6%	
	physician	Count	45	75	
		% within profession	37.5%	62.5%	
	midwife	Count	8	5	
		% within profession	61.5%	38.5%	

Age	18-24	Count	54	56	.0001
		% within age	49.1%	50.9%	
	25-30	Count	45	63	
		% within age	41.7%	58.3%	
	31-35	Count	9	27	
		% within age	25.0%	75.0%	
	36-40-	Count	0	19	
		% within age	0.0%	100.0%	
	41and above	Count	0	7	
		% within age	0.0%	100.0%	
Sex	male	Count	58	89	.704
		% within sex	39.5%	60.5%	
	female	Count	50	82	
		% within sex	37.9%	62.1%	
Place of work	emergency	Count	38	26	.0001
		% within work area	59.4%	40.6%	
	opd	Count	15	35	
		% within work area	30.0%	70.0%	
	U5/paediatrics	Count	31	62	
		% within work area	33.3%	66.7%	
	adult in patient	Count	11	32	
		% within work area	25.6%	74.4%	
	Maternity/Deli very	Count	11	2	
		% within work area	84.6%	15.4%	
	other	Count	2	15	
		% within work area	11.8%	88.2%	
Service year	<3	Count	81	76	0.0001
		% within service year	51.6%	48.4%	
	4-10	Count	27	72	

		% within service year	27.3%	72.7%	
	11-15	Count	0	18	
		% within service year	0.0%	100.0%	
	>15	Count	0	6	
		%	0.0%	100.0%	

7.2 Needle stick related characteristics of the respondent

Majority of 172(61.4%) of respondents said they didn't sustain any Needle stick related injury. But 108(38.6) of the respondent claim they had sustained NSI.

Among this 34(12.4%) of them sustained injury two times in the past 12 month while 8 (2.9%) of the respondent sustain within the past one month. Most of them injured themselves by suturing material 38(13.6%) followed by syringe in 32 (11.4%) of cases. The respondent were also asked the type of injury they sustained and majority of them had superficial injury in 59(29.1%) of cases followed by slight skin penetration in 27(9.6%) of individual. Deep injury accounted for 22(7.9%) of cases.

About 39 (13.9%) of respondent injure themselves while the patient suddenly move and 34 (12.9%) of respondent injure during recapping of used syringe. Most of the respondent 172(61.2%) said there is post exposure management system in their hospital for people who sustained injuries. About 121(43.2%) of respondent know where to report when an individual sustains needle stick injury.

Majority of respondent about 166 (59.3%) had no onsite or offsite training on infection prevention and 99(35.4%) of them claim there is no IP committee in the hospital only 83 (29.6%) said yes there is and 98(35%) said they don't know whether there is or not. The participants of the study were also asked how the environment of injection looked like and about 182(65%) claim they had dirty and possible contaminated syringes and needles with blood or other body fluids, while 98 (35%) of them claim they had a clean environment.

Almost all of the respondent 256(91.4%) said there is collection box in the room for needle, syringe and sharp object. They were also asked to name the type of box available and 266(95%) said it is a safety box. About 193(68.9%) respondents seen dirty needles and sharps in place where they expose health care workers to needle stick injuries and most of it over filled. About 152(54.3%) participant said there Is list of recommended practices to prevent NSI in their work place like Universal Precaution.

Table 5.2 Needle stick related characteristics of the respondent

Characteristics	number	percent
IP committee		
yes	83	29.6
no	99	35.4
I don't know	98	35.0
Subtotal	280	100%
Have sharp injury		
yes	108	38.6
no	172	61.4
Subtotal	280	100%
Number of NSI in 12month		
onetime	81	28.9
two times	34	12.1
None	165	58.9
Subtotal	280	100%
Number of NSI in 1month		
Onetime	31	11.1
Two times	8	2.9
none	241	86.1
Subtotal	280	100%
Type of item		
syringe	32	11.4
suture needle	38	13.6
Iv cannula	23	8.2
blade	15	5.4
none	172	61.4
Subtotal	280	100%
Type of injury		
Deep injury	22	7.9
slight skin penetration	27	9.6
superficial	59	21.1

none	172	61.4
Subtotal	280	100%
How you sustained the injury		
during recapping	34	12.1
by sudden movement of the patient	39	13.9
by another staff	5	1.8
during sharp collection	29	10.4
other	1	.4
none	172	61.4
Subtotal	280	100%
Is there active PEP		
yes	172	61.4
no	57	20.4
I don't know	51	18.2
Subtotal		
Do you know the Department you should report too		
yes	121	43.2
no	159	56.8
Subtotal	280	100%
Training on IP		
yes	114	40.7
no	166	59.3
Subtotal	280	100%
How needle stick injury occurred		
abrupt movement of the patient/s	34	12.1
two handed recapping	22	7.9
carelessness/negligence	29	10.4
other	23	8.2
none	172	61.4
Subtotal	280	100%
Is there box in room		

yes	256	91.4
no	24	8.6
Subtotal	280	100%
Type of Box		
safety box	266	95.0
none	14	5.0
Subtotal	280	100%
Have you ever seen sharp container		
over filled	193	68.9
Torn and needle seen through the hole	10	3.6
empty or few dirty syringes and needle inside	77	27.5
Subtotal	280	100%
Is there Recommended practice		
yes	152	54.3
no	128	45.7
Subtotal		
Are there Safety boxes available within reach of your hands		
yes	97	34.6
no	183	65.4
Subtotal	280	100%

7.3 Relationship between the occurrence of NSI and contributing factors

The study sought to establish if there was a relationship between the occurrence of NSI and contributing factors. Chi square test were used to check the association between the occurrence of NSI and contributing factors.

Among people who sustained needle stick injury 39(36.1%) of them reported excess client as the contributing factor for NSI. and 18(29%) reported shortage of gloves as contributing factor. About 6 (5.6%) of people who had sharp injury said shortage of sharp box was a factor for needle stick injury and 41(38%) people claim emergency situation as contributing factor for NSI. 25(23.1%) of respondent reported Recapping of needle as a contributing factor for NSI. 5(4.6) reported removing used needles as contributing factor. Of those who sustained NSI 13(52%) reported bending needles as a factor.

Table 5.3 Relationship between the occurrence of NSI and contributing factors

variables		Have needle stick injury			p-value
			yes	no	
Excess clients	yes	Count	39	3	.0001
		% within excess clients	92.9 %	7.1 %	
	no	Count	69	169	
Shortage gloves		% within excess clients	29.0 %	71.0 %	.036
	yes	Count	18	15	
		% within shortageglooves	54.5 %	45.5 %	
	no	Count	90	157	
		% within shortageglooves	36.4 %	63.6 %	
Shortage of sharp box					.003
	yes	Count	6	0	
		% within shortageofsharp box	100.0 %	0.0 %	
	no	Count	102	172	
		% within shortageofsharp	37.2 %	72.0 %	

		box			
Emergency situation	yes	Count	41	0	.0001
		% within emergency situation	100.0%	0.0%	
	no	Count	67	172	
		% within emergency situation	28.0%	72.0%	
Recapping of needle	yes	Count	25	0	.0001
		% within recapping of needle	100.0%	0.0%	
	no	Count	83	172	
		% within recapping of needle	32.5%	67.5%	
Removing of used needle	yes	Count	5	22	.017
		% within removing of used needle	18.5%	81.5%	
	no	Count	103	150	
		% within removing of used needle	40.7%	59.3%	
	yes	Count	13	12	
Attempt into bend		% within attempt into bend	52.0%	48.0%	.110
	No	Count	95	160	
		% within attempt into bend	37.3%	62.7%	

8. Discussion

Our study found that 108(38.6) of health professionals sustained at least one NSI in the past 2 years preceding the survey; among this 34(12.4%) of them sustained injury two times in the past 12 month while 8 (2.9%) of the respondent sustained within the past one month prior to the data collection. Our finding is higher than a study done in Ethiopia, in Bahir Dar health centers which is 35%. Our finding is close to a study done in the UK which showed the prevalence of NSI to be 37%(1), but is lower to a study done in Nepal which is 46.9%.(10) The statistical analysis in this study indicates that male workers (39.5%) are more victims as compared with female workers (37.9%) unlike other studies which have shown a higher prevalence of NSI among females. This may be due to the fact that the number of male workers is higher than female workers in the study.(16) Maternity/ Delivery was the departments where high risk of NSI was observed 11 (84.6%). This may be because high risk procedures like delivery or suturing episiotomy are done here.

It's also evident from this study that Young age and low work experiences is associated with high prevalence of NSI. In our study 49.1% of those with NSI were between the age of 18-24 and 51.6% had less than 3 years. This is similar to a study done in Pakistan which reported that those health professionals having less than five years of work experience are more likely to be injured than those who have more experience.(5) Experience, Exposure and injury rates also differ by occupation, and our study has shown like other studies which have been done previously a higher prevalence of NSI among nurses 53(40.8%) which can be explained by the fact that nurses are involved in risky procedures like blood draw and IV line insertion on a daily bases.(16)

In our study Most of those who had NSI injured themselves by suturing material 38(13.6%) followed by syringe in 32 (11.4%) of cases and surgical blades 15(5.4%). This is different from one study done which showed that (64.52%) of NSI were attributed by needle, followed by surgical blade 69 (16.43%) and Injection and suturing contribute to sharp injuries in 40% of the situation (11). The study has shown superficial injury occurred in 59(29.1%) of cases followed by slight skin penetration in 27(9.6%) of individual. Deep injury account in 22(7.9%) of cases.

Patient's sudden movement has shown to be a risk for sustaining NSI in About 39 (13.9%) of the cases this might be because of the lack of counseling and poor set up under which most

procedures are carried out. It could also be explained by the lack of training, in our study majority of respondents about 166 (59.3%) had no onsite or offsite training on infection prevention and 99(35.4%) of them reported that there is no IP committee in the hospital only 83 (29.6%) said yes there is. Our study has shown that about 182(65%) of participants claim they had dirty and possible contaminants of syringes and needles with blood or other body fluids, which increases the risk of acquiring infection and even though Most of the respondents 172(61.2%) said there is post exposure management system in the hospital less than half (43.2%) know where to report.

All most all of the respondents 256(91.4%) said there is collection box in the room for needle, syringe and sharp object. They also asked to name the type of box available and 266(95%) said it is safety box. The availability of safety boxes is good in this hospital, 266(95%) said there is safety box but most of them are 193(68.9%) over filled which expose health care workers to needle stick injuries.

In our study Among the those who sustained needle stick injury 39(36.1%) of them claim excess client as the contributing factor for NSI. 18(29%) claimed shortage of gloves as contributing factor. 6 (5.6%) people who had sharp injury said shortage of sharp box was a factor for needle stick injury. 41(38%) people claim emergency situation as contributing factor for NSI. 25(23.1%) of respondents claimed Recapping of needle as a contributing factor for NSI. 5(4.6%) reported removing used needles as contributing factor. emergency situation and excess client are the major risk factors for acquiring NSI in the hospital

The study identified that Age, work area and experience, excess client, shortage of sharp box, shortage of gloves, removing of used needles, emergency situations and recapping of needles has significant statistical association with sustaining needle stick injury. On the other hand factors like, attempting to bend the needle, had shown no association with sustaining needle stick injury.

9. Limitation of the study

Some staffs couldn't remember the exact time that they sustained needle stick injuries whether it was within the past 12 months or not., and some of them didn't reply early which delayed the data analysis.

10. Conclusion

The study has shown that the prevalence of NSI in the hospital is high at 38.6%. The study identified that Age, work area and experience, excess client, shortage of sharp box, shortage of gloves, removing of used needles, emergency situations and recapping of needles have significant statistical association with sustaining needle stick injury. Emergency situation, excess client and recapping of needles were listed as major contributing factors for acquiring NSI in the hospital.

11. Recommendation

After analyzing the major finding from this cross sectional study the following recommendation will be forwarded to SPHMMC, MOH Ethiopia, health care professionals.;

- Formal training and continuous monitoring of the work place safety should be ensured by SPHMMC and the MOH.
- On the job training by the health bureau of Addis Ababa and other NGO to the health care worker on safety practices of injection.
- Patient education at facility level on advantage and disadvantage of injection and infection prevention
- Qualitative assessment is needed to determine the reason for these unsafe practices by using standard tool.
- All staffs should be involved in safe segregation and disposal of all sharps items immediately in marked containers. .

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SECTION ONE

Questionnaire on a research on the magnitude and associated factors of needle stick injuries among healthcare professionals in SPHMMC.

Confidentiality and consent

We would like it if you answered the questions honestly, your answer will help us understand the situation better. Complete confidentiality will be kept. We would very much appreciate your help in participating in our study. Would you be willing to participate?

Back Ground and Work Related Information

No	Questions	Choice	Skip to
101	What is your profession?	1) physician 2) Mid wife 3) Nurse 4) Laboratory technician 5) Health officer 6) Anesthetist 7) Other Specify.....	
102	How old are you?	1) 18- 24 2) 25 – 30 3) 31 – 35 4) 36 – 40 5) 41 and above	
103	sex	1) Male 2) Female	
104	What area / unit are you assigned to work in past 12 months? In day, evening, night and week end or holly day? (YOU CAN SELECT MORE THAN ONE ANSWERS)	1) emergency 2) OPD 3) U5 / Pediatrics 4) Adult in patient care 5) Maternity / Delivery 6) Other, specify.....	
105	Your service years	1) <3 2) 4 – 10 3) 11 – 15 4) >15	
106	Is there any infection prevention committee?	1) yes 2) No	

		3) I don't know	
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INFORMATION ON NEEDLE STICK INJURY (NSIs)

No	Questions	choice	Skip
201	Have you had any sharp injury since last two years?	1) yes 2) No	
202	How many times have u sustained sharp (needle) injury in the last 12 months?	1) one time 2) two times 3) three times 4) four and above	
203	How many times have u sustained sharp (needle) injury in the past 1 month?	1) one time 2) two times 3) three times 4) four and above	
204	In your most recent needle stick injury, what type of item caused your injury?	1) Syringe needle 2) suture needle 3) glasses item 4) IV cannula 5) Insulin needle 6) blade 7) Other Sharp.....	
205	Type of injury you sustained?	1) Deep injury 2) Slight skin penetration 3) superficial 4) Others, specify	
206	How did you sustain the injury?	1) During recapping 2) By Sudden movements of the patients 3) By another staff 3) During sharp collection 4) Others specify	
207	Is there any active post exposure management system in your facility?	1) yes 2) No 3) I don't know	
208	Do you know which unit / Department or room you should report to if you sustain NSI?	1) yes 2) No	

209	Have you ever had training on infection prevention?	1) yes 2) No	
210	How did the needle stick injury occur?	1) Abrupt movements of the patient/s 2) Two handed recapping 3) unsafe sharp collection 4) carelessness/ negligence 5) Other, specify	
211	Have you ever observed reuse of needle for more than one person?	1) yes 2) No	
212	How is the injection environment?	1) Clean and no potential contamination of syringes and needled with blood or other body fluids 2) Dirty and potential contamination of syringes and needles with blood or other body flu-ids. 3) Comments	
213	Are there any needle, syringes, and sharp collection box in the room?	1) yes 2) No	
214	Type of needle, syringes and sharp collection box? (CAN SELECT MORE THAN ONE)	1) safety box 2) Liquid proof 3) Open container 4) puncture proof 5) Others (specify)	
215	Have you ever seen sharp container? (CANSELECT MORE THAN ONE)	1) Over filled 2) Torn and needle seen through the hole 3) Empty or few dirty syringes and needle inside it 4) Others (specify)	
216	Have u ever seen any dirty needles and sharps in places where they expose health care workers to needle stick injuries.	1) yes 2) No	

DETERMINANTS, CIRCUMSTANCES OR PROCEDURE THAT CONTRIBUTE TO THE NEEDLE STICK INJURY (NSI)

No	Questions	choice	Skip
301	Is there a list of recommended practices to prevent NSI in your work place?	1) yes 2) No	
302	In your last NSI, you sustained or observed which of the following was the contributing factor?	1) Excess clients, 2) Shortage of gloves 3) Shortage of sharp box 4) Emergency Situation 5) Recapping of used needle 6) Removing of used needle 7) Attempting to bend the needle After drawing blood	
303	Are there safety boxes available at your work place within reach of your hands?	1) yes 2) No	
304	What suggestion do you have for preventing needle stick injury (NSI); Sharp injury		

Annex II Assurance of Principal Investigator

The undersigned agrees to accept responsibility for the scientific ethical and technical conduct of the research project and for provision of required progress reports as per terms and conditions of the research publications office in effect at the time of grant is forwarded as the result of this application.

Name of the student: -Esrom Hagos

Date September /2017 Signature_____

Approval of the Primary Advisor

Name of the primary Advisor

Date September/2017 Signature_____