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ORIGINAL ARTICLE

Prevalence of needle sticks injury and its associated factors among healthcare workers in Bahir Dar city Health Centres, Northwest Ethiopia

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Abstract

It is important for HCWs to remember that over 20 pathogens have been reportedly transmitted from needle stick injuries. The most serious are the transmission of Hepatitis C virus, Hepatitis B virus and Human immunodeficiency virus. World Health organization report showed that 16,000 HCV, 66,000 HBV & 1000 HIV may have occurred worldwide. Two million needle stick injuries are reported in health care providers every year. This study was institution based cross-sectional study conducted in 10 Bahir Dar City public health centres from June to October 2014. 194 health care workers were selected using cluster followed by systematic random sampling technique. Data has been collected using pre tested self-administered questionnaire. The collected data was entered and analyzed by using SPSS statistical software version 20. Bi-variate logistic regression model was used to assess the association between dependent and independent variables and P-value less than 0.05 was considered statistically significant.

Among 194 study participants, 83 (42.8%) participants showed history of needle stick injuries. Needle stick injuries were higher in outpatient departments and emergency unit, 59 (30%) and delivery room 40 (20.6%). The proportion of needle stick injuries were higher among health officers 16/30 (53.3%). The major item cause for needle stick injuries were syringe with needle, 55/83 (66%) and the most injured body part were fingers 58/83 (70.7%). In conclusion, significant proportion of health care workers experienced needle sticks injuries. Therefore, ongoing training and supervision should be given to curb the situation in the study area.

Keywords: Health personnel; Needlestick injuries and epidemiology

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Introduction

Needle stick injuries (NSIs) are wounds that occur when a needle or sharp instrument accidentally punctures the skin.[1,2] With the introduction of blood or other potentially infectious material into the body, healthcare workers (HCW) are at risk of occupational acquisition of blood borne pathogens such as Hepatitis B viruses (HBV), Hepatitis C Virus (HCV), Human Immunodeficiency Virus (HIV) and other disease. The average risk of HIV transmission to HCW after exposure to HIV infected blood has been estimated as 3 in 1000. Seroconversion after a single needle stick exposure to an HBV-infected patient is estimated to be 6-30%.[3, 4] It is important for HCWs to remember that over 20 pathogens have been reportedly transmitted from NSIs.[5] The most serious are the transmission of HCV, HBV and HIV.[6]

Factors that determine a HCW's risk of infection include the frequency of needle stick incidents, the pathogen involved, the immune status of the worker, the severity of the NSI and the availability and use of appropriate post-exposure prophylaxis (PEP).[7]

The Centres for Disease Control and Prevention (CDC) estimates that about 385,000 sharps-related injuries occur annually among HCW in hospitals. Most reported sharps injuries involve nursing staff, laboratory staff, physicians, housekeepers, and other HCW.[8] World Health Organization report showed that 16,000 HCV, 66,000 HBV & 1000 HIV may have occurred worldwide.[9] The annual estimated proportion of HCW exposed to blood born pathogen globally were 2.6% for HCV, 5.9 % for HBV, and 0.5 % for HIV.[9]

Numerous modifiable and non-modifiable factors place HCWs at risk of NSIs. The most common reasons are two handed recapping, and the unsafe collection and disposal of sharps waste.[10] Two millions NSI are reported in health care providers every year.[11] But these are only the reported cases and about 40-70% cases of NSI are unreported in developing countries.[11]

The study conducted in USA in 2002, shows that 57 HCW seroconvert to HIV following occupational exposure; of these, 26 have developed AIDS.[12] Available statistics underestimate the severity of the NSIs problem in the study area because many HCWs do not report their injuries. Therefore, it is not known how serious the problem is or how well prevention programme will work. Based on this background, this study aimed to assess the prevalence of NSI and its associated factors among HCWs in Bahir Dar city public health centres, North western Ethiopia.

Methods

Study Design, Period and Area

The study was institution based cross-sectional study, conducted between June and October 2014 in public health centres in Bahir Dar city administration, northwest Ethiopia. The study was carried out in ten public health centres (Abaymado health centre (HC), Shumabo HC, Han HC, Bahirdar HC, Ginbot Haya HC, Shembet HC, Meshenti HC, Zegie HC, Zenzelema HC and Tiseabay HC).

Source and study population

The source populations include all health professionals working in the Bahir Dar city administrations. The study population has been those HCWs working in the ten public health centres and participated in this study.

Sample Size and sampling technique

In this study, 194 HCW were selected using cluster followed by systematic random sampling technique.

Data collection and Data Quality Assurance

Data has been collected using pretested self administered structured questionnaire. The questionnaire included questions on Socio-demographic characteristics and NSI. The data collectors trained on how to carry out the data collection and approach to the participants. Furthermore, the data has been checked daily for its completeness by the supervisors.

Data Analysis

The collected data was entered and analyzed by using SPSS statistical software version 20 *(IBM Corp. Released 2011. IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.)*. Frequency, percentage and mean were used to describe the participants with relevant variables using tables. Bi-variate logistic regression model has been used to assess the association between dependent and independent variables and P-value less than 0.05 considered statistically significant.

Ethical considerations

Ethical clearance was obtained from the ethical committee of Bahir Dar University. Support and permission was secured from Bahir Dar city administrative health bureau and all health centres before data collection. Informed consent was obtained from study participants during data collection. The study participants were informed about the purpose of the study and the importance of their participation in the study and that they could stop at any time during data collection. Confidentiality has been maintained and the information collected has been used only for the purpose of this research.

Results

Socio demographic characteristics of the study participants

A total of 194 health professionals participated, 56 (28.9%) and 138 (71.1%) were male and female respectively. The mean age of participants was 29.9 years old, ranging from 21-54. The majority (95.4%) were orthodox Christian by religion, and nearly two third (69.1%) were diploma holders by qualification. The majority of participants, 107 (55.2%), were clinical nurses and 74.2% were married. Ninety five (49%) participants had less than five years of work experience (Table I).

Table I. Socio demographic and work characteristics of the study participants Bahir Dar, North West Ethiopia, 2014

Variable	Category	Frequency (n)	Percent (%)
Sex	Male	56	28.9
	Female	138	71.1
Age (years)	20–29	116	59.8
	30 – 49	75	38.7
	>50	3	1.5
Marital status	Married	144	74.2
	Single	49	25.3
	Divorced	1	.5
	Widow	0	0
Religion	Orthodox	185	95.4
	Muslim	6	3.1
	Protestant	2	1.0
	Other	1	.5
Ethnicity	Amhara	191	98.5
	Tigre	2	1.0
	Oromo	1	.5
	Other	0	0
Education level	Diploma	134	69.1
	BSc.	58	29.9
	2nd degree	1	0.5
	Others	1	0.5
Job category	Nurse	107	55.2
	Midwife	32	16.5
	Health officer	30	15.5
	Laboratory Technicians	25	12.9

Working area/Department	OPD and emergency	59	30.4
	Laboratory	24	12.4
	Injection and dressing room	18	9.3
	Delivery room	40	20.6
	Under 5	21	10.8
	Others	31	16.0
Years in clinical practice	< 5	95	49
	6–10	66	34
	11–20	25	12.9
	21–35	8	4.1

(Total number of participants = 194)

Prevalence of NSI

Among 194 study participants, 83 (42.8%) participants showed history of NSI in the preceding year. NSIs was higher in OPD and emergency unit, 59 (30%), and delivery room 40 (20.6%) than other working area (Table II). The proportion of NSI was higher among health officers 16/30 (53.3%), followed by midwifery nurses 15/32 (46.8%). The prevalence among nurse professionals was 43/107 (40.1%). The major item causing NSIs was syringe with needle, 55/83 (66%), and the most injured body part were fingers 58/83 (70.7%) (Table II).

Table II. Prevalence of NSI among HCW and by socio demographic and work related factors, Bahir Dar, North West Ethiopia, 2014

Variables	Descriptive	Frequency(n=)	Percent (%)
History of NSIs	YES	83	42.8
	NO	111	52.7
Age (years)	20–29	49	59.03
	30 - 49	32	38.55
	>50	2	2.4
Sex	Male	20	24
	Female	63	76
Job category	Nurse	43	51.8
	Midwife	15	18.07
	Health officer	16	19.28
	Laboratory Technician	9	10.84
Current working area	OPD and emergency room	26	31.32
	Laboratory	9	10.84
	Injection and dressing room	9	10.84
	Delivery room	18	21.68
	Under 5	9	10.84
	Others	12	14.45
Years in clinical practice	< 5	39	46.98
	6–10	29	34.94
	11–20	12	14.45
	21–35	3	3.6

Associated factors for NSI

In this study we tried to assess the possible associated factors (sex, age, educational status, professional category, work area, clinical service year and training on occupational safety, universal precaution and recapping practice) for NSI. According to our findings, the prevalence of NSI was higher among female HCW than male but there was not statistical significant difference; P=0.205, OR (95% CI) = 0.66 (0.35-1.256). Moreover, proportion of NSI was also higher among health officers (HO) followed by Midwifery nurses followed by nurse HCW but still failed to get significant difference on the prevalence of NSI by professional category, P= 0.503 (Table III).

Table III. Bi-variate analysis showing the association NSI with socio-demographic, work and training related factors, Bahir Dar, North West Ethiopia, 2014

		NSI					
		No		Yes			
Variables	Descriptive	N	%	N	%	COR (95%CI)	P-value
Sex	Male	36	64.2	20	35.8	0.66 (0.35-1.25)	0.205
	Female	75	54.3	63	45.7	1	
Age	20-29	67	57.8	49	42.2	1	
	30-49	43	57.4	32	42.6	0.10 (0.65-1.8)	0.70
	>50	1	33.3	2	66.6	2.73 (0.24-31.01)	
Job category	Nurse	64	59.8	43	40.1	1	
	Midwifery	17	53.1	15	46.8	1.3 (0.59-2.9)	0.503
	HO	14	46.6	16	53.3	1.7 (0.75- 3.84)	
	Lab .Tec	16	64	9	36	0.8 (0.34-2.0)	
Work experience	< 5	56	59	39	41	1	
	6–10	37	56	29	44	1.25 (0.6-2.1)	0.914
	11–20	13	52	12	48	1.32 (0.5-3.2)	
	21–35	5	62.5	3	37.5	0.86 (0.19-3.81)	
Current working area	OPD and emergency room	33	56	26	44	1	
	Laboratory	16	64	9	36	0.91 (0.33-2.49)	0.89
	Injection & dressing room	9	50	9	50	0.66 (0.2-1.66)	
	Delivery room	22	61	18	39	1 (0.44-2.23)	
	Under 5	12	54.5	9	45.5	1.22 (0.42-3.5)	
	Others	19	61.2	12	38.8	0.77 (0.13-1.86)	
Participate training on occupational safety	YES	42	53.8	36	46.2	1	0.43
	NO	69	59.4	47	40.6	0.79 (0.4-1.4)	
Participate Training on Universal Precaution	YES	20	51.2	19	48.8	1	0.4
	NO	91	59	63	41	0.74 (0.36-1.49)	
Recapping practice	Never recap	60	58.2	43	41.8	1	
	Sometimes recap	21	33.8	41	66.2	0.9 (0.42-2.0)	0.54
	Little times recap	17	47.2	19	52.8	1.56 (0.72-3.43)	
	Always recap	13	65	7	35	0.75 (0.27-2.04)	

Discussion

This study was an important addition to the existing literature. Like that of different studies our finding confirmed that NSI was a major work associated health risk in our country especially in the study area. Among the 194 HCW that participated in this study, 83 (42.8%) had experienced some type of NSI during service delivery. This result showed that large proportions of HCW in the study area were exposed to infectious and deadly blood borne pathogens like HBV, HCV and HIV. According to the participants report, 47/83 (56.6%) and 63/83 (75.9%) participants did not have any occupational safety and universal precaution training respectively. Moreover, 61/83 (73.5%) and 57/83 (68.67%) did not take any antiretroviral (ARV) PEP for HIV and did not report their injury to their supervisor for immediate medical attention (Table II and III) despite there is ARV PEP and line of reporting system with assigned supervisor.[13,14] All these figures showed that infection prevention activities were neglected in Bahir Dar city administrative healthcare facilities. The healthcare workforce, 35 million people world wide, represents 12% of the working population. The occupational health of this significant group has long been neglected, both organizationally and by governments.[15]

According to this study, HCW who have recapping practice have lower risk of NSI than HCW who have no recapping history. This is in contrast with current literature. The possible reasons might be their awareness for the association of recapping and NSI might be high, those not recapping were more observant to following instructions including reporting, or that their sharps injury occurred in other situations.

When we compared our finding of NSI prevalence with studies done in Pakistan 67%,[16] Sub-Saharan Africa 57%,[12] and Ethiopia 66%,[17] the prevalence of NSI in the present study was lower. The reason why our study is lower than the other studies might be the difference in the study population, sample size and time frame. In our cases we included all HCW like nurses, health officers, midwifery nurses and laboratory technicians but studies in Pakistan used only nursing professionals, Uganda only nurses and midwives, Ethiopia only among nurses who were working at injection room. On the other hand our finding was higher than studies done in Nigeria 34%,[18] in Felege Hiwot Referal Hospital (FHRH) in Ethiopia 31%[19] and Assam 52/220 (27.4%).[20] The reason behind these difference might be difference in level of education, training and the infection prevention programme of the health facility that unlike our, the Nigerian and FHRH studies were done in teaching hospitals where high level, skilled and experienced professionals were found. Moreover, as compared to health centres, hospitals, especially teaching hospitals, might have better infection prevention activities.

In our study, the prevalence of NSI was higher among female, at age range of 20-29 years of old, HOs, work experience of less than 5 years, working at injection and dressing room but not statistically significance in all cases (P> 0.05). As it can be seen from the table III, the 95% CI was so wide indicating that the sample size was small and was not good enough to strongly conclude that there were no associations in this study. Even though there were methodology and study site differences, our study was in line with Pakistan, Ugandan and Ethiopian studies. A study in Pakistan, and Uganda showed that lack of training was the main factors leading to needle stick injuries,[10,12] working for more than 40hour per week, recapping needles and not using gloves when handling needles were associated factors.[12]A recent study in FHRH also identified suboptimal practices and behaviours that put them at risk to the injury.[19]

Conclusions and Recommendations

The findings of this study indicated that NSI were common among health care workers. Health facilities should put a policy, a standardized written protocol and line of communication for management of occupational exposures. Moreover, on job training should be given to HCW. Further research is needed to determine the actual incidence of NSI and sharp injury exposure, and the type of disease they would acquire.

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