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Original Research Paper

Occupational exposure to sharp injuries and associated factors among nurses in Nekemte referral hospital, West Oromia, Ethiopia.

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ABSTRACT:

Background: Occupational exposure to health risks exist wherever health care is practiced. Nurses are the largest hospital work force that face occupational hazards particularly the transmission of blood borne pathogens such as Human immune deficiency virus, Hepatitis B virus and Hepatitis C virus through needle stick and sharp injuries. **Objective:** to assess the occupational exposure to sharp injuries and associated factors among nurses in Nekemte referral hospital, West Oromia , Ethiopia, January 9 to 21, 2024. **Method:** Institution-based census was conducted among 121 nurses working in Nekemte referral hospitals from January 9 to 21, 2024. Data were collected by using pretested self-administered questionnaire. Data was analyzed using manual scientific calculator; test of association was done by using chi-square test. **Result:** Of the total 129 questionnaire were distributed 121 returned and this yield a response rate of 93.8%. 52(43%) were exposed to sharp injury in their experience years and the prevalence of sharp injury in the last 12 months was found to be 14(11.6%). Injection needle was the most frequently mentioned causative device 22(42.3%). Nearly fifty percent (48%) were exposed to sharp injury in an emergency situation, where as majority of the nurses (38.2%) in the outpatient department where exposed to sharp injury. Also around sixty percent (57.7) of injury were occurred during night time. More than eighty percent (82.7%) of the nurses didn't report their sharp injuries. **Conclusion and recommendation:** Forty three percent of the nurses had ever exposed to sharp injuries whereas the prevalence of sharp injuries in the 12 months preceding the study was (11.6%). An emergency situation, age and training were associated variables with exposure to sharp injuries. On the other hands, majority of the nurses were found not trained on prevention strategies. Therefore, improving nurse reporting practice of incident to obtain services, updating prevention strategies and arrange training for nurses on prevention of sharp injuries and importance of reporting.

Keywords: Sharp injuries, Needle stick injury, Occupational exposure, Nurse

INTRODUCTION:

Health care institutions were assumed to be safer than other work environment and health care workers are viewed as professional who are capable of maintaining their health without assistance thus administrators have allocated few resource to the occupational health risks of health care workers (1).However health care environment exposes HCWs for various occupational and safety risks such as exposure to blood and body fluids from patients, needle stick and sharp injuries (2).

Nurses are the largest hospital work force that face such occupational health risks particularly the transmission of blood borne pathogens such as HIV, HBV, and HCV through needle stick and other sharp objects (3) and usually such sharp objects would have been in contact with the patient body fluid (blood, pus, amniotic fluid etc.. (4).

One of the potential hazards for healthcare workers is needle stick and sharp object injuries. NSIs are associated with a number of different health hazards for HCWs; the most important of which is the risk of acquisition of potentially fatal diseases such as HBV, HCV and HIV /AIDs. The National Institute for Occupational Health and Safety (NIOSH) has estimated that 600,000 to 800,000 needle stick and other percutaneous injuries occur annually in hospitals in the United States (20).

Global estimate for burden of disease attributable to contaminated sharp injuries among health care workers, overall two millions injuries have occurred from which

16,000 HCV(range:6,000-86,000), 66,000 HBV(range:2,400-240,000) and 1000 HIV(200-5000) infection may have occurred in year 2000 worldwide among HCWs, due to their occupational exposure to percutaneous injuries. The fraction of HCV, HBV, and HIV in HCWs attributable to occupational exposure to percutaneous injuries reaches 39%, 37%, and 4.4% respectively (5). In 2001 survey of American Nurse Association health and safety concerns influence their decision to continue working in the field of nursing and the kinds of nursing activity they choose to perform. Moreover, disabling back injury, fear of contracting HIV or hepatitis from needle stick and sharp injuries were among the top three health concerns (6).

The prevalence of sharp injury among physicians, nurses, laboratory technicians and health assistants in 10 hospitals and 20 health centers of Harari and Dire Dawa was found to be 13.5% [7]. Occupational exposure to health risks such as sharp injuries exists where health care is practiced (2).Therefore, this study is aimed to assess occupational exposure to sharp injuries and associated factors among nurses working in Nekemte referral hospital, West Oromia , Ethiopia.

MATERIALS AND METHODS:

Study Area and period:

The study was under taken at Nekemte Referral Hospital, West Oromia, East Wollega, Ethiopia from January 9 to 21/2024. Nekemte town was established between the year 1865-1867E.C and currently the capital of eastern Wollega Zone. The town is located 331km to west of Addis Ababa and 250 km Northwest of Jimma. The town has a total population of 75,219 with an area of 32km$^{2.}$ Nekemte Referral Hospital is one of the government hospitals in Nekemte Town. It serves as the Referral Hospital of the State and has four main departments; Gynecology/Obstetric, Internal Medicine, Surgery and Pediatric.

Study design:

An institutional based cross-sectional study design was conducted

Sample size and sampling technique:

A census was conducted among 121 nurses working in Nekemte Referral Hospital

Data collection procedure:

Data was collected using a self-administered questionnaire. The questionnaire comprised of question addressing information on personal information, prevalence and associated factors of occupational exposure to sharp injuries.

Data Quality control:

To ensure the accuracy, completeness and good quality of data appropriate data collectors was recruited and oriented, the questionnaire was been pre-tested on 5% of the total expected respondents. Data collection was supervised by investigator.

Data Analysis procedures:

Descriptive statistics and chi-square test was done to describe the study variable and identify factors associated with occupational exposure to sharp injuries.

RESULTS:

Socio-demographic characteristics:

Of the total 129 questionnaire distributed 121 returned and this yield a response rate of 93.8%. Of the returned questionnaire more than three fourth of the respondents were in between the age of 22 and 30 years. Majority of the respondents were male 64(52.9%). Nearly fifty percent 59(48.4%) were orthodox, more than fifty percent 66(54.5%) were Oromo, sixty one (50.4%) were single, more than fifty percent 70(57.5%) were diploma nurses, more than seventy percent were served for less than five years and Seventy nine (65.3%) were staff nurse (Table 1)

Table 1: Distribution of study respondents by their socio-demographic characteristics at Nekemte Referral Hospital, West Oromia, East Wollega, Ethiopia, January 9-21/2024 (n=121).

Variable	Category	Frequency	Percent
Age	20-29	80	66.1%
	30-39	24	19.8%
	≥40	17	14.1%
Sex	Female	57	47.1%
	Male	64	52.9%
Religion	Muslim	13	10.7%

	Orthodox	59	48.8%
	Protestant	42	34.7%
	Others	7	5.8%
Ethnicity	Oromo	66	54.5%
	Amhara	26	21.5%
	Gurage	11	9.1%
	Tigre	5	4.1%
	Other	13	10.7%
Marital status	Married	59	48.8%
	Single	61	50.5%
	Widowed	1	0.84%
Qualification (educational level)	Bsc nurse	51	42.5 %
	Diploma nurse	70	57.5%
Work experience in years	≤5	87	71.9%
	6-10	13	10.7%
	11-15	13	10.7%
	>15	8	6.6%
Occupational status	Head nurse	7	5.8%
	Expert	35	28.9%
	Staff nurse	79	65.3%

N.B "Other: for religion (catholic, waqefeta and Adventist), "Other: for ethnicity (Dawiro,Gumuz and Silite)

According to the report of the participant nurses, 52(43%) were exposed to sharp injury in their experience years and the prevalence of sharp injury in the last 12 months was found to be 14(11.6%). Injection needle was the most frequently mentioned causative device (item) as reported by 22(42.3%). Medical ampoules and bottles were the next most frequently type of devices reported by 12(27.9%) as causative items for sharp injury. Nearly fifty percent (48%) of the nurse reported that they were exposed to sharp injury in an emergency situation where as disassembling sharp injury and sudden movement of patient were the next major factors contributed for exposure to sharp injury as reported by 8(15.4%) and 7(13.5%) respectively.

Majority of the nurses (38.2%) were in the outpatient department exposed to sharp injury. Delivery rooms were the other workplace where many incidents of sharp injury occurred as it is reported by 20(29.4%).

As report shows nearly sixty percent (57.7) of injury were occurred during night time of working followed by evening 15(28.8%). However, more than eighty percent (82.7%) of the nurses were exposed they did not report their sharp injuries. Of the main reason mentioned by the nurses for not reporting sharp injuries happened to them, majority (67.5%) of the nurse feel that nothing could be done to help them whereas 9(21%) of them were not aware of the need to report. With respect to on job training on prevention of sharp injuries 90(74.4%) of the participant nurses reported that they had no such training. Regarding the availability of personal protective equipment's and west disposal container for used sharp device, they are adequately available as reported by 110(90.9%) and 117(96.7%) of respondents respectively (Table 2).

Table 2: Distribution of study respondents by their occupational exposure to sharp injuries at Nekemte Referral Hospital, West Oromia, East Wollega, Ethiopia, January 9 -21/ 2024(n=121).

Variables	Category	Frequency	Percent
Ever exposed to Sharp injury	Yes	52	43.0
	No	69	57.0
Injury in past 12 Months	Yes	14	11.6
	No	107	88.4
Causative devices (items)	Medical ampoules &bottles	12	23
	Scalpel blade	6	11.5
	Injection needle	22	42.3
	Blood lancet	8	15.4
	Other(suture needle)	4	7.7
Factor exposure to Injury	Sudden movement of patient	7	13.5
	Heavy work load and fatigue	5	9.6
	Emergency situation	25	48
	Disassembling of sharp device	8	15.4
	Handling sharp device on tray	4	7.7
	Lack of training	3	5.8
Work place at time of injury	Outpatient department	19	36.5
	Medical ward	6	11.5
	Surgical ward	5	9.6
	Delivery room	15	29
	Operation theater	3	5.7
	Minor OR	4	7.7
Work time during injury	Morning	7	13.5
	Evening	15	28.8
	Night	30	57.7
Reported sharp injury	Yes	9	17.3
	No	43	82.7
Reason for not Reporting	Not aware of the need to report	9	21
	Not aware of the health service available	2	4.6
	Occupational health service not available	3	6.9

	Feel nothing can be done for me	29	67.5
On job Trained	Yes	31	25.6
	No	90	74.4
Availability of Container for used Sharp disposal	Yes	117	96.7
	No	4	3.3
Utilization of PPE	Yes	110	90.9
	No	11	9.1

Table 3: Factors associated with sharp injury at Nekemte Referral Hospital, West Oromia, East Wollega, Ethiopia, January 9 -21/ 2024(n=121).

Variable	Category	Status of sharp injury		Total	X^2	p- value
		Injured	Not Injured			
		n(%)	n (%)			
Age	22-29	33(41.2%)	47(58.8%)	80		
	30-39	6(25%)	18(75%)	24		
	≥40	13(76.5%)	4(23.5%)	17	11.04	**0.004**
Sex	F	22(38.6%)	35(61.45%)	57		
	M	30(46.9%)	34(53.1%)	64	0.843	0.359
Religion	Muslim	7(53.8%)	6(46.2%)	13		
	Orthodox	28(47.5%)	31(52.5%)	59	2.61	0.456
	Protestant	15(35.8%)	27(64.2%)	42		
	Others	2(28.6%)	5(71.4%)	7		
Ethnicity	Oromo	29(43.9%)	37(56.1%)	66		
	Amhara	12(46.2%)	14(53.8%)	26		
	Gurage	4(36.4%)	7(63.6%)	11	0.420	0.981
	Tigre	2(40%)	3(60%)	5		
	Other	5(38.5%)	8(61.5%)	13		
Marital status	Married	22(37.3%)	37(62.7%)	59		
	Single	30949.2%)	31(50.8%)	61	5.26	0.531
	Widowed	-	1(100%)	1		
Qualification	Bsc nurse	18(35.3%)	33(64.7%)	51		
	Diploma nurse	34(48.6%)	36(51.4%)	70	2.12	0.145
Work experience	≤5	42(48.3%)	45(51.7%)	87		
	6-10	5(38.5%)	8(61.5%)	13	4.93	0.177
	11-15	4(30.8%)	9(69.2%)	13		

	>15	1(12.5%)	7(87.5%)	8		
Occupational status	Head nurse	2(28.6%)	5(71.4%)	7	9.71	**0.008**
	Expert nurse	20(57.1%)	15(42.9%)	35		
	Other nurses	30(38%)	49(62%)	79		
On job Trained	Yes	7(22.6%)	24(77.4%)	31	5.999	**0.01**
	No	45(50%)	45(50%)	90		

A test for association was done on above variables with exposure to sharp injuries using chi-square test. As can be seen from table 3, age of the participants, occupational status and training of the nurses on prevention of sharp injuries were significantly associated with sharp injuries among nurses working in Nikimite referral hospital

DISCUSSION:

The study showed that the sharp injuries were common among nurses. Forty three percent of nurses reported that they had ever exposed to sharp injuries during their experience years. This is smaller than the 49.2% report of the study conducted in Hawassa (12). The difference may be due to sample size. A prevalence of sharp injury in the 12 months preceding the study was found to be 11.6%. This is less than the prevalence of needle stick injuries, 17.5% and sharp injuries, 13.5% reported in the studies conducted in eastern Ethiopia (Harari and Dire Dawa) (7). This could be due to higher availability, of reported personal protective equipment as reported by 90.1%, participants in this study as compared to lack of personal protective equipment reported by 70.1% of participants in study conducted in eastern Ethiopia.

Similar to the study conducted in Hawassa, needle stick injury was found to be a leading causative item for sharp injury as it accounts for 42.3%, but lower than 54.4% of the finding in Hawassa (12) and 58% in Malaysia (11). The difference may be due to sample size difference which was 366 in study conducted in Hawassa and 345 in Malaysia. The other most reported causative device were items such as medical ampoules and bottles that shared 23% followed by blood lancet which account for 15.4%.

Related to the conditions exposing the study participants to sharp injuries, nearly fifty percent, 25(48%), reported that they were exposed to sharp injury in an emergency situation. Such emergence situation was also reported as a leading factor as reported by 23.9% of respondents of a study conducted in Hawassa (12).The other major contributing factor reported in this study was disassembling sharp device which had contributed, 15.4%; whereas sudden movement of patient had contributed 13.5% of sharp injury. These factors were also among the reported contributing factors in other studies. For instance, disassembling sharp device was reported as it had contributed 7.4% in a similar study conducted in Malaysian hospital (11) whereas unexpected (sudden) movement of patient was reported as it had contributed, 9.4% in a study conducted in Hawassa (12). However, sudden movement of patient was reported contributed 45% in study conducted in Dire Dawa and Harari and this may be due to the study was conducted in more than one hospital(7). Sharp injury were more common during night shift(57.7%) similar as study conducted in public hospital of Dessie town, North East Ethiopia(53.7%) but, opposite of study conducted in three different public hospital in South West Ethiopia(17,16)

According to this study, majority, 38.2% of the incidents were occurred in outpatient department (OPD) followed by delivery room, 29.4% and Medical ward, 10.3%. The fact that high incident in OPD is might be due to emergence situations which was found to be the most frequently reported contributing factor for sharp injury as mentioned by respondents of this study. Similarly, Delivery rooms and medical wards were also reported as a place in Malaysia Hospital where majority of injuries occurred, 51.9% and 16% respectively (9).

This study showed that only 17.3% of the sharp injuries were reported. This is lower than the 37.8% and 30.9% report of study conducted in Hawassa and Malaysia respectively (11, 9). The basic reason for the difference might be due higher lack of awareness of the need to report sharp injury because 20.6% of respondents who had injured were not aware as compared to only 0.9% report of Malaysian study (9). In addition, majority, 67.8%, of the nurse participated in this study feels that nothing could be done to help them by reporting their sharp injury and this is much higher than only 12.5% report of study in Hawassa (12).With respect to on job training on prevention of sharp injuries, only 25.6%, of the participant nurses reported that they had training as compared to 39.6% reported preventive training in Dire Dawa and Harari (7). This difference could be due to higher number of participant and involvement of more than one facility in study conducted in Eastern Ethiopia.

A test for association was done on certain selected variables with exposure to sharp injuries using chi-square test. Age of the participants, occupational status

and training of the nurses on prevention of sharp injuries was found to have association with sharp injuries because for all the three variables p-value is less than 0.05.

CONCLUSION:

Forty three percent of the nurses had ever exposed to sharp injuries whereas the prevalence of sharp injuries only in the 12 months preceding the study was 11.6%.The majority of incidents occurred in outpatient department and the leading contributing factor was reported to be an emergency situation. Age, Occupational status and on job training were associated variables with exposure to sharp injury. On the other hands, majority of the nurses were not trained on prevention strategies.

Declarations:

Ethics approval and consent to participate:

Letter of ethical clearance was obtained from Research Ethics Committee of Jimma University. Then formal letter taken to Nekemte referral hospital to get permission to conduct the study. All respondents were informed of the study's purpose, that the participation is entirely voluntary, and the respondents had the right not to participate in or withdraw from the study at any stage. Participants' anonymity and confidentiality had been kept.

Competing interests:

We all strongly clarify that there is no any financial and non-financial competing interest among us and with other bodies.

Author's Contribution:

Yeshitila Belay conducted the study, contributed to the study conception and design, conducted data entry and analysis and wrote the manuscript. Admasu Belay contributed on data analysis, supervised the study and critically revised the manuscript.

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