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Percutaneous Exposure Incidents and Associated Factors among Health Care Personnel in Jigjiga Government Health Facilities, Somali Region, Ethiopia

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Keywords

percutaneous exposure, associated factors, health care personnel, Ethiopia

Abstract

Objective: To assess percutaneous exposure incidents and associated factors among healthcare personnel in Jigjiga government health facilities. **Methodology**: Institutional based cross-sectional study was conducted in five government health facilities in April 2021. The total sample size of this study was 291, and the allocated sample size was proportional to the five government health facilities based on their number of health care professionals. Then, the respondents were selected using a simple random sampling technique. Data was collected by using a pretested structured self-administered questionnaire. Next to that, after data collection, the data was entered into EPI DATA software version 3.1.0. Data were exported to the SPSS version 23 for analysis. Descriptive and inferential statistical analysis was used. **Results:** The prevalence of percutaneous exposure incidents was

148 (56%) with a confidence interval (of 50.6 – 62.2%) for the last 12 months. The multivariate logistic regression noted that laboratory technician of the worker (AOR=2.73,95%CI), monthly salary 3600-4500birrand =>5000birr (AOR: AOR=1.418 and 2.636,95% CI), non-training of standard precaution ((AOR=2.929, 95%CI) feeling uncomfortable ((AOR=1.802, 95%CI) and sometimes hand washing (AOR=1.980, 95%CI were the independent predictors of percutaneous exposure incidents. **Conclusion**: According to this study, the findings showed significant factors associated with the percutaneous exposure incidents were age, education, salary, working hours per week, feeling uncomfortable, and unavailable personnel protection equipment. Shallow coverage of hepatitis B vaccination among health care personnel. On-job training should be given to health care professionals to increase skill and knowledge about standard precaution guidelines and reduce workplace occupation hazards.

1. Introduction

The incident involving percutaneous exposure (needle poke, sharp object, or splash) that exposed the skin or mucosa to blood is a typical model of blood-borne infectious disease exposure and transmission among healthcare professionals. It is a significant occupational risk for those who work in healthcare. Most healthcare professionals are susceptible to percutaneous exposure from injuries from needle sticks, sharp objects, and splashes (Kuhar et al. 2013). However, percutaneous exposure incidents occurred during routine activities like surgical procedures, blood collection, needle recapping, suturing, intravenous line administration, blood sugar monitoring, and poor sharps management systems (Liyew et al. 2020). Infections from needle stick wounds can be deadly or extremely serious. The risk of needle stick injuries may be higher for healthcare professionals exposed to needles. All personnel in danger should take precautions to safe guard themselves from this serious health risk. A sharp injury is a penetrating wound caused by a needle, scalpel, or another sharp device that could expose the victim to blood or other bodily fluids (Control and Prevention 2014).

The international health agency noted that hepatitis C and B infections among healthcare personnel resulted in an estimated 37%, 39% of cases of the diseases occurring worldwide each year. Each year, 142 and 261 health care professionals lose their lives to HCV and HBV infections from 16,600 and 36,600 cases of contaminated sharp injuries. Additionally, sharp occupational injuries may be the source of 4% or less of HIV infections among healthcare workers (Handl 2012). Percutaneous occupational exposure was the cause of 40%–65% of HBV and HCV infections among healthcare professionals in underdeveloped countries. Because vaccination and PEP were applied, the attribute- able fraction for HCV in developed regions was only 8%-27%, and that for HBV was less than 10%. In different localities, the attributable share of HIV varied from 0.5% to 11% (Tipayamongkholgul et al. 2016). According to studies conducted in the USA and Thailand, the potential risk factors for needle stick injuries, sharps injuries, and blood and body fluid include insufficient staffing, outdated practice guidelines, long workweeks, a sense of being rushed, a lack of hazard awareness, inadequate training, and not wearing personal protective equipment (Kasatpibal et al. 2016; Green-McKenzie et al. 2016).

In addition, factors that increase the risk of occupational infections include overcrowding in hospitals, a lower worker-to-patient ratio, a lack of awareness of the dangers of blood exposure, a failure to take the necessary precautions, a lack of basic safety equipment supplies, handling contaminated needles, and the reuse of other sharp objects. Developed nations acknowledged the significance of HCW safety practices (Akyol and Kargin 2016). According to research done in Tanzania and Kenya, the prevalence of

percutaneous exposure incidents for lifetime injuries and injuries sustained in the previous 12 months was 59% and 48.6%, 19%, and 7.2%, respectively (Chalya et al. 2015; Laisser and Ng'home 2017; Mbaisi et al. 2013). According to studies done in northwest and southwest Ethiopia, 34%, 62.6%, and 58.8% of people reported having a needle stick, blood, or body fluid at least once in the previous 12 months, respectively (Walle et al. 2013; Belachew et al. 2017). Like that, a study done in the public hospital in Addis Ababa found that 62.3% of respondents reported seeing used sharps or needles in the area they moved to work were 56.4% of them were carrying out their regular work without any on-site or off-site training on safe practices or infection prevention. Additionally, staff reported that 73.2% of them recapped after injection and 55.5% of them recapped using two hands, respectively, and that 66% of injured staff members experienced NSI accidents while providing patient care due to inadequate training and ignorance of significant occupational hazards (Holana 2015). Ethiopia Labor Law Proclamation No. 377/2003 was adopted to strengthen and develop the healthcare system. Ethiopia's federal health ministry created guidelines for infection prevention and control and PEP practice in 2004 and 2006 (Sahiledengle et al. 2018). Articles 95-112 recognized the legislation of occupational injuries, which stipulates that occupational disease, accident, and injury minimize morbidity and death linked to occupational hazards among health care employees at work (Kumie et al. 2016). According to a study conducted in Iran, 64.1% of incidents of needle stick injuries involved percutaneous exposure (Mohammadnejad and Nemati Dopolani 2015). Additionally, investigations in Palestine and India have shown that 90% and 21.1% of health care professionals suffer from percutaneous injuries (Rabi et al. 2017; Gogoi et al. 2017).

Africa's countries stated that the prevalence of occupational exposure to bodily fluid for a lifetime and a year was 65.7% and 48.0%. Percutaneous damage, with an estimated 12-month frequency of 36.0% (Auta et al. 2017), was the primary exposure cause. However, all types of occupational exposure to blood and bodily fluids over 12 months varied between 17.0% and 67.6% in Kenya and Burundi, respectively(Auta et al. 2017). According to research conducted in Ethiopia's Amhara, Oromia, and SNNP regions, sharp and needle stick injuries were present at 22.2%, 19.1%, and 46% of the time, respectively (Aderaw 2013; Bekele et al. 2015; Kaweti and Abegaz 2015). Additionally, research done in the Jigjiga zone found that needles had injured 30.1% of healthcare professionals in the previous year (Lema and Teka 2014).

The Ethiopian Public Health Association highlighted the standard precaution as having a research deficit and essential for public health in the nation (Engelbrecht et al. 2016). However, the associated causes of the exposure incidence among HCP have not yet been adequately addressed because of resource limitations and Ethiopia's climatic shift. As a result, there has been no research on percutaneous exposure incidents among healthcare professionals in the Somali region. As a result, this study aims to evaluate percutaneous exposure incidents and related factors among medical staff at government health facilities in Jigjiga, Somali Region, and Ethiopia. The current study aims to assess percutaneous exposure incidents and associated factors among healthcare workers in the Somali area of Ethiopia's Jigjiga government health institutions.

2. Methods

To evaluate the percutaneous exposure incident and related factors among healthcare workers in Jigjiga government health institutions, a cross-sectional study was carried out in the Jigjiga administrative city in March 2022. The graduateschool at Jigjiga University granted ethical approval. The Jigjiga Health Bureau and the medical director's office also gave official consent. Each respondent was made aware of the study's objectives, assurances of confidentiality, risks, and advantages. Health education and awareness were provided to study participants who occasionally did not wear personal protective equipment (PPE). The study's source population

consisted of all medical staff employed by government health facilities, and the sample size was determined using a simple random sampling procedure.

Using the single population proportion formula and the epi information for the risk factor sample size calculation, the actual sample size for this study was established. The largest sample size among the computed sample sizes was chosen next. The following assumptions were used to calculate the sample size for prevalence: 5% margin of error (d), 95% confidence level (alpha,=0.01,two-tailed), and a prevalence of 46% from earlier research done in Hawassa referral hospital (Kaweti and Abegaz 2015). Therefore, using the information provided above, the total sample size for this study was determined using the single population percentage formula shown below.

$$N= (Z\alpha/2)2p (1-p)/d2$$

To determine the sample size for risk factors, the epi info version 7 was computed, and the following assumption was taken:

Confidence level=95%,

Power (1-ß) =80%, Unexposed to exposed ratio=1:1, % outcome of unexposed group, and % outcome of exposed group and odds ratio

Health care personnel (Nurses, midwives, physicians, surgeons, laboratory clinician, health officers, and anesthetics) working in governmental health facilities for the last 12 months who had direct contact with patients' needle stick, sharps, and blood/body fluid was included in the study. Students and those absent from their workplaces during data collection due to some reasons (annual leave, training, education, chronic illness, mental disability, etc.).

Data was collected using a self-administered questionnaire, adopted, and modified from the WHO best practices for injections and related procedures toolkit, consisting of 38 questions directly related to the study's objectives.

The questionnaire was developed first in English and then translated into Somali and Amharic versions. Then back translation was done to check the completeness and consistency of the meaning of each question. The questionnaire contains all the variables directly related to this study's objective, such as socio-demographic characteristics, behavioral factors, and organizational factors.

Also, two health professionals of BSc (one health officer and one midwife)and one supervisor were employed for data collection with two days of training on the purpose of the study, how to collect the data, and keeping the confidentiality of the participant. Before data collection, the data collection tool, validated by the WHO best practice of injection and related procedures toolkit and some other related literature, was prepared in English, and then translated into Somali and Amharic versions. Also, data collectors were given two days of straining. Then, a pretest was done on other non-selected government health facilities on 5%of the total sample size.

Furthermore, continuous, and careful supervision was made during data collection. After that, when the data was collected, the completeness and consistency of data were checked and examined before and during the data entry to the EPI DATA version 3.0.2 and exported into the SPSS version 23 for analysis. The descriptive study assesses frequencies, percentages, and means of needle stick, sharp, and splash incidents. Bivariate and multivariate logistic regression analysis was employed to test the relationship or statistical association between outcome and independent variables using an odd ratio; the significance of statistical association was tested using a 95% confidence interval and p-value (<0.05).

3. Results

Table 1 presents the socio-demographic characteristics of the study population. This study chose 291 healthcare professionals from Jigjiga government health facilities. The response rate was 90.4% since 263 of the surveys were fully

completed and received, while 28 of the questionnaires were only partially completed and never returned. Finally, 263 (90.4%) healthcare industry members underwent analysis. Among the responders, 152 (57.8%) were men, and 111 (42.2%) were women working in healthcare. One hundred twenty-six (47.9%) of the study participants were between the ages of 19and 25, while 103 (39.2%) were between the ages of 26 and 34. The average age of the medical staff was 27.5, and the standard deviation was6. Mostrespondents—162—were single (61.6%). Regarding educational attainment, 102 (38.8%) had a diploma, and 151 (57.4) had a degree. 191 (72.6%) of the responders identified as nurses or midwives (Table 1).

Table1: Socio-demographic characteristics of the study population

Variable	Categories	Frequency (n=263)	Percentage%
Sex	Male	152	57.8
	Female	111	42.2
Age	19-25age	126	47.9
	26-34age	103	39.2
	=>35 age	34	12.9
Marital status	Single	162	61.6
	Married	89	33.8
	Divorced	12	4.6
Education status	Diploma	102	38.8
	Degree	151	57.4
	Specialist	2	0.8
	Others	8	3
Professional status	Nurse/midwife	191	72.6
	Physicians	41	15.6
	Health officer	13	4.9
	Laboratory	11	4.2
	Others	7	2.7
Monthly salary	2000-3500birr	89	33.8
	3600-4500birr	90	34.2
	>=5000birr	84	31.9
Work experience	<=1year	64	24.3
	2-4 years	119	45.2
	>=5years	80	30.4

Figure 1 demonstrates a graphical representation of the prevalence of percutaneous exposure incidents for the last 12 months. According to analyzed data, the prevalence of percutaneous exposure incidents was 148 (56%) with a confidence interval (of 50.6 – 62.2%) for the last 12 months.

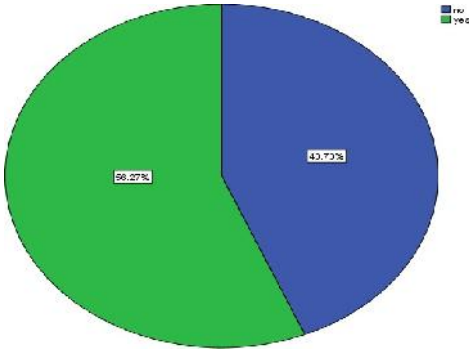

Figure 1: Graphical representation of the prevalence of percutaneous exposure incidents for the last 12 months

Table 2 presents the frequency and patterns of percutaneous exposure incidents. Most percutaneous exposure incidents occurred once, 77 (52%). Most exposure incidents occurred among health care workers working the morning shift. The percutaneous exposure incidents also happened in the ob/gynecology 39(26.4%) and emergency department 33(22.3%), as presented in Table 2 below.

Table 2: Frequency and patterns of percutaneous exposure incidents among health care personnel

Variable	Characteristic	Frequency N= 148	Percentage%
Exposure incident	Once	77	52.
	=>twice	71	48
Working shift	Morning Evening	83	56
	Night	28	19
		37	25
Working department	Ob/gyno	39	26.4
	Emergency	33	22.3
	Operation room	22	15
	Pediatric	13	8.8
	Internal medicine	13	8.8
	Others Outpatient	12	8
	Surgical	8	5.4
	Laboratory	6	4
		2	1.3

Table 3 discusses the Organization factors of percutaneous exposure incidents among health care personnel. Of 263 study participants, 220(83.7%) worked at the hospital, while 43(16.3%) worked at the health center. Most 188(71.5%) health care personnel worked more than 40 hours per week, and 75(28.5%)workedlessthan40hoursperweek.Outofr espondents,153(58.2%)ofthem reportednot having universal precautions in their work place.134 one hundred thirty-four (51%) of them had no infectious diseases prevention and control guidelines in their workplace, whereas 182 (69.2%) ofthem had personal protection equipment available in their workplace. Also, 137(52.1%) health care personnel have not taken any vaccination for HBV (Table 3).

Table 3: Organization factors of percutaneous exposure incidents among health care personnel

Variables	Characteristic	Frequency N=263	Percentage %
Health facilities	Hospital	220	83.7
	Health center	43	16.3
Working hour per week	<=40 hours	75	28.5
	>=40 hours	188	71.5
Universal precaution	Yes	110	41.8
	No	153	58.2
infectious diseases prevention and control guideline	Yes No	129 134	49 51
personal protection equipment	Yes	182	69.2
	No	81	30.8
Standard precaution training	No	146	55.5
	Onetime	88	33.5
	>=two times	29	11
Infectious diseases prevention and control Training	Yes No	140 123	53.1 46
	No	137	52.1
Taken hepatitis B virus vaccination	Onetime	34	12.9
	Two times Three	39	14.8
	times	53	20.2
Availability of safety Box work places always	Yes	238	90.5
	No	25	9.5

Table 4 presents the behavioral factors. Of the 263 participants, 222 (84.4%) used personal protection equipment during day-to-day working time, while 41(15.6%) had not used personal protection equipment during daily working time. Most 110 (49.8%) of the study participants had used a single glove during working time. Also, 116 (44.1%) respondents felt uncomfortable wearing personal protection equipment. Eighty-six (32.7%) of health care personnel felt stress during working time, whereas 177 (67.3%) were not feeling stress during working time. 188 (71.5%) participants were often washing their hands after contacting contaminated things, where 75 (28.5%) of participants were sometimes washing hands after getting contaminated things, and most 135(51.3%) of respondents used soap and water when cleaning their hand and contaminated body area (Table 4).

Table 4: Behavioral factors of percutaneous exposure among health care personnel

Variables	Characteristic	Frequency N=263	Percentage%
Using of personal protection equipment	Yes No	222 41	84.4 15.6
Types of PPE	Single glove Double glove Mask Others	110 76 25 11	49.8 34.1 11.2 4.9
Uncomfortable PPE	Yes No	116 147	44.1 55.9
Types of PPE	Singleg loves Double glove Mask Others	31 25 47 13	26.7 21.6 40.5 11.2
Stress	Yes No	86 177	32.7 67.3
Hand wash	Often Sometime	188 75	71.5 28.5
Hand washing agent	Alcohol and iodine Soap and water Water	111 135 17	42.2 51.3 6.5
Recapping needle	Two hands recapping One hand recapping Both them	91 138 34	34.6 52.5 12.9
Safety box always	Often Sometime	221 42	84 16
Follow-up infectious prevention and control And universal precaution	Often Sometime Never	100 85 78	38 32.3 29.7

Figure 2 presents the frequency of reasoning for not using personal protection equipment. Regarding the reason for not using personal protection equipment, 24(58.5%) respondents reported a lack of personal protection equipment.

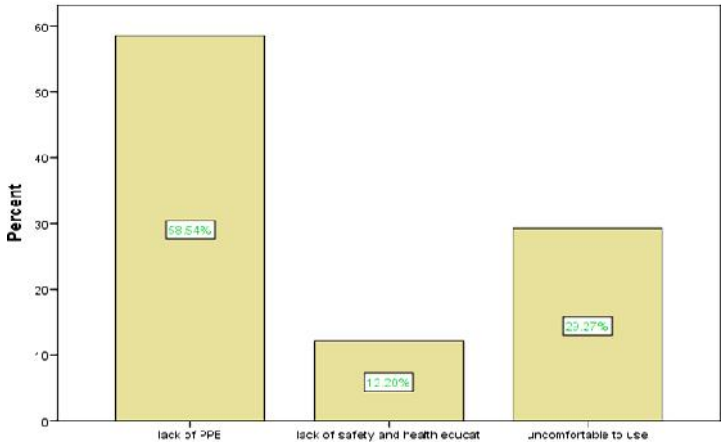

Figure 2: Frequency of reasoning for not using personal protection equipment

Table 5 presented the bivariate analysis on the variables of marital status, profession, salary, working hours, per week working hours, lack of availability of universal precaution, unavailability of infection prevention and control guidelines, training of standard precaution, training infectious prevention and control guidelines, use of PPE, feeling uncomfortable, hand wash and vaccinated were found to be significantly associated with percutaneous exposure incidents. Though, age, education, health facilities, department, stress, recapping needle, and work experience were not significantly related to mucocutaneous exposure to blood and body fluids splash. Thus, variables at p-values less than 0.2 were considered multivariate logistic regression nominees (Table 5).

Table5: Bivariate logistic regression analysis of associated factors with percutaneous exposure incidents among health care personnel

Variable	Categories	Yes 148	No 115	COR	*p*-value
Marital status	Single	94(65.5%)	68(59%)	0.461(0.120,1.766)	0.258
	Married Divorce	45(30.4%)	44(38%)	0.341(0.87,1.343) R	0.12*
		9(6.1%)	3(3%)		
Professional	Nurse/midwife	109(74%)	82(71%)	R 0.871(0.442,1.715)	
	Physician	22(15%)	19(16.5%)	1.613(0.504,5.688)	0.871
	Health officer	9(6%)	4(3.5%)	0.282(0.073,1.096)	0.395
	Laboratory	3((2%)	8(7%)	1.881(0.356,9.9838)	0.06*
	Others	5(3%)	2(2%)		0.457
Salary	2000-3600birr	44(30%)	45(39%)	R 1.400(0.776,2.524)	
	3600-4500birr	52(35%)	38(33%)	1.662(09.07,3.045)	0.264
	=>3500birr	52(35%)	32(28%)		0.1*
Hours working	=<40hours	48(32%)	27((23.5%)	R	
Per week	>40hours	100(68%)	88(76.5%)	0.639(0.368,1.110)	0.11*
Available of	Yes	71(48%)	39(34%)	R	
universal	No	77(52%)	76(66%)	0.557(0.337,0.920)	0.02*
precaution					

Available infection prevention and control	Yes No	80(54%) 68(46%)	49(43%) 66(57%)	R O.631(0.386,1.031	***0.06****
Training of standard precaution	No One time =>two times	77(52%) 49(33%) 22(15%)	69(60%) 39(34%) 7(6%)	0.355(o.143, 0.883) 0.400(0.155,1.032) R	***0.02**** ***0.05****
Training ipps	Yes No	86(58%) 62(42%)	54(47%) 61(53%)	R 0.638(0.391,1.042	***0.07****
Vaccination	No One time Two times Three times	70(47.2%) 20(13.5%) 25(17%) 33(22.3%)	67(58.3%) 14(12.2%) 14(12.2%) 20(17.3%)	R 1.367(0.639,2.926) 1.709(0.820,3.565) 1.576(0.826,3.021	***0.42*** ***0.15**** ***0.16****
USE PPE	Yes No	120(81%) 28(19%)	102(88.7%) 13(11.3%)	R 1.831(0.901,3.719)	***0.09****
Feeling Uncomfortable	Yes No	73(49%) 75(51%)	43(37.4%) 7262.6%)	1.630(0.992,2.678) R	***0.05****
Hand wash	Often Some times	100(67.6%) 4832.4%)	88(76.5%) 27(23.5%)	R 1.564(0.901,2.716	***0.11****

***Statistically significance at p-value less than<0.2*, *R=reference**
**COR=crude odd ratio and 95% CI=confidence interval*

Table 6 presents the multivariate logistic regression analysis of the adjusted odd ratio of independent predicting variables and found that being a laboratory technician, earning a monthly salary range of 3600-4500 birr =>5000birr, not taking training on standard precautions, feeling uncomfortable at the workplace, and sometimes hand washing was significantly associated with percutaneous exposure incidents. The respondents who chose their profession were laboratory 2 times higher risk of percutaneous exposure incidents as contrasted those their professional were nurse/midwife (AOR= 2.73, 95% CI= (2.063, 1.177, p-value =0.028). The participants with a monthly salary range of 3600- 4500 birr and => 5000birrwere found to be more likely1.4and 2.6times at risk of percutaneous exposure injuries as compared to those monthly salary range between 2000-3500birr (AOR=1.418and 2.636,95%CI (1.723,2.741),(1.103,6.302), p-values =0.030 and 0.029). In addition, among health care personnel, those who had not taken training in standard precaution were greater than2.92 times at risk of percutaneous exposure incident as compared with those who had taken equally or greater than two times training of standard precaution (AOR=2.929(1.005,8.536)), *p*-value =0.049)). Health care personnel who felt uncomfortable during the working time had1.8 times more likely exposure incidents than those who felt comfortable during day-to-day activities (AOR=1.802, 95%CI (1.011, 3.211), 0.046).

Moreover, among health care workers, those who washed their hands sometimes were at 1.9 times higher risk of percutaneous exposure incidents as assimilated with those who washed their hands often when contacted with contaminated things (AOR=1.980, 95% CI (1.043,3.759), p-value =0.037) (Table 6).

Table 6: Multivariate logistic regression result for percutaneous exposure incidents

Variable	Categories	Yes	No	AOR	p-value
Profession	Nurse/midwife	109(74%)	82(71%)	R 0.765(0.281,2.081)	
	Physician Health	22(15%)	19(16.5%)	2.173(0.566,8.342)	0.599
	officer	9(6%)	4(3.5%)	2.73(2.063,1.177)	0.258
	Laboratory	3((2%)	8(7%)	1.771(0.306,10.230)	0.028*
	Others	5(3%)	2(2%)		0.523
Salary	2000-3500birr	44(30%)	45(39%)	R 1.418(1.723,2.741)	
	3600-4500biir	52(35%)	38(33%)	2.636(1.103,6.302)	0.030*
	=>5000birr	52(35%)	32(28%)		0.029*
Training of standard precaution	No	77(52%)	69(60%)	2.929(1.005,8.536)	0.049*
	Onetime	49(33%)	39(34%)	1.273(0.629,2.741) R	0.502
	=>two times	22(15%)	7(6%)		
Uncomfortable	Yes	73(49%)	43(37.4%)	1.802(1.011,3.211)	0.046*
	No	75(51%)	7262.6%)	R	
Hand wash	Often	100(67.6%)	88(76.5%)	R	
	Sometimes	48(32.4%)	27(23.5%)	1.980(1.043,3.759)	0.037*

Statistical significance at a p-value less than 0.05
R=reference
AOR stands for adjusted odd ratio
95%CI stand for confidence interval

4. Discussion

Health care workers frequently have percutaneous exposure incidents, which is a problem on a global scale. Health care workers may be exposed to HIV, HBV, and HCV through blood and bodily fluids while performing their daily duties. This study aimed to evaluate percutaneous exposure incidents and related factors among medical staff in government health facilities in the Jigjiga district of Ethiopia's Somali region. According to the study, 148 percutaneous exposure incidents occurred in the previous 12 months, or 56 percent, with a 50.6 to 62.2 percent confidence interval. Compared to studies conducted in Iran and India, where the prevalence of needle injuries and splash incidents was 34.17% and 21%, respectively, this study's prevalence was more significant (Organization 2002).

Additionally, this conclusion was supported by other studies carried out in several Ethiopian regions, including Amhara, Oromia, SNNP, and Wolaita Zone, which found that the prevalence of needle sticks, sharps injuries, and bodily fluid was, respectively, 22.2%, 19.1%, and 46% and 55.1% (Aderaw 2013; Bekele et al. 2015; Kaweti and Abegaz 2015). Similar investigations in Harare and Dire Dawe found that 17.5%, 13.5%, and 20.2% of people reported having a needle stick, finding a sharpone, or having blood or other body fluid in their possession. Additionally, the study's results go beyond the Fafan zone study, which found that 30.1% of healthcare workers have needle sticks (Lema and Teka 2014).

In addition, this study's findings were less significant than other studies. According to several research studies, the prevalence of needle/sharps and body/blood fluid was 64.4%, 67.6%, 62.6%, 58.8%, and 55.1%, respectively, from earlier studies in Tehran, Iran, Kenya, and southwest Ethiopia (Belachew et al. 2017; Auta et al. 2017). The study methodology, working environment, health care professionals' skills, sample size, job service training, the availability of guidelines, and health workers' knowledge and education may all play a role in why they obtained different results. Another potential factor is the lack of reporting, follow-up, and registration among medical staff who experienced exposure incidents in this area. Most healthcare professionals in the research area were unaware of specific preventive measures. In addition, compared to earlier studies, the health care employees' discomfort at work may have contributed to the high exposure episodes in Jigjiga government health facilities.

The findings suggest that individuals with monthly salaries of 3600-4500 birr and => 5000 birr were more likely to be 1.4 and 2.6 times more at risk of percutaneous exposure injuries than those with monthly salaries of 2000-3500 birr (AOR=1.418 and 2.636, 95%CI (1.723,2.741), respectively) (1.103,6.302). Bahir Dar was statistically critically related to exposure events among health by the level of their pay compared to studies done in the East Gomma Zone (Aderaw 2013). Due to their high level of professional training, job stress, and potential additional responsibilities within government institutions or private healthcare facilities, they may be more susceptible to such injuries than their coworkers. Regarding routine precaution training, health care professionals who had not received it were 2.92 times more likely to experience a percutaneous exposure incident than those who had received the same or more than twice training. Similar studies in southwest Ethiopia, northeast Ethiopia, and north-western Tanzania have demonstrated that health care workers' exposure occurrences were statistically significantly associated with their lack of training on standards (Chalya et al. 2015; Walle et al. 2013; Belachew et al. 2017).

Due to a lack of education, knowledge, and skills, a lack of personal protective equipment, and a lack of workplace health hazard guidelines such as standard precautions and infectious disease prevention and management. According to this study, healthcare personnel who felt uneasy while at work were 1.8 times more likely to experience a percutaneous exposure incident than those who felt at ease while doing their daily business. According to a study conducted in the Amhara region, healthcare workers who were dissatisfied with their jobs were statistically significantly more likely to experience percutaneous exposure occurrences that resulted in a sharp or needle stick injury (Aderaw 2013). In terms of respondents' professions, those who worked in laboratories were 2 times more likely to experience percutaneous exposure episodes than those who worked as nurses or mid wives. According to various review articles in Africa, health care workers who worked in laboratories had statistically significant exposure incidences compared to their counterparts (Auta et al. 2017).

The lack of laboratory professionals at the workplace and the constant risk to workers from exposure incidents could be the causes. Other research results revealed a statistically significant relationship between exposure events among health care personnel and recapping needles, educational level, gender, age, job experience, department or wards, and marital status (Aderaw 2013; Kaweti and Abegaz 2015). As a result, it was determined by the study's findings that they had no statistically significant relationship to exposure incidents. This variation may result from different study designs, sample sizes, or study areas. However, this study found that when health careworkers occasionally encountered contaminated objects, those who washed their hands were 1.9 times more likely to do so than those who did so frequently. Previous studies have not found any statistical correlation between percutaneous exposure incidents and hand washing. While findings from prior studies indicated that health care professionals' exposure incidences were statistically significantly correlated with their wage, profession, and lack of training, this conclusion has shown that all these variables are statistically significant.

The study subjects were primarily unaddressed members of the medical community. Other published publications translated into Somali and Amharic were utilized as valid questionnaires to evaluate percutaneous exposure incidents and for processing relevant data in accordance with WHO best practices. Before collecting data from the non-selected government health facilities, the questionnaire was pretested. It employed various software analyses. The study had some limitations, such as the fact that it was limited to the staff of Jigjiga government health facilities; hence, conclusions cannot be applied to other government or private health facilities. Social desirability and recollection bias may be added to the results because the survey was self-administered, and the most recent occurrence was assessed. Due to the retrospective nature of the questions about the hazards and the fact that the research was only conducted in one location, a cross-sectional study design cannot uncover cause-and-effect correlations and recall bias.

Conclusion and Recommendations

It has been determined that incidences of percutaneous exposure were frequent in Jigjiga government health facilities. Health care personnel have seen more percutaneous exposure occurrences over the past 12 months due to suboptimal procedures and behavior changes that put them at risk for injury. It is found that there are essential contributing factors to instances of percutaneous exposure among healthcare workers. Increasing their understanding of exposure incidents and the risk factors resulting in blood-borne illnesses is preferable. Laboratory technicians should raise their awareness of exposure episodes among health professionals. At the workplace, formal continuous monitoring and assessment should be used to ensure safety. A precise methodology for reporting injuries is required, with good counseling, testing, and, if necessary, post- exposure prophylaxis for victims. Percutaneous exposure events happen to highly compensated workers. Therefore, these employees should be considered during infection prevention efforts. A surveillance system should be set up in health facilities for recording, reporting, and managing exposure episodes. The application of universal precaution, infection prevention and control guidelines, infection prevention materials throughout daily activities, and vaccination against HBV for all healthcare professionals are crucial in bridging the knowledge and competence gap. Ensure that the workplace has personal protective equipment. Research may be required to determine the exact frequency of percutaneous exposure occurrences.

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