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Magnitude of Occupational Exposure to Hiv/Aids and Post Exposure Prophylaxis Usage among Health Care Workers in Dilla University Referal Hospital, Southern Ethiopia

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Abstract

Background: Occupational injuries are injuries like needle stick or cut with a sharp object or contact of mucous membrane or non-intact skin (e.g.., Exposed skin that is chapped, abraded, or afflicted with dermatitis) with blood, tissue or other potentially infectious body fluid. Each day thousands of Health Care Workers (HCWs), Around the World, Suffers accidental occupational injuries. These injuries can result in a variety of serious and distressing consequence. This study will help the healthcare workers to know the severity and prevalence, to minimize its impact, to be safe in their working environment, and remain healthy.

Objective: To assess the prevalence of occupational exposure to HIV and Post Exposure Prophylaxis usage among health care workers in Dilla University Referral Hospital, Gedeo Zone, SNNPR, Ethiopia.

Methods and materials: A descriptive cross-sectional institution based study was conducted from May 1-30 in Dilla University Referral Teaching Hospital. Data was collected using semi structured interviewer administered questionnaire from 272 participants by simple random sampling method. The collected data was entered, cleaned and analyzed using SPSS version 20. Descriptive statistics and chi-square test was employee to assess association among variables. Additionally the data was arranged and presented using different tables and graphs. P-value less than 0.05 were considered statistically significant.

Result: From a total of 272 healthcare workers involved in this study, and revealed that occupational exposure to blood and body fluid were 76.1%, among the exposed healthcare professionals 11.4% use post-exposure prophylaxis. Majority of the exposed health profession were found to be nurses which accounts (36.1%). Out of 76.1% exposed to HIV risk, 39.7% sustained needle stick injury nearly all (80.1) perceived that personal protective equipments can prevent from occupational risk to HIV infection.

Conclusion and recommendation: This study showed that occupational exposure to HIV were common among healthcare workers and continue to occur presenting a very real of HIV infection, and the utilization of post-exposure prophylaxis among healthcare profession was low. Dilla university referral hospital should make available within their system a standardize written protocol for infection prevention and reporting unit for management of occupational exposure, and to increase the utilization of post-exposure prophylaxis.

Keywords: Occupational exposure; Post exposure prophylaxis; Health care workers; HIV/AIDS

Introduction

Health care workers are exposed to different kinds of occupational hazards due to their day to day activities. The most common occupational exposure like body fluids is a potential risk of transmission of blood-borne infection like human immunodeficiency virus.

Occupational injuries like injuries needle stick or cut with sharp object or contact of mucous membrane or non-intact skin (e.g. exposed skin that is chapped, abraded, or afflicted with dermatitis) with blood, tissue or other potentially infectious body fluid, synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid and amniotic fluid [1].

Each day Thousands of Health Care Workers (HCWs), Around the world, Suffer accidental occupational injuries during the course of their role of caring for patient who have the potential for exposure to infectious material like blood tissue, and specific body fluid and medical supplies, equipment or environmental surface contaminated with these substance. These injuries can result in a variety of serious and distressing consequences ranging from extreme anxiety to chronic illness and premature death for the individual involved [2-4].

These all variety of serious and distressing consequence are linked with occupational exposure to blood and body fluid that are recognized as a mode of transmission of blood born pathogen such as hepatitis B virus, hepatitis C virus, and HIV. Exposure to HIV infection is probably the most serious and causes the highest level of anxiety among HCWs [1, 2].

Although preventing exposure to blood and body fluid is the primary means of preventing occupationally acquired HIV infection, appropriate post exposure management is the important element of workplace safety. Moreover, there is often suboptimal adherence to standard precaution [5-7].

HIV/AIDS is a serious public health problem costing the lives of many people including health care workers [8]. It is probably the most serious and causes the highest level of anxiety amongst HCWs in many countries including Ethiopia. Ethiopia is one of the hardest hit countries by HIV/AIDS epidemic with the National HIV

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prevalence of 1.4% in Adult [3,9,10]. Each day Thousands of HCWs around the world suffers accidental occupational exposures to blood borne pathogens [1,11]. Health care worker can minimize their risk of occupation HIV infection by following the universal precaution. [3] Even though adherence to universal standard precautions supposed to optimal, exposure may occur in difficult situations. The prescription of antiretroviral therapy as a PEP following a significant potential exposure to HIV has a great value [4].

Most case of Health Care Worker Sero-conversion occurs as a result of needle stick injuries. When one considers the circumstances that result in needle stick injuries, it is immediately obvious that adhering to the Standard Guideline for dealing with sharp object would result in a significant decrease in this type of accident.

Dilla University Referral Hospital is one of the hospital has large number of HIV positive case registered each year.In Dilla University referral hospital there is no adequate documented research or findings about the Health Care Workers occupational exposures to HIV and PEP. Therefore; the result of these study will provide the source of information to investigate the assessment of Health Care Workers occupational exposure to HIV and PEP in Dilla Hospital and the finding may call for attention of concerned bodies to make a decision and take measure in adherence of universal precaution, comprehensive management of occupational exposure to HIV and PEP so as to achieve good intervention.. Thus, this study assessed the health care workers occupational exposure to HIV and PEP in Dilla University Referral Hospital.

Subjects and methods

Study area and period

This study was conducted at Dilla University Referral Hospital, which is found in Dilla town, Gedeo zone, SNNPR, Ethiopia. DURH is established in 1977 E.C/1985 G.C as zonal Hospital in Gedeo Zone with former name of Dilla Hospital until June 11/2001 E.C that changed in to DURH. It is located 360 Km from A.A (capital city of Ethiopia) and 90 Km from Hawassa (the capital city of SNNPRE). It provides curative and rehabilitative services for about 2 million catchment populations. At the same time of its establishment, about 154 staffs were present, of them 104 were health professionals and the remaining were supportive staffs. Now they have 5 wards, Medical, Surgical, OBY/GYN, pediatrics, Psychiatry. The Hospital services around million peoples from which 95% belong to Gedeo ethic group (Dilla municipality, 2007)

The study was conducted from May 1-30, 2016 [12-15].

Study design and study population

Study design: Cross-sectional study design was conducted from May 1-30, 2016.

Study population: All health care workers working in Dilla University Referral Hospital

Inclusion and exclusion criteria

Inclusion criteria

All healthcare workers working in Dilla University referral hospital who have a potential to be exposed to human immunodeficiency virus in their day to day professional activities such as medical doctors, nurses, laboratory technologist/technicians, health officers, anesthesiologist psychiatry, and midwifes [16-19].

Exclusion criteria

Health care workers who were not voluntary, critically ill (to the extent of unable to read and write) during the data collection and HCWs who have communication problem were exclude from this study

Sample size and sampling technique

The sample size was determined using single population proportion formula by assuming confidence level of 95 % (z=1.96) estimate of proportion towards Occupational exposure to HIV and PEP as P=0.5(b/c there is no similar study) and marginal error as 5% (w=0.05).

$$Ni=z^2 \times p \times (1-p)$$

$$W^2$$

Where ni = initial sample size

z = critical value of 95% confidence interval

p = estimate proportion of population

w = marginal error

$ni = (1.92)^2 \times 0.5 \times 1\text{-}05/(0.05) = 384$

Since the population Size (number of Health workers in DURH) less than 10000 which is 676 the formula will be

$nf = ni / (1+ni/N)$

Where ni = initial sample size

nf = final sample size

N = total population

$Nf = 384 / (1 + 384/676) = 246$

Contingency of non-respondents as 10% = 10 x 246/100 = 24.6

Sample size = Nf + contingency which is 246 + 24.6 = 272

A simple random sampling technique was used to select health care workers we use simple random sampling method because we have sampling frame. This was done after collecting the sample frame from Dilla University Referral hospital [20-23].

Data collection procedures

Data was collected by using semi structured interviewer administered questionnaire. The data collection tool has three parts; part one: socio-economic and demographic characteristics of healthcare workers, part two: organizational and behavioural factors, and part three: occupational exposure to human immunodeficiency virus infection. The questionnaire was adopted from similar studies and modified according to the study context the questionnaire was prepared in English. To collect the data each respondent was invited to a private room for face-to-face interview with data collectors [24-26].

Data quality assurance

All Group members of research were undertaking data collection. Before the actual data collection, the questionnaire was pre tested in 5% of health care workers in yirgalem referal hospital Based on the pre-test, necessary modification were made on the questions and the data of the pre-test was excluded in the actual data analysis [27-30].

To keep the data as accurate as possible, the structured check list for data collection was used thoroughly throughout the process.

Completeness of the data and possible errors was also be monitored carefully.

Data processing and analysis

After the data was collected the frequency distribution of dependent and independent variables was organized using frequency table, graph, and chart. Chi-square was used to determine the associations between the selected variables. *p*-value also was calculated in order to identify possible statistically significant risk factors (Figure 1).

Ethical considerations

Ethical clearance was obtained from research and ethical committee (REC) of rift valley University, department of public health. Permission for conducting the study was obtained from Dilla university ren ferral hospital. In addition written informed consent was obtained from the study participant before data collection and all data obtained from individual was kept confidentially by using codes instead of any personal identifier. The positive finding obtained was given to the physician for possible treatment of patient with depression with HIV.

Results

A total of 272 HCWs in DURH were selected for the study. The age of the respondent in this study ranges between 20 and 54, about 82.4% of them is between 26-35 years. When we look the respondents in terms of profession most of them are clinical nurse 38.2%, physician 28.3%, 9.6% are lab technicians, psychiatry (6.3%) and anesthesia's (5.9%). In terms of sex (59.6%) are male and (40.4%) are females. About respondent marital status (58.5%) of them are married, and (26.5%) are unmarried (Table 1).

Exposure information

Among the total respondents (76.1%) of healthcare workers have exposed to HIV infection in there working place. Most of them (45.2%) were exposed during night duty and the remaining in day duty.

In this study 58.5% of healthcare workers respondents there hand is mostly exposed in needle stick and sharp object and 17.6% of the respondent exposed to their face, and at the time of injection 35.7%, and dressing 16.2% of healthcare workers was exposed (Table 2 and 3).

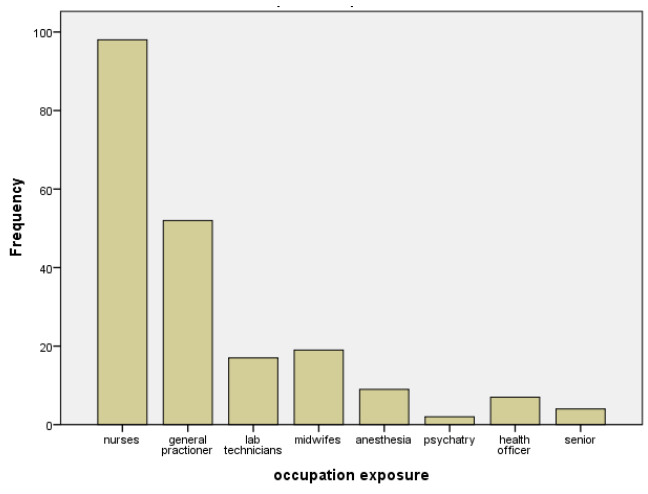

Figure 1: Relation between occupational status and exposure to HIV, DURH from May 1-30, 2008 E.C.

Variable	Frequency	Percent (%)
Sex (n=272) Male	162	59.6
Female	110	40.4
Age (n=272) 18-25	13	4.8
26-35	224	82.4
36-45	26	9.6
>45	9	3.3
Educational status(n=272) Diploma	47	17.3
Bachelor Degree	220	80.9
Other higher level	5	1.8
Total work experience (n=272) 1-3yr	185	68
4-6yr	69	25.4
7-9yr	18	6.5

Table 1: Variable, Frequency and Percent.

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Table 2: Socio-demographic characteristics of healthcare workers occupational exposure to HIV and PEP usage DURH from May 1-30, 2008 E.C.

Variable	Frequency	Percent (%)
Marital status(n=272) Married	159	58.5
Unmarried	72	26.5
Widowed	5	1.8
Separated	36	13.2
Occupational status(n=272) Nurse	104	38.2
General practioner	77	28.3
Lab technicians	26	9.6
Midwife	19	7
Anesthesia	16	5.9
Psychiatry	17	6.3
Health officer	9	3.3
Senior	4	1.5
Religion(n=128) Protestant	62	48.4
Orthodox	43	33.6
Muslim	21	16.4
Others	2	1.6
Monthly income(272) 1000-2400	37	13.6
>2500	235	86.4

Table 3: Socio-demographic characteristics of healthcare workers occupational exposure to HIV and PEP usage DURH from May 1-30, 2008 E.C.

Looking the respondent in terms of profession 36.1% are clinical nurse, 7.0% of midwifes, 19.1% of physicians, 6.3% lab technicians, anesthesiology 3.3%, psychiatry 0.7%, health officer 2.6% and senior 1.5% are mostly exposed to HIV

HCWs that faced HIV exposure has taken immediately a treatment is about 16.2% and 11.4% of them get post exposure prophylaxis in the hospital. 57.7% of them use glove as protective equipments where as 16.9% use gown (Table 4 and 5).

Discussion and conclusion

In this study female workers were less likely to be exposed than males. This finding was consistent to the study finding done in northern Uganda [31].

Organizational and Behavioral information	Frequency	Percent (%)
Hours worked per week		
>40hr	225	82.7
<40hr	47	17.3
Read Universal guidelines/protocol		
Yes	208	76.5
No	64	23.5
Attained or experienced with any Training/seminars on infection prevention		
Yes	101	37.1
No	171	62.9
A behavior that Use of personal protective equipment		
No	70	25.7
Yes	202	74.3
Negligence on written guidelines		
Yes	120	44.1
No	152	55.9

Table 4: About Organizational and Behavioral information on healthcare workers occupational exposure to HIV and PEP usage DURH from May 1-30, 2008 E.C.

Exposure information	Frequency	Percent
Exposed to HIV		
Yes	207	76.1
No	65	23.9
Exposed to occur to		
Blood	141	51.8
Blood fluid	62	22.8
Parental exposure		
Needle stick	108	39.7
Cut	55	20.2
At the time of		
Phlebotomy	1	0.3
Injection	97	35.7
Dressing	44	16.2
Other	70	25.7
Personal protective equipments		
Glove	157	57.7
Gown	46	16.9
Treatment used		
First aid	56	20.6
Post-exposure prophylaxis	31	11.4

Table 5: Exposure information healthcare workers occupational exposure to HIV and PEP usage DURH from May 1-30, 2008 E.C.

Variables	Categories	Do you exposed		d.f	Chi-Square	P-Value
		Exposed	Non exposed			
What is your profession	Nurse	98	6	2	1456	0
	General practioner	52	25			
	Lab technician	17	9			
	Midwife	19	0			
	Anesthesia	9	7			
	Psychiatry	2	15			
	Health officer	7	2			
	Senior	1	3			

Table 6: Association between professional status and exposure.

Variables	Categories	Personal Protective equipment		d.f	Chi-Square	P-Value
		Users	Non user			
Do you have a behavior that Use of personal protective equipment	Nurse	88	10	1	40.205	0
	General practioner	44	8			
	Lab technician	7	10			
	Midwife	10	9			
	Anesthesia	9	0			
	Psychiatry	2	0			
	Health officer	7	0			
	Senior	3	1			

Table 7: Association between personal protective equipment users and exposure.

The result of this study shows that (76.1%) of the healthcare workers who participate in the study had experienced risky occupational exposure during their professional activity. This found to be higher than the finding of other study conducted in London teaching hospital 76% [31], united state of America emergency medical hospital (56.1%) [32], Kenya rift valley provincial hospital (51%) [33-34], and Jimma zone, oromia region southwest Ethiopia. This difference might be due to small sample size of the study, variation in the study area, and economic development variation of nation, but this finding was less than the study done in Serbia (98.4).

Regarding the mode of exposure to human immunodeficiency virus this study reveals that (39.7%) of the healthcare workers experienced needle stick injury, and (22.8%) of them experienced contact with potentially infectious body fluids. This result was higher than the study conducted in northern Uganda which was 27% of health care workers experienced needle stick injury. But the finding was less than the study done in Serbia [35] which was 89% had needle stick injury, 59% skin contact with potential infections blood and fluids and finding of the study done Jimma zone, oromia region, southwest Ethiopia [34], which was 105(60.3%) sustained needle break/cut by sharps, 77(44.3%) to blood, and 68(39.1%) exposed to patients body fluids. Moreover, it was higher than the result in Kenya [33] which was 19% had needle stick injury, 25% had contact with blood and other body fluid in the past one year and results of the study conducted in Ethiopia, Tigray region (1) which was 17.2% had needle stick injury, 56.3% contact with blood and body fluids in the past 12 months this discrepancies' due to difference in baground of healthcare workers, difference in sample size and the concern of employing organization (Table 6).

Likewise, in this study most of the respondents were exposed to risky condition, this finding was similar with finding of the study done in northern Uganda.

The result of this study showed that 80.1% of the respondent perceived that they were at risk of exposure to human immunodeficiency virus infection due to their profession. This finding was almost similar to the result of health care worker in Ghana 79% [36]. This discrepancy might be due to the effect of globalization, global burden of HIV/AIDS, and internet technology that was helpful to update themselves.

This study shows that majority 67.8% 0f health care workers identified the commonest occupational risk to human immunodeficiency virus infection. This finding was completely contradictory to the report from south Africa [37-38] which was 83% of the health care workers did not identified. This discrepancy might be due to lack of training, variation in organizational safety policies and procedures, and less exposure to the occupational hazards.

76.5% the study participant were informed about the universal precaution and guidelines about infection prevention. In contrary to this finding, the study conducted in Serbia [35] discovered that 80% of the healthcare workers had not been informed. This might be due to variation in training to healthcare workers on universal precaution to decrease the rate of occupational exposure.

In this study 74.3% of the respondent was used personal protective equipment, only 23.9% of them were protected from injury. This was almost similar to Serbian healthcare workers that only 17% had been protected this does not mean that using personal protective equipment can expose healthcare workers to injury but it is the fail to use them at appropriate time and condition and problem in the quality of the personal protective equipment (Table 7).

Among the exposed health care workers about (16.2%) taken treatment immediately and 11.4 of them take PEP. Most of HCWs use gloves to personal protective from infection.

This study was likely to be the actual reflection of the occupational exposure to human immunodeficiency virus infection of healthcare workers in Dilla referral hospital.

Even though most of healthcare workers were informed as well as being familiar to universal standard and guidelines, this study reveals that majority (76.1%) of healthcare worker had experience the risky occupational exposure during their profession. A number of determinant factor which were potential acquisition of occupational hazard were identified. The statistically significant determinant factor were professional status and personal protective equipment usage.

Healthcare workers can minimize the risk of occupational HIV infection by universal precaution using the prescription of antiretroviral therapy as Post exposure prophylaxis following significant potential exposure to HIV. In This study 16.4% of exposed healthcare get the treatment.

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