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Assessment of Knowledge and Practice towards Post-Exposure Prophylaxis against HIV among Health Workers at Hoima Regional Referral Hospital Hoima District

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ABSTRACT

Every year more than 250,000 health workers are exposed to HIV through their healthcare setting, and as a result, more than 1000 health workers get infected with HIV, most of these exposures occur in developing countries where HIV prevalence is very high in the general population and access to treatment is limited. To assess the knowledge and practice of health workers towards PEP against HIV at Hoima Regional Referral Hospital (HRRH), a descriptive cross-sectional study was done. The questionnaire was used as the main tool for data collection and data used for data analysis. Simple random sampling was used to collect data from 100 health workers. The study shows a low PEP usage percentage by 16 of the 100 subjects in the study, with the majority (14/16) of those who had used PEP and those (78/80) who had never, defining it as prevention against HIV establishment. The study established that having heard about PEP and knowing how it works did not significantly correlate with using PEP at p-values of 0.701(0.77(0.06-7.43) and 0.0190.77(1.40-3.55), respectively. There was a good knowledge of PEP among health workers, majority 14(87.5%) of those who had used PEP and those 78(92.9%) who had never used PEP knew it was used as a protection strategy against HIV. More so, having knowledge of the reason for using was a significant correlate to using PEP with an odd ratio of 0.09(0.05-1.76 and p-value of 0.003, at least 6(7.1%) didn't know the exact time for PEP use. There was low PEP usage among health workers, majority 13(81.3%) said they had used it once, while only 3(18.7%) said more than once, the majority of reasons identified for using PEP were needle prick injuries 14(87.5%), with all those who had previously used PEP willing to use again, while at least 14(16.7%) of those who had not used PEP previously were not willing to use it. The study concludes that there was good knowledge (95.2%) among health workers on PEP against HIV, but was low practice (16%) in regards to its usage. Health workers should be health educated about PEP and more should be availed to all health facilities for easy accessibility.

Keywords: Health workers, Needle prick injuries, HIV, PEP.

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INTRODUCTION

Globally, there are 0.2 million HIV infections annually among healthcare workers as a result of occupational exposure [1]. Occupational exposure occurs when HIV-infected blood comes into contact with health workers through the skin or mucous splash or skin puncture [2]. The probability of getting HIV after exposure varies from one type of exposure to another, with a percutaneous needle prick at one HIV seroconversion for every 200 exposures while the infection risk remains relatively high in patients who are in acute and late HIV stages as well as those with a high viral load [2]. Africa accounts for the greatest number of the world's AIDS-related deaths, of which a good number of deaths are health workers in different health facilities [3-5]. Post Exposure Prophylaxis (PEP) among health workers has been recommended extensively in the context of risky exposures in health care settings, and there is a need to protect health care workers from acquiring HIV through administration of PEP for those accidentally exposed [6]. HIV transmission among health workers may be prevented by taking careful precautions when working on patients such as suturing, and surgical procedures, especially by use of protective gear such as gloves. However, sometimes gloves may not be used or not used correctly for a number of reasons, such as in emergencies, lack of these facilities, or sometimes breakage [7]. In such situations, the probability of HIV transmission may be reduced by the administration of PEP. This involves taking 2-3 antiretroviral (ARV) drugs for a period of one month, in conjunction with appropriate counseling, monitoring, and post-PEP follow-up [7]. Health workers taking PEP should be prescribed for 28 days and needs to be taken within 2 hours and not later than 72 hours, since even a few hours may make a significant difference. In general, the efficacy drops after 24 hours, and PEP should not be offered if it is more than 72 hours after the HIV exposure occurrence [2]. Post-exposure prophylaxis treatment is now available at accident and emergency areas in hospitals, or HIV clinics, and via some medical doctors experienced in preventing HIV, in different countries and anybody who has been exposed to HIV is able to access the services [8]. Cumulative evidence is enough to suggest that PEP might be effective in reducing the risk of HIV infection. This conclusion is widely recognized and as a result, a number of countries have produced guidelines for the use of PEP in both occupational and non-occupational circumstances [9].

Every year more than 250,000 health workers are exposed to HIV through their healthcare setting, and as a result, more than 1000 health workers get infected with HIV [10] and most of these exposures occur in developing countries where HIV prevalence is very high in the general population and access to treatment is limited. In Africa, it is estimated that 0.8% & to 18.5% of all HIV infections among health workers are a result of occupational exposure, and health workers in private facilities are more at risk at 1.6% than those in government health facilities at 0.4% [10]. According to the joint United Nations Program on HIV/AIDS, in Uganda, health workers who are exposed to need prick and other forms of exposure to HIV-infected blood at work have a 0.23% risk of being infected [11]. Although Uganda has reported a significant reduction in the rates of HIV infections among its health workers through its national AIDS policy, they are still experiencing new infections and following the 2017 United Nations Program on AIDS (UNAIDS) report on the global AIDS epidemic showed that at the end of 2019, there were 2,800(37.4%) health care providers living with HIV in Uganda [12]. At Hoima Regional Referral Hospital (HRRH), at least 7 different health workers per month report occupational-related injuries which expose them to HIV. And although studies have been done in different parts of the country on the use of PEP in the prevention of HIV, no documented information on such a study has been conducted in HRRH, so, this study on the assessment of knowledge and practices of health workers toward Post Exposure Prophylaxis (PEP) will bridge the gap so as to set up strategies on how to reduce HIV spread.

METHODOLOGY

Study Design

A descriptive cross-sectional study was done where quantitative methods of data collection were employed on health workers who practice health as a form of living. A cross-sectional study was used because it involved interacting directly with these health workers so that the findings are generated from the health workers themselves. Quantitative methods helped to ascertain the number of healthcare workers who practiced the use of post-exposure prophylaxis (PEP). This helped to generate a workable solution that helped them to appreciate the importance of post-exposure prophylaxis (PEP) in HIV prevention.

Area of Study

The study was carried out at HRRH located in Hoima District, Western Uganda. Hoima RRH was a government hospital with specialized clinics including the ANC/MCH among others. It also comprises inpatient departments like the surgical, medical, pediatrics, and private wards. Most of the people in Hoima district are peasant farmers and the majority of the people in HRRH are from the catchment areas of Bulisa, Kibaale, Kiryandongo, and Kagadi. Kakumiro, Kikuube, Masindi and Hoima city. They live in semi-permanent houses. The investigator chose Hoima RRH since the healthcare workers do not know her and may easily disclose the related information and most of the

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staff of Hoima RRH speak the same language as that of the investigator.

Study Population

The study was done among health workers in HRRH who were present during the time of the study. Health workers had been chosen as a study population because they are in direct contact with patients which put them at risk of contracting HIV. Nurses, laboratory personnel, and doctors have been considered because according to ILO Report [13], they were the most affected health workers taking up to 80% of all HIV infections following exposure among health workers.

Sample Size Determination

The sample size was determined using Fishers *et al.*, 2003 formula given by the method below, $n = z^2pq/d^2$

Where

n= minimum sample size

d=margin of error

z=standard normal deviation corresponding to 1.96

p= existing prevalence in mid-western Uganda, 7.0 % KP of health workers on PEP (UDHS [12]).

q=1-p

Therefore, taking

$p = 2.8 / 100 = 0.07$ (Uganda Demographic Health Survey [12]) $z = 1.96$

$q = 1 - p = 0.93$

d= 5% or 0.05

$$n = \frac{1.96^2 \times 0.07 \times 0.93}{0.05^2}$$

n= 100 respondents were interviewed

The sampling method

The study was carried out among health workers at HRRH in which a convenient method of sampling was employed. Convenient is a non-probability sampling method that entails using the most conveniently available subjects.

Inclusion Criteria

The study included all health workers of HRRH who had consented to take part in the study.

Exclusion Criteria

Health workers who refused to consent were excluded from the study. Health workers who were very busy such as in theatre were excluded.

Dependent variables

Dependent variables are factors that are described PEP utilization among health workers, and these are practices, (having used PEP, reasons for using PEP, or having to finish the prescribed dose).

Independent variable

Independent variables are those parameters that describe the knowledge, and its interaction that leads to poor or good PEP utilization, this is basically knowledge, (knowing what PEP is, when to seek PEP, and knowledge on side effects).

Research Instruments

A semi-structured questionnaire containing bio-data of the respondents and questions assessing the knowledge, practices of health workers were used. The research formulated multiple-choice questions in the form of a structured questionnaire. Open-ended and close-ended structured questionnaires were administered to subjects, where a set of questions were used and respondents answered them in writing.

Data Analysis

Data was collected manually, tallied, and grouped in the form of tables as found applicable and appropriate. Also, the acquired results were analyzed by Microsoft Excel and Statistical Package for Social Science (SPSS) and then eventually presented using tables, bar graphs, and pie charts.

RESULTS

Table 1: Proportion of using PEP among health workers.

Variable	Frequency (N=100)	Percentage
Ever used PEP	16	16%
Never used PEP	84	84%

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From the study, the health workers were asked who of them had ever used PEP, and which majority 84(84%) said they had never used PEP in their practice while at least 16(16%) health workers have ever used PEP.

Table 2: Knowledge of the respondents on PEP

Variable (About PEP)	Used PEP n=16		Never used PEP n=84		OR (95%CI)	P-value
	Freq.	Per cent	Freq.	Per cent		
Have you ever heard of PEP?						
Yes	16	100.0	80	95.2	0.51(0.04-2.36)	
No	00	0.0	00	0.0	Ref.	
Rarely	00	0.0	04	4.8	0.77(0.06-7.43)	0.701
How PEP works						
Prevent HIV infection	14	87.5	78	92.9	0.08(0.13-1.80)	
Treat HIV	02	12.5	06	7.1	Ref.	
I don't know	00	0.0	00	0.0	0.77(1.40-3.55)	0.019
Use of PEP						
Psychological support	02	12.5	6	7.1	0.22(0.28-4.78)	
Protective against HIV	14	87.5	78	92.9	0.04(0.67-8.00)	0.004
I don't know	00	0.00	00	0.0	Ref.	
Reasons for you using PEP						
Needle prick injuries	12	75.0	74	88.1	0.09(0.05-1.76)	0.003
Patient's body fluids	04	25.0	10	11.9	0.55(0.14-6.85)	
I don't know	00	0.0	00	0.0	Ref.	
About PEP						
A combination of drugs	13	81.2	74	88.1	0.10(1.82-5.33)	
Single drug	02	12.5	06	7.1	Ref.	
I don't know	01	6.3	04	4.8	0.83(3.41-8.12)	0.082
Time duration of PEP						
One week	00	0.0	02	2.4	0.29(0.54-3.25)	
One month	16	100.0	76	90.5	Ref.	
I don't know	00	0.0	06	7.1	0.18(0.92-2.65)	0.002

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From the study, the health workers were asked if they had ever heard about PEP and all of them agreed having heard about it, and when they were asked about its working modality only 2(12.5%) of those who had used PEP, the study established that having heard about PEP and knowing how it works did not significantly correlate into using PEP at p-values of 0.701 and 0.019 respectively. The health workers were asked what they knew about the importance of PEP in regard to HIV management, only 2(12.5%) of those who have ever used it and 6(7.1%); who had never used PEP thought it was psychological support. The study established that having knowledge of the use of PEP significantly influenced one to use PEP, at an odds ratio of 0.04(0.67-8.00 and p-value of 0.004). The health workers were asked for reasons for seeking PEP, and all the health workers gave at least various reasons for using PEP, majority of the health workers who had ever used PEP and those who had never used PEP, identified needle prick injuries as a reason for PEP use, the study showed that, having knowledge on the reason for using was a significant correlate to using PEP with an odd ratio of 0.09(0.05-1.76 and p-value of 0.003). The study indicated that having knowledge of PEP composition was not a significant factor in using it, with an odds ratio of 0.83(3.41-8.12 and a p-value of 0.082). The health workers were asked about the time duration for the administration of PEP, all the health workers who had used PEP before knew it was one month, the majority of those who had never used PEP said it was for one month and at least 6(7.1%) didn't know the exact time for PEP use. The study established that having knowledge of duration for PEP use correlated with one using it, at an odds ratio, of 0.18(0.92-2.65 and p-value 0.002).

Table 3: Practices of health workers on PEP

	Used PEP (n=16)		Never used PEP (n=84)		OR (95%CI)	p-value
	Freq.	Per cent	Freq.	Per cent		
How often have you used PEP?						
Once	13	81.3	-	-	Ref	0.000
More than once	03	18.7			0.28(3.92-14.11)	
Reasons for your PEP						
Needle prick	14	87.5	-	-	0.52(0.18-8.11)	0.000
Fluid splash	02	12.5			Ref	
Can you use PEP now?						
Yes	16	100	70	83.3	5.18(0.14-6.24)	0.003
No	00	0.0	14	16.7	Ref	
PEP availability						
Always available	12	75.0	60	71.4	1.88(2.26-7.62)	0.002
Rarely available	04	25.0	24	28.6	Ref	
Side effects occurred						
Yes	06	37.5	-	-	0.77(0.35-1.51)	0.000
No	10	62.5			Ref	

The health workers were asked how often they had used PEP, majority 13(81.3%) said they had used it once, while only 3(18.7%) said more than once, the majority of reasons identified for using PEP was needle prick injuries 14(87.5%) The participants were assessed if they were willing to take on PEP if there was a need, and all those who had previously used PEP were willing to use it again, the study showed that having used PEP previously was significant to using it again, more than those who had not used it, with the odd ratio of 5.18(0.14-6.24) and p-value of 0.003. The health workers were asked about the availability of PEP, majority of those who had used PEP said that PEP was always available while at least 24(28.6%) of those who had not used PEP said it was rarely available, the study established that availability of PEP was a significant factor to using PEP at an odds ratio 1.88(2.26-7.62) and p-value 0.002. The health workers were asked if they developed any side effects after using PEP in which the majority 10(62.5%) had not experienced any side effects while at least 6(37.5%) experienced side effects.

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DISCUSSION

The proportion of health workers who had ever used PEP

From the study, the health workers were asked which of them had ever used PEP, and which majority 84(84%) said they had never used PEP in their practice while at least 16(16%) health workers have ever used PEP, the study shows a low PEP usage percentage of only 16%, this could be because most might not have been exposed and therefore no need for PEP or declining to use it, even after exposure. When compared with other studies, the study by Guadalupe *et al.* [14], showed that Post Exposure Prophylaxis (PEP) among health workers had been recommended extensively in the context of risky exposures in healthcare settings, and there is a need to protect healthcare workers from acquiring HIV through the administration of PEP for those accidentally exposed. Page | 76

Knowledge of PEP usage among health workers

In the study, the health workers were asked if they had ever heard about PEP and all of them agreed having heard about it, the study, therefore, shows that all the participants had heard about PEP, and when they were asked about its working modality only 2(12.5%) of those who had used PEP, and 6(7.1%) of those who never used PEP, referred to it as treatment for HIV, the majority of those who had used PEP and those who had never defined it as a prevention against HIV establishment, the study established that having heard about PEP and knowing how it works did not significantly correlate into using PEP at p-values of 0.701 and 0.019 respectively, all the health workers having heard about PEP is attributed to the fact that they have heard about it from training, colleagues and their own practice. The health workers were asked what they knew about the importance of PEP in regards to HIV management, the majority 14(87.5%) of those who had used PEP and those 78(92.9%) who had never used PEP knew it was used as a protection strategy against HIV, only 2(12.5%) of those who have ever used and 6(7.1%); who had never used PEP thought it was psychological support. The study established that having knowledge of the use of PEP significantly influenced one to use PEP, at an odds ratio of 0.04(0.67-8.00 and p-value of 0.004, this is because a person who has knowledge about PEP will also appreciate its need to use it in case of HIV exposure. Those who thought PEP was for psychological support could be because of having less information in regards to PEP or having encountered someone being positive even after taking PEP. There is a correlation between this study and a study by Waldo *et al.* [15] who showed that among 3% of HIV-positive midwives who reportedly got infected while on duty at Mulago Hospital between 2015 and 2017 declined to discuss PEP with their colleagues, all of them were under stress and didn't consider using PEP. This figure was much lower amongst those who get exposed at the hospital but it remains of public health significance. The health workers were asked for reasons for one to seek PEP, and all the health workers gave at least various reasons for using PEP. The majority of the health workers who had ever used PEP and those who had never used PEP identified needle prick injuries as a reason for PEP use. The study showed that having knowledge of the reason for using was a significant correlate to using PEP with an odd ratio of 0.09(0.05-1.76 and p-value of 0.003. This study shows that health workers have good knowledge of reasons for seeking PEP, which could be because of the easy access and availability of information in regard to HIV prevention and treatment. The health workers were about PEP drug composition, majority 13(81.2%) of those who ever used PEP and 74(88.1%) who had never used PEP knew it as a drug combination while at least 1(6.3%) of those who had ever used PEP and 4(4.8%) people didn't know PEP combination. The study indicated that having knowledge of PEP composition was not a significant factor in using it, with an odds ratio of 0.83(3.41-8.12 and a p-value of 0.082. The study indicated a drop in a percentage (100% to 88%) between having heard about PEP and its composition, this shows that health workers basically know PEP but don't have detailed information regarding it. The health workers were asked about the time duration for the administration of PEP, all the health workers who had used PEP before knew it was one month, the majority those who had never used PEP, said it was for one month and at least 6(7.1%) didn't know the exact time for PEP use. The study established that having knowledge of the duration for PEP use correlated with one using it, at an odds ratio, of 0.18(0.92-2.65 and p-value 0.002. All those who had used PEP knew it is taken for one month, this could be due to experience from previous usage, while 7.1% of those who didn't know could be because of having no detailed information in regards to PEP. When compared with other studies, it shows a difference from studies by Henrike *et al.* [16] who showed that regardless of having knowledge of the timing of PEP still they couldn't stick to duration, the individuals were given PEP supplies to commence immediately after exposure in which Sero- conversions occurred in significantly fewer health workers who utilized PEP i.e. 1.2% than those who did not (14%) utilize it properly.

The practice of health workers on PEP

The health workers were asked how often they had used PEP, the majority 13(81.3%) said they had used it once, while only 3(18.7%) said more than once. The majority of reasons identified for using PEP were needle prick injuries 14(87.5%), this could be because needle pricks are the commonest injuries during nursing procedures such as cannulation and other procedures such as suturing. When this study is compared with other studies, this might

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have resulted from reluctance in observing preventive measures or lack of personnel protective gear, PPEs, this study shows a correlation with a study by Waldo *et al.* [15] who cited that 7% of health workers requested a second course of non-occupational PEP during the year after the first course since they never used any protective gears during their working duties, indicating that although the majority of health workers did not contract HIV on duty, there are few of them who had observed precaution measures. The participants were assessed if they were willing to take on PEP if there was a need, and all those who had previously used PEP were willing to use it again, while at least 14(16.7%) of those who had not used PEP previously were not willing to use it. The study showed that having used PEP previously was significant to using it again, more than those who had not used it, with the odd ratio of 5.18(0.14–6.24) and p-value of 0.003. This could be because those who hadn't used it before still have a phobia related to side effects attributed to PEP. When compared with other studies, the study shows a difference from a study by [17–20] on the risk precaution measures and willingness to use PEP among health workers which showed that, 57% of HIV- positive health workers reported a previous HIV exposure on duty while working on HIV positive patients, but PEP had not been given to them in any of these situations. The health workers were asked about the availability of PEP, the majority of those who had used PEP said that PEP was always available while at least 24(28.6%) of those who had not used PEP said it was rarely available. The study established that availability of PEP was a significant factor in using PEP at an odds ratio of 1.88(2.26–7.62) and p-value of 0.002, availability of PEP helps health workers to quickly access it, some health workers may choose not to use PEP if it requires being obtained from a different location or if its time elapses. When compared with other studies, this study differs from Donnell *et al.* [8] who showed that Post-exposure prophylaxis treatment is now available in accident and emergency areas in hospitals, or HIV clinics, and via some medical doctors experienced in preventing HIV, in different countries and anybody who has been exposed to HIV is able to access the services. The health workers were asked if they developed any side effects after using PEP which majority 10(62.5%) had not experienced any side effects while at least 6(37.5%) experienced side effects, development of side effects after using PEP discourages others from using it, these can vary from mild skin manifestations to having hallucinations or other psychotic disorders. When compared with other studies, this study's results show a lower percentage as compared to studies by [18–20]. In the same study, healthcare providers in private clinics, self-reported a significant decrease in risk precaution measures in clinics that provided PEP.

CONCLUSION

The study shows that the health workers had a basic understanding in regards to PEP, (all having heard about PEP and reasons for its administration), but some lacked detailed knowledge (7.1% not knowing its duration) on PEP usage, there was a low practice as pertains to PEP usage 16% among health workers.

RECOMMENDATION

There is a need for continuous medical education (CMEs) among health workers to appreciate the use of PEP in case they get exposed. PEP should be availed to all health facilities such that health workers can easily access it in case, there is a need. More studies need to be done, to ascertain factors that make health workers have low practice use of PEP.

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