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# Patterns and Determinants of HIV Postexposure Prophylaxis in a Tertiary Health Facility in Nigeria

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## Abstract

**Background:** One of the targets of HIV prevention strategy is to ensure that 95% of the population access prevention services by 2030 with the aspiration of ending the AIDS epidemic by 2030.

**Methods:** This is a record-based cross-sectional review. Data was extracted from the PEP registers and treatment folders from January 2017 to December 2021.

**Results:** Non-occupational exposure (82.5%) was reported more than occupational (17.5%). Majority of cases (442) resulted from rape. Only 9.1% of the clients returned for follow-up and all were negative.

**Conclusion:** Behavioral interventions designed to promote HIV risk reduction and protective behaviors should be promoted.

**Keywords:** Post exposure prophylaxis, Occupational exposure, Non-occupational exposure

## 1. Introduction

Human immunodeficiency virus (HIV) has continued to be of major public health concern globally with 38 million people living with HIV (PLHIV) at the end of 2019, 67.8% of which were recorded in Africa [1,2]. Even with interventions in place to close the gap in HIV service delivery, 1.7 million new infections were still recorded globally while 690,000 HIV-related deaths were reported in 2019 [2,3]. However, with immense efforts by international and national HIV programmes, there has been a 39% decrease in new infections between 2000 and 2019 and 15.3 million lives saved due to antiretroviral therapy (ART) [3]. Based on the 2018 Nigeria National HIV/AIDS Indicator and Impact Survey (NAIIS), a national prevalence of 1.4% was recorded bringing the total number of PLHIV in

Nigeria to 1.9 million among persons aged 15–64 years with 130,000 new infections in 2019 [4,5].

Post-exposure prophylaxis (PEP) is the most effective method of preventing infection in an uninfected person after a recent potential exposure to the virus. Accidental exposure to HIV can occur among healthcare workers (HCWs) as an occupational hazard or outside the healthcare settings through sexual contacts, sharing needles, syringes, or other equipment to inject drugs [3,6]. PEP involves the use of anti-retroviral (ARV) medications, commenced immediately after contact with the potentially infective viral contaminant, preferably within 72 h of the event and maintained for 28 days [3,7,8]. Timing of commencement of PEP, as well as optimal adherence to the 28-day course of the ARVs, determines the outcome of the prophylaxis [3]. This is aimed at inhibiting the replication of the viral particles in the initial inoculum so as to terminate

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the eventual establishment of the disease which may progress to chronic HIV infection [7].

In the health sector, PEP is recommended as a part of the universal precautions to reduce exposure of HCWs to infectious agents at work [3]. However, evaluating the exposed HCW's eligibility for PEP involves assessing the timing of the potential exposure, HIV status of the exposed and source; nature and risk of the exposure [8]. Its use as a universal precaution was informed by the efficacy of PEP in reducing the odds of HIV infection by over 80% in a case–control study after PEP was initiated timely and completed in HCWs who sustained needle stick injuries [3,7,9,10]. Finding from recent retrospective studies following occupational exposure among HCWs reported no seroconversion [11]. Varying degrees of seroconversion has been recorded with non-occupational events occurring as a result of sexual or non-occupational routes in the United States and the rate of seroconversion was dependent on the average time from exposure to first PEP medication dose as well as completion of prescribed regimen [11].

The target of the 2016 United Nations Political Declaration on ending HIV/AIDS was to reduce new HIV infections from over 1.8 million in 2016 to less than 500,000 by 2020 [12]. In the United States, achieving this also means saving the lifetime medical costs for each unit of HIV infection averted by \$229,800 [13]. One of the targets of the prevention strategy outlined in the National HIV and AIDS Strategic Framework is to ensure that 95% of the population including vulnerable and key groups' access combination prevention services by 2030 with the aspiration of ending the AIDS epidemic by 2030 [13,14]. Research has shown that uptake of this preventive measure is yet to be maximized as only 57% of people who initiated PEP completed the full course and this rate is even lower among sexual assault victims where only 40% completed the course [3]. Several challenges have been noted in different climes to militate against timely access to PEP. In sub-Saharan Africa, factors affecting PEP services in Kenya, Nigeria and Uganda include lack of defined protocol, limited compliance and limited access to ARVS [15–17]. Overcoming these challenges will increase availability and accessibility to the PEP recommended regimen.

Despite the global and national commitments in closing the gap in HIV prevention in recent years, new infections among adults are yet to decrease substantially. Although the prevalence of HIV is decreasing in Nigeria, Enugu state is one of the states with the highest prevalence of HIV in Nigeria with a prevalence of 2.1% based on the recent

NAIIC report [5]. this is worrisome as it denotes a gap in HIV services in the state. Our study set out to assess the pattern and determinants of PEP in Enugu state as this is pivotal in reducing the incidence of HIV in the state. There is a dearth of literature on PEP in this region as the most recent data on PEP in Enugu was more than ten years ago. Findings will provide data that will offer a direction on effective planning and health policy initiatives to achieve the prevention targets.

## 2. Methodology

### 2.1. Study setting

The study area is Enugu state, one of the South-eastern states in Nigeria. ART programme was introduced in the state in 2004. ART services are provided across selected comprehensive and tertiary health facilities in the state with support from the Presidential Emergency Plan for AIDS Relief (PERP-FAR) agencies in partnership with the State Ministry of Health. The study setting is Enugu State University Teaching Hospital (ESUTH), one of the tertiary health facilities in Enugu State. The ART services offered include HIV counseling and testing (HCT), prevention of mother-to-child transmission, provision of Highly Active Anti-retroviral Therapy medications (HAART) and management of Pre and Post-exposure to HIV. ESUTH is located at the heart of the city and is accessible to the populace, hence the large patient load recorded on a daily basis. Both occupational and non-occupational exposures to HIV are managed within the facility. Cases of assault from individuals, the police, and a non-governmental organization; TAMAR Sexual Assault Referral Centre (TAMAR-SAC) are also managed in the hospital. There are laws that prohibit sexual assault and rape in Nigeria; the Criminal Code, the Penal Code, the Violence against Persons (Prohibition) Act of 2015 and the Child Rights Act. The minimum punishment for rape in Nigeria is 12 years imprisonment without fine and the maximum punishment is life imprisonment.

### 2.2. Study design and population

This is a cross-sectional review of records of clients who received PEP at the Anti-retroviral clinic of Enugu State University Teaching Hospital (ESUTH) Enugu. Records of all clients that reported to the clinic from 2017 to 2021 were included in the study. Records having incomplete medical data were however excluded from the study.

PEP services in ESUTH are available 24 h daily, during and outside clinic hours. The services are free

and readily available for all individuals with an exposure that has the potential for HIV transmission (for both occupational and non-occupational exposures). However, due to the high risk of HIV following occupational exposure, especially following a needle-stick injury or mucosal exposure, the National guideline recommends that exposed HCWs do not squeeze, suck or rub the injury site, allow free flow of blood or secretion, wash the exposed area immediately with soap and running water or antiseptic solutions before presenting for PEP [8].

Based on the National Guidelines, a three-drug ARV regimen comprising of: Tenofovir combined with either lamivudine (3 TC) or emtricitabine (FTC) and dolutegravir (DTG) or efavirenz (EFV) is the recommended PEP regimen for adults or children above 30 kg; while zidovudine (AZT), lamivudine (3 TC) and DTG are backbone drugs for children aged 10 years and below or weighing less than 30 kg [8,18]. Exposed clients receive HCT first before PEP services are rendered. The Guideline recommends that eligible clients are tested for HIV-1 and 2 antibodies, HBV, HCV and other tests such as full blood count, liver function test and renal function test at baseline [8]. Repeat visit is recommended at two weeks to assess organ functions, at six weeks, 3 months and 6 months for repeat HIV screening [8]. This is to assess the level of adherence to ARV, side-effects to the drugs and also ascertain the efficacy of the PEP in preventing sero conversion in exposed clients. Clients having negative HIV results at baseline qualify for PEP otherwise they are enrolled into ART services. PEP is not recommended when the risk of HIV transmission is negligible or when patients' requests came more than 72 h after a considerable exposure [9,18]. It is recommended that sexually assaulted clients receive psychosocial, mental and legal support and also be assessed for sexually transmitted infections (STIs) [8]. Emergency contraceptives are provided for the female victims where necessary.

### 2.3. Data collection and analysis

Data were extracted from the 2016 revised version of the National PEP register and treatment folders of all clients who received PEP within the facility from January 2017 to December 2021. The incidence of PEP and factors associated with exposure to the virus with reference to age, gender, mode of exposure and time of presentation were assessed. The mode of exposure was categorized into occupational and non-occupational exposure. While occupational exposures are reported in persons with possible HIV exposures occurring in health care settings to

blood, genital secretions, or other potentially infectious body fluids that might contain HIV, non-occupational exposures are for persons with isolated exposure outside health care settings [8]. Duration before PEP was provided was categorized into four; less than 24 h, less than 48 h, less than 72 h and more than 72 h. Based on the fact that PEP is best achieved when persons seek care within 72 h after potential exposure, the time of presentation was further categorized into an early presentation (within 72 h) and a late presentation (after 72 h).

Data collected from 674 clients were analysed using the Statistical Package for Social Sciences (SPSS) version 22. Descriptive statistics were presented as frequencies, percentages, mean and standard deviation. Pearson Chi-square test of statistical significance and student t-test was used to determine the association between the socio-demographic variables and the categorical variables. The level of statistical significance was set at a predetermined p-value of <0.05. Variables that had a p value of <0.2 in the bivariate analysis, were entered into the logistic regression model to determine the outcome variables. Results were reported using Odds ratio, Confidence Interval at 95% and level of significance was also set at <0.05.

Ethical approval with the reference number – ESUTHP/C-MAC/RA/034/VOL.2/28 was obtained from the Health Research Ethics Committee of Enugu State University Teaching Hospital, ESUTH.

### 3. Results

Out of the data of 692 clients that received PEP after testing negative for HIV within the 5-year study period in the facility, 674 records had complete data. Two out of the clients tested positive at baseline screening and were linked to care. The mean age of the clients was  $23.2 \pm 10.1$ . Almost half the clients were within the age range of 16–25 years. Among the clients who presented for PEP, majority were females (76.6%) (Table 1).

Table 1. Socio-Demographics of exposed clients that presented for PEP.

Variable	Frequency (N = 674)	Percentage (%)
Age		
Mean $\pm$ (SD)	23.2 $\pm$ 10.1	
Age in groups		
≤5 years	22	3.3
6–15 years	106	15.7
16–25 years	325	48.2
26–35 years	148	22.0
≥36 years	73	10.8
Sex		
Male	158	23.4
Female	516	76.6

Incidence of PEP occurred most (25.4%) in 2019. Non-occupational exposure 556 (82.5%) was recorded more than occupational (17.5%). Of the 118 HCWs that presented due to occupational exposures, 94.1% presented after a needle stick/sharp exposure and 3.4% after mucosal exposure. Forced sexual intercourse (79.5%) was the commonest form of non-occupational exposure recorded in this study. Majority of the clients (44.1%) presented less than 48 h after exposure for PEP while 35 (5.2%) presented more than 72 h after exposure. Only 61 clients returned for follow-up visits; 55.7% at first visit, 37.7% at second visit and 6.6% at third visit (Table 2).

Table 3 shows the factors associated with sex of exposed clients presenting for PEP. A significantly higher proportion of clients less than 15 years were females when compared with those more than 15 years ( $p < 0.001$ ). Clients more than 15 years were about 4 times more likely to be females than those less than 15 years (AOR: 4.183; 95% CI: 2.049–8.538). Occupational exposure and non-occupational exposure occurred more among the females clients than their male counterparts and this finding is statistically significant ( $p = 0.007$ ). Clients that presented with non-occupational exposure had about two times the odds of being females when compared with those with occupational exposure

Table 2. Patterns of exposure.

Variable	Frequency (N = 674)	Percentage (%)
<b>Year of Exposure</b>		
2017	104	15.4
2018	97	14.4
2019	171	25.4
2020	159	23.6
2021	143	21.2
<b>Mode of Exposure</b>		
Occupational Exposure	118	17.5
Non-Occupational Exposure	556	82.5
<b>Occupational Exposure</b> n = 118		
Needle stick/sharp	111	94.1
Mucosal exposure	4	3.4
Exposure to broken skin	3	2.5
<b>Non-Occupational Exposure</b> n = 556		
Forced sexual intercourse	442	79.5
Consensual sexual intercourse	67	12.1
Non-sexual (accident, domestic injuries)	47	8.5
<b>Timing of PEP</b> n = 674		
<24 h	222	32.9
<48 h	297	44.1
<72 h	120	17.8
>72 h	35	5.2
<b>Follow up visits</b> n = 61		
First visit	34	55.7
Second visit	23	37.7
Third visit	4	6.6

(AOR: 0.502; 95% CI: 0.326–0.773). Also, a significantly higher proportion of the female clients were sexually assaulted (92.1%) when compared to their male counterparts in this study ( $p < 0.001$ ) (Table 3).

Table 4 shows the factors associated with time of presentation for PEP. Though not significant at bivariate ( $p = 0.063$ ), clients presenting for PEP in 2020 were about three times more likely to present late for their PEP when compared with those that presented in 2017 (AOR: 3.169; 95% CI: 1.025–9.802) (Table 4).

#### 4. Discussions

In the present study, only 61 clients returned for follow-up visits after 3 months and all were HIV negative. This finding reveals an improvement as studies carried out in this setting several years ago reported zero follow-up visits after being placed on PEP [19,20]. This is bothersome as these clients were supposed to have received HCT services which include counseling on the importance of follow up assessments. Findings from a 16-year systematic review on HIV non-occupational PEP reveal that follow up visits after PEP is generally low (0%–2%) [13]. HIV prophylaxis is eminently associated with the occurrence of serious adverse effects from the short-term use of antiretroviral medications by otherwise healthy persons without HIV infection, and potential infection with drug-resistant strains of the virus [9]. This could explain the loss to attrition reported in these studies. This is nevertheless worrisome as cases of sero-conversion after completion of PEP has been reported; hence the need for the clients to be certain of their status after the three months window period as literature has shown that PEP does not provide 100% protection after exposure [21]. Contrary to these findings, a higher proportion of clients returned for follow-up as reported in other studies with one Nigerian study reporting as high as 83.3% follow up to the 6th month [9,22]. The high rate of return for follow up appointments recorded in these studies could have resulted from additional efforts made by the HCWs to reach out to the patients in the course of routine clinic tracking through phone calls to ensure to turn up for their visits. Such efforts have been successful in improving adherence and retention in patients on ART [23].

Needlestick injuries are major risks for HIV transmission in the healthcare setting [8]. The commonest route of exposure among HCWs in this study is through a needle stick/sharp exposure (93.2%). A high prevalence of needle/sharp exposures has been recorded in occupational exposures in previous studies [19,24]. The risk of transmission is significantly increased if the injury is deep, blood is visible on the sharp instrument, procedures involving a

Table 3. Factors associated with the sex of exposed clients presenting for PEP.

Variable	Male N = 158	Female N = 516	p-value*	AOR[95% CI]
<b>Age in groups</b>				
≤15 years	9 (7.0)	119 (93.0)	<0.001	1
>15 years	149 (27.3)	397 (72.7)		4.183[2.049–8.538]
<b>Yearly distribution of clients</b>				
2017	24 (23.1)	80 (76.9)	0.417	NA
2018	26 (26.8)	71 (73.2)		
2019	32 (18.7)	139 (81.3)		
2020	37 (23.3)	122 (76.7)		
2021	39 (27.3)	104 (72.7)		
<b>Mode of Exposure</b>				
Occupational Exposure	46 (39.0)	72 (61.0)	<0.001	1
Non-Occupational Exposure	112 (20.1)	444 (79.9)		0.502[0.326–0.773]
<b>Occupational Exposure (n = 118)</b>				
Needle stick/sharp	42 (37.8)	69 (62.2)	0.540	NA
Mucosal exposure	2 (50.0)	2 (50.0)		
Exposure to broken skin	2 (66.7)	1 (33.3)		
<b>Non-Occupational Exposure (n = 556)</b>				
Forced sexual intercourse	35 (7.9)	407 (92.1)	<0.001	NA
Consensual sexual intercourse	45 (67.2)	22 (32.8)		
Non-sexual (accident, domestic injuries)	32 (68.1)	15 (31.9)		
<b>Timing of PEP**</b>				
Early presentation	154 (24.1)	485 (75.9)	0.085	1
Late presentation	4 (11.4)	31 (88.6)		0.432[0.148–1.262]

\*p-value on bivariate.

NA –Not applicable (as only variables with p-value<0.2 at bivariate were logged into multiple logistic regression model) \*\*Timing before PEP was categorized into 2; Early presentation within 72 h after exposure, Late presentation after 72 hours

needle placed in the patient's blood vessel, in virally unsuppressed and terminally ill patients [8]. Needles and sharps, having the ability to penetrate personal protective equipment easily when not handled safely increases the risk associated with this form of occupational exposure. Exposure to the mucosal membrane and broken skin may also pose the risk of HIV transmission to HCWs and is recommended for PEP especially when the source is known to be positive.

The commonest route of exposure to HIV in this setting is through non-occupational means; with forced sexual intercourse accounting for more than two-thirds (80.9%) of the cases. High rates of exposure from sexual assault have been reported in other studies within Nigeria and other African countries [13,19,25,26]. This high prevalence could be attributed to the fact that most victims of forced sexual intercourse are females [13,25]. Women and girls being vulnerable are at greater risk and are generally less able to avoid or escape abuse [27,28]. Approximately one in three women and girls worldwide will experience physical or sexual violence in their lifetime [29–31]. In Nigeria, the National Rape Incidence for

women and girls reveals that the incidence of rape is on an increasing trend in the country [32]. Forced sexual intercourse is often associated with physical trauma and genital trauma leading to inflammation of the affected regions [13]. Inflammation in the mucous membrane of female genitalia can increase the risk of HIV transmission among females. This is of great concern as abused women due to socio-cultural barriers; stigma and discrimination rarely present to the health facilities for care; even when they do, they report late. Hence a majority of these victims are likely to come down with STDs including HIV. It is therefore not surprising that HIV prevalence has remained higher among females in Nigeria over the years [2,5,13].

The most effective methods for preventing HIV infection are those that protect against exposure. However, it is surprising that some clients still expose themselves to HIV through consensual sexual activity. Accessing PEP after consensual sexual intercourse was reported in 12.1% of the clients. Persons engaging in this may rely solely on PEP instead of adopting more long-term risk-reduction

Table 4. Factors associated with the time of presentation of exposed clients presenting for PEP.

Variable	Timing of PEP		p-value	AOR[95% CI]
	Early presentation N = 639	Late presentation N = 35		
<b>Age in groups</b>				
≤15 years	120 (93.8)	8 (6.3)	0.549	NA
>15 years	519 (95.1)	27 (4.9)		
<b>Sex</b>				
Male	154 (97.5)	4 (2.5)	0.085	1 0.431[0.149–1.248]
Female	485 (94.0)	31 (6.0)		
<b>Yearly distribution of clients</b>				
2017	97 (93.3)	7 (6.7)	0.063	1 2.446[0.695–8.603] 1.887[0.492–7.228] 3.169[1.025–9.802] 0.873[0.214–3.562]
2018	92 (94.8)	5 (5.2)		
2019	156 (91.2)	15 (8.8)		
2020	155 (97.5)	4 (2.5)		
2021	139 (97.2)	4 (2.8)		
<b>Mode of Exposure</b>				
Occupational Exposure	114 (96.6)	4 (3.4)	0.331	NA
Non-Occupational Exposure	525 (94.4)	31 (5.6)		
<b>Occupational Exposure (n = 118)</b>				
Needle stick/sharp	107 (96.4)	4 (3.6)	0.780	NA
Mucosal exposure	4 (100.0)	0 (0)		
Exposure to broken skin	3 (100.0)	0 (0)		
<b>Non-Occupational Exposure (n = 556)</b>				
Forced sexual intercourse	415 (93.9)	27 (6.1)	0.492	NA
Consensual sexual intercourse	65 (97.0)	2 (3.0)		
Non-sexual (accident, domestic injuries)	45 (95.7)	2 (4.3)		

\*p-value on bivariate.

NA –Not applicable (as only variables with p-value<0.2 at bivariate were logged into multiple logistic regression model) \*\*Timing before PEP was categorized into 2; Early presentation within 72 h after exposure, Late presentation after 72 hours

behaviors such as safer sexual practices. A higher prevalence of unprotected consensual intercourse with HIV-infected partners among users of PEP has been reported in an Australian study resulting in a greater likelihood of HIV sero-conversion even after completion of the PEP [21]. The highest level of risk to HIV is associated with exposure to potentially infected body fluids from persons known to be HIV positive, particularly those not on ARVs [9]. These clients on PEP, perceiving high effectiveness of PEP have a sense of protection thereby resulting in their throwing caution to the wind. This has also been demonstrated in other studies [33,34]. Continuous provision of PEP based on a consensual basis is not encouraged in the facility. Through enhanced counseling, they are encouraged to maintain effective risk-reduction behaviors such as the correct and consistent use of condoms to support other risk-reduction strategies. On the other hand, it is recommended that persons who engage in frequent recurrent exposures like HIV-discordant sex partners are considered for Pre-exposure prophylaxis.

PEP is most effective when initiated as soon as possible after a potential exposure; the earlier the commencement of the ARV, the better the outcome. Clients are known to present to health facilities for PEP at various time intervals; while some report early

enough, others report later than 72 h after exposure. In this study, 32.9% of the clients presented within 24 h of exposure. This is less than 50% reported by Onyedum et al. in Enugu, Nigeria [19]. Only 5.2% of the patients presented for PEP later than 72 h after exposure, which is similar to 8.6% recorded in another study [19]. The delay could have been a factor of poor awareness of the need and availability of PEP services. Due to the non-availability of PEP services in the primary health care centers which are usually the first port of call for health care service delivery in our setting, clients can present late for their PEP. Besides, sexual assault being the commonest reason for non-occupational exposures could have left the victims traumatized, depressed or worried about confidentiality; thereby reducing the desire to seek care immediately [13]. Cultural attitudes and values of this society pay little attention to the rape victim's trauma and in some cases makes excuses for rape. Moreover, the stigma and discrimination attached to being diagnosed with HIV/AIDS in this setting are high as HIV, primarily transmitted through sexual intercourse is associated with promiscuity and unfaithfulness [35]. This is worrisome as PEP is unlikely to be effective when commenced more than 72 h after exposure; therefore such clients are not offered PEP as specified in the national guideline.

Younger females were more likely to present for PEP than males. This corroborates the finding that the highest proportion of exposures occurred as a result of forced exposure in women. Women generally are vulnerable and are more likely to be sexually abused by the opposite sex invariably exposing the gender inequalities which exist especially in this clime. The patriarchal cultural setting also predisposes females to different forms of abuse. In a Cameroonian study, findings reveal that the most frequent indication for assessing PEP was due to sexual assault or gender-based violence (75%) [36]. This is of grave concern as, despite research pointing to the efficiency of PEP in the prevention of HIV transmission, many sub-Saharan countries still experience challenges implementing PEP programs [13,36]. This is worsened by poor knowledge on HIV transmission especially among the young people thereby exacerbating their vulnerability to HIV [13,36].

Clients who presented in 2020 were more likely to present later than others. This finding could be attributed to interruptions in assessing health care reported across the globe when the novel COVID-19 outbreak was declared a Public Health Emergency of International Concern pandemic in 2020. In response to increasing spread of COVID-19 infections and deaths, governments across the globe adopted some containment measures such as social distancing, “lockdowns” (including restrictions on non-essential travels, closing schools and non-essential work), and quarantine of suspected cases [37]. With these restrictions in place, more cases of forced sexual intercourse were expected though the means of reporting to the health facility to assess care could have been a major deterrent.

A higher proportion of clients occupationally exposed presented earlier than those whose exposures were non-occupationally related. This is not surprising as the proximity of the HCWs to the ART clinic is expected to be a determinant for early presentation. Also, those within the hospital community are expected to have better knowledge of the benefits, access and availability of PEP services than others. Occasionally the HCWs are aware of the HIV status of their sources, and even when not available, are aware that sero-conversion could occur within days or months after an otherwise HIV negative result depending on the window period of contact at presentation. Consequently, it is safer to assume everyone is positive irrespective of their current result. This supposition could have given rise to the desire to seek care without delay.

Being a retrospective study, incomplete documentation on the caliber of HCWs that received PEP was a major limitation. Also based on the

substantial number of clients’ loss to follow up after completion of PEP in this study, the level of adherence to PEP or side-effects of the medication could not be determined. Similarly, the overall efficacy of the PEP could not be ascertained as there was no record of the rate of sero-conversion in a considerable number of the clients.

## 5. Conclusion

HIV PEP recorded in this health facility involved both occupational and non-occupational exposures. The majority of clients presenting for PEP were young people and females. Needles stick injuries were the commonest forms of occupational exposure while forced sexual contact was the most reported form of non-occupational exposure. Late presentation for assessing PEP was recorded in 35 clients. The government and stakeholders need to create more awareness on the need for early presentation for PEP services. Counseling sessions should be intensified to ensure clients are fully informed on the benefits of following up re-testing after exposure. Antiretroviral therapy cannot replace behaviors that help avoid HIV exposure hence consensual sexual intercourse or activities that expose clients to HIV should be discouraged. Clients should be encouraged to adopt risk-reduction behaviors. Based on the reported prevalence of forced sexual assault against females, more action is needed to protect and eliminate violence against women and girls in our setting as sexual violence can pose a threat to them psychologically especially when there is no care and support from friends, family and HCWs. Evidence-based age-appropriate behavioral interventions including a range of behavior change communication activities designed to promote HIV risk reduction and protective behaviors should be promoted. Cultural values and norms that uphold and tolerate rape should be abolished. Deliberate actions and commitments should be taken by the government to ensure the implementation of existing policies and laws addressing stigma and discrimination, legal and human rights violations, gender-based violence and inequality.

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## Conflict of interest

The authors declare no conflicts of interest.

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