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ORIGINAL ARTICLE

# Post exposure prophylaxis uptake against exposure to HIV/AIDS risk factors in healthcare settings was very low

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## Abstract

On the already limited human resource capacity in health care workforce, HIV is also causing loss of health professionals. Africa, in particular, faces the loss of vast number of educated health care workers. Given the pivotal role of frontline health care workers in resource constrained countries, the potential loss of this number of health care workers each year is a serious problem that needs urgent attention. The aim of this study was to evaluate post-exposure prophylaxis utilization against exposure to HIV/AIDS risk factors among health care workers in Gondar city, Northwest Ethiopia. Institution based quantitative cross-sectional study was conducted from May 5-26, 2014 in one referral hospital and three health centres in Gondar city. A total of 162 health care workers having history of occupational exposure to HIV/AIDS risk factors within the last one year were selected through simple random sampling method. Data collected by interviewing health care workers were entered using EPI INFO version 3.5.3 statistical software and exported to and analyzed using SPSS version 20.0. From a total of 162 health care workers having occupational exposure to HIV/AIDS risk factors, only 41 (25.3%) received post exposure prophylaxis. Gender, reporting occupational exposure and drinking alcohol were significant factors associated with post exposure prophylaxis uptake by health care workers having one year history of accidental occupational exposure to HIV/AIDS risk factors.

The great majority of health care workers fail to utilize HIV post exposure prophylaxis following accidental exposure to HIV/AIDS risk factors, which leads to a high occupational risk of HIV/AIDS infection. Thus, there is a need for provision of training on infection prevention and development of guidelines outlining reporting mechanism and procedure to be followed for post exposure prophylaxis and follow-up testing.

**Keywords:** Anti-HIV agents; Postexposure prophylaxis; Acquired immunodeficiency syndrome prevention and control; Risk factors; Health personnel.

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## Introduction

It is estimated that worldwide, about 35 million healthcare worker (HCWs) provide services to patients.[1] However, occupational exposure to blood or other body fluids in healthcare facilities constitutes a significant risk of transmission of HIV and other blood borne pathogens to HCWs. HIV/AIDS in particular is a major threat in the workplace.[2] Each day thousands of HCWs around the world suffer accidental occupational exposures during the course of their role of caring for patients. These exposures can result in a variety of serious and distressing consequences ranging from tremendous anxiety to chronic illness and premature death for the individual involved that can have a negative impact not only on the HCWs, but also their families and colleagues.[3]

It is further estimated that through occupational exposure, 0.5% of HCWs are exposed to HIV annually and this equates to approximately 200-600 HIV infections worldwide.[4] On the already limited human resource capacity in health care workforce, HIV is also causing loss of health professionals. Africa, in particular, faces the loss of vast numbers of educated health care workers.[5] While there is still a lack of hard data, anecdotal evidence suggests that, in Africa, the health systems may lose one-fifth of their employees to HIV/AIDS over the next several years.[6]

HIV/AIDS is among the top ten causes of death in developing countries, and the leading cause of death in sub-Saharan Africa.[7] While sub- Saharan Africa contains only 10% of the world's population, it accounts for more than two thirds of the world's HIV infected people.[8] Moreover, Ethiopia is one of the seriously affected countries in sub-Saharan Africa with a large number of people (approximately 800,000) that are living with HIV/AIDS and 44,751 AIDS-related deaths.[9-11] In this high HIV/AIDS prevalence environment, health care workers investigating and managing these patients are at risk of contracting HIV during the course of their duties.

In order to prevent transmission of pathogens after potential exposure and also to refer for comprehensive management to minimize the risk of infection after potential exposure to HIV, post exposure prophylaxis (PEP) is recommended.[12,13] When administered shortly following exposure, PEP has been shown to reduce the risk of HIV infection by 81%.[14] In line with this, the Ethiopian Federal Ministry of Health developed guidelines for infection prevention and PEP use (in the ART guideline) in 2004 and 2005, respectively.[15,16] Even taking into account this highly effective role of PEP, it is estimated that 1,000 HCWs are infected with HIV each year (range 200 – 5,000).[17] Given the pivotal role of frontline HCWs in resource constrained countries in expanding ART, the potential loss of this number of workers each year is a serious problem that needs urgent attention.[3] In Ethiopia, specifically in Gondar area, there is no published study showing the clear picture of PEP uptake among HCWs in health facilities. Therefore, this study was undertaken primarily to evaluate the newly developed PEP uptake status of HCWs in Gondar city, Northwest Ethiopia.

## Methods

Institution based quantitative cross-sectional study was conducted from May 5$^{th}$ to 26$^{th}$ 2014 in one referral hospital and three health centres in Gondar city, Northwest Ethiopia to evaluate PEP uptake status among HCWs exposed to HIV/AIDS risk factors. A total of 162 HCWs having history of accidental occupational exposure to HIV/AIDS risk factors within the last one year were selected by using probability simple random sampling method from the aforementioned health institutions.

Ethical clearance was obtained from Institutional Review Committee of University of Gondar. The purpose of the study was clearly explained to the study subjects and their verbal consent was obtained. Data were collected through interviewing HCWs using structured and pre-tested questionnaire. The questionnaire was constructed after a thorough review of literatures and it contained 24 questions divided into four sections (socio-demographic, PEP uptake, behavioural and working environmental characteristics/information). Before the actual data collection the questionnaire was pre-tested in 25 HCWs working in other health institution found nearby Gondar city.

One supervisor and three trained health professionals from other site other than the study area were involved in data collection. The supervisor made spot-checking and reviewing the completed questionnaires on daily

bases to ensure completeness and consistency of the information collected. After collection, data were entered into EPI INFO version 3.5.3 statistical software and exported to and analyzed using SPSS version 20.0. Descriptive statistics such as frequency tables, bar charts and summary statistics were used to examine the primary objectives. A two-tailed chi-square ($X^2$) test was done and a p-value <0.05 was considered as statistically significant.

**Exposure to HIV/AIDS risk factors** is a percutaneous injury (needle stick or a cut by sharp objects) or the contact of mucus membranes or non-intact skin with blood, tissue or other body fluids that are considered to be potentially infectious.[18,19]

## Results

### *Socio-demographic characteristics of healthcare workers*

All the selected 162 HCWs participated in this study, which forms a response rate of 100%. One hundred two (63%) of the study participants were males and the rest 60 (37%) were females. Their age ranged from 20 to 54 years with a mean (± standard deviation) age of 29 (± 5.9) years and most of them, 106 (65.4%), were in the age group 20-29 years (Table I).

### *PEP utilization behaviour of healthcare workers*

Of 162 HCWs with history of occupational exposure to HIV/AIDS risk factors, only 41 (25.3%) took PEP for their exposure against HIV/AIDS risk factors. The rest

**Table I. Socio-demographic characteristics of healthcare workers**

| Variables | Number | Percent |
|---|---|---|
| **Sex** | | |
| Male | 102 | 63 |
| Female | 60 | 37 |
| **Age Group** | | |
| 20-29 | 106 | 65.4 |
| 30-39 | 44 | 27.2 |
| 40-54 | 12 | 7.4 |
| **Religion** | | |
| Orthodox | 124 | 76.5 |
| Muslim | 20 | 12.4 |
| Protestant | 18 | 11.1 |
| **Educational level** | | |
| Not attended formal education | 8 | 4.9 |
| Elementary and high school | 8 | 4.9 |
| College and above | 146 | 90.2 |
| **Marital status** | | |
| Married | 67 | 41.3 |
| Single | 85 | 52.5 |
| Divorced | 6 | 3.7 |
| Separated | 4 | 2.5 |
| **Job category** | | |
| House keeper | 22 | 13.6 |
| Nurse | 54 | 33.3 |
| Midwifery | 20 | 12.4 |
| Health officer | 8 | 4.9 |
| Laboratorytechnologist | 14 | 8.6 |
| Anaesthetist | 10 | 6.2 |
| Physician | 34 | 21.0 |
| **Work experience in years** | | |
| <5 | 116 | 71.6 |
| 5 – 10 | 24 | 14.8 |
| >10 | 22 | 13.6 |

121 (74.7%) HCWs did not take PEP. Among those who received PEP, more than half (53.7%) were females, and 19 (46.3%) were males. Major reasons cited by HCWs for not receiving PEP following their exposure were negligence 60 (49.6%), client tested negative 38 (31.4%), lack of awareness about existence of PEP service and protocol 12 (9.9%), and considering PEP as not important 11 (9.1%).

Moreover, only one of ten and 9 (16.7%) exposed anaesthetists and nurses received PEP, respectively. Housekeepers are usually people from the lower socioeconomic groups and with low educational background; no focused programs are available to teach them the risks of occupational exposure to blood borne pathogens including HIV/AIDS risk factors. The duties of housekeepers in the health institutions include collection and disposal of waste materials such as sharp objects and other contaminated items; cleaning rooms and toilets, and washing contaminated bed sheets. Therefore, this category of HCWs could have been exposed to HIV/AIDS risk factors due to misplaced or mishandling of sharp objects and other contaminated items while they discharge their aforementioned duties. Even, in this study alone, only 27.3% of exposed housekeepers utilized PEP for their exposure against HIV/AIDS risk factors, which means the rest 72.7% were left unprotected against HIV infection.

### *Work environment and behavioural characteristics of health care workers*

Majority, 131 (80.9%) of HCWs reported that their workplace lacks any written protocol for reporting their exposure conditions, and 75.3% reported that they did not take any training on infection prevention. Pertaining to behavioural characteristics of HCWs, 33.3%, 6.8%, and 3.7% drink alcohol, chew khat and smoke cigarette, respectively. Despite the great majority (94.4%) of HCWs perceived that exposure to HIV/AIDS risk factors is risky, only 52 (32.1%) of them never recapped needles at all (Table II).

### *Factors associated with PEP uptake*

Behavioural characteristics such as alcohol drinking status ($X^2$= 6.31, P < 0.011) and reporting accidental

**Table II. Work environment and behavioural characteristics of healthcare workers**

| Variables | Number | Percent |
|---|---|---|
| **Took training on infection prevention** | | |
| Yes | 40 | 24.7 |
| No | 122 | 75.3 |
| **Existence of written protocol for reporting exposure to HIV/AIDS risk factors at workplace** | | |
| Yes | 31 | 19.1 |
| No | 131 | 80.9 |
| **Drink alcohol (current status)** | | |
| Yes | 54 | 33.3 |
| No | 108 | 66.7 |
| **Chew khat (current status)** | | |
| Yes | 11 | 6.8 |
| No | 151 | 93.2 |
| **Smoke cigarette (current status)** | | |
| Yes | 6 | 3.7 |
| No | 156 | 96.3 |
| **Exposure to HIV/AIDS risk factors is** | | |
| Risky | 153 | 94.4 |
| Not risky | 9 | 5.6 |
| **Recap needles after use** | | |
| Yes | 52 | 32.1 |
| No | 110 | 67.9 |

occupational exposure to HIV/AIDS risk factors ($X^2$= 66.877, P < 0.001) had statistically significant association with PEP utilization among HCWs. Also, gender is significantly associated HIV PEP uptake ($X^2$= 6.503, P < 0.011) (Table III).

## Discussion

This study implies that the Ethiopian health system should scale up PEP uptake in order to ascertain and prevent HIV/AIDS infection due to occupational exposures in healthcare setups because work-related accidental exposures need urgent medical attention to ensure timely post-exposure management.

As part of occupational safety measures, despite all exposed HCWs are required to take PEP against accidental exposure to HIV/AIDS risk factors, only 25.3% of exposed HCWs received PEP for their exposures against HIV/AIDS risk factors. This finding is similar with the study done in Kenya,[20] where 25% of the exposed HCWs took a course of PEP against HIV/AIDS. However, this figure is high as compared to the studies conducted in India[21] and Nepal,[22] where only 7.8% HCWs and none of the total exposed nurses to HIV/AIDS risk factors took PEP services, respectively. This remarkably low rate of PEP utilization among HCWs may be largely attributed to HCWs fear of getting HIV tested, fear of drug side effects, lack of established regulations and absence of legislation for PEP utilization following occupational exposure to HIV/AIDS risk factors. Moreover, the low level of PEP utilization among HCWs highlights the need for improvement in occupational health and safety to prevent transmission of HIV/AIDS. Negligence

**Table III. Association of some variables with HIV PEP use behaviour of healthcare workers**

| | Took PEP | | | |
|---|---|---|---|---|
| **Variable** | **Yes** | **No** | **$X^2$** | **P-value** |
| **Sex** | | | | |
| Male | 19 (11.7%) | 83 (51.2%) | 6.503 | 0.011 |
| Female | 22 (13.6%) | 38 (23.5%) | | |
| **Age group** | | | | |
| 20-29 | 24 (14.8%) | 82 (50.6%) | 1.386 | 0.500 |
| 30-39 | 14 (8.6%) | 30 (18.5%) | | |
| 40-54 | 3 (1.9%) | 9 (5.6%) | | |
| **Job category** | | | | |
| House keeper | 6 (3.7%) | 16 (9.9%) | 8.952 | 0.176 |
| Nurse | 9 (5.6%) | 45 (27.8%) | | |
| Midwifery | 7 (4.3%) | 13 (8%) | | |
| Health officer | 2 (1.2%) | 6 (3.7%) | | |
| Laboratory technologist | 7 (4.3%) | 7 (4.3%) | | |
| Anaesthetist | 1 (0.6%) | 9 (5.6%) | | |
| Physician | 9 (5.6%) | 25 (15.4%) | | |
| **work experience in years** | | | | |
| < 5 | 28 (17.3%) | 88 (54.3%) | 0.578 | 0.749 |
| 5-10 | 6 (3.7%) | 18 (11.1%) | | |
| >10 | 7 (4.3%) | 15 (9.3%) | | |
| **Reported the exposure** | | | | |
| Yes | 35 (21.6%) | 19 (11.7%) | 66.877 | 0.001 |
| No | 6 (3.7%) | 102 (63%) | | |
| **Drink alcohol (current status)** | | | | |
| Yes | 7 (4.3%) | 47 (29%) | 6.531 | 0.011 |
| No | 34 (21%) | 74 (45.7%) | | |

accounted for the highest percentage (49.6%) among the major reasons for not receiving PEP following exposure to HIV/AIDS risk factors. This finding signifies the need to provide education and infection prevention/safety training programs for HCWs to practice precaution behaviours such as taking PEP and avoiding the risk of acquiring HIV/AIDS following exposure to HIV/AIDS risk factors.

In the current study, despite majority (75.3%) of the HCWs lack training on infection prevention, only 5.6% of the study participants had the perception that exposure to HIV/AIDS risk factors is not risky. This finding is lower than the report of the study done in Northern Nigeria, where 19.2% of all participants believe that they are not at risk of being infected with HIV/AIDS as a result of occupational exposure.[23] This difference in perception about the risk of infection associated with accidental occupational exposure to HIV/AIDS risk factors might be linked to difference in level of awareness and information about occupational hazards associated with occupational transmission of HIV to HCWs in health care setups.

In another study,[19] gender was not statistically associated with HIV PEP utilization. However, in the current study gender is significantly associated with PEP utilization against HIV/AIDS ($X^2 = 6.503$, $P < 0.011$), which could probably be explained by the fact that priority would be given for women should there be shortage of drugs (PEP) in the health facilities. The other reason may be due to the fact that females have high responsibilities in the household for baby care such as breast feeding, which imposes them to undergo the necessary protective precautions because once they are affected by the virus, they could easily transmit it to their babies and other members of the family.

Reporting occupational exposure to HIV/AIDS risk factors showed strong association with HIV PEP uptake among HCWs ($X^2 = 66.877$, $P < 0.001$). It has also been proved that failure to report accidental occupational exposure to HIV/AIDS risk factors increases the risk of HIV infection, since no post exposure preventive measures are taken to reduce the risk of infection. This in fact, should be an avoidable behaviour as non reporting HCWs are left unprotected against a potential risk of infection that could have been prevented if post exposure tests and treatment were implemented.[24,25]

There was no significant difference in HIV PEP uptake among job category ($X^2 = 8.952$, $P < 0.176$), and this has also been observed in relation to other type of PEP utilization (occupational groups/job category of HCWs was not statistically associated with immunization with HBV vaccine).[26] This could be explained by the fact that all these categories of HCWs work in the same work environment and work culture, and thus, may have equal access to different sources of information regarding health and safety issues in the healthcare setups.

This study also depicted association between drinking alcohol and HIV PEP utilization ($X^2 = 6.31$, $P < 0.011$), which might be due to the fact that drinking alters behaviour and is linked to anxiety disorders,[27] which can lead to a tendency towards risky behaviours and poor compliance with the precautions such as HIV PEP utilization. Probably, the other possible explanation is that non drinkers are perhaps conscious to take the necessary precautions once they are exposed to potential HIV/AIDS risk factors, contrary to drinkers.

## Conclusion

The great majority of HCWs fail to utilize HIV PEP following accidental exposure to HIV/AIDS risk factors, which leads to a high risk of healthcare associated HIV infection. Gender, reporting occupational exposure and drinking alcohols were factors significantly associated with HIV PEP uptake by HCWs against accidental exposure to HIV/AIDS risk factors. Thus, there is a need for provision of training on infection prevention and development of guidelines outlining reporting mechanism and procedure to be followed for PEP and follow-up testing.

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