

Knowledge and Practice of Healthcare Workers (HCWs) on HIV Post Exposure Prophylaxis in Bindura District, Zimbabwe

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Abstract:

Background: Occupational exposures to HIV are relatively common among Health Care Workers (HCWs), especially nurses in the wards as they are in direct contact with patients, some of whom are HIV positive. Their chances of percutaneous and mucocutaneous exposure are very high. Practising universal guidelines may greatly reduce HCWs' occupational exposures.

Materials and Methods: A sample of 92 HCWs was selected using simple random sampling to assess knowledge and practice of HIV Post-Exposure Prophylaxis (PEP) at Bindura Provincial Hospital, Zimbabwe. A cross-sectional descriptive research design was used. Statistical Package for the Social Sciences (SPSS) was used to analyse data.

Results: The study revealed that 67.4% HCWs had inadequate knowledge on PEP. Furthermore, HCWs remain reluctant to report exposure to HIV and fail to seek management as only 9 (22.5%) out of the 40 exposed respondents received PEP while the majority 31 (77.5%) did not receive PEP.

Conclusion: Health Care workers (HCWs) take inadequate preventive measures due to lack of knowledge on PEP. Therefore, there is need for the infection control team to provide regular training to all HCWs on PEP. Health care educators also need to strengthen PEP component in their curricula.

Key words: Knowledge; Practice; Post-exposure Prophylaxis; Occupational Exposure; HIV; Healthcare workers

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I. Introduction

HIV can be transmitted through needle stick injuries (percutaneous) or mucosal exposure of the eyes and mouth (mucocutaneous). Although the chances are very low, health care workers have been infected and are at risk. Mucocutaneous and percutaneous injuries are common in the wards mainly to those who are in contact with the patients particularly nurses and doctors who handle sharp instruments during the procedures and work with infectious body fluids such as blood and cerebrospinal fluid. Policies are in place in healthcare sectors which help to reduce the risk of occupational exposure and this includes the guideline and proper handling of sharps and body fluids as well as Post Exposure Prophylaxis (PEP). PEP is a medical response given to prevent the transmission of pathogens after exposure.

PEP for HIV refers to a set of comprehensive services to prevent HIV infection in exposed individuals. These services include, first aid care, counselling and risk assessment, HIV testing based on informed consent, and depending on risk assessment, the provision of short term (28 days) antiretroviral (ARV) drugs, with follow up and support (ILO/WHO 2016). PEP is an antiretroviral treatment that may prevent HIV infection after the virus has entered the body. PEP has been available for HIV prevention since the early 1990s for health care workers who have had needle stick or similar injuries.

Occupational exposure is common among HCWs, especially nurses in the wards as they are in direct contact with patients, some of whom are HIV positive. Their chances of percutaneous and mucocutaneous exposure are very high. The overall rate of HIV transmission through percutaneous inoculation (that is by needle prick or other instruments that pierce the skin) is widely reported to be 0.3% (WHO, 2016). Furthermore, WHO (2016) revealed that splashes of infectious material to mucous membranes (for example conjunctivae or oral mucosa) or broken skin may also transmit HIV infection (estimated risk per exposure is 0.09%).

According to the Zimbabwe Ministry of Health and Child Care (ZMHCC, 2013) in the event of an injury with a sharp object, such as a needle or scalpel, that has been used on a patient or in the event of a mucous surface being contaminated with blood or secretions from a patient, the following steps should be

followed: wash the exposed area thoroughly with soap and water, rinse the eye or mouth with plenty of water if contaminated. The injury should be reported to a senior member of staff or the victim's immediate supervisor. Start the ARVs recommended for post-exposure prophylaxis immediately – these should be started within 1 hour if possible and at the latest within 72 hours of the exposure. Both patient and health care worker should be referred for HIV counselling and testing.

Ascertain HIV status of both the patient and health care worker. If patient is HIV negative and health worker is HIV negative, stop PEP, offer supportive counselling and follow up. Repeat HIV test at 6 weeks, then 3 months and 12 months after initial test, if HIV positive, provide appropriate care and counselling and refer for expert opinion. If negative, counsel the HCW. If health worker is negative and patient is HIV positive or unknown source or patient refuses testing, assume positivity. Complete 4 weeks of PEP and offer supportive counselling. Repeat HIV test at 6 weeks, 3 months and 12 months after initial test, if HIV positive, provide appropriate care and counselling and refer for expert opinion. If negative, counsel the HCW. If the health worker is HIV positive, stop PEP, counsel and refer to specialist or Opportunistic Infections (OI) department. Immediately after exposure, all exposed health care workers should take Zidovudine 300mg orally twice daily, Lamivudine 300mg orally once daily and Atazanavir (300mg) / ritonavir 100mg orally once daily for one month (ZMHCC, 2013).

Although, the Zimbabwe Ministry of Health and Child Care (ZMHCC) has clear guidelines following exposure, HCW at times do not properly follow the guidelines following exposure, thus exposing themselves to high risk of seroconversion due to delays in taking PEP. Timely PEP is believed to reduce the risk of seroconversion to HIV by 81% if taken appropriately. So if health care workers are equipped with knowledge about PEP then incidences of seroconversion can be reduced.

According to Bindura district health information department (2022), unpublished, there were 44 reported cases of occupational exposure to HIV from October to December 2021 in Bindura district. Thirteen (13) of the exposed accessed PEP but only 4 were reported to have completed the PEP. The number of those who completed PEP is low considering the percentage of patients that test HIV positive among those who seek treatment in health care centers.

At Bindura Provincial Hospital, one case of occupational exposure to HIV was reported in 2020, and the exposed worker was a student nurse. In 2021 six cases were reported, of which two were general hands, two student nurses, one general nurse and a medical doctor. In 2022, three cases were reported, was a student nurse and two were general nurses. Six cases were reported in 2022, of which three were student nurses, two general nurses and a primary counselor. In 2021, three cases were reported, one general hand, a student nurse and a health information officer. However, of all the reported cases of occupational exposure to HIV at Bindura Provincial Hospital, none was reported in maternity department (Bindura Hospital health information department 2022, unpublished). These figures show that there is relatively high occupation exposure to HIV among HCWs. Therefore, there is need to assess knowledge and practice of healthcare workers (HCWs) on HIV post exposure prophylaxis in Bindura District.

II. Material And Methods

Study Design: A cross-sectional descriptive research design was used to conduct the study. **Study Location:** Bindura Provincial Hospital.

Sample size:

A sample of 92 participants (doctors, nurses and student nurses) was drawn from the health care workers in the outpatient department, theatre, children's ward, male ward, female ward, maternity department, eye unit, OI clinics and Family and Child Health department using simple random sampling method.

Data Collection and Analysis:

Data was collected using a self-administered questionnaire. The questionnaire was constructed from relevant literature specifically for this study. It had 3 sections: section A: Demographic data, section B: Knowledge of PEP and section C: Practice of PEP. It was verified by experts at Zimbabwe Open University and Bindura University in the Department of Health Science, to ensure content validity. Six questionnaires were administered to registered nurses at Mvurwi Hospital to test the reliability of the questionnaire. No corrections were made after the pilot study. Data was collected from Monday to Friday in May 2022. Questionnaires were distributed to the selected participants and were collected the following day from the Nurse-in-Charge who kept them in a lockable cupboard in the ward. The highest total possible knowledge score was 36. A score of 0 – 26 indicated inadequate knowledge and a score of 27 – 36 indicated adequate knowledge on the designed total knowledge level score.

Permission to carry out the study was obtained from the Bindura University Research Ethics Board, the Provincial Medical Director Mashonaland Central as well as the Medical Superintendent and Senior Nursing

Officer of Bindura Provincial hospital. Through the nurses-in-charge, the study participants were given a written informed consent forms to sign and verbal information on the purpose of the study. The participants' voluntary freedom to participate or withdraw from participating was clarified. The completed questionnaires were kept in a lockable cupboard and only the researchers had access to the questionnaires and they were destroyed after the research to ensure confidentiality. Code numbers were also used to ensure anonymity of the participants. Data was analyzed using Statistical Package for the Social Sciences (SPSS) version 16, 2012.

III. Results and Findings

Demographic Data

Thirty-six (39.1%) of the respondents were in the age category of 26 to 30 years. Females constituted the majority of the respondents 77 (83%). There were 4 (4.3%) doctors, 46 (50.0%) senior nurses, 3(3.3%) nurses-in-charge, 22 (23.9%) junior nurses as well as 17 who participated in the study. The majority of the respondents 59 (64.1%) had a working experience of 5 years and below. Most of the respondents 21 (22.8%) were working in maternity department, 17 (18.5%) of in the OPD, 14 (15.5%) in the male ward and 14 (15.5%) in the female ward (Table 1).

Table 1: Demographic Data (n = 92)

Variable	Frequency (n)	Percentage (%)
Age in years		
20-25	8	8.7
26-30	36	39.1
31-35	27	29.3
36-40	12	13.0
41-45	6	6.5
46 and above	3	3.3
Sex		
Male	15	16.3
Female	77	83.7
Designation		
Nurse-in-charge	3	3.3
Senior nurse	46	50.0
Junior nurse	22	23.9
Doctor	4	4.3
Student nurse	17	18.5
Working experience in years		
0-5	59	64.1
6-10	25	27.2
11-15	4	4.3
16-20	1	1.1
21 and above	3	3.3
Working area		
Operating Theatre	7	7.6
OPD	17	18.5
Maternity	21	22.8
Male ward	14	15.2
Female ward	14	15.2
Children's ward	9	9.8
OI Clinic	3	3.3
Eye Unit	7	7.6
Total	92	100

Knowledge on Post Exposure Prophylaxis

The majority of the respondents 48 (52.2%) did not give correct definition of PEP while 44 (47.8%) knew the correct definition of PEP. Quite a large number 65(70.7%), could identify the correct first aid action followed after needle stick injury (NSI). Seventy-two (78.3%)of the respondents could correctly outline the first aid action following splashes of potentially infectious fluids and 71 (77.2%) knew who should be informed first post occupational exposure. However, 23(25.0%) of the respondents did not know first aid action following NSI, 17 (18.5%) did not know first aid action to be taken following splashes of potentially infectious fluids, 19 (20.7%) of the respondents knew where PEP is found (Table 2).

The majority 89 (96.7%) of the respondents had knowledge of how soon should you commence PEP after an exposure. However, there was lack of knowledge on drug regimen that is used for PEP as 34 (37.0%) of

the respondents did know the correct regimen and 45 (48.9%) gave incorrect answers (Table 2). Fifty-four (58.7%) of the respondents failed to give correct answers on the time frame PEP is taken. Half 46 (50.0%) of the respondents did not know the percentage of percutaneous injuries that results in transmission of HIV and 21 (22.8%) gave incorrect answers. Furthermore, 57 (62.0%) of the respondents did not know the percentage of mucocutaneous exposure which results in transmission of HIV while 24 (26.0%) gave incorrect answers (Table 2).

A quarter of the respondents could not identify correctly that timely PEP is believed to reduce risk of seroconversion by 81% while 36 (39.1%) did not know. Twenty-seven (29.7%) of the respondents incorrectly identified type of sharps likely to increase risk of HIV infection while the majority 54(58.7%) were knowledgeable. Eighty (87.0%) of the respondents were knowledgeable of the high risk body fluids while 12 (13.0%) did not know (Table 2).The majority of the respondents 62 (67.4%) had inadequate knowledge on PEP by scoring 26 and below on the knowledge scores while 30 (32.6%) scored 27 to 36 scores.

Table 2: Knowledge on Post Exposure Prophylaxis (N = 92)

Variable	Response		
	Do not know	Incorrect	Correct
First aid action taken following stick needle injury	23 (25.0%)	4 (4.4%)	65 (70.7%)
First aid action following splashes of potentially infectious fluids	17 (18.5%)	3 (3.3%)	72 (78.3%)
Who should be informed first following occupational exposure	15 (16.3%)	6 (6.5%)	71 (77.2%)
Where is PEP found	19 (20.7%)	17 (18.5%)	56 (60.9%)
How soon should you commence PEP after an exposure	2 (2.2%)	1 (1.1%)	89 (96.7%)
For how long is PEP taken	7 (7.6%)	54 (58.7%)	31 (33.7%)
Drug regimen is used for PEP	34 (37.0%)	45 (48.9%)	13 (14.1%)
Percentage of percutaneous injuries that results in transmission of HIV	46 (50.0%)	21 (22.8%)	25 (27.2%)
Percentage of mucocutaneous exposure resulting in transmission of HIV	57 (62.0%)	24 (26.0%)	11 (12.0%)
Timely PEP can reduce risk of seroconversion by 81%	36 (39.1%)	23 (25.0%)	33 (35.9%)
Type of sharps is likely to increase risk of infection	11 (12.0%)	27 (29.7%)	54 (58.7%)
High risk body fluids	12 (13.0%)	0 (0.0%)	80 (87.0%)

Practices on PEP

Table 3 shows that 62 (67.4%) of respondents read PEP guidelines in the ward or department they work in while 30 (32.6%) never read the guidelines. Over half of the respondents 52 (56.5%) had never had input on PEP through workshops or in-service training. Fifty-six (60.9%) reported that curriculum at school had input on PEP while 36 (39.1%) reported that did not have input on PEP.

Forty (43.5%) of the respondents were at one point exposed accidentally to HIV infection at work. Of the 40 respondents who were exposed to HIV at work, 16 (40%) were exposed through inoculation only, 21 (22.5%) were exposed through splashes only and 3 (7.5%) were exposed through both. Only 9 (22.5%) out of 40 exposed respondents received PEP. The majority 31 (77.5) did not receive PEP (Table 3).

The highest number of those exposed to HIV accidentally were senior nurses 23/40 (57.5%); 15/40 (37.5%) of these senior nurses were working in maternity department. Only 3/40 (7.5%) working in maternity department received PEP. In total 18/23 (78.3%) of these senior nurses did not receive PEP. Out of the 12 student nurses who participated in the study 5 were exposed accidentally to HIV infection and all the 5 did not receive PEP. Two out of the three (2/3) of the nurses-in-charge were exposed to infectious material and all these 2 did not receive PEP. Three doctors were exposed to infectious material and 2 of these received PEP.

Table 3: Practices on PEP (n=92)

Variable	Frequency (n)	Percentage (%)
Read PEP guidelines in department		
Yes	62	67.4
No	30	32.6
In-service training on PEP		
Yes	40	43.5
No	52	56.5
PEP in school curricula		
Yes	56	60.9
No	36	39.1
HIV exposure at work		
Yes	40	43.5
No	52	56.5
Total	92	100
Type of exposure		
Inoculation	16	40.0

Splash	21	52.5
Both	3	7.5
Did you receive PEP		
Yes	9	22.5
No	31	77.5
Total	40	100

Reasons for not receiving PEP

The major reasons cited by respondents for failure to receive PEP are: Lack of knowledge on where to get PEP and the procedure 12 (38.6%), afraid of side effects of ARVs 8 (25.8%) and fear of getting tested of HIV 5 (16.6%) (Table 4).

Table 4: Reasons for not receiving PEP (n=31)

Reason(s) for not receiving PEP	Frequency (n)	Percentage (%)
Lack of knowledge on where to get PEP	12	38.6
Patient was HIV negative	1	3.2
On ART, therefore PEP was not necessary	1	3.2
Fear of getting tested for HIV	5	16.6
Thought the patient was HIV negative	1	3.2
Afraid of side effects of ARVs	8	25.8
PEP was out of stock	2	6.5
It is a usual occurrence in the labour ward due to lack of protective clothing so you can't get tested everyday	1	3.2
Total	31	100

IV. DISCUSSION

Knowledge of Post-exposure Prophylaxis (PEP) is very important to health care workers as it guides their practice. The results revealed that the majority of the respondents (70.7%) knew that following a needle stick injury one should promote active bleeding of the site; wash thoroughly with soap and flush mucous membranes with copious amounts of water following splashes with potentially infectious fluids (78.3%). Furthermore, a larger number (77.2%) knew that the immediate supervisor should be informed first post occupational exposure. This high level of knowledge is very encouraging as it can lead to high uptake of PEP.

Although a large number of respondents 96.7% knew that HIV PEP should be commenced within 1 hour if possible and at the latest within 72 hours, 48.9% could not give the correct drug regimen used for PEP in Zimbabwe while (51.1%) did not know. Fifty-four (58.7%) of the respondents did not know that PEP is taken for 1 month. These results concur with previous findings by Tshering et al (2020) where the majority (89.6%) of our participants failed to identify single ARV drug used as prophylaxis against HIV after exposure and 80.1% of participants in the study had poor knowledge regarding PEP for HIV.

Half of the respondents (50.0%) did not know that 0.3% of percutaneous injuries results in transmission of HIV and 62.0% of the respondents did not know that 0.09% of mucocutaneous exposure results in transmission of HIV. A quarter of the respondents did not know that timely PEP reduces risk of seroconversion by 81% while 39.1% did not know. This is a quite significant number of HCWs who had no knowledge of the level of risk of HIV transmission through accidental exposure. This lack of knowledge results in poor uptake of PEP.

Over half of the respondents (58.7%) were knowledgeable about the type of sharps likely to increase risk of HIV infection. Eighty (87.0%) of the respondents were knowledgeable of the high risk body fluids. This high level of knowledge is important in practice as it reduces accidental exposures as HCWs will take precautions when working with these high risk body fluids in the clinical area. Quite a large number of the respondents (67.4%) had inadequate knowledge on PEP by scoring 26 and below out of the maximum possible score of 36 on the designed knowledge scores instrument while only 32.6% had adequate knowledge by scoring between 27 and 36 scores. This shows inadequate knowledge of PEP which is consistent with previous studies by Shamil et al (2021), Tshering et al (2020) and Kimaro et al (2018) who also revealed inadequate knowledge levels on PEP among participants.

Over two-thirds of respondents (67.4%) had read PEP guidelines in their respective wards or departments while a small but significant number (32.6%) never read the guidelines. This calls for proper induction when these HCWs are joining the various departments. There is need for frequent workshops or in-service training on PEP as quite a significant number of respondents (56.5%) had never had input on PEP through workshops or in-service training and (39.1%) reported that their school curriculum did not have input on PEP.

Of the 40 (43.5%) respondents who were exposed to HIV at work, only 9 (22.5%) received PEP and the majority 31 (77.5%) did not receive PEP. This shows very poor uptake of PEP. These results are consistent

with previous Kimaro et al (2018) who reported that only 26.4% used PEP and Mponela et al (2015) who also report poor uptake of PEP. Furthermore, Ajibola et al (2014) reported poor uptake as only 6.3% participants received PEP. A study also by Mabwe et al (2017) and Kezang et al (2020) also reported poor uptake of PEP.

The highest number of those exposed to HIV accidentally were senior nurses 23/40 (57.5%); 15/40 (37.5%) these senior nurses were working in maternity department. This shows that most senior nurses might not be taking precautionary measures to prevent accidental exposure and also a lack of proper protective clothing in the maternity department. Only 3/40 (7.5%) working in maternity department received PEP. In total 18/23 (78.3%) of these senior nurses did not receive PEP. Also all the 2 exposed nurses-in-charge did not receive PEP. This shows very poor uptake of PEP among senior nurses (nurses-in-charge included) which might be as a result of poor attitude. These nurses are supposed to be mentors for the junior nurses and student nurses. This might explain why all the exposed 5 student nurses did not receive PEP. This is supported by findings Mponela et al (2015), Mushambi et al (2021) and Sadia Shakeel_(2022) that cited lack of understanding the value of reporting and lack of support and encouragement to report.

The major reasons cited by respondents for failure to receive PEP were: Lack of knowledge on where to get PEP (38.6%), afraid of side effects of ARVs (25.8%) and fear of getting tested of HIV (16.6%). These barriers are similar to those reported by Bareki et al (2018).

V. CONCLUSION

The study revealed that these health care workers had inadequate knowledge of PEP. The uptake of PEP following accidental occupational exposure to potentially HIV infectious material was very poor. Therefore, there is need for the infection prevention and control department to provide regular training to all HCWs on management of inoculation injuries and splashes by infectious fluids. All HCWs should be offered regular refresher courses on PEP to keep the workers abreast with current information.

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